Great Basin:

An Ecoregion-based Conservation Blueprint

The Nature Conservancy®
of Nevada

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Many individuals and institutions contributed their knowledge, passion, and support to the making of this first conservation blueprint of the Great Basin ecoregion. For a listing of the 172 individuals contacted as experts refer to appendix 6. We thank each and everyone for their contributions to this effort without which a weaker plan would have emerged. Their knowledge of distributions, abundances, and viabilities of ecological systems, natural communities, and species, as well as current threats and management opportunities, was critical. We also thank the agencies and academic institutions involved in this process, in particular, the Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, Department of Defense, Nevada Division of Wildlife, Utah Division of Wildlife Resources, University of Nevada–Reno, and Utah State University.

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Three or four little puddles, an interminable string of crazy, warped, arid mountains with broad valleys swung between them; a few waterholes, a few springs, a few oasis towns and a few dry towns dependent for water on barrels and horsepower; a few little valleys where irrigation is possible and where the alfalfa looks incredibly green as you break down out of the pass; a desert more vegetationless, more indubitably hot and dry, and more terrible than any desert in North America except possibly Death Valley; an uncounted wealth of minerals—gold, silver, lead, zinc, copper, mercury, antimony—that about sums up the Great Basin.

Its rivers run nowhere but into the ground; its lakes are probably salty or brackish; its rainfall is negligible and its scenery depressing to all but the few who have lived in it long enough to acquire a new set of values about scenery. Its snake population is large and its human population small. Its climate shows extremes of temperature that would tire out anything but a very strong thermometer. It is a dead land, though a very rich one.

Wallace Stegner, *Mormon Country*, 1942

I. GREAT BASIN: An Ecoregion-based Conservation Blueprint

A. Summary

Overview

The mission of The Nature Conservancy is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. To achieve this mission, the Conservancy has determined that we must plan and work at larger geographic scales than we have historically. In *Conservation by design: a framework for mission success*, we outline the need to plan for site-based actions to conserve biodiversity within ecologically-defined areas called ecoregions (The Nature Conservancy 1996 and 2000a). Ecoregions are relatively large areas of land and water delineated by biotic and environmental factors that regulate the structure and function of ecosystems within them. Planning at the ecoregional level will help maximize the chances of capturing all conservation targets in sufficient numbers and distribution for their long-term survival. The Conservancy adopted ecoregion units delineated by Bailey *et al*. (1995) and amended by the National Ecoregional Working Group (Bailey 1998, The Nature Conservancy 1997) for conservation planning in the United States. Figure 1 is a map of the ecoregions of the U.S.

Our conservation vision, as stated in *Conservation by Design*, is the long-term survival of all viable native species, natural communities, and ecological systems through the design and conservation of functional conservaton areas within ecoregions. The design of functional conservation areas, called an ecoregional portfolio, would collectively conserve native species and ecological systems both representative of and unique to an ecoregion if properly protected and managed. Guidelines for this ecoregion-based conservation approach are outlined in *Designing a geography of hope: guidelines for ecoregion-based conservation* (The Nature Conservancy 1997 and 2000b). We believe that by following this approach the Conservancy and others will achieve a greater vision of conservation success. The four fundamental components of the approach include setting priorities through ecoregional planning, developing strategies through site conservation planning, taking direct conservation action, and measuring conservation success. By assessing the long term reduction of critical threats and maintaining or enhancing biodiversity health, we will be able to measure success. Conservation partners are crucial to the quality and success of ecoregion-based conservation, especially in the largely publicly-owned Great Basin.

This blueprint for the Great Basin identifies 358 potential conservation areas that fully represent the ecological systems, natural communities, and species characteristic of the ecoregion. The portfolio sites complement one another by harboring different assemblages of conservation targets and simultaneously, providing for maximum efficiency by incorporating the least area possible. These sites will be the focus of conservation activities for the coming years, and if we succeed in protecting them, the long-term survival of viable, vulnerable plants, animals, and natural communities in the Great Basin will be ensured.

The Great Basin encompasses more than 72 million acres of semidesert from the east slope of the Sierra Nevada across much of Nevada to the west half of Utah. It is topographically and physiographically diverse with about 300 mountain ranges separating characteristically long, broad valleys. Elevations range over 13,000 feet across the ecoregion and culminate at 14,426 feet in the White Mountains of California. Large matrix forming sagebrush and salt desert

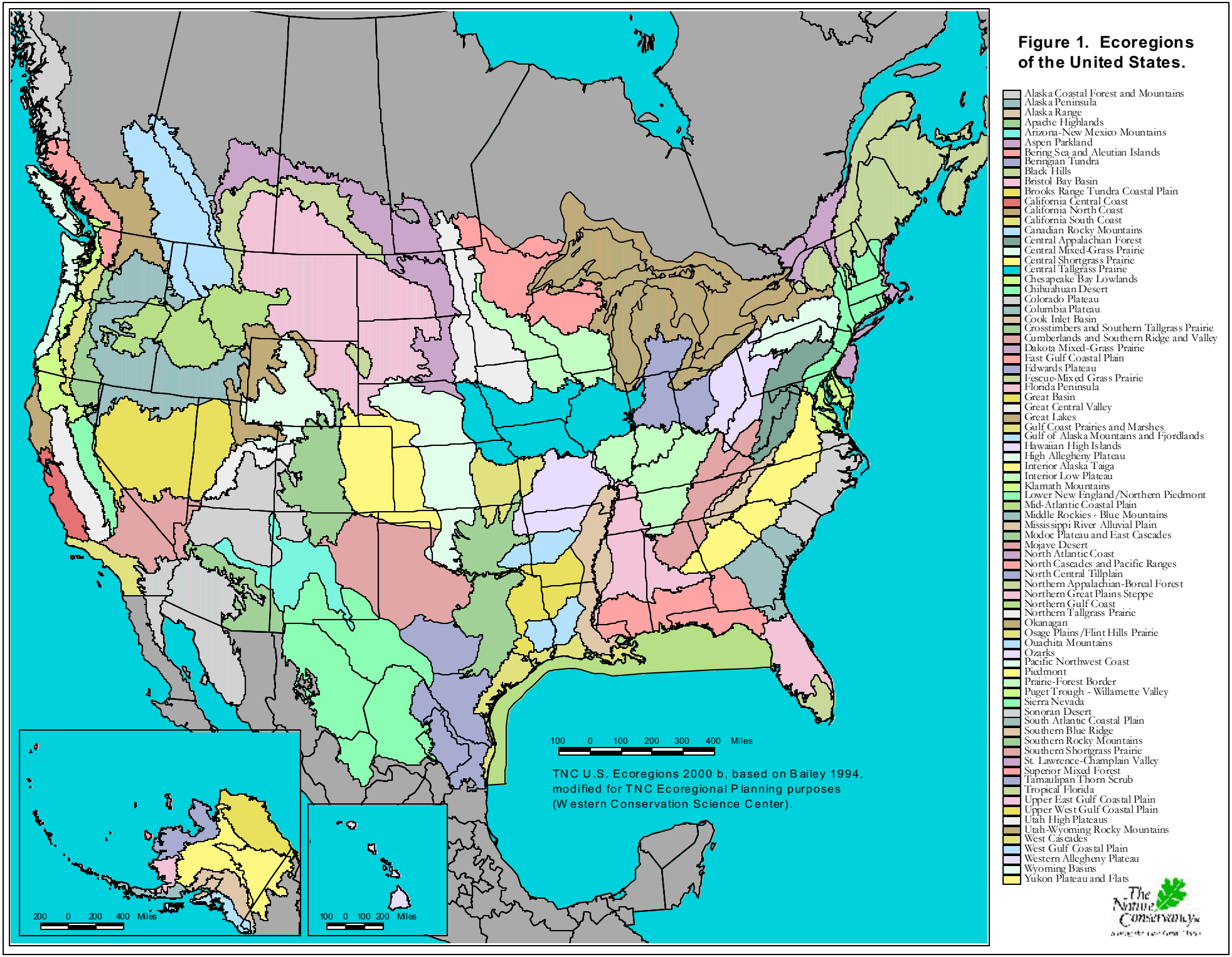


Figure 1. Ecoregions of the United States.
Alaska Coastal Forest and Mountains
Alaska Peninsula
Alaska Range
Apache Highlands
Arizona-New Mexico Mountains
Aspen Parkland
Bering Sea and Aleutian Islands
Beringian Tundra
Black Hills
Bristol Bay Basin
Brooks Range Tundra Coastal Plain
California Central Coast
California North Coast
California South Coast
Canadian Rocky Mountains
Central Appalachian Forest
Central Mixed-Grass Prairie
Central Shortgrass Prairie
Central Tallgrass Prairie
Chesapeake Bay Lowlands
Chihuahuan Desert
Colorado Plateau
Columbia Plateau
Cook Inlet Basin
Crosstimbers and Southern Tallgrass Prairie
Cumberlands and Southern Ridge and Valley
Dakota Mixed-Grass Prairie
East Gulf Coastal Plain
Edwards Plateau
Fescue-Mixed Grass Prairie
Florida Peninsula
Great Basin
Great Central Valley
Great Lakes
Gulf Coast Prairies and Marshes
Gulf of Alaska Mountains and Fjordlands
Hawaiian High Islands
High Allegheny Plateau
Interior Alaska Taiga
Interior Low Plateau
Klamath Mountains
Lower New England/Northern Piedmont
Mid-Atlantic Coastal Plain
Middle Rockies - Blue Mountains
Mississippi River Alluvial Plain
Modoc Plateau and East Cascades
Mojave Desert
North Atlantic Coast
North Cascades and Pacific Ranges
North Central Tillplain
Northern Appalachian-Boreal Forest
Northern Great Plains Steppe
Northern Gulf Coast
Northern Tallgrass Prairie
Okanagan
Osage Plains/Flint Hills Prairie
Ouachita Mountains
Ozarks
Pacific Northwest Coast
Piedmont
Prairie-Forest Border
Puget Trough - Willamette Valley
Sierra Nevada
Sonoran Desert
South Atlantic Coastal Plain
Southern Blue Ridge
Southern Rocky Mountains
Southern Shortgrass Prairie
St. Lawrence-Champlain Valley
Superior Mixed Forest
Tamaulipan Thorn Scrub
Tropical Florida
Upper East Gulf Coastal Plain
Upper West Gulf Coastal Plain
Utah High Plateaus
Utah-Wyoming Rocky Mountains
West Cascades
West Gulf Coastal Plain
Western Allegheny Plateau
Wyoming Basins
Yukon Plateau and Flats
100 0 100 200 300 400 Miles
TNC U.S. Ecoregions 2000 b, based on Bailey 1994,
modified for TNC Ecoregional Planning purposes
(Western Conservation Science Center).
200 0 200 400 Miles
100 0 100 200 Miles
The Nature Conservancy

communities are representative of the ecoregion. Isolated mountain tops, isolated aquatic habitats in valley bottoms, and unusual badlands and sand dunes highlight habitats with unique biological diversity in the Great Basin.

More than 78% of the ecoregion is federally managed lands, while private lands encompass the second largest land ownership category. The primary land managers, in order of the extent that they manage are the Bureau of Land Management (BLM), private lands, U.S. Forest Service (USFS), Department of Defense (DOD), State Parks and trust lands, U.S. Fish and Wildlife Service (FWS), tribal lands, and Department of Energy (DOE). This mix provides multiple challenges as well as opportunities to partner our conservation efforts in the Great Basin.

Conservation Targets and Goals

The ecoregion is characterized by salt desert scrub and sagebrush shrublands in the valleys and on lower slopes, and by pinyon-juniper woodlands, mountain sagebrush, open conifer forests, and alpine areas in the mountain ranges. Nestled within and running through these characteristic ecological systems are important aquatic, riparian, wetland, badland, and dune habitats. Numerous plants and animals are endemic to this cold desert ecoregion. The planning team assembled a list of 675 plants, animals, ecological systems, aquatic habitats, and rare terrestrial plant communities as Great Basin conservation targets to drive the selection of conservation areas for protection.

To supplement an initial database of nearly 2800 viable occurrences of targeted species and terrestrial community information culled the natural heritage programs of California, Nevada, and Utah, we gleaned data from published literature and unpublished documents, and met with numerous experts from a variety of government agencies, universities, and private firms. We collected information on the locations, range distributions, abundances, and viability of the conservation targets. We also collected information on the sizes of their populations, conditions of their habitats, ecological processes needed to maintain those habitats over the long-term, and threats to those processes. Altogether, the biological experts nearly doubled the number of viable occurrences of conservation targets and they delineated 660 potential sites for conservation attention. Additionally, we used ecological models of vegetation and physical gradients to map the diversity of ecological systems throughout the Great Basin, which was valuable in the absence of specific plant community location data.

Conservation goals were established for each conservation target based on their global distribution, rarity, and vulnerability. All known viable and feasibly restorable occurrences of imperiled species, imperiled plant communities, and all aquatic species targets were sought. Less rare species had less robust goals based on their geographic distributions while representative ecological systems had goals based on overall extent and minimum size criteria. We used the six sections of the ecoregion to geographically stratify known occurrences in an effort to capture variation at multiple scales for better-represented targets. We built the portfolio from areas already in protected status and managed primarily for biodiversity protection.

Results

With a huge amount of biological data, the planning team employed a portfolio selection computer program—SITES—to design the most efficient collection of conservation areas in the Great Basin. Core protected areas were built upon using a suitability index that was based on viability information and factors thought to degrade the landscape. An initial 320 potential

conservation areas were identified for local and intermediate scale targets (species, imperiled plant communities, and small ecological systems), then an additional 348 potential conservation areas were identified for representative coarse and regional scale targets (large ecological systems and wide-ranging species habitats) in a two step run of the site selection program. Thus, representative ecological systems with greater ecological integrity were added to areas supporting unique conservation targets. This draft portfolio of potential conservation areas was evaluated by the planning team who removed an abundance of smaller areas identified solely to capture physical variation in ecological systems, and divided a few large areas while aggregating a few smaller ones into larger more intuitive conservation areas. The resulting 358 sites cover about 40% of the Great Basin ecoregion and they captured 76% of the expert nominated sites.

About eleven percent of the portfolio is well-protected in status 1 and 2 lands, although this includes wilderness study areas that as yet have not received congressional decision regarding their long term status. About 57% of the sites are on lands managed by public agencies typically for multiple purposes (status 3) and the remaining 32% have no guaranteed management protection (status 4). The BLM manages the greatest extent (50%) of the conservation areas, followed by private ownership (17%), USFS (15%), State lands (8%), and DOD (5%).

An assessment of multi-site stresses revealed several widespread threats at the portfolio sites. The three most common threats included inappropriate grazing (either inappropriate intensity, frequency, or location), non-native species (both by plant and animal invasions), and hydrologic alterations (including water diversions, dams, stream channelization, and ground water pumping). Additional, less commonly occurring localized threats throughout the Great Basin include urban and related development, recreation, altered fire regimes (both increased burning and fire suppression), and mining. These threats cause habitat degradation, fragmentation, and conversion, and they alter natural ecological processes and disturbance regimes necessary for maintenance and evolution of biodiversity.

Ninety-four portfolio sites were identified as functional landscape scale sites and the remaining 264 are smaller functional sites. Functional landscape sites are larger and have more habitat, more habitat diversity, and larger populations of known and unknown species. They also have (or can have restored) a high degree of ecological intactness, and have most or all of their key components, patterns, and processes. Among the functional landscape scale sites, twenty priority action sites were selected based on their conservation value, complementarity, threats, feasibility, and leveraging opportunity.

Strategies and Plan Implementation

A Great Basin ecoregional implementation team will assist with next steps needed to protect the portfolio of sites. Among the next steps that the team will assist with and oversee are:

- soliciting feedback on the portfolio of sites from the conservation community, including public partners, private land owners, academics, and practitioners;
- Great Basin conservation plan communication and outreach activities;
- identifying and refining multi-site strategies;
- building strong working relationships with key partners;
- implementing conservation strategies on sites led by key partners;
- identifying specific strategies at Conservancy-led action sites and implementing actions at those sites;

- setting priorities for anchor sites and community-based projects;
- setting priorities for inventory and research needs to fill knowledge gaps; and,
- ensuring that the next iteration of the ecoregional plan occurs in five years.

A variety of strategies for protection action will need to be employed by the conservation community to achieve mission success. Innovative, clever, and possibly risk-taking strategies should be considered along with historically effective ones. The implementation team and key partners can assist with developing site specific conservation strategies. Multi-site threats are complex and need broad scale strategies to reduce their impacts on biodiversity health. General strategies that the Conservancy currently uses at sites involving private lands include working with private partners, finding conservation buyers, making key acquisitions, and using conservation easements.

Critical strategies to engage public partners will be needed to address the majority of portfolio sites that occur on public lands. We will need the support and commitment of key federal managing agencies—BLM, USFS, DOD, FWS, NPS—and state and local agencies to take the lead on conservation actions at many sites. Increasing their capacity and resources to work on conservation actions is needed to achieve success. Providing the database and spatial files for the Great Basin ecoregion portfolio will allow partners to incorporate conservation considerations into their required planning efforts. We also will need to engage other conservation partners at sites that the Conservancy has ranked lower for action priority because of limited capacity and resources. The implementation team will ensure that as new information becomes available the conservation blueprint for the Great Basin will be periodically updated.

B. Purpose

The goal of the Great Basin conservation blueprint was to develop a portfolio of conservation areas that fully represent the natural communities and species characteristic of the Great Basin in viable populations and landscapes within the least area possible. This plan is the first broad effort by the Conservancy to assemble biological information in the Great Basin for strategic conservation planning.

The plan had several purposes. The planning team identified areas where the Conservancy, government agencies, and other entities in the conservation community should work on the ground to achieve the overall conservation goal in the Great Basin. It has highlighted important partners and stakeholders with whom we need to develop better and lasting working relations to successfully implement the plan, both on public and private lands. It has set the stage for a working bond between Conservancy offices in California, Nevada, and Utah to collaborate on multi-state projects within the Great Basin. It has identified common threats across sites to help frame strategies necessary to protect those areas in the Great Basin. It has identified knowledge gaps that need to be filled for better informed, future assessments and plan revisions. And it has identified priority landscape scale conservation areas for near-term action.

To achieve these purposes, the ecoregional planning team synthesized biological and land management information into a Great Basin conservation database. The database and associated spatial files will be made available to key conservation partners. As a result of this effort, the Conservancy has successfully secured funding with one key federal partner, DOD, for site conservation planning and initial implementation work. Conceivably, the plan will motivate other key partners and stimulate additional opportunities for site conservation planning, taking action, and measuring conservation success.

This is the first iteration of a conservation blueprint for the Great Basin using an ecoregional approach. The planning period encompassed a two-year time frame from April 1999 to April 2001, and the work was done by a small core team. The resulting Great Basin ecoregional plan is a first approximation of conservation sites based on current knowledge. It is a dynamic plan that will be expanded upon and updated on a periodic basis (indicated by the version date in the document footer) as data gaps are filled, and it will be assessed for relevance and effectiveness in meeting conservation goals in the Great Basin. As a consequence, the plan is quite detailed to provide the necessary documentation of methods employed, assumptions made, and rationales for team decisions. Key partners will sometimes need to know these details as we work together to implement action steps. However, for those primarily interested in the conservation portfolio identified in the Great Basin, without the detailed methodologies, a separate executive summary is available from The Nature Conservancy of Nevada.

No other region-wide comprehensive conservation planning effort has been made for the largely publicly-owned Great Basin. The predominant land management agencies in the Great Basin—BLM and USFS—along with DOD, FWS, and National Park Service (NPS), conduct land and natural resource management planning for their respective units. The information contained in this plan will help agencies with their separate planning needs. However, identifying conservation areas and priorities across the ecoregion underscores a shared responsibility among public and private entities. Collaborative efforts across administrative boundaries are imperative to accomplish the overall goal of efficient biodiversity conservation in the Great Basin.

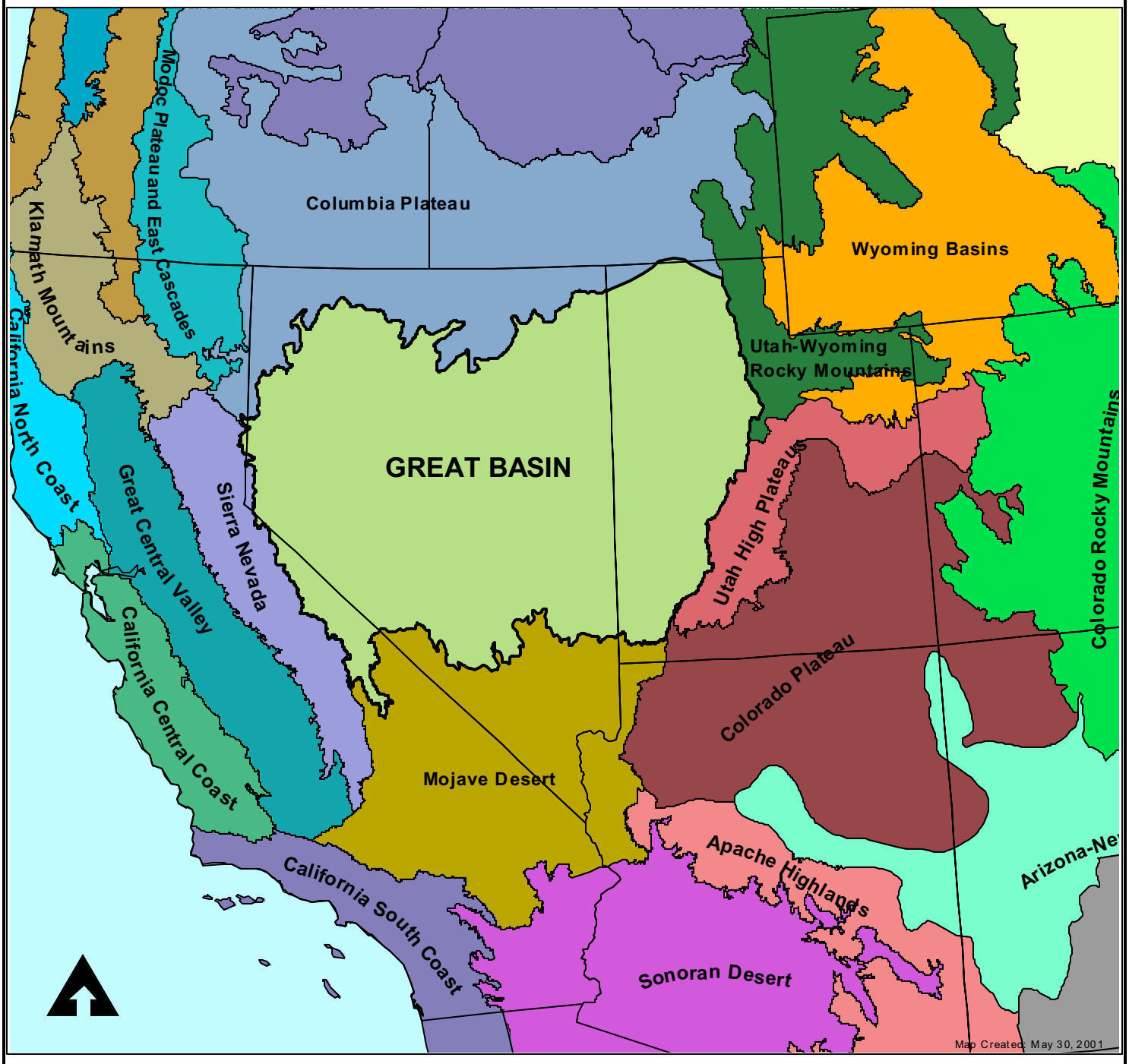
C. Description of the Great Basin

The Great Basin lies within the Intermountain Semi-Desert and Desert Province delineated by Bailey *et al*. (1995) and the Basin and Range Physiographic Province delineated by Hunt (1967). It is bounded by six ecoregions—the Columbia Plateau, Utah-Wyoming Rocky Mountains, Utah High Plateaus, Colorado Plateau, Mojave Desert, and Sierra Nevada (figure 2). The ecological boundary of the Great Basin is more readily distinguished by fairly sharp vegetation changes along its western and eastern edges, but is more difficult to distinguish along the north and south edges where broad transition zones of vegetation occur with the Columbia Plateau and Mojave Desert.

Various scientific disciplines define the Great Basin differently (Grayson 1993). Ask a plant ecologist, hydrologist, geologist, and an anthropologist to define it and you will get four answers with unlike floristic, hydrographic, geologic, and cultural boundaries (d'Azevedo 1986, Fiero 1986, Holmgren 1972, Hunt 1967). Acknowledging that there are different perspectives of delineating the Great Basin, we made modifications to Bailey's province to reflect a refined understanding of the ecoregion's boundaries (see box).

This ecophysiographical delineation of the Great Basin covers about 29.3 million hectares (72.4 million acres). The ecoregion extends from eastern California to central Utah between the Sierra Nevada Range and the Wasatch Mountains of the central Rocky Mountains. Although the name congers up a vision of one gigantic bowl, it is far from that. Between the outer mountain boundaries, more than three hundred long, narrow, roughly parallel mountain ranges are separated by broad elongated valleys. The valley floors are highest in the center of the ecoregion and lowest at the western and eastern margins, the result of stretching tectonic forces. Captain Clarence E. Dutton described it militaristically as an army of caterpillars

Figure 2. Great Basin ecoregion in relation to surrounding ecoregions.



Scale 1:8,000,000

0 50 100 150 Miles

0 100 200 300 Kilometers

Great Basin Boundary Refinement

The planning team modified the boundaries of the Great Basin ecoregion from preliminary and rough small-scale delineations to reflect more specific and local knowledge of regional ecology. In concert with the Mojave Desert ecoregional team, we modified the southern boundary to follow the widely used delineation at the northern limit of the creosote bush-dominated ecological system. With prodding by local ecologists and concurrence from the Columbia Plateau ecoregional team, we expanded the northwestern boundary to include the terminus of the Truckee River, Pyramid Lake, and the Smoke Creek Desert. Because the most recent 1999 version of the ECOMAP boundary moved the northeast corner further south than the Columbia Plateau ecoregional team had included in their first assessment, we have maintained the more northern boundary to accommodate that planning gap. In subsequent ecoregional efforts, both the Columbia Plateau and Great Basin planning teams will adopt the revised 1999 delineation. Justifications for our Great Basin boundary refinements were provided to the Western Conservation Science Center in summer 1999 and were approved by the Director of Conservation Planning. WCSC made and distributed GIS files of the modified Great Basin ecoregional boundary to national and state offices.

crawling northward out of Mexico (Dutton *in* King 1977). The Great Basin also has been described as a region of jagged and crazy ranges rising from irreclaimable desert (Stegner 1942) and a landscape of washboard topography (Houghton 1978).

The structures of Great Basin ranges are roughly similar, but their compositions are diverse. The structure is the result of high angle block faulting. The ranges are uplifted horsts and the basins are lowered grabens. Granite and basalt mountains occur in the west and south, rhyolite mountains prevail in the center, and limestone mountains predominate in the east. Elevations in the Great Basin range from 324 m (1,063 ft) on the east flank of the Inyo Mountains to 4,342 m (14,246 ft) at the summit of the White Mountains, both in the southwest portion. Valley floors in the Lahontan and Bonneville basins average 1,150-1,525 m (3,800-5,000 ft) above sea level, whereas valley floors in the central sections average 1,675-1,950 m (5,500-6,400 ft) in elevation.

The climate of the ecoregion, according to Mark Twain, is elementary—"only two seasons in the region . . . the breakup of one winter and the beginning of the next" (Twain 1872). A more elaborate description of its climate is provided in Hidy and Klieforth (1990). The Great Basin is semiarid and continental because it lies in the rain shadow of mountains. The Sierra Nevada effectively captures much of the moisture from east-moving Pacific storms while the Rocky

Mountains intercept moisture coming from the Gulf of Mexico. In short, the Great Basin is characterized by hot, dry summers and longer, cold and dry winters.

Common Temperature Conversions Between Fahrenheit (°F) and Celsius (°C)

Condition	°F	°C
A very hot GB day	107°	42°
A hot GB day	95°	35°
A warm GB day	86°	30°
An average July GB day	78°	26°
A mild GB day	68°	20°
A cool GB day	50°	10°
An average Jan GB day	29°	-2°
A cold GB day	10°	-12°
A very cold GB day	-43°	-42°

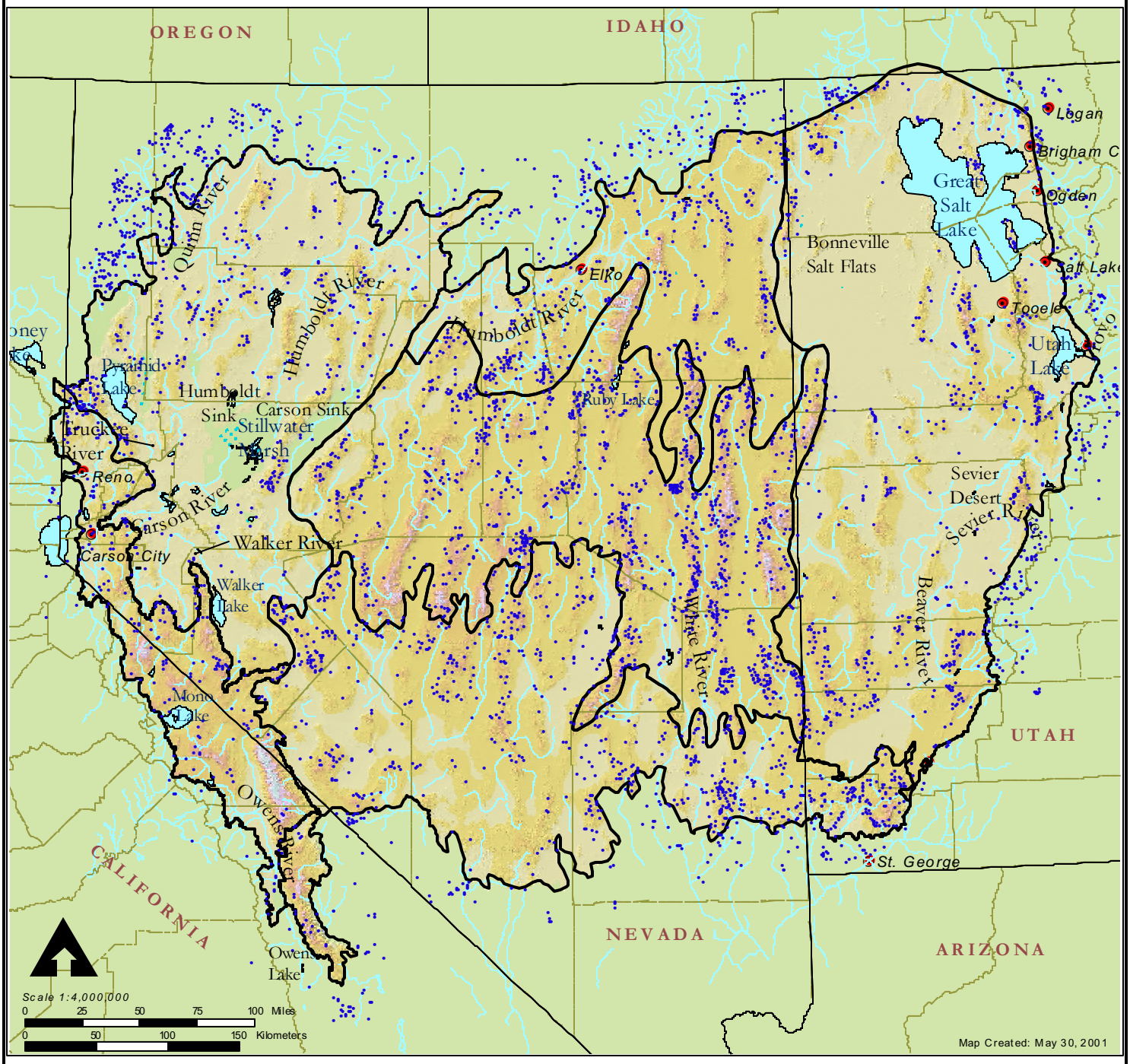
Temperatures have both daily and seasonal extreme variation while spatial distinctions occur from valley floors to mountaintops. The mountains tend to be cooler and windier than the valleys. Surface air heating during the day yields very high valley temperatures, often accompanied by strong local turbulence that creates dust devils. At night, valleys lose heat rapidly by radiation and cool air pools below warmer air above. The cold winter temperatures are typically 10 to 40ºF and the hot summers are typically 50 to 90ºF (see box for some common ºF to ºC conversions). Daily temperatures vary up to 68ºF, while seasonal averages vary more than 73ºF (<32 to >105ºF). Near the heart of the Great Basin, Elko boasts a 150ºF temperature range, from –43º to 107ºF (Trimble 1989). Salt Lake City temperatures average 29ºF in January and 78ºF in July.

There are three principal precipitation regimes in the Great Basin. Frontal cyclones from the Pacific cause winter maximum precipitation mostly as snowfall in the western and northern Great Basin. Cold continental cyclones result in spring maximum precipitation in the central and eastern Great Basin. Summer thunderstorms in subtropical air masses from the Gulf of Mexico cause a secondary summer maximum in the southeastern Great Basin, which is often heaviest in the valleys. The average annual regional precipitation is 216 mm (8.5 in), however there is great variation. In Wendover, the average is 114 mm (4.5 in), while at the base of the Ruby Mountains only 95 km (60 mi) to the west, the average is 432 mm (17 in). At the edges of the Great Basin, the average annual precipitation in the rain shadow of the Sierra Nevada is 127 mm (5 in), while it is 254 mm (10 in) along the Wasatch Front. No surface water leaves the Great Basin except by evaporation. At Pyramid Lake, evaporation exceeds precipitation about twelve to one.

Ironically, water is both scarce and abundant in this desert ecoregion (figure 3). The longest river—the Humboldt—flows 330 miles across the interior, but “dies with an alkaline whimper in the Humboldt Sink” (Stegner 1942). The Great Salt Lake, when it spills over during wet periods is greater than the size of some smaller eastern seaboard states. Tectonic stretching has thinned the earth’s crust throughout the ecoregion more so than any other place in North America (Fiero 1986). This allows water to percolate from heated subregions. Thus, springs—many of them thermal, are amazingly abundant. More than 30,000 springs are estimated to occur in the hydrographic Great Basin (Sada 2001).

Given its size, topographic diversity, geologic diversity, and isolating nature of habitats within the basin and range landscape, it should not be surprising that the ecoregion ranks second in diversity of imperiled species (Nichols *et al*. 1998, Rosenzweig 1995, Stein *et al*. 2000). These physical factors favor the evolution of currently rare neoendemics in specialized habitats. Yet driving along the main artery between Salt Lake City and Reno on Interstate 80 it is understandable how one acquires a sense of monotony from the vast areas of sagebrush and salt desert shrublands. These are the matrix forming ecological systems. Biologists too have succumbed to this overriding suggestion from the matrix landscape and some have erroneously

Figure 3. Great Basin hydrologic features.



Springs

Rivers and streams

Lakes and reservoirs

County lines

Ecoregion boundary

concluded that it has relatively low biodiversity (Ehrlich *et al*. 1988). It is the smaller patch communities and unusual habitats that endow the Great Basin with a rich diversity of life.

Mountains and adjacent valleys are barriers to one another and each become isolated refugia for species sheltered since Pleistocene times or they furnish a modern landscape for newly evolving species. There are several noteworthy landscapes of biodiversity significance in the Great Basin (figure 4). Mountain landscapes include the White Mountains, Inyo Mountains, Toiyabe Range, Toquima Range, Monitor Range, Ruby Mountains, Snake Range, Deep Creek Range, and Pine Valley Mountains. Mountaintops in the Great Basin characteristically harbor the oldest living trees on earth—Intermountain bristlecone pines, which can live for more than 4,900 years (Schmid and Schmid 1975). Valleys and their associated water features include Mono Lake, Owens Valley, Benton Valley, Truckee River and Pyramid Lake, Stillwater Marsh in the Carson Sink, Monitor Valley, Ruby Valley, Railroad Valley, White River Valley, Steptoe Valley, Great Salt Lake, and Utah Lake. Unusual terminal lakes are remnants of pluvial times—Pyramid, Mono, Walker, and the Great Salt Lake each harbor their own unique aquatic fauna and flanking terrestrial plant communities. Sand dune complexes add to the ecoregion's landscape and biological diversity. They include Blowsand Mountains, Sand Mountain, Silver State Dunes, Crescent Dunes, Thorne Dune, San Antonio Dunes, Great Salt Lake Desert Dunes, and Little Sahara Sand Dunes.

Ecological Processes

The primary ecological processes driving the distribution and abundance of natural systems and species of the Great Basin ecoregion are climate, topography, soils and fire. The natural systems defining the Great Basin today are partially a result of past climates. Climate of the Pleistocene Epoch was wetter and included major glaciations and recessions that fed enormous lakes in the valleys, while climate of the Holocene Epoch involved general warming and drying. During these times, plants and animals, including people, either responded by adapting in place, moving north or south and up or down mountains and drainages, or becoming locally or globally extinct (Grayson 1993). The effects of climate may occur at regional scales and control the distribution of matrix forming ecological systems, and they may occur at local scales controlling temporal variations of larger systems and the distribution of small patch ecological systems.

Topographic relief in the ecoregion is great with a range of 4,018 m (13,180 ft) from valley floors to mountain tops. The highest elevation in the ecoregion is 4,342 m (14, 246 ft) on White Mountain Peak in the western Great Basin. Variations in slope angles and aspects add to the diversity of microhabitats (see section H). In general, with increasing elevation, precipitation and solar radiation increase while air density and temperatures decrease, and variations of slope and aspect change the relationship locally. Although landforms and soils of the Great Basin are generally recent geologically, they are quite diverse because of the complex geology and overall size of the ecoregion. Topography and soils effect ecological processes at intermediate to local scales.

The natural role of fire in the evolution of Great Basin matrix forming communities was probably minor with long intervals between fires and of local impact (Whisenant 1990). Shadscale and other desert scrub communities did not have fuels to allow extensive burns (Young 1994). Sagebrush ecological systems are dominated primarily by fire intolerant shrubs indicating that fire had a minor role in their evolution (West 1988). In contrast, bitterbrush shrublands appear to have evolved and are maintained by occassional burns in adjacent forested ecological systems. Montane shrublands, woodlands, and forests in the Great Basin probably evolved with a greater role by fire than sagebrush covered valley bottoms (West and Young 2000). With

Figure 4. Great Basin placenames and noteworthy features.

the introduction of exotic annual grasses that serve as fine fuels, however, fire freqencies and intensities have increased and they effect larger patches of vegetation in virtually all ecological systems today.

The biological result of the last three million years of climate fluctuations in a topographically diverse landscape has left a legacy of endemic taxa throughout isolated basins and ranges of the Great Basin. The continued interaction of climate at varying spatial scales, intensities, and frequencies along with topographic and edaphic variability is fundamental to maintaining landscape and biotic diversity in these cold desert and mountain ecosystems (Gaston 1996 and Rosenzweig 1995). Thus, the portfolio includes conservation areas large enough to allow large scale, long term ecological processes to continue, assuring maintenance and evolution of Great Basin ecological systems in evolving climates.

Threats and Trends in Great Basin Biodiversity

Overall, the Great Basin is a relatively intact ecoregion biologically. Much of the landscape has not been converted or fragmented by development and roads, and in unmarred areas the only evidence of degradation might be the presence of the ubiquitous, exotic cheatgrass (*Bromus tectorum*). However, other parts of the Great Basin have been significantly impacted by human activities over the last 150 years. Human induced activities that impact biodiversity include urbanization, rural sprawl, intensive agriculture, livestock grazing, construction of roads and utility corridors, recreation, mining, military activities, groundwater withdrawals, and stream diversions. Structural and compositional changes to ecological systems include destruction or alteration of habitat, habitat fragmentation, and exotic species introductions, while functional changes to ecological systems include increased fire frequencies and intensities, decreased instream flows and ground water, as well as increased soil erosion and compaction. A summary of trends in biodiversity of specific taxonomic groups as a result of recent human impacts is provided in Brussard *et al*. (1998).

The Great Basin ecoregion has an overwhelmingly urban human population pattern. Population centers are located along its western and eastern fringes in Nevada and Utah. The area along the Sierra Front including Reno, Sparks, Carson City, and Gardnerville supports about 20% of the Great Basin's population, while the Wasatch Front, from Brigham City through Salt Lake City to Spanish Fork south of Provo supports over 77% of the Great Basin's population. The interior is largely rural with only one town, Elko, of noteworthy size (population >10,000). As the human population increases and private lands are developed in the Great Basin, land use decisions could incorporate data from the ecoregional assessment to evaluate impacts of growth on the conservation of biodiversity.

By far, the greatest impacts to biodiversity in this desert ecoregion have revolved around the extraction of its most limiting resource, water. Desert agriculture demands ground water withdrawals and stream diversions for irrigating croplands. These uses and changes to hydrologic systems have led to ground water depletions and reduced or otherwise altered instream flows, which has led to decreases in aquatic ecological systems and their associated species. Agricultural reservoirs have replaced stream systems, which has changed aquatic faunas associated with flowing water to those associated with standing water, and has favored an increase in the number of exotic aquatic species. Agriculture has degraded water quality through siltation and pollution, in addition to depleting water supplies.

Agriculture has displaced large acreages of native vegetation and replaced it with cultivated plants and weeds. This occurred historically only at the western and eastern periphery of the

ecoregion, but more recently has impacted areas along the Humboldt River corridor and other interior locations. Vast areas of salt desert shrublands in the Lahontan and Bonneville basin sections of the ecoregion have been converted to alfalfa and other crops. The narrow level strip of land in the Salt Lake Valley abutting the Wasatch Front is the most fertile, productive, and densely populated part of Utah. West (1996) estimates 10% of sagebrush steppe has been lost to agriculture. Attendant with crop plantings are noxious weed introductions, such as Canada thistle *(Cirsium arvense*).

Springsnails, other aquatic invertebrates, and fishes are especially vulnerable to hydrologic alteration. There are several known recent fish and springsnail extinctions in the Great Basin, including Pyramid Lake springsnail, Fish Springs marshsnail, thickshell pondsnail, Great Basin ramshorn, Utah Lake sculpin, and Grass Valley speckled dace (Miller *et al*. 1989, Sada 2001). Federally listed threatened and endangered aquatic species are numerous here and Nevada holds the national record for highest number of federally listed fishes. Several of the listed fishes in the Great Basin, such as Owens pupfish, are perilously close to extinction.

Hydrologic alteration impacts riparian and wetlands systems as well as aquatic systems. Unfortunately, riparian and wetland systems in the intermountain west have experienced both huge losses and degradation (Langner and Flather 1994, Noss *et al.* 1995). More than 80% of all BLM managed riparian is in unsatisfactory (functioning at risk or non-functioning) condition and in need of restoration. Thirty to more than 50% of the wetlands in Utah and Nevada, respectively, were lost from the 1780s to the1980s (Dahl 1990). Associated species, especially bird assemblages, have declined. Among the 134 species of migratory land birds that regularly breed in the Great Basin, more than half are associated primarily with riparian habitats (Dobkin1998). Many neotropical migratory birds are declining in the Great Basin as elsewhere (Langner and Flather 1994).

Rangeland use has provided the greatest economic contribution from Great Basin landscapes. Most of the land has been subject to grazing and much of that has been heavy grazing (Horning 1994). Significant impacts from grazing have occurred at springs and seeps, along riparian corridors, and on bottomland meadow vegetation. Grazing impacts that change ecological systems include displacement of plant species, which decreases their areal extent, increases soil erosion, and increases less palatable species. Young *et al*. (1976) in a historic review of pristine and grazed Great Basin plant communities conclude that there are no more pristine Great Basins to graze. Essentially all remaining sagebrush steppe has been affected by livestock, while 30% has been heavily grazed (West 1996). Bird species dependent on sagebrush, such as sage grouse, sage thrasher, and Brewer's sparrow, all have declining population trends (Paige and Ritter 1999).

Grazing has impacted rare and endangered species in the Great Basin, such as Lahontan and Bonneville cutthroat trout by decreasing riparian plant cover, which leads to increases in water temperature (Horning 1994). Additionally, several associated grazing activities, including trampling, introduction of diseases carried by livestock, pollution of aquatic systems from fecal material, range improvement projects, and invasion by exotics introduced by livestock, imperil rare species. The spread of noxious weeds is increasing as a result of historic and some current grazing management conducted at inappropriate levels, frequencies, or seasons of use. Cheatgrass, halogeton, and Russian thistle have altered the functioning of Great Basin ecological systems greatly (*e.g.,* by altering natural fire regimes, altering soil chemistry, and reducing native wildlife habitat).

Mining tends to occur in areas where endemic plant and terrestrial invertebrate specialists have evolved on unusual substrates. Today, open pit mines and their associated heap leach percolation ponds displace large areas of native vegetation with sterile or toxic soils and water. Impacts to edaphic specialists include the loss of habitat, loss of pollinator specialists or host plants, and local extirpations. Additionally, dewatering mining pits is a source of groundwater withdrawal and local hydrologic alteration.

Electrical and other utility transmission lines and pipelines, radio or satellite antennae sites, military facilities, highways, all indiscriminately cross geologic substrates or mountain tops that non-randomly harbor unique species. The numbers of imperiled plant and terrestrial invertebrate species associated with these habitats is high.

Most recently, increased recreational use of public lands stemming from increased leisure time, longer life spans, and quest to get away from increasingly crowded areas has impacted biodiversity in the Great Basin. Use of all terrain vehicles and cycles, mountain bicycles, and recreational horses has increased habitat fragmentation and soil compaction in areas that until recently received little use and were relatively intact. Sand dune habitats and their endemic floras and faunas are especially vulnerable to off road vehicle activities. Playa lakes, when dry, and their aestivating invertebrate faunas also are vulnerable to vehicles.

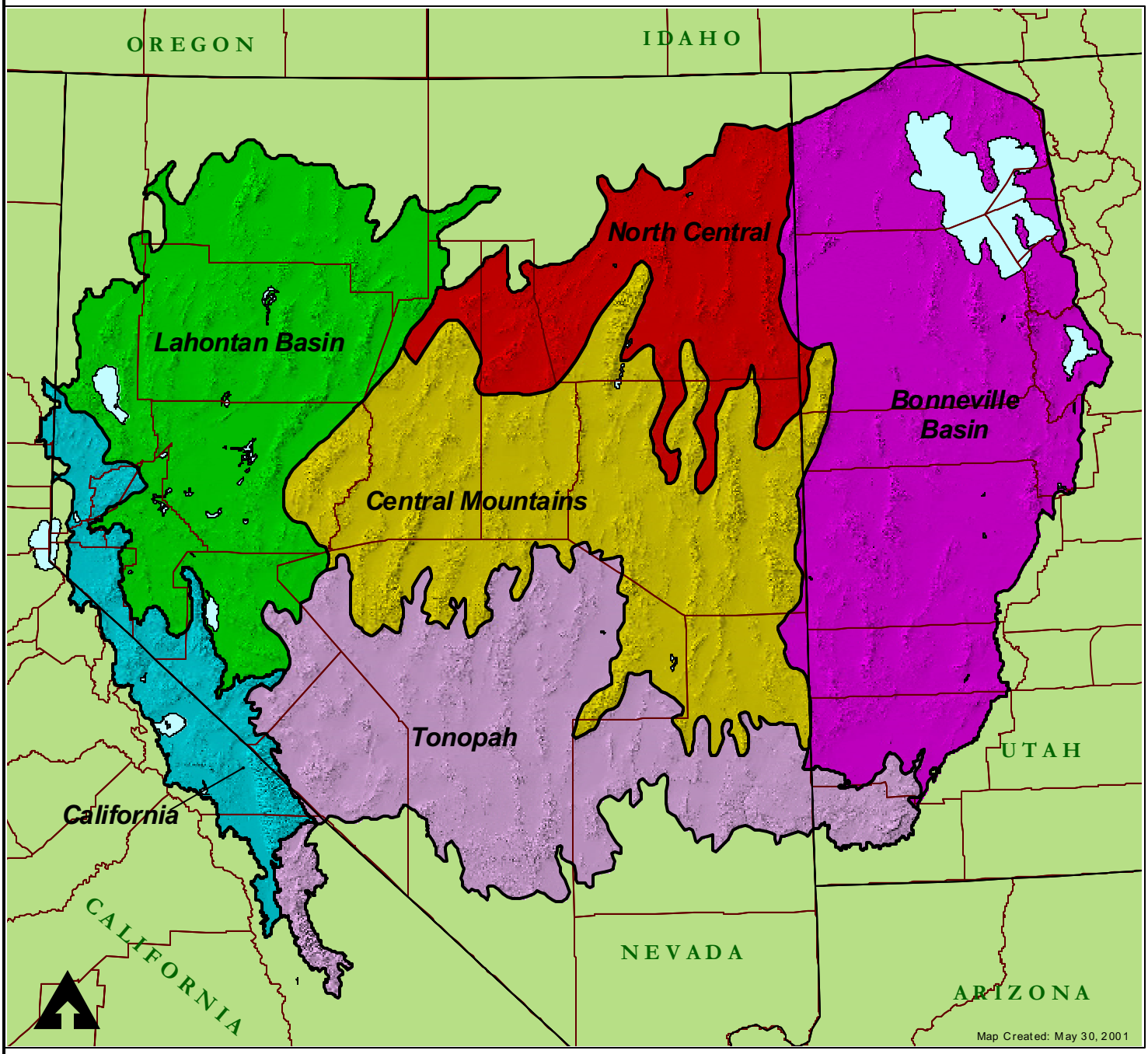
Stratification

The Great Basin is distinguished ecophysiographically by its semi-arid vegetation across the western intermountain landscape. Nevertheless, in such a large ecoregion stratification is necessary to address both physical and biologic diversity at all levels. The planning team adopted the six sections of the Great Basin as delineated by Bailey (1998) and modified recently by the USFS to stratify terrestrial biodiversity (figure 5). With one exception the six sections are in close agreement with the floristic-physiographic sections defined by Holmgren (1972) so the following general descriptions are adapted from that work. The exception involves the boundary of the North Central and Central Mountains sections, which are divided north and south, whereas Holmgren's central and calcareous mountains sections that overlap the same area are divided west and east. Refer to figures 4 and 5 for placenames and section names in the following descriptions.

The Lahontan Basin section lies in the depression of western Nevada that Lake Lahontan once occupied. Pyramid and Walker lakes are remnants of this Pleistocene lake, fed today by runoff from the Sierra and adjacent mountains in the Truckee, Carson, and Walker rivers. The mountain ranges are volcanic, smaller and less elongated, and separated by broad, very low valleys. Much of the section is alluvial flat and playa—the Black Rock Desert, Smoke Creek Desert, Carson Desert, Dixie Valley, and Humboldt Sink. Dry climate from the extreme rain shadow of the Sierra and the saline nature of the valley floors account for the absolute desert conditions in these valleys. This section is 53,772 km^2 (20,762 mi^2), or the fourth largest, and is a bit smaller than the Central Mountains and Tonopah sections.

The North Central section is characterized by high valleys over 1,525 m (5,000 ft) and mountains only moderate in elevation, except for the East Humboldt Range rising to alpine. The northern portion of the Ruby Mountains probably better fits in this section although it has been delineated in the next. The mountains are sandstone, siltstone, and shales of volcanic rock. Drainage is via the Humboldt River into the adjacent Lahontan Basin section. The Humboldt River has an average annual discharge of about 5,000 acre feet per year, but today most of it is used for agriculture. Only Ruby Valley contains a permanent lake—Ruby Lake, while other

Figure 5. Six geographic sections of the Great Basin.



Sections

- Lahontan Basin
- North Central
- Central Mountains
- California
- Tonopah
- Bonneville Basin

- County lines
- Water bodies

Scale 1:4,000,000

0 25 50 75 100 Miles

0 50 100 150 Kilometers

valleys are playa bottoms rimmed by salt desert vegetation. This section is 28,266 km^2 (10,913 mi^2), or the second smallest, and is about half the size of the Central Mountains, Tonopah, and Lahontan Basin sections.

The Central Mountains section is distinguished by the highest sagebrush-covered valley floors up to 1,950 m (6,400 ft) in elevation and an absence of permanent lakes. In addition, the mountains are high, very elongated, and closely paralleling one another. Volcanic and sedimentary rocks of sandstones and shales make up the western mountains—including the Shoshone, Toiyabe, Toquima, and Monitor ranges, while calcareous rocks of limestone and some quartzite comprise the eastern mountains, including Grant, White Pine, Egan, Schell Creek, Snake and Deep Creek ranges. This section of high elevations is a rich area of endemism. This section is 60,006 km^2 (23,169 mi^2), or the second largest, and is a bit larger than the Tonopah and Lahontan Basin sections.

The westernmost California section (Holmgren's Reno section) parallels the Sierra and has a moister climate influenced by the juxtaposition of this massive mountain range. It generally has high sagebrush-covered valleys. The terminal Mono Lake is present in an area of numerous recent volcanoes and pumice flats. The Owens River is the largest river flowing in this section. Mountains are high, including the highest range in the ecoregion—White Mountains, along with Sweetwater and Glass mountains and the Wassuk Range. These mountains are primarily composed of Tertiary igneous rocks and Cenozoic volcanics. This is the smallest section at 17,201 km^2 (6,641 mi^2) and is less than one-fourth the size of the largest Bonneville section.

The southernmost Tonopah section contains hot, dry, and broad desert valleys covered primarily by salt desert shrublands. The mountains are generally of volcanic origin, and except for the Inyo Mountains, are smaller and lower in elevation. The western portion, like the Lahontan Basin section, is influenced by the strong effect of the Sierra Nevada's rain shadow. The eastern portion is more moist and influenced by Gulf stream air flows. If it were not so dry, the White River would flow to the Colorado River, so technically the White River Valley is not part of the hydrographic Great Basin. The Tonopah section is 55,909 km^2 (21,587 mi^2), or about the size of the Central Mountains and Lahontan Basin sections.

The Bonneville Basin section lies in the depression of western Utah that Pleistocene Lake Bonneville once occupied. The Great Salt Lake and Utah Lake are remnants, fed today by runoff from the Wasatch Mountains in the Bear, Weber, and Provo rivers. Another remnant, Sevier Lake, fed by the Sevier River, loses much of its water to agriculture and is usually a playa except in exceptionally wet years. This section is characterized by numerous small mountains low in elevation, and broad, low basins with alkaline soils supporting salt desert shrublands. The valley floors are slightly higher than in the Lahontan Basin section. Absolute desert with brilliant white salt crusts occupies much of this section. Many of the eastern cities rimming the Great Basin, including Ogden, Salt Lake City, and Provo sit upon ancient lake terraces while their scenery is made greener from irrigation diversions. At 78,022 km^2 (30,124 mi^2) this is by far the largest section of the Great Basin.

These six sections do not appropriately stratify the aquatic biodiversity of the Great Basin so we chose to use a system that took into account factors that influence the distribution of aquatic species and the types of systems in which they occur. The Freshwater Initiative team helped us in this endeavor (see box below). The result of this effort was a map of four aquatic regions and 19 ecological drainage units for the Great Basin (figure 6).

Ecological Drainage Units for the Great Basin
—Jonathan Higgins and Jennifer Perot

Ecological drainage units (EDUs) were developed because of the influences that drainage basin and physiography have on the regional diversity of aquatic biota and systems. The EDUs were created by aggregating hydrologic units (8-digit catalog units of the USGS) and EPA RF1/RF3 hydrography coverages that had common connectivity to a drainage, similar patterns of elevation gradients, and surficial geology. We generated a map of World Wildlife Fund's (WWF) Aquatic Ecoregions to use as a base map. We next used finer scale environmental factors (depicted as digital elevation models, surficial geology and ecoregional section boundaries) to further subdivide the aquatic ecoregions into smaller assessment units. We identified 19 EDUs in the Great Basin. We sometimes separated headwaters from mainstems of rivers since capturing small, high gradient, snow melt streams is adequate for only one physiographic portion of a river system. The lower, warm desert portions of the rivers are stratified from higher headwaters based on their ecological differences.

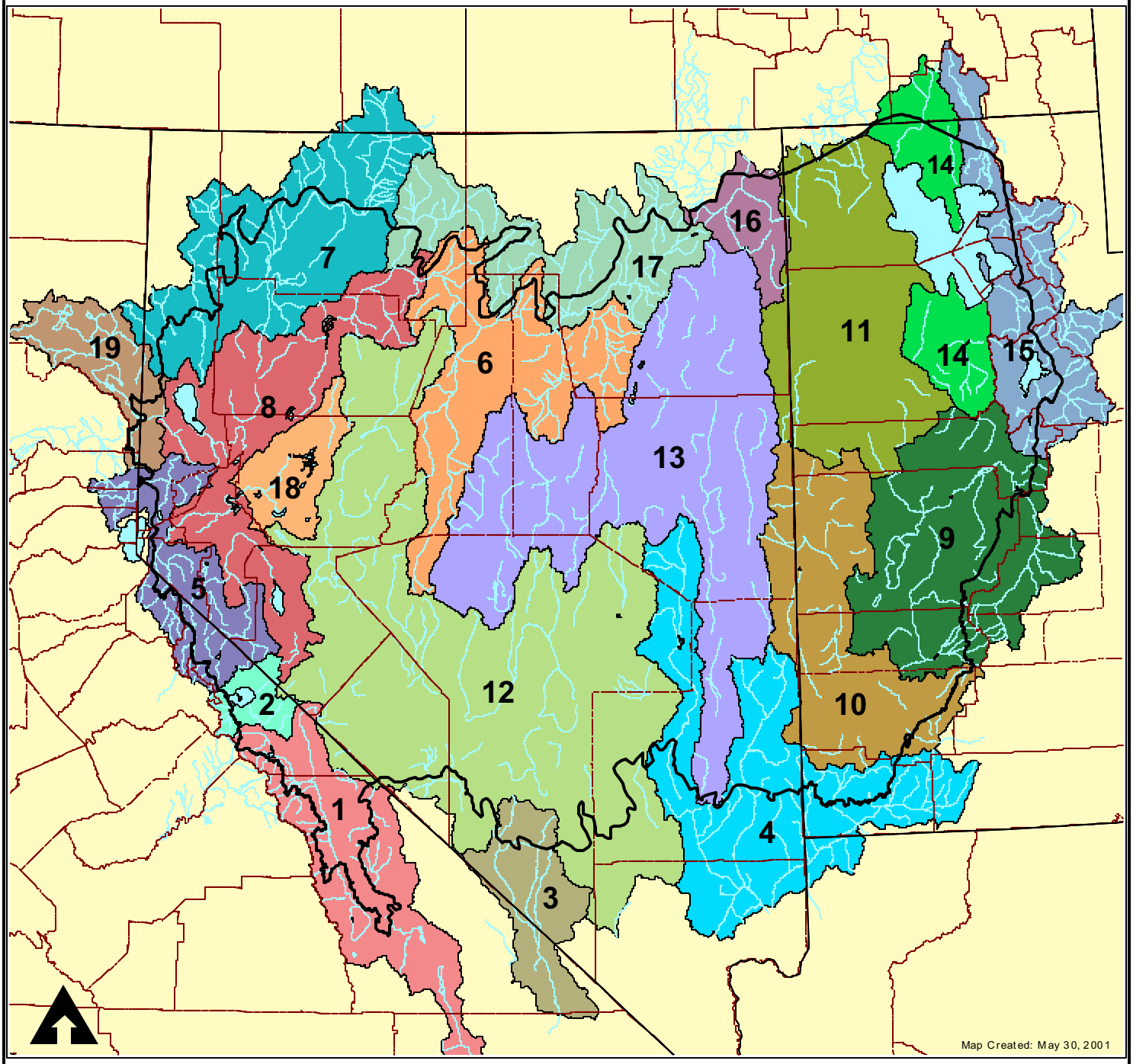
The four aquatic ecoregions for the Great Basin include Lahontan, Bonneville, Death Valley and Vegas-Virgin (Abell *et al*. 2000). They capture nearly all of the internal drainage basins in North America—the one exception is Oregon Lakes in the Columbia Plateau ecoregion. Three aquatic ecoregions are characterized by endorheic (closed basin, lacking an outlet) rivers, lakes, and springs, while the Vegas-Virgin is xeric and externally drained. Brief descriptions of each aquatic ecoregion and their EDUs follow. Information on patterns of physical and biological characteristics were obtained from Sigler and Sigler (1987) and La Rivers (1994).

The Lahontan aquatic ecoregion includes drainages that extend north into the Columbia Plateau and west into the Sierra Nevada ecoregions. The rivers (Walker, Carson Truckee, and Humboldt drainages) originate as high elevation small, clear, swift streams ending in larger, turbid, sluggish rivers evaporating into saline-alkaline basins. The lakes include Mono, Walker, Pyramid, and Tahoe. Numerous cold and thermal springs and spring complexes are present. Harsh conditions and isolation has resulted in differentiation and endemism of aquatic taxa, especially in fishes (33% endemism), invertebrates, and springsnails. Nine Great Basin EDUs make up this largest of the four aquatic ecoregions. They are the Quinn River, North Humboldt Headwaters, Middle Humboldt River, East Central Great Basin, West Central Great Basin, Carson Desert Basin, Lake Lahontan, Lahontan Western Headwaters, and Honey Lake.

The Bonneville aquatic ecoregion includes drainages that extend east into the Utah-Wyoming Rocky Mountains and Utah High Plateaus ecoregions. The rivers (Bear, Provo, Weber, and Sevier) include the largest single interior drainage into the Great Basin. Lakes include the Great Salt, Utah, Sevier, and Bear. Fish endemism (44%) is harbored in the lakes. Numerous cold and thermal springs and spring complexes are present. Six Great Basin EDUs make up the second largest of the aquatic ecoregions. They are the Pilot-Thousand Springs, Great Salt Lake Desert, North Bonneville Valleys, Northeast Bonneville Lakes, Sevier/Beaver, and Southwest Bonneville Valleys.

The Death Valley aquatic ecoregion includes drainages that extend south into the Mojave Desert ecoregion and include the Owens, Amargosa, and Mojave systems. The rivers generally

Figure 6. Great Basin ecological drainage units.



Ecological drainage units

1. Death Valley
2. Mono Lake
3. Upper Amargosa
4. Colorado Basin
5. Lahontan W. Headwaters
6. Middle Humboldt River
7. Quinn River
8. Lake Lahontan
9. Sevier/Beaver
10. S.W. Bonneville Valley
11. Great Salt Lake Desert
12. W. Central Basin
13. East Central Basin
14. N. Bonneville Valley
15. N.E. Bonneville Lakes
16. Pilot-Thousand Spring
17. N. Humboldt Headwaters
18. Carson Desert Region
19. Honey Lake

Scale 1:4,500,000

0 25 50 75 100 Miles

0 50 100 150 Kilometers

have low flow (or are ephemeral) with local variability in surface flow, turbidity, and temperature. Many cold and thermal springs occur here. Aquatic endemism is very high, especially in springsnails, insects, and fish species and is largely restricted to the spring systems. Three Great Basin EDUs make up this small unit: Mono Lake, Death Valley, and Upper Amargosa.

The Vegas-Virgin aquatic ecoregion is comprised of xeric region rivers, lakes, and springs. River drainages extend south and east into the Mojave Desert and Colorado Plateau ecoregions. The rivers (White, Meadow Valley Wash, Moapa, and Virgin) are part of the Colorado River complex, but are no longer connected because of the presence of Lake Mead. Many thermal springs are present. High aquatic endemism occurs in this section especially in the spring systems. One Great Basin EDU makes up this smallest of units, the Colorado Basin.

D. Ecoregional Planning Team

The core planning team for the Great Basin ecoregion was organized in April 1999 and consisted of representatives from the three state field offices of The Nature Conservancy (CAFO, NVFO, and UTFO) present in the ecoregion along with two additional outside conservation partners from the Great Basin Bird Observatory (GBBO) and the University of Nevada, Reno's Biological Resources Research Center (BRRC). Actual core team members changed with time as a result of staff changes. The core team participated in target selection, information gathering and interviewing experts, terrestrial and aquatic community classification refinements, data management and GIS analyses, portfolio design, an abbreviated threats assessment, and methodology documentation. The team followed updated guidelines for ecoregion-based conservation in the Great Basin assessment (The Nature Conservancy 2000b). The principal core team members who participated throughout the process are on left, while members on the right participated at early stages:

Graham Chisholm – CAFO, former NVFO
Ted Floyd – GBBO
Teri Knight – NVFO
Craig Mayer – CAFO
Jan Nachlinger – NVFO
Kei Sochi – NVFO

Julie Steincamp – former UNR/BRRC
Christine Tam – CAFO
Joel Tuhy – UTFO
John Walker – former UNR/BRRC
Pam Weiant – former CAFO
Nathan Welch – former NVFO

In addition to the core planning team, several other participants and working groups contributed as part of special teams to assist with specific tasks. Overarching sponsorship and financial support came from all three state's chapter directors. Assistance with government agency relations and funding opportunities were provided by the Western Regional Office. The Western Conservation Science Center gave invaluable assistance with terrestrial community classification refinement, GAP vegetation map crosswalking, assessing ecological land units, and running the SITES program for optimal portfolio selection. The managed area analysis was accomplished by contract. An aquatic assessment of ecological drainage units was done by the Freshwater Initiative (FWI) team. A preliminary aquatic habitat classification was developed with assistance from several aquatic ecologists, notably Donald Sada, but also including David Herbst, Marilyn Myers, and Robert Hilderbrand. Scientists and data managers at Nevada and Utah natural heritage programs provided help with compiling initial lists of species targets. Assistance with GIS was provided by BRRC at the University of Nevada, Reno. An initial assessment of ecological land units for the Lahontan Basin section was tackled by graduate students at UNR. Additional team individuals and heritage programs are listed below.

Dave Livermore – UTFO
Steve McCormick – HO, former CAFO
Robin Cox – CAFO
John Humke – WRO
Pat Comer – WCSC
Gwen Kittel – WCSC
Dan Dorfman – WCSC
Michael Heiner – WCSC
Shannon Kimball – Independent
Kerry Green – UTFO
Joel Peterson – UTFO
Rob Scanland – NVFO
Jim Moore – NVFO
Donald Sada – Independent
Jonathan Higgins – FWI
Mary Lammert – FWI
Jennifer Perot – FWI
Brian McMenamy– UNR/BRRC
Bob Elston– UNR/BRRC
Cari Leversee – UNR
Alyce Brandigan – UNR
Nevada Natural Heritage Program
Utah Conservation Data Center
California Natural Diversity Database

E. Conservation Targets

The planning team selected a set of conservation targets at different geographic spatial scales and levels of biological organization to best represent all biological diversity within the Great Basin. We employed the Conservancy's coarse-filter and fine-filter approach to identifying these conservation targets. For fine-filter targets, the team selected species conservation targets at all geographic scales, including regional, coarse, intermediate, and local scales as guided in Poiani and Richter (2000). In the fine-filter strategy, we included imperiled plant communities and several small patch and linear ecological systems at intermediate and local geographic scales because limited information on their distribution precluded their inclusion in the coarse-filter analysis. The coarse-filter targets included ecological systems at coarse, intermediate, and local geographic scales and habitats for wide-ranging species at a regional scale.

The Great Basin team identified 287 ecological communities as occurring in the ecoregion and initially considered them all to be conservation targets. These terrestrial natural plant associations were initially selected from the national vegetation classification system developed by the Conservancy and its Heritage/Conservation Data Center partners with the Association for Biodiversity Information (Grossman *et al*. 1998, Anderson *et al*. 1998a). Numerous, previously undocumented plant associations also were brought into the classification and target list from other sources (*e.g.*, West *et al*. 1998), including experts. WCSC compiled alliance descriptions for Great Basin natural communities for use in this planning effort (The Nature Conservancy 2000c). However, there is little mapped information on the locations of plant associations and we were unable to fill the large gaps in specific occurrences and viability data. As a result, we adopted the use of ecological systems in combination with ecological land units (see section H) as a coarse-filter surrogate for the ecological diversity represented by the most common of these associations. Appendix I is a record of Great Basin alliances and associations organized by ecological system.

Great Basin terrestrial ecological systems are dynamic spatial assemblages of ecological communities that occur together on the landscape, are tied together by similar ecological processes (*e.g.*, fire), underlying environmental features (*e.g.*, soils and geology) or environmental gradients (*e.g.*, elevation), and they form a readily distinguished unit on the ground. Ecological systems are characterized by both biotic and abiotic components and in this ecoregion they can be terrestrial, aquatic, or a combination of the two. The playa lakes ecological system is the one Great Basin case of the latter.

The ecological systems were described, in part, using the national vegetation classification and they represent taxonomically related associations and alliances, or easily identifiable ecological assemblages that can be incorporated into landscape-based conservation action. For easier understanding, the ecological systems were placed in vegetation or geomorphic aggregations (*e.g.*, forest and woodland or wetland). Appendix 2 provides a list of the ecological systems of the Great Basin. The second half of this plan, which details the portfolio by ecological systems within seven system groups, includes narratives that describe each ecological system (see section II).

Ecological systems were assigned a characteristic patch size (small patch, large patch, matrix, linear), which helped the team to better understand spatial patterns and scale of the units, and to better determine the appropriate size of examples required to sustain natural patch dynamics of the systems. Appendix 3 defines general characteristics of the four system patch types. The team assumed that these general characteristics apply to the ecological systems present in the Great Basin so the starting point for minimum sizes of patches were derived from this model. Section II provides specific patch type characteristics of each Great Basin ecological system type.

We emphasized ecological systems because 1) our current knowledge of plant associations in the Great Basin is uneven and incomplete; 2) again, we lacked information about specific occurrences of plant associations—and obtaining such information was constrained by our timeline and was financially impractical; 3) ecological systems are more comparable in scale to the information that was available from GAP vegetation layers; 4) using ecological systems effectively reduced the number of the coarse-filter targets to a more practical number; 5) many ecological processes operate at the spatial scales above those that support individual plant associations, and may be best represented through more broadly defined units; and, 6) ecological systems established as conservation targets at an ecoregion scale will serve equally well as targets at individual conservation sites.

Additionally, 36 imperiled plant associations in the national vegetation classification were retained as conservation targets. We selected only imperiled plant associations that are ranked G1 or G2 by the Association for Biodiversity Information. We felt that these targets would not be represented adequately with coarser-scale ecological systems and ecological land units. Although these imperiled plant communities are coarse-filter targets also, we analyzed them as part of our fine-filter strategy of portfolio design. Appendix 4 defines global rankings used from the Association for Biodiversity Information as well as the criteria used to summarize rankings.

We also identified aquatic habitat targets that represent the range of aquatic ecosystems in the Great Basin ecoregion. Ecological drainage units (EDUs) were defined to spatially stratify the ecoregion based on environmental variables that determine patterns of aquatic biodiversity and ecological system characteristics within the internally drained Great Basin. However, they became unnecessary when the lack of detailed occurrence information prevented the need for stratification.

Aquatic ecological systems, like their terrestrial counterparts, are dynamic spatial assemblages of ecological communities that occur together on the landscape with similar geomorphological patterns, are tied together by similar ecological processes (*e.g.*, hydrologic and nutrient regimes, access to floodplains) or environmental gradients (*e.g.*, temperature, chemistry), and they form a cohesive and distinguishable unit on a hydrography map.

The first step in identifying aquatic ecological system targets was to determine the key environmental variables that shape aquatic diversity in this desert ecoregion. Aquatic experts provided the variables based on literature and they include elevation, size of watershed, and chemical characteristics. The second step was a partial assessment of the distribution of the biota throughout the ecological drainage units. The third step generated a hierarchical list of the aquatic ecological systems that describe patterns of aquatic settings and processes. The preliminary aquatics habitat classification system is provided in table 31 in the analysis of the aquatics system group (see section II. G.). Consulting aquatic experts who mapped specific known examples of system types accomplished the final step of identifying examples of each system type. As was done for the G1 and G2 imperiled communities, we analyzed them as part of our fine-filter strategy of portfolio design.

In addition to the system-level and community targets, we identified species targets for the Great Basin. We targeted all imperiled species ranked G1 and G2 by the Association for Biodiversity Information, all federally listed threatened and endangered species, and a representative subset of species of special concern. In the federally listed threatened and endangered species category we included a few candidates for listing since these are high priority species for land management agencies. The species of special concern included declining species, endemic species, disjunct species, vulnerable species, and wide-ranging species ranked G3 through G5 (see appendix 4 for definitions). These fine-filter targets were selected to assure that none fall through the mesh of the coarse-filter strategy.

We identified 362 imperiled (G1 and G2) taxa (species and subspecies) as targets for this first iteration of the Great Basin ecoregion. The imperiled targets were initially determined from the state heritage programs, which have customarily regarded these species as highest priority. They include examples from terrestrial and aquatic taxonomic groups—amphibians, birds, fishes, invertebrates, mammals, reptiles, and plants. Biological experts helped refine the final list of species targets during scheduled interviews. One introduced G1 fish (*Empetrichthys latos latos*) is among this group. It was extinguished from its native Mojave Desert habitat, but is thriving in a refugium within the Great Basin and we wanted to ensure its protection until it is restored to its native location. Sixty-three percent of the species targets are considered imperiled, but we also identified 216 species of special concern (G3 through G5).

Table 1 summarizes the 578 species conservation targets while a complete list of taxa is provided in appendix 5. There are 224 plant species and 352 animals, and among the animals are eight wide-ranging species. Also among the species are 31 federally listed threatened and endangered or candidate taxa, and 16 of these are fishes. Non-natives were not considered.

Table 1. Conservation targets for the Great Basin ecoregion (continues on next page).

Summary of Great Basin Ecoregional Targets	
Targets	**Total Number***
Terrestrial Ecological Systems	29
Imperiled Terrestrial Communities	36
Aquatic Ecological Systems	32
Plant and Animal Species	578
All Conservation Targets	675
Imperiled Species (G1 and G2 ranked)	362
Species of Special Concern (G3 – G5 ranked)	216

Table 1. Continued.

Summary of Great Basin Ecoregional Targets	
Targets	**Total Number***
Federally listed Endangered, Threatened, and Candidate Species	31
Endemic Species	296
Limited Species	165
Disjunct/Peripheral Species	61
Widespread Species (including declining, habitat specialists, and migratory concentrations)	41
Wide-ranging Species	8

* This bottom section of table is not additive since some categories overlap.

An early step in the planning process involved core team members breaking into taxonomic/system groups to gather information on potential species targets and their global distributions. The taxonomic groups included aquatics (fishes and aquatic invertebrates), birds, mammals, terrestrial invertebrates, herptiles, and plants. We worked with local experts and consulted the literature to determine their global distributions and classified each as endemic, limited, peripheral, disjunct, or widespread. Our definition of endemic is strict, that is, the target was classified as endemic only if all known occurrences fall within the bounds of the Great Basin. There are 296 taxa currently considered endemic in the Great Basin. Limited taxa occur in one or a couple of other ecoregions beyond the Great Basin. Almost 80% of the species targets have strict endemic or limited global distributions relative to the ecoregion. Many of the target species classified as limited or peripheral occur only in the Mojave Desert and Great Basin, while many others occur only in the Columbia Plateau and Great Basin—these species typically are restricted in distribution to the hydrographic Great Basin. Lesser numbers of target species classified as limited or peripheral occur only in the Sierra Nevada or Utah High Plateaus and the Great Basin ecoregions. Vulnerable species (The Nature Conservancy 2000b) include numerous G3 plants and animals. These targets generally have limited global distributions, but are not so rare as to be imperiled. Raptors fall into this category and they tend to be persecuted by some people and vulnerable to population declines.

Several G4-G5 declining species were selected as conservation targets for this ecoregion. The majority are bats and birds. For the latter, we referred to Great Basin Bird Observatory and Partners in Flight information. Birds that are habitat specialists in riparian systems are not only vulnerable, but declining because of their declining habitats within the Great Basin. These birds include Blue Grosbeak, Southwestern Willow Flycatcher, Western Yellow-billed Cuckoo, and Yellow-breasted Chat. Another set of bird targets was selected because of their dependence on wetland systems. These include American Avocet, American White Pelican, California Gull, Eared Grebe, Franklin Gull, Least Bittern, Long-billed Curlew, Redhead, Western Snowy Plover, White-faced Ibis, and Wilson's Phalarope. Others are declining and their stronghold is in the Great Basin—Pinyon Jay, Juniper Titmouse, Sage Grouse, Loggerhead Shrike, Black Rosy-Finch, Lewis's Woodpecker, Sage Thrasher, Brewer's Sparrow.

Wide-ranging species and their habitats were selected as conservation targets to help identify necessary linkages among the conservation sites and adjacent ecoregions. We identified the three subspecies of bighorn sheep that occur in the Great Basin, three raptors, American White Pelican, and the peripheral black bear as wide-ranging species and we analyzed their habitats as part of our coarse-filter site selection strategy.

F. Data Collection and Management

Data management

Data management for the Great Basin ecoregional plan was done at the Nevada Field Office (NVFO) of The Nature Conservancy, with support from TNC's Western Resource Office (WRO/WCSC), and the California Field Office (CAFO). Spatial data were compiled and managed using ArcView 3.2a, a geographic information system. Data obtained for analyses and map production included vegetation, soils, land cover, hydrography, topography, political boundaries, transportation, conservation target occurrences and land managements status, among others. Attribute information for all data layers was managed and distributed using Microsoft Access and Microsoft Excel. Key sources of information for the plan included occurrence data from the three state heritage programs, vegetation and land management information from the GAP analysis program, expert interviews, the U.S. Geological Survey, TNC files, and the published literature.

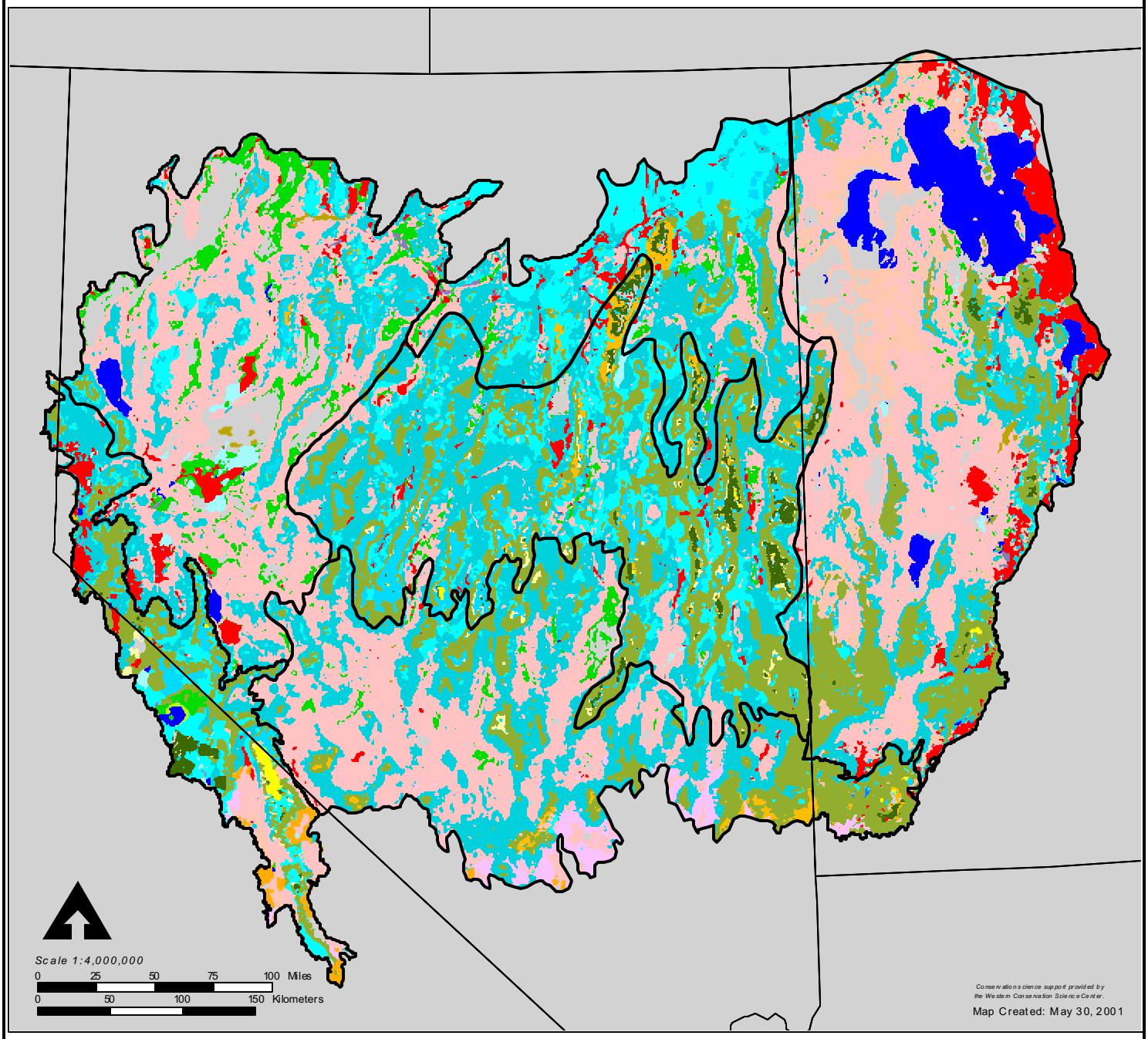
GAP Coverages

The U.S. Geological Service's Gap Analysis Program (GAP) vegetation coverages of four states were obtained to supplement limited plant community occurrence data (Davis *et al.* 1998, Edwards *et al.* 1995). However, differences in approaches to mapping employed by the various state GAP efforts were reflected in inconsistencies in spatial resolution and cover classes of vegetation types, especially across the California-Nevada boundary.

Because the ecoregion classification of terrestrial ecological systems and component plant associations (see appendix 1) provided the best available knowledge of Great Basin vegetation, it formed the basis for linking the various land cover classifications across state borders. Where appropriate, many GAP cover types were renamed to match those of the Great Basin classification of ecological systems. For example, several different mixed conifer cover types from each state were combined to depict a montane forest and woodland ecological system. In total, 26 native vegetation cover types were depicted on the ecoregion-wide map. These represented 26 of 29 terrestrial ecological systems targeted in the ecoregion. Three system types not depicted on the map were clifflands, altered andesite soils, and caves, which occur only as small patches on the landscape, or occur below the surface. Creosote-bursage desert scrub, which occurs on the southern periphery of the ecoregion, was not reliably depicted in available vegetation maps (possibly because of insufficient ground checks of modeled delineations), and was combined with Joshua Tree-mixed Mojave scrub.

Cross-state differences in spatial resolution resulting from modeling efforts in the UT/NV coverage that produced finer scale maps than in CA, produced another challenge in attempts to stitch the GAP coverages together. A reconnaissance field visit along the California-Nevada border by the Mojave Desert ecoregion team suggested that small units were not reliably spatially represented, so a smoothing technique using a focal majority filter (with1 km radius focal window) eliminated many very small polygons. This process resulted in a unified vegetation coverage of ecological systems for the ecoregion (figure 7).

Figure 7. Terrestrial ecological systems of the Great Basin.



Target Occurrence Information

Occurrence information was obtained from the California Natural Diversity Database (CNDDB), Nevada Natural Heritage Program, and Utah Natural Heritage Program in summer 1999. A minor updated data file was provided by Nevada in spring 2000. The majority of target occurrence information obtained from the three state heritage programs were rare species data that provided the foundation for characterizing the uniqueness of the ecoregion. All records were spatially referenced and a limited number of records contained viability estimates. California's data set included both species and natural community occurrence information depicted spatially as polylines. Nevada and Utah data sets included only species occurrence information depicted spatially as points. Polyline-depicted occurrences from the California data set were transformed into point occurrences, and then merged with the Nevada and Utah data sets for the computer-aided portfolio selection and design step. In addition, each state provided similar, but somewhat different, data fields to characterize the occurrence information. Non-spatial attribute data were merged in an Access database and later joined to the unified spatial data layer. Original shapefiles are being maintained separately for each state for use in refining site boundaries during site conservation planning.

No database sources of aquatic community occurrences were available, although the Natural Heritage Programs' databases included occurrences of some rare aquatic species. An aquatic classification system for the Great Basin was lacking, which made it difficult to make an assessment of the aquatic biodiversity of the ecoregion.

The BLM, Nevada Division of Wildlife, and Bechtel, Inc. supplied additional digital occurrence information on specific targets. This information was maintained in ArcView shape files and also incorporated into the Access database for analysis.

Expert Interviews

With the available digital information on target occurrences in hand, it was clear that there remained significant gaps in specific biodiversity data for the Great Basin ecoregion. Almost no information was available for aquatic communities. GAP coverages more accurately depict large patch and matrix communities, but missed many of the small patch and linear ones. Information estimating occurrence viability for species, natural communities, and ecological system targets was sparse. To fill these data gaps, the planning team traveled throughout the ecoregion to conduct numerous interviews with biologists, land managers, academics, and other experts with knowledge about the abundance and distributions of conservation targets, their viability, site and target threats, ecological processes at work at these locations, site connectivity, and current land management. Experts were asked to review and improve the species targets list and the imperfect list of vegetation types for the ecoregion. Expert knowledge of small patch and linear vegetative communities helped fill gaps in the modeled coverages. This information was digitized, attribute fields were imported into the Great Basin database, and linked to the digital ArcView shapefile.

Approximately 170 individuals were interviewed in person during the 1999-2000 winter season. A few experts were contacted via phone conversations and email messages. Many experts contacted provided information on additional experts to contact for more information. We traveled to Bishop, Austin, Carson City, Battle Mountain, Eureka, Ely, Elko, Reno, Sparks, Tonopah, Winnemucca, Logan, Provo, Richfield, and Salt Lake City for both personal and group interviews.

Because much of the Great Basin is managed by federal and state entities, we made a special effort to contact as many agency biologists as possible. We interviewed biologists from every USFS unit (forests and ecounit offices) within the Great Basin in all three states. We contacted and interviewed at all BLM area (district) offices in California and Nevada, and although we did not contact all area offices in Utah, we interviewed the two prominent ones and collected information that covered all five Utah areas. We spoke with several state wildlife biologists in all three states. We interviewed numerous academic field biologists from universities and colleges, and we also contacted many independent specialists throughout the Great Basin.. The uncounted number of hours willingly donated by these biologists and land managers to provide information for the planning effort is an invaluable contribution to this first iteration. Future iterations will be strengthened with additional information from experts that were not contacted, typically because of scheduling conflicts and time constraints. A data file on Great Basin biologists, land managers, and other experts was compiled (appendix 6).

G. Evaluation of Conservation Management Areas

An assessment of land ownership and land status was important for ecoregional conservation planning to assist the team in designing the portfolio of sites and in preparing strategies for conservation. The assessment within the Great Basin was accomplished in part by private contract through the Conservancy's Western Resouce Office and in part with core team GIS assistance. The end product was a series of GIS layers for the ecoregion that showed land ownership and protected area status with associated attribute data.

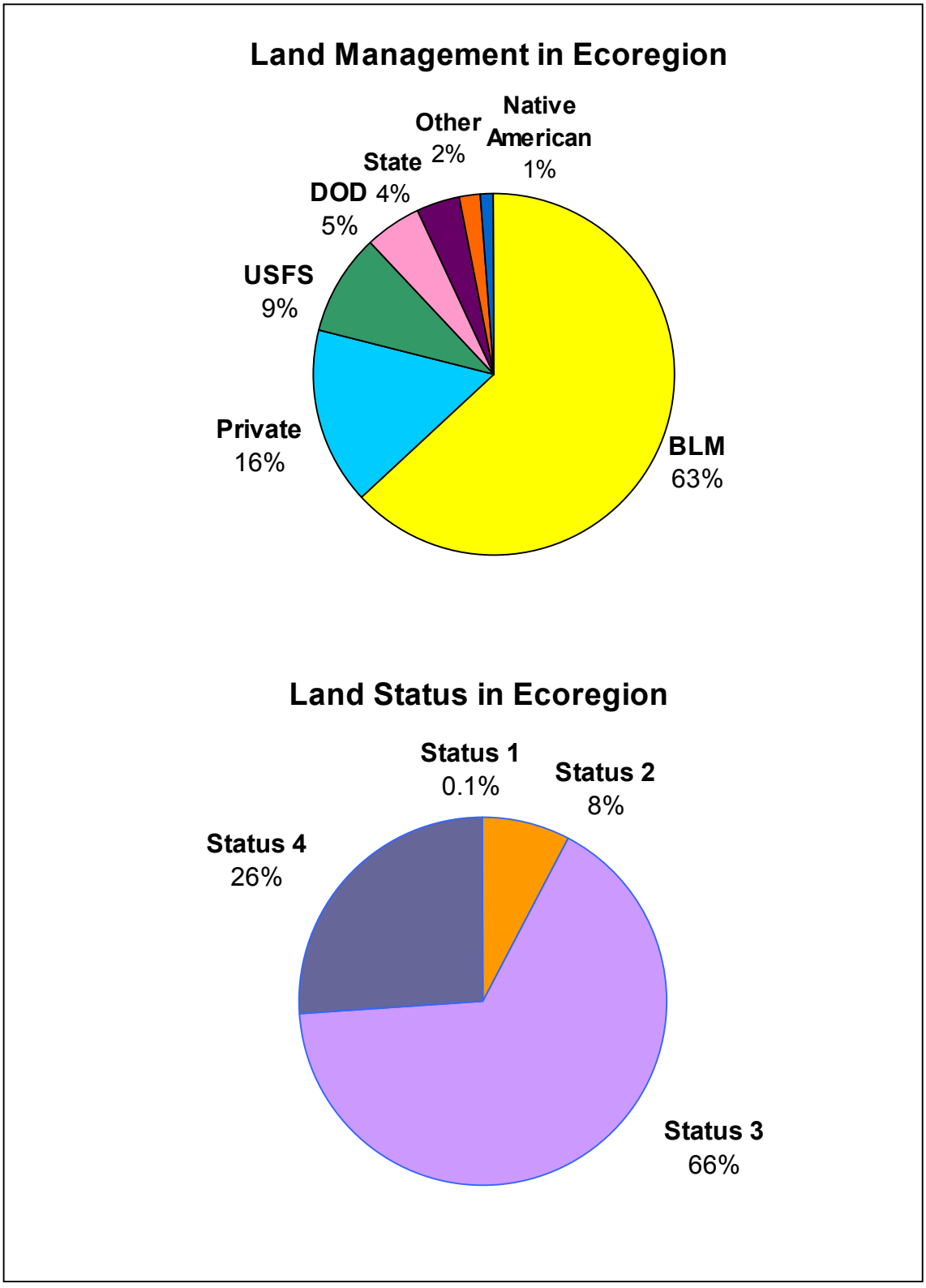
An initial task for the assessment involved identifying general land ownership categories, which included various federal land managing agencies, state entities, Native American lands, military withdrawals, and private holdings. This information provided detail on Great Basin land ownership and management in the various categories (figure 8). GAP land use and ownership data layers from 1996 were used.

BLM is the major land manager in the Great Basin with 63% of the ecoregion under their management. Private landowners are second and collectively own 16% of the ecoregion. The USFS is third with 9% and the DOD is fourth with 5% land management in the ecoregion. Collectively, the FWS, NPS, DOE, Bureau of Reclamation, and county governments manage 2% of the ecoregion and comprise the other category (figure 8). Native American tribes own and manage about 1% of the ecoregion.

A second task identified an initial list of protected areas in the ecoregion. Protected areas are primarily designated and managed for maintenance of biological diversity or natural values. These areas include designations such as TNC preserves, national parks and national wildlife refuges, wilderness areas and wilderness study areas, state parks and natural areas, federal research natural areas, and BLM areas of critical environmental concern. An emphasis is placed on special designations because permanent protection is more likely there than in an area that has a local administratively defined protective management with no permanent guarantee. Nevertheless, some public lands (lacking special designation) are currently managed such that biodiversity is well protected.

Next, TNC land class rankings were assessed for all land designations in the Great Basin. Table 2 provides definitions of the four rankings of land protection status used (Scott *et al.* 1993). The percent of Great Basin lands categorized in the four protection levels is given in figure 8. The vast majority of the Great Basin falls into the multiple use status 3 category while

Figure 8. Distribution of land management and land status in the Great Basin ecoregion.



a small percentage of lands fall into the protected status 1 and 2 categories. Descriptive information (name of protected area, designation type, manager, areal extent, state, comments, and TNC land class rankings) is included in the database. Appendix 7 provides the detailed descriptive information for designated areas along with their assigned land protection status.

Table 2. Land status categories of the GAP analysis program and their definitions.

Category	Description
Status 1	An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state within which disturbance events (of natural type, frequency, intensity, and legacy) are allowed to proceed without interference or are mimicked through management.
Status 2	An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a primarily natural state, but which may receive uses or management practices that degrade the quality of existing natural communities, including suppression of natural disturbance.
Status 3	An area having permanent protection from conversion of natural land cover for the majority of the area, but subject to extractive uses of either a broad, low-intensity type (*e.g.*, logging) or localized intense type (*e.g.*, mining). It also confers protection to federally listed endangered and threatened species throughout the area.
Status 4	There are no known public or private institutional mandates or legally recognized easements or deed restrictions held by the managing entity to prevent conversion of natural habitat types to anthropogenic habitat types. The area generally allows conversion to unnatural land cover throughout.

Most (about 92%) of the Great Basin is multiple use in status 3, or unprotected lands in status 4 category. Almost 8% falls into the protected areas categories of status 1 and 2 lands, but less than 0.1% (24,944 ha or 61,638 ac) is managed explicitly for biodiversity protection (status 1).

Two designations will need further analysis in future interations of the Great Basin plan. Wilderness study areas (WSAs) and the proposed Black Rock Desert National Conservation Area are currently categorized as status 2 as if they were permanently designated because current management is as such. Inevitably, some WSAs will not be designated as wilderness when Congress makes its decision on BLM wilderness areas in the three states. Those areas would revert to a status 3 category as lands managed for multiple uses. The same situation would occur for the Black Rock Desert proposal if Congress fails to designate it as a National Conservation Area. (The Black Rock Desert NCA was recently designated, but the analysis has not incorporated the change in status yet). This will effect the percentage of lands classified as status 1 and 2 lands in the Great Basin. The team used an intermediate (2.5) category to

distinguish lands currently managed as status 2, but waiting Congressional decision, which will result in some reverting to status 3 (thus, protection is not permanent).

Digital boundary information either was obtained or created for each existing conservation area and organized into the database. Land ownership and management GIS layers from GAP were used, but modifications were made to update the layers with new information from various agencies. Maps of Great Basin land management and land status are given in figures 9 and 10, respectively.

H. Ecological Land Unit Assessment

Ecosystem-based conservation strategies include the design of an interconnected reserve network that represents all major environmental gradients. This approach aids in conserving ecological processes and species habitats within their natural range of variability. By conserving environmental variability and gradients, we provide a buffer against a changing environment, either through changes in climate, or through other sources. When evaluating the ecoregional portfolio, we needed to ask, *Does this set of conservation areas look like the ecoregion as a whole?* We used a biophysical model of the Great Basin ecoregion as a tool to help evaluate this question in reserve design.

A variety of factors, such as insolation, temperature, soil moisture, and plant-available nutrients, can be considered driving abiotic variables influencing vegetation pattern across the earth's surface. Indirect measures of these variables may be combined with a vegetation map to characterize and assess biophysical variation captured by conservation areas. Ideally, indirect measures to use in the Great Basin could include climatic zone, elevation, landform, slope, aspect, hydrologic regime, soil depth, soil texture, soil pH and salinity, exposed bedrock, and others. Given available spatial data, we adapted methodologies developed in the eastern United States (Anderson *et al*. 1998b) to map ecological land units (ELUs) for the Great Basin ecoregion. Figure 11 provides a schematic of our process for developing ELUs.

Spatial data sets included a $90m^2$ digital elevation model (DEM) developed from 1:250,000 scale topography, and surficial geology from California, Nevada, Idaho, and Utah. Variables and variable classes used to develop ELUs were derived from documented knowledge of driving ecological factors within the ecoregion (*e.g.*, Sharik, *et al*. 2000).

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First, the DEM was used to develop a classification of eight major landforms that are known to effect vegetation pattern. Landform character is primarily a function of slope angle—from flat topography to steep cliff faces, and landscape position—from lowest to highest, relative to adjacent areas. The continuous elevation grid was broken into discrete classes for slope angle (5 classes) and landscape position (5 classes). Five classes of slope angle were developed to help distinguish topography (figure 12). Landscape position was a relative measure assigned to each grid cell using the relative elevation of surrounding grid cells. For example, if surrounding cells were all above a given cell, that cell received a positive value, while negative values were applied to cells surrounded by others of lower elevation. Cells along side slopes (with surrounding cells both higher and lower) and cells along flat topography (elevations similar to original grid cell) received neutral values. All grid cells were then categorized into four major slope positions (highest, high, mid-slope, and low). The various combinations of slope angle and landscape position then were combined to highlight characteristic landforms for the ecoregion (figure 12).

Figure 9. Land management in the Great Basin.

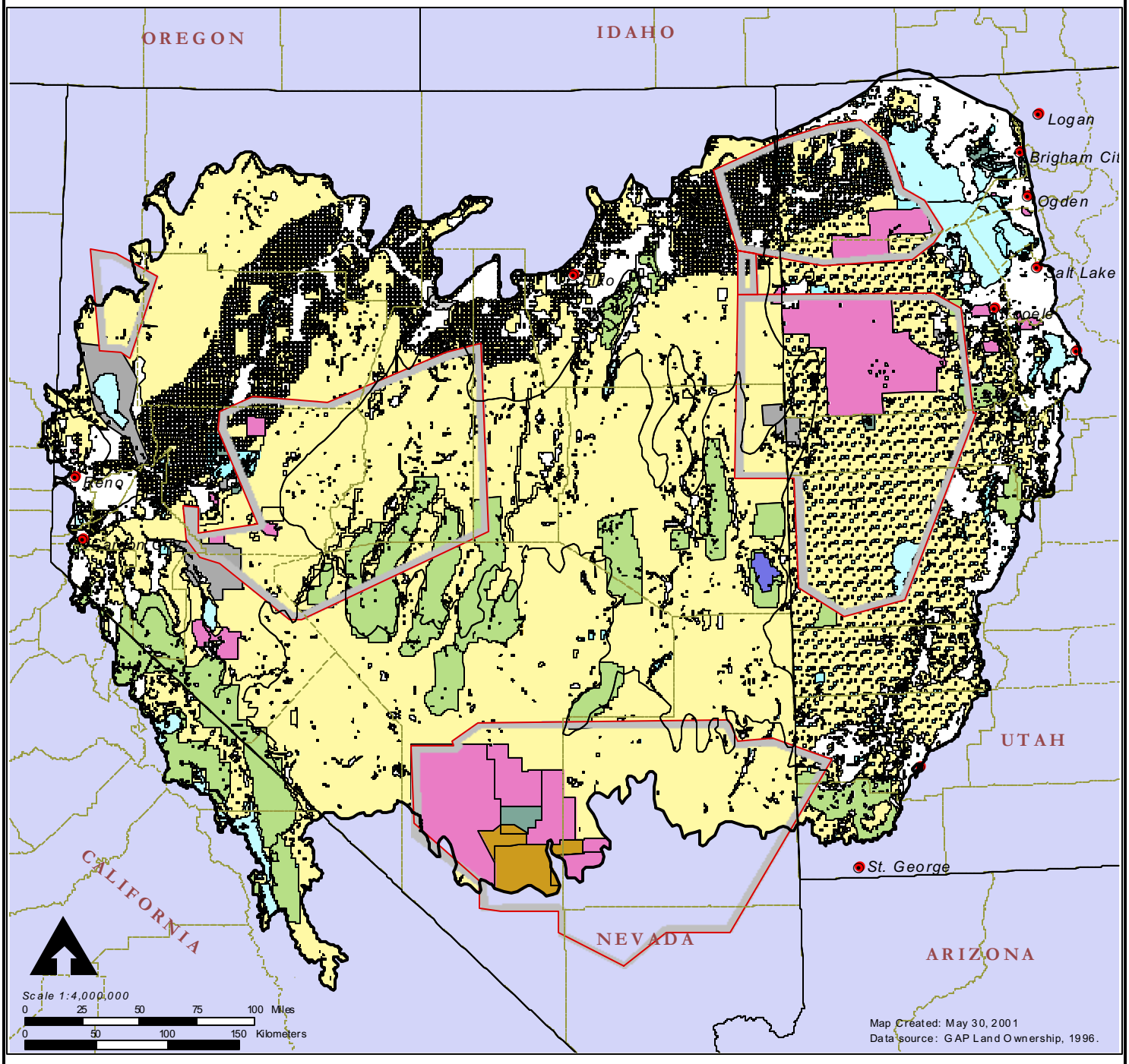


Figure 10. Land status in the Great Basin.

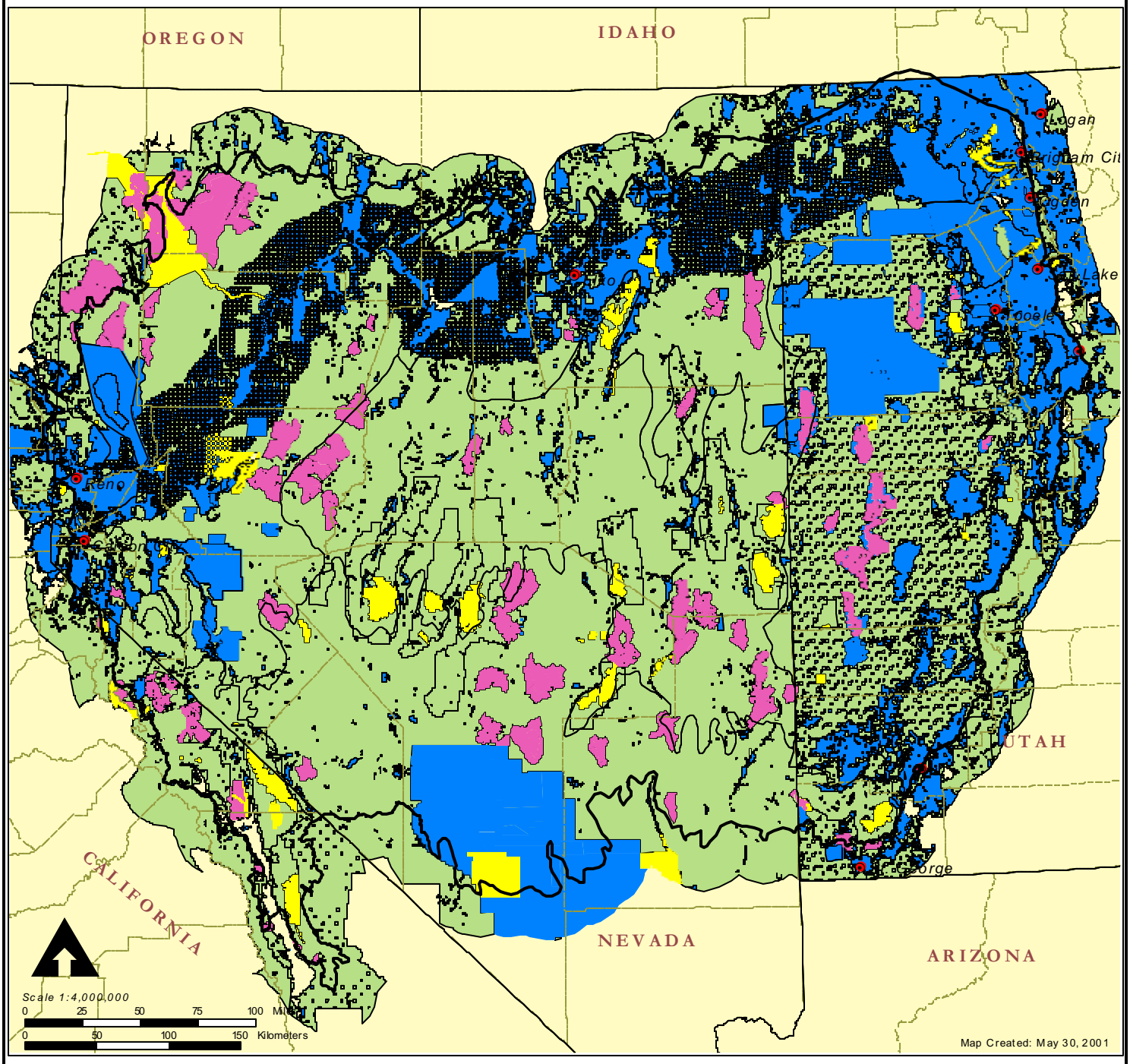


Figure 11. Schematic for development of ecological land units in the Great Basin ecoregion.

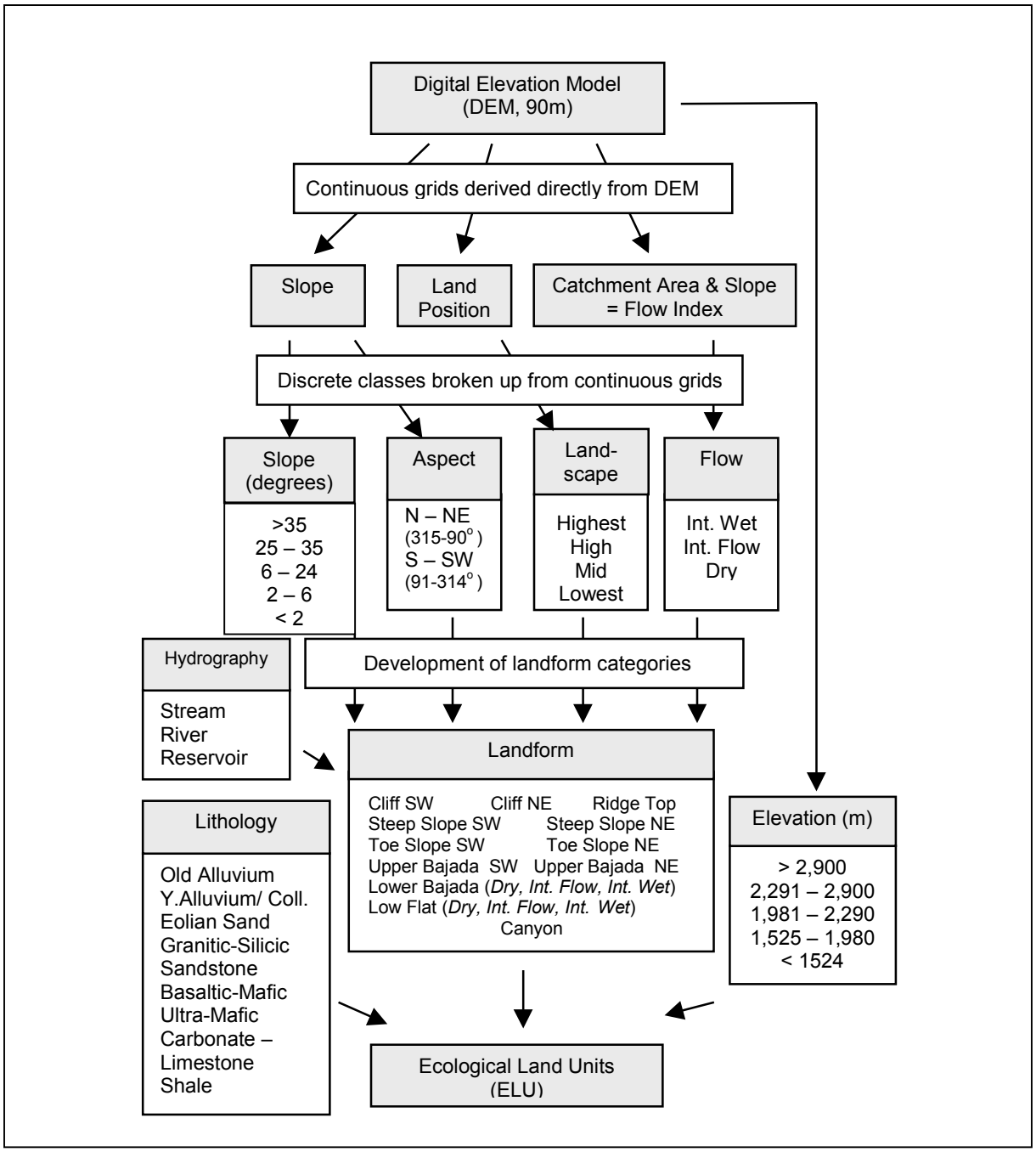


Figure 12. Characteristic landforms for the Great Basin as defined by slope angle and landscape position.

<table>
<tr><th colspan="6">Landscape Position</th></tr>
<tr><th>Slope Angle°</th><th>Highest</th><th>High</th><th>Mid</th><th>Low</th><th>Lowest</th></tr>
<tr><td>> 35</td><td rowspan="5">Ridge Top</td><td colspan="3">Cliff</td><td rowspan="2">Canyon</td></tr>
<tr><td>24 - 35</td><td colspan="3">Steep Slope</td></tr>
<tr><td>6 - 24</td><td colspan="2" rowspan="2">Upper Bajada</td><td rowspan="2">Lower Bajada</td><td rowspan="3">Toe Slope</td></tr>
<tr><td>2 - 6</td></tr>
<tr><td>0 - 2</td><td colspan="3">Flat</td></tr>
</table>

A surface flow index was used that combines the catchment area of each grid cell, that is, the number of $90m^2$ cells above and likely flowing into the grid cell, and the slope angle of the grid cell, which indicates drainage conditions of that cell. The index was used to modify flat to gently sloping landforms (*e.g.*, flats and lower bajadas) as an initial indicator for desert wash (with intermittent flow) and riparian or playa lake (with intermittent wet) environments. Slope aspect (south-southwest versus north-northeast) was used to modify more steeply sloping landforms. Hydrography was used primarily to define the terrestrial/aquatic boundary of the landforms, but it also served as ancillary data to calibrate the flow index. Figure 13 is a map of the distribution of the 18 categories of the eight major Great Basin landforms.

Each landform was further modified by one of nine classes for surficial geology, developed from lithology groups established by Raines *et al*. 1996 (appendix 8). Alluvial deposits dominate the ecoregion. Sand dunes also are prominent surface features influencing vegetation pattern. Six classes for bedrock exposed at the surface were defined by major physical and chemical properties likely to effect vegetation. Figure 14 is a map of the distribution of the nine geologic classes of Great Basin lithology types.

Finally, all landforms were nested within five elevation zones selected for the ecoregion and mapped using the DEM. Figure 15 is a map of the distribution of the five elevation classes in the Great Basin. The unique combinations of landform, surficial geology, and elevation classes produced 691 ELUs mapped with 510,000 polygons across the ecoregion. This data set was smoothed using a focal majority filter (168 m radius focal window), and when polygons classified as water were eliminated, this yielded 627 unique ELUs for the ecoregion. Figure 16 is a map of ELU distribution in the Great Basin. A compilation of the ELUs in the Great Basin is provided in appendix 9.

The vegetation map (see section F and figure 7) was then overlaid on the ELUs across the entire ecoregion. Several mapped ecological systems have characteristic spatial patterns that are small patch and linear, and because these cover types may not be accurately depicted on the vegetation map, they were excluded from further GIS-based analysis. This left 13 large patch and matrix forming ecological systems to use as coarse-filter targets for automated portions of portfolio design (see section K on SITES). With additional smoothing that eliminated minor combinations resulting from map error, a total of 941 unique vegetation/ELU combinations

Figure 13. Landform classes used for ecological land unit assessment.

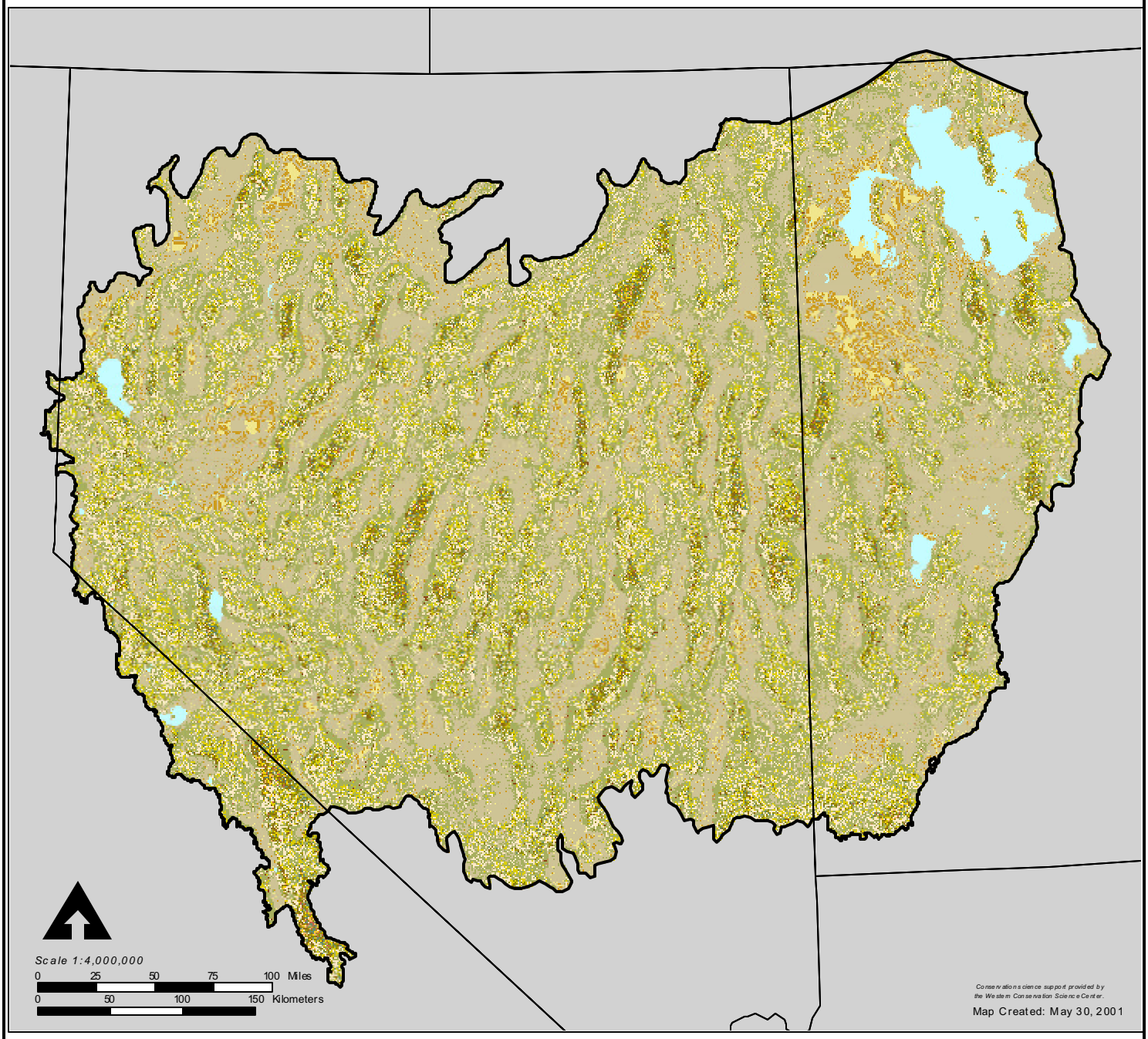
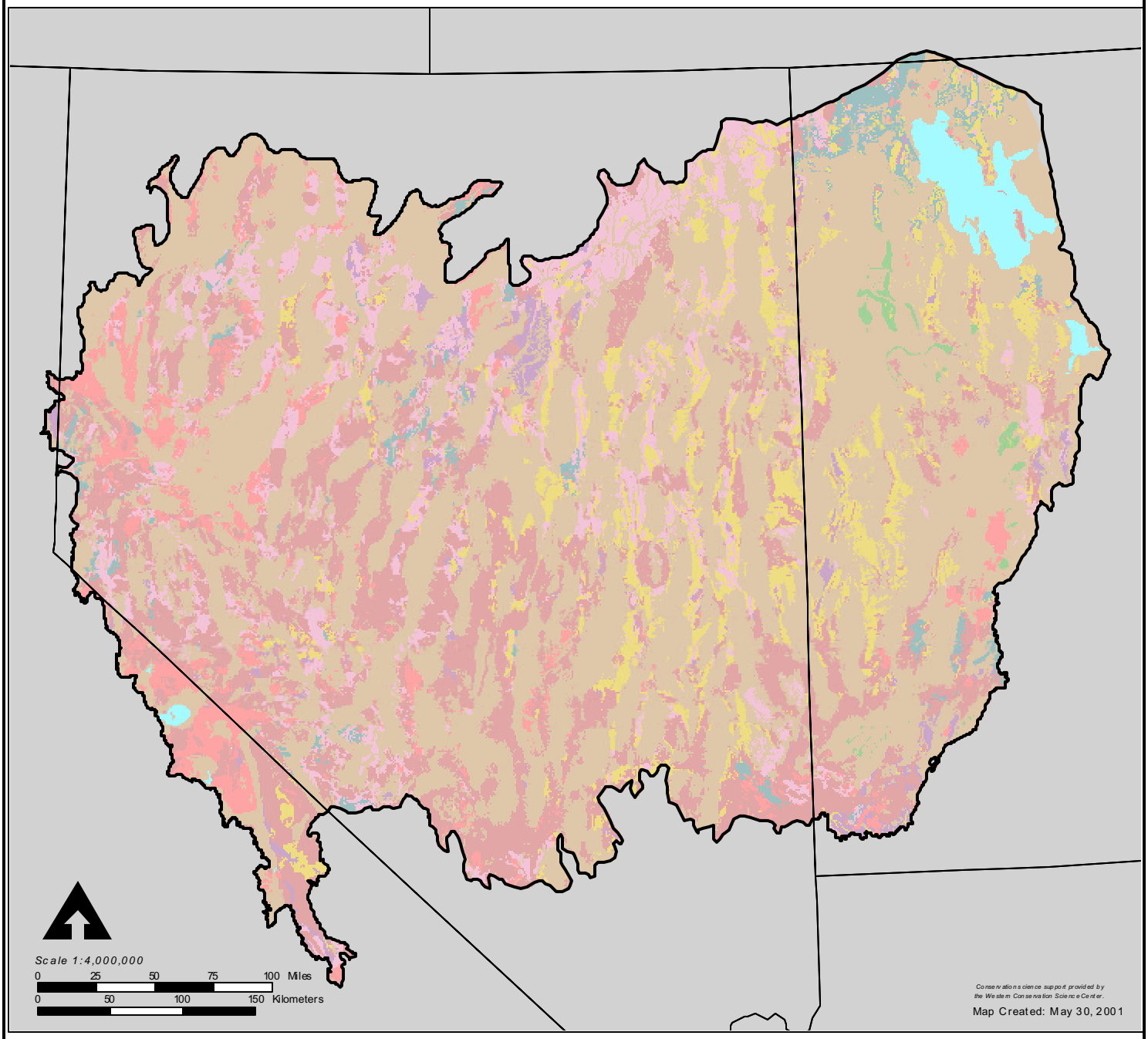


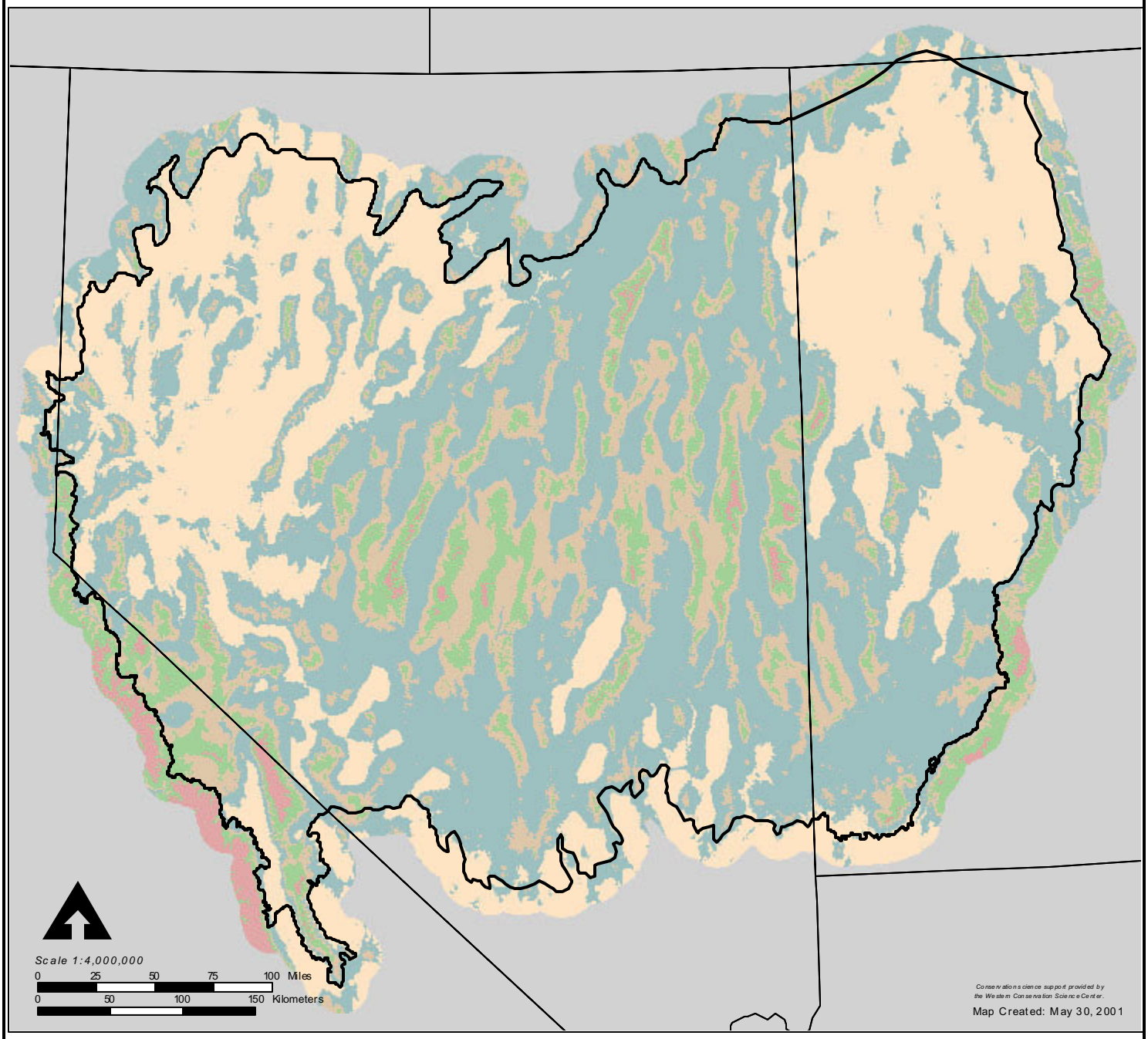
Figure 14. Geology classes used for ecological land unit assessment.



Geologic classes

- Sandstone
- Basaltic-Mafic
- Ultramafic
- Carbonate-Limestone
- Shale
- Water
- Old Alluvium
- Young Alluvium-Colluvium-Glacial Deposit
- Eolian Sand
- Granitic-Silicic

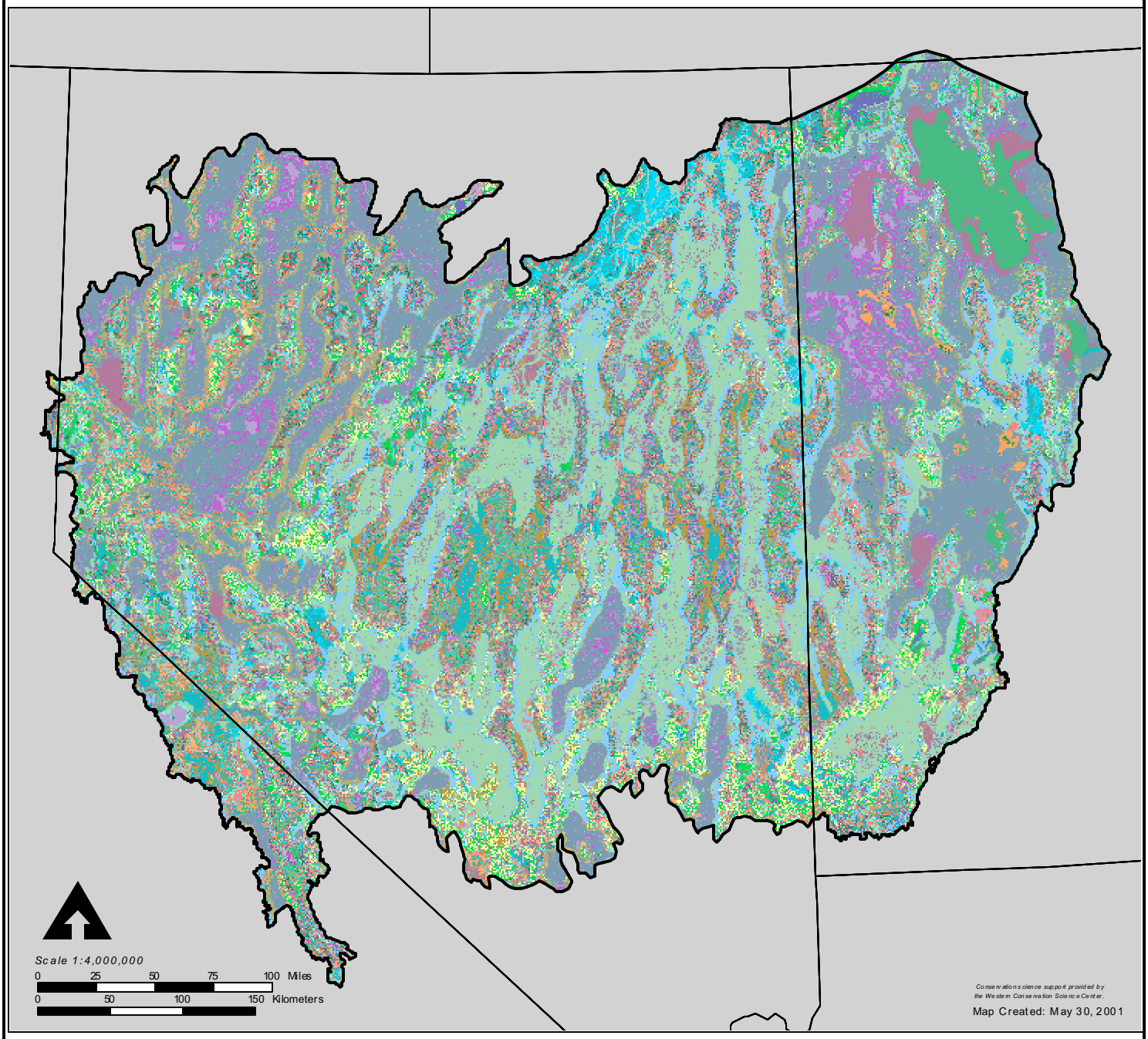
Figure 15. Elevation classes used for ecological land unit assessment.



Elevation classes

- 321-1524 m
- 1525-1980 m
- 1981-2290 m
- 2291-2900 m
- 2901-4406 m

Figure 16. Ecological land units of the Great Basin.



Based on:

Elevation
+ Geology
+ Landform

Elevation Classes:

1000 = 321 - 1524 m
2000 = 1525 - 1980 m
3000 = 1981 - 2290 m
4000 = 2291 - 2900 m
5000 = 2901 - 4406 m

Geologic Classes:

100 = Old Alluvium
200 = Young Alluvium-Colluvium-Glacial Deposit
300 = Eolian Sand
400 = Granitic-Silicic
500 = Sandstone
600 = Basaltic-Mafic
700 = Ultramafic
800 = Carbonate-Limestone
900 = Shale

Landform Classes (NE& SW indicate aspect):

10 = Ridgetop
21 = Cliff, NE
22 = Cliff, SW
31 = Steep Slope, NE
32 = Steep Slope, SW
41 = Upper Bajada, NE
42 = Upper Bajada, SW
50 = Lower Bajada, Dry
51 = Lower Bajada, Int. Flow
52 = Lower Bajada, Int. Wet
60 = Flat, Dry
61 = Flat, Int. Flow
62 = Flat, Int. Wet
71 = Canyon, NE
72 = Canyon, SW
80 = Toe Slope, Dry
81 = Toe Slope, Int. Flow
82 = Toe Slope, Int. Wet
90 = Water

remained as our tool to represent variability within the dominant terrestrial ecosystem targets, and to capture the major physical gradients of the ecoregion in portfolio design. Table 3 is an example that includes a small portion of the vegetation/ELU combinations that were used to represent Great Basin biophysical gradients within the sagebrush semidesert ecological system.

Table 3. Sample output indicating areal statistics for a subset of ELUs combined with the sagebrush semidesert cover type for the Great Basin ecoregion.

Great Basin Ecoregion Sagebrush Semidesert (matrix forming)*			
ELU Code **	**ELU Description (elevation zone, substrate type, landform type, flow/aspect)**	**Total Area** ELU/Cover Type Combination (ha)	**% Total Area of Cover Type**
2260	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Dry	1,502,004	5.169%
2250	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Dry	1,233,319	4.245%
2450	1525-1980 m, Granitic-Silicic, Lower Bajada, Dry	551,054	1.897%
2442	1525-1980 m, Granitic-Silicic, Upper Bajada, SW exposure	355,300	1.223%
2950	1525-1980 m, Shale, Lower Bajada, Dry	292,565	1.007%
1260	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Dry	214,111	0.737%
2441	1525-1980 m, Granitic-Silicic, Upper Bajada, NE exposure	177,610	0.611%
2942	1525-1980 m, Shale, Upper Bajada, SW exposure	159,611	0.549%
2850	1525-1980 m, Carbonate-Limestone, Lower Bajada, Dry	155,387	0.535%
3250	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Dry	153,755	0.529%

* This is a sample subset of 105 ELUs identified for sagebrush semidesert.

** An example of the ELU code derivation is given for the first one, 2260:
(2) = elevation class of 1525 – 1980 m above sea level;
(2) = surficial geology class of young alluvium-colluvium-glacial deposit; and
(60) = landform and drainage type classes of flat, dry.

I. Conservation Goals

Conservation goals represent the end toward which we direct conservation efforts for targeted species, communities, and ecosystems. Goals provide the quantitative basis for identifying and prioritizing areas that contribute to the reserve network. Reserve design is appropriately dictated by target goals, thus creating a vision of landscape functionality at a regional scale. Establishing conservation goals is among the most difficult–and most important–scientific questions in biodiversity conservation (*e.g.*, *How much is enough? How many discrete populations and in what spatial distribution are needed for long-term viability?*). As some have pointed out these questions cannot be answered by theory, but require an empirical approach, target-by-target, and a commitment to monitoring and continual re-evaluation over the long-term (*e.g.,* Noss 1996, Soule & Sanjayan 1998). We can, however, use our knowledge of conservation targets to develop some empirical generalizations to serve as guiding principles; and our own experience may provide important insights.

For ecoregional planning purposes, we define a viable species or population as one that has a high probability of continued existence in a state that maintains its vigor and potential for evolutionary adaptation over a specified period of time. For this we assumed a 95% certainty of surviving 100 years or ten generations and that the species or population has sufficient genetic variation to adapt by natural selection to changing environmental conditions within a predicted range of frequency and amplitude of disturbance and change. While that concept of viability could be said to apply to all targets, in practice we use several closely related, though distinct,

groups of targets. It is important to distinguish *species* targets from *communities* and *ecosystems* targets in terms of conservation strategies. Species-based strategies appropriately emphasize recovery and evolutionary adaptation of individual species. In addition to species viability, community and ecosystem-based strategies emphasize the conservation of ecosystem services (*e.g.,* air, water, and nutrient cycling), perhaps better characterized as *ecological integrity* at an ecoregion scale (Noss 2000). These differences may result in different approaches for setting conservation goals. While conservation goals for species correctly emphasize genetic fitness and the functional roles of species in ecosystems, coarse-filter goals focus more strongly on representation of ecological variability and environmental gradients.

Given the limits of current knowledge, we state conservation goals simply as initial objectives. They are stated as a desired number and distribution. They must be tested and refined through time by monitoring the status and trends of individual species and ecological communities. As a general rule, conservation of multiple examples of each target, stratified across its geographic range, is necessary to represent the variability of the target and its environment, and to provide some level of replication. Replication is needed to ensure persistence in the face of environmental stochasticity and likely effects of climate change. Also, it is required to allow for comparative study–to better understand our conservation targets–and to reliably detect change.

Species Goals

There is little empirical research that addresses representation goals of species, though metapopulation theory and population viability analyses (PVA) offer some insights into this issue (Morris *et al*. 1999). In general, experience with PVA suggests that we conserve a combination of core interconnected populations along with outlying unconnected isolates. The relative emphasis on interconnected or isolated populations may vary depending on the species. Population viability can be assessed using information on 1) the quality of each population, 2) the correlation of the fates of separate populations, and 3) the degree of movement between each pair of populations. For example, with species that typically occur in small isolated habitats, such as some rare plants, the probability of long term survival of the species should increase significantly by protecting additional, healthy, though naturally isolated populations. Conversely, for species with high degrees of movement between sub-populations, the added conservation of a few low quality occurrences may contribute relatively little to species survival.

Unfortunately, in most instances, we have too little information on population quality, correlated fates, or population movements to establish more rigorous goals. The team is left to establish initial conservation objectives for target species, and over time to gather appropriate data for future refinements.

In order to establish initial objectives, the team used the target's conservation status and ecoregional distribution relative to its global distribution as primary factors. Species targets with imperiled conservation status (G1/T1 and G2/T2) require conservation of all potentially viable occurrences. Future inventory and research focused on these targets is needed to establish more suitable goals. For species of less imperiled taxa, replicated examples are required throughout the Great Basin, and in most cases, within each ecoregional section where they naturally occur. Table 4 summarizes stated conservation goals for species targets in the Great Basin ecoregion.

Table 4. Conservation goals for species targets in the Great Basin ecoregion based on conservation status and global distribution.

Conservation Targets	Conservation Goal for Entire Ecoregion	Conservation Goal by Section (for Geographic Stratification)
G1-G2	At least 20 and all viable and feasibly restorable occurrences available	All available and feasibly restorable per section
G1-G5 Aquatics	At least 20 and all viable occurrences available	All available and feasibly restorable per section
G3 Endemic & Limited Distribution	At least 18 viable occurrences	3 per section; with exceptions for declining species
G3 Disjunct, Peripheral, & Widespread Distribution	At least 6 viable occurrences	1 per section; certain case by case exceptions may be made
G4-G5 Selected Endemic, Declining, Disjunct or Wide-ranging Species	Typically, at least 6 viable occurrences	1 per section; certain case by case exceptions may be made

Communities and Ecological Systems Goals

For terrestrial ecological systems we considered the system's distribution relative to the ecoregion and its typical spatial patterning (Anderson *et al.* 1999). For the Great Basin ecoregion, conservation goals were developed for all ecological systems and targeted rare communities. Conservation goals are expressed in different forms, depending on the typical spatial patterning of the target occurrences. Table 5 includes conservation goals for imperiled plant community and aquatic system targets based on numbers of occurrences. For matrix forming and large patch ecological systems conservation goals are expressed as a percentage of current extent within the ecoregion, while those for small patch and linear communities are expressed as numbers of occurrences (table 6). Assumptions and ecological justification of these initial goals follow tables 5 and 6.

Table 5. Conservation goals for imperiled terrestrial plant communities and all aquatic systems in the Great Basin ecoregion.

Conservation Targets	Conservation Goal	Assumptions
G1-G2 Communities	At least 20 and all viable and feasibly restorable occurrences available	Distribution, patch size and stratification are not issues
G1-G5 Aquatic Systems	At least 20 and all viable occurrences available with known biological significance	Distribution and stratification are not issues; all aquatic systems are vulnerable in this desert ecoregion

Table 6. Conservation goals for terrestrial ecological systems in the Great Basin ecoregion.

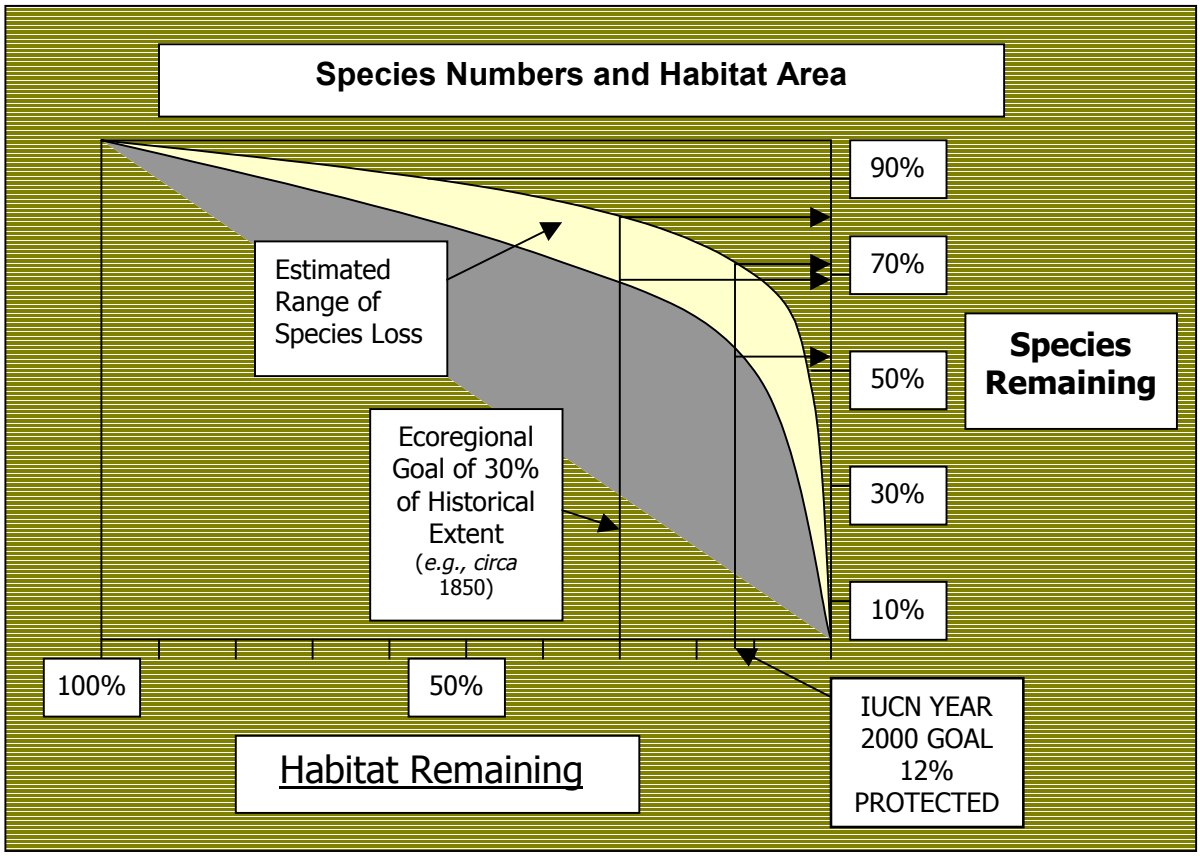
Ecoregional Distribution	Conservation Goal		
	Percent of Area (by Section)	# of Known Occurrences	
	Matrix Forming and Large Patch	Small Patch/ Linear	Per Section Goal**
Endemic	30% of area proportionally representing major gradients*	30	6
Limited	25% of area proportionally representing major gradients*	16	6
Widespread	20% of area proportionally representing major gradients*	12	6
Peripheral	10% of area proportionally representing major gradients*	6	6

* The proportions of an ecological system's major gradients were determined from the ELU data layer.

** Minimum number of occurrences per section exceeds minimum for the total ecoregion because individual small patch and linear ecological systems are not distributed evenly.

In the context of identifying a network of conservation sites, expressing goals as an areal extent has several advantages. Matrix forming systems overwhelmingly dominate landscapes of the Great Basin. They also dominate large interconnected areas identified for biodiversity conservation. Dividing an interconnected network to count numbers of discrete occurrences (*e.g.*, isolated polygons on a map versus a broad interconnected area) in order to assess how well conservation goals were met has little ecological meaning. Areal measures have been commonly applied to reserve design goals at national scales using theory from island biogeography (MacArthur and Wilson 1967, Wilcox 1980) and working hypotheses on the role of species diversity in ecosystem function (*e.g.,* see Hart *et al*. 2001). A well-established, albeit quite general, relationship exists between habitat area and the number of species that an area can support (*e.g.,* Wilcox 1980, Rosenzweig 1995). Relationships specifically for Great Basin matrix communities are unavailable. Over time, loss of habitat tends to result in the loss of species within an approximate range. This relationship formed the basis for international goals (12% of country area) set by the World Conservation Union (IUCN) for member countries (World Commission on Environment and Development 1987). Arguably, the goals set by IUCN were far too low. For instance, it is estimated that with an 88% decrease in habitat extent–that is, a conservation goal of 12%–one could expect over time a decrease of 25-45% of species supported by the habitat (Rosenzweig 1995). This idea is graphically represented below in figure 17 and was adapted from Cincotta and Engleman (2000). Regardless of future land use outside of the reserve network, the species/area relationship suggests that our ecoregional goals generally should be set above 12%.

Figure 17. Hypothesized relationship between species numbers and habitat area adapted from Cincotta and Engleman (2000).



To establish initial objectives, we coupled inferences from this generalized relationship with the 29 terrestrial system types, 32 aquatic types and 578 species that were targeted individually. We also considered the likelihood of intensive development occurring on less disturbed lands remaining outside of conservation sites. We then selected an initial goal for matrix forming and large patch communities of 30% of the ecoregion, but this percentage decreased incrementally to 10% depending on the ecoregional distribution of the ecological system (table 6).

Areal estimates should be placed in historic context, by expressing the desired extent as a percentage of estimated area *circa* 1850, the time immediately prior to widespread European-American settlement in the Great Basin. Ecosystems are dynamic, changing at varying rates, with short-term cycles, and long term trajectories. However, in many places, short term cycles and long term trajectories have been abruptly altered through human land use and have had obvious impact on native biodiversity (Wilson 1992). Our task is to understand natural dynamics, then to evaluate human alterations and mitigate their effects. Although water diversion and hunting historically supported Native American cultures, most rapid and widespread change to the upland matrix of the Great Basin has been through over-grazing, fire cycle alterations, and introduction of non-native plants. The 1850 year marks the beginning of more extensive and rapid human/ technology-driven changes to ecosystems, but is recent enough to reflect vegetation patterns under modern climatic conditions. It therefore, provides a useful and important reference point.

Areal extents of the three major matrix forming ecological systems vary differently from presettlement times. The sagebrush semidesert has increased in extent, sagebrush steppe has been reduced, while salt desert scrub has probably remained about the same (Robertson and Kennedy 1954, Vale 1975, Young *et al.* 1976). Of the 14 large patch ecological systems, ten have probably remained about the same in extent. One, pinyon-juniper woodland, has increased, while three—semidesert shrub steppe, bitterbrush shrubland, and mountain sagebrush—have decreased in extent from presettlement times. However, documented changes are only relative. In the absence of quantitative information on changes in areal extents of the Great Basin's matrix forming and large patch ecological systems, we assumed that their current extents as modeled by GAP approximate that of the 1850 reference year. The potential error in this assumption is unknown. In future iterations of the Great Basin portfolio, planning teams may choose different approximations of presettlement extents and adjust goals accordingly.

In addition to setting a goal for areal extent, all large patch and matrix forming systems additionally had objectives for proportional representation across all their major physical gradients. This was accomplished in two ways. First, all systems were represented in each of the ecoregional sections of their natural distribution. And second, the portfolio design software (see section K on SITES) was programmed to apply percent goals to vegetation/ELU combinations (see section H on ELUs). This ensured that the major physical gradients of each system would be represented in the portfolio in proportion to their modeled occurrence for the ecoregion as a whole.

As noted above, conservation goals for the ecological systems that exhibit small patch and linear spatial patterns are expressed as a number of known occurrences (table 6). These goals follow similar assumptions and numerical estimates described by Anderson *et al*. (1999). To capture a community's variability, goals included representation among the six sections in which the community naturally occurs.

J. Viability Assessment

Conservation goals address questions of species viability and ecosystem integrity at regional scales and rangewide. We also evaluated viability and integrity of target occurrences. Species viability is usually addressed with information from population viability analyses. However, little data exist for most Great Basin conservation targets to conduct population viability analyses for each target. Consequently, occurrences for intermediate and local scale species and communities were evaluated with a surrogate ranking system. They were scored for size, quality or condition, and landscape context, relative to other, apparently viable or functional examples. Criteria in the three categories are briefly defined below.

Size is a measure of the area or abundance of the conservation target's occurrence, relative to other known or presumed viable examples. For ecological systems and communities size is simply a measure of the occurrence's patch size or geographic coverage. Specific minimum size criteria for each Great Basin ecological system is listed in section II. For animal and plant targets size takes into account the area of occupancy and number of individuals. Minimum dynamic area, or the area needed to ensure survival or re-establishment of a target after natural disturbance, is another aspect of size.

Quality/Condition is an integrated measure of the composition, structure, and biotic interactions that characterize the occurrence. This includes factors, such as 1) reproduction, age structure, biological composition (*e.g.*, presence of native versus exotic species and presence of characteristic patch types for ecological systems); 2) structure (*e.g.*, canopy, understory, and groundcover in a forested community and spatial distribution and juxtaposition of patch types or seral stages in an ecological system); and, 3) biotic interactions (*e.g.*, levels of competition, predation, and disease).

Landscape context is an integrated measure of two factors, the dominant environmental regimes and processes that establish and maintain the target occurrence, and connectivity. Dominant environmental regimes and processes include herbivory, hydrologic and water chemistry regimes (surface and groundwater), geomorphic processes, climatic regimes (temperature and precipitation), fire regimes, and many kinds of natural disturbances. Connectivity includes such factors as species targets having access to habitats and resources needed for life cycle completion, fragmentation of ecological communities and systems, and the ability of any target to respond to environmental change through dispersal, migration, or recolonization.

We asked Great Basin experts to carefully review and comment on the status of each occurrence with these general criteria in mind. A relative ranking of very good, good, fair, or poor in each of these categories, along with specific comments, provided considerable useful information not previously available, especially for ecological systems (and for many plant alliances) for planning. Very good, good, and fair ranks were considered viable occurrences. A poor rank was considered non-viable and eliminated from the selection analysis. When no viability information was available for extant occurrences, we assumed they were viable (that is, good to fair) rather than non-viable. This assumption was based on the general status for Great Basin landscapes as typically in functioning (sometimes at risk) condition and not usually subject to rapid conversion or degradation as in other highly threatened ecoregions.

Viability of aquatic, riparian, and wetland systems is often reported in terms that describe functioning condition or degrees of disturbance. Proper functioning condition and no disturbance were translated to very good viability rankings. Slight disturbance (*e.g.*, minimal ground water pumping and surface water diversion) was translated to good viability ranking. Functioning at risk and moderate disturbance (*e.g.*, moderate ground water pumping and surface water diversion) were assumed to be fair viability rankings. And, non-functioning and heavy disturbance (*e.g.*, piped and troughed or heavy grazing) were poor, and thus, not viable occurrences.

The element occurrence (EO) ranks given by state natural heritage programs were used for determining occurrence viability of species targets when available. EO ranks of A (excellent), B (good), C (fair), E (extant), H (historical), I (introduced), O (obscure), and Z (migrants/accidentals) were considered viable. EO ranks of D (poor) were considered non-viable and eliminated from the selection analysis. EO ranks were not available for many of the heritage occurrences and for these we assumed viability since much of the ecoregion is relatively intact. Viability information was incorporated into a suitability index, which was used for portfolio design (see section K on suitability index). The suitability index itself provided an indirect measure of ecological integrity for ecological systems, where no expert opinion was available.

K. Portfolio Assembly

The Great Basin ecoregion planning team chose to use the SITES V1.0 portfolio design toolbox for portfolio assembly. There were several data cleaning steps necessary to be able to use the information as input for the SITES program (see section below). Non-viable records were removed. All duplicate records needed removal so that multiple counting and analysis did not occur. We made several decisions regarding duplicate records. Where expert delineated sites were similar in size and overlapped by a small amount, we assumed that their target occurrences were probably in different locations, so no occurrences were removed as duplicates. Where sites were a similar size and overlapped significantly (>50%), ecological system targets were assumed to be duplicates and the less precise record was removed. The most reliable and up-to-date information on viability was retained. When a smaller site was completely subsumed or overlapped significantly (>50%) with a larger more general site, the smaller site was assumed to be a more accurate location of the target, so duplicates were removed from the larger site.

To be able to stratify site selection by the six Great Basin sections, we identified every occurrence of a conservation target by the section in which it was located. The state heritage databases provided us with 2,788 viable occurrences of conservation targets. These were primarily species target occurrences, but the California data set included occurrences of plant community targets as well.

The expert interviews and associated sources of information, including publications, unpublished reports, and GIS coverages, provided us with a total of 660 sites nominated for consideration in the portfolio. These site boundaries sometimes overlapped one another and they ranged in size from 11 ha (27 ac, Ruth) to 904,168 ha (2,233,340 ac, Great Salt Lake). Altogether, the expert nominated sites encompassed 36% of the ecoregion (10,546,537 ha or 26,049,948 ac). Within the 660 sites, there were 2,668 occurrences of conservation targets after removal of occurrences that were duplicate records of the state heritage data sets. In addition to these target occurrences, we also had 119,018 polygons representing major biophysical gradients among ecological systems (see section H) for use in portfolio design.

SITES V1.0 Portfolio Design Toolbox

To effectively complete an ecoregion-wide conservation plan, teams need to evaluate and connect thousands of individual pieces of information. SITES is a computer modeling program developed by the National Center for Ecological Analysis and Synthesis, University of California at Santa Barbara, specifically for the Conservancy's use in ecoregional planning (Andelman *et al.* 1999). SITES enables ecoregional planning teams to evaluate each potential conservation site in relation to the conservation targets within it and surrounding it, and additionally, to make an initial evaluation of threats to conservation at each site.

The strength of the SITES program is that it allows for a broad diversity of inputs associated with conservation planning in a real world environment, thus accommodating the varied needs of different ecoregional planning teams. First, it allows inputs of locations of a variety of conservation targets and conservation goals for those targets. Second, it can incorporate the full range of values used in manual (not computer-assisted) site selection because it provides flexibility in the emphasis of particular species, conservation threats, and opportunities (*e.g.*, its ability to "lock in" or "lock out" certain sites) over others. Third, it allows us to quickly evaluate alternative portfolio configurations to determine their effect on conservation target goals, or to

easily update portfolios as new data become available. Flexibility in the SITES program, however, requires ecoregional teams to customize the tool for use in their particular ecoregion. Once adapted for the given situation, SITES is an extremely powerful and quick tool for optimizing conservation portfolios. It can simultaneously synthesize much more information than is humanly possible. However, the ecoregional planning team needs to bring the process full circle by evaluating results of SITES modeling and, through human eyes familiar with the ecoregion, apply common sense to the result.

The SITES program is a MS-DOS based application which has an ArcView GIS graphic user interface. It evaluates portfolio design by comparing millions of possible portfolio designs against chosen conservation values to determine the most efficient portfolio. SITES allows for two different algorithms to select an optimal and efficient portfolio. The greedy heuristic mode may be used, for example, with traditional gap assessments where each conservation area is selected to fill the largest remaining gap in an existing conservation portfolio. In contrast, the simulated annealing mode uses a process of tolerating gains and losses in overall portfolio conservation value to help find an optimal solution. For the Great Basin portfolio design we used simulated annealing so that a variety of alternative portfolios could be compared to one another to yield an optimal solution.

The first step the Great Basin planning team faced in adapting the SITES tool was to select the appropriate analysis unit—a discrete geographic unit of evaluation, which can be included or removed from the portfolio. All conservation targets, threats, and goals are viewed from the perspective of this analysis unit. SITES analysis units can be watersheds, such as hydrologic unit codes (HUCs) of a given scale, road-bounded blocks, or they can be derived from an arbitrary grid, such as contiguous hexagons. The effectiveness of a contiguous set of hexagon units for defining natural variability, especially among spatially heterogeneous data sets, is well documented (White *et al*. 1992). For the Great Basin, watersheds and road-bounded blocks would not provide meaningful analysis units. They were too variable in size and configuration. The ideal size for an analysis unit used in automated portfolio design should be roughly the size of a small, landscape scale conservation area. Ideal sizes in the Americas likely range between 200 and 5,000 hectares, depending on the ecoregion. We found that a 2,000 ha (~5,000 ac) hexagon-shaped analysis unit was specific enough for capturing species targets, was still useful for aggregation into clusters to address ecological system targets in the Great Basin, and allowed a realistic computational time period. Two thousand-hectare hexagons gave us 15,159 SITES analysis units for the entire ecoregion. The analysis unit grid was constructed for this portfolio analysis and was not derived from other environmental assessments (*e.g.* Environmental Protection Agency's EMAP hexagon grid).

Each analysis unit was populated, by overlaying GIS layers, with occurrences of local and intermediate scale species and communities (points), matrix forming and large patch ecological systems, and wide-ranging species habitats (polygons).

Suitability Index

SITES selects areas to meet goals for conservation targets while balancing objectives of efficiency—that is, the greatest number of target goals met in least amount of suitable land. The "suitability index" integrates land use factors for a given geographic area, and is used to help select among analysis units (hexagons) that contain conservation targets. As was done in the Columbia Plateau, Cook Inlet, and elsewhere, the suitability index is a mechanism for integrating economic, socio-political, and biological factors in the portfolio design process. On its own, the suitability index should not be viewed as a direct measure of target viability, but

target occurrence viability scores may be integrated with the larger index to provide a good indication of the chances for conservation success in a given area. We developed a suitability index for the entire ecoregion using readily available spatial data sets representative of land use in the Great Basin, and it was applied to each 2,000 ha analysis unit. The objective was to assist selection of more intact areas when all other factors were equal, rather than randomly selecting less intact, fragmented, and less viable areas.

The index was based upon several factors including road length, presence of railroads, density of dams, density of mines, presence of land converted to agriculture, and recent fires in Nevada. Additionally, viability scores of target occurrences where targets were present and scores available were added to the index. The land use factors, which were specifically selected because of their influence on ecological integrity of Great Basin matrix forming and large patch ecological systems, are depicted in figure 18. These factors were identified as "costs" or penalties, in the overall suitability index score (table 7). Viability scores for targets were identified as modest "discounts" in the suitability index score (table 8). Each factor was given different weight in the index depending on their likely impact to conservation targets.

Roads were by far the most abundant and ubiquitous land surface change with the Great Basin ecoregion. About 44% of the analysis units had 0 km of roads, 54% had 1-57 km of roads, and only 2% contained >59 km of road per analysis unit (figure 19). In initial runs with a five category road index (0, <20, 20-40, 40-200, >200 km with 0, 5, 10, 20, 50 penalty score, respectively), SITES would choose huge contiguous areas. Therefore, we developed the 12 categories for roads to differentiate penalties across 54% of the land area. Analysis units with less than 1 km road present were removed from the sensitivity analysis). Four categories that divide the upward trend of the curve are considerable less costly than the descending portion, which is separated into four categories also.

Table 7. Penalty given in the suitability index score based on habitat degradation factors.

Factor	Penalty Score
Road Length:	
0 km	0
<2 km	20
2-4 km	50
5-8 km	100
9-21 km	200
22-31 km	500
32-34 km	600
35-40 km	650
40-47 km	700
48-57 km	750
57-199 km	800
>200 km	1000
Each Dam Present	20
Each Mine Present	20
Railroad Present	10
1999 Fire Present	10
Intensive Agriculture Present	10

Figure 18. Indicators of habitat fragmentation and decreased ecological system integrity.

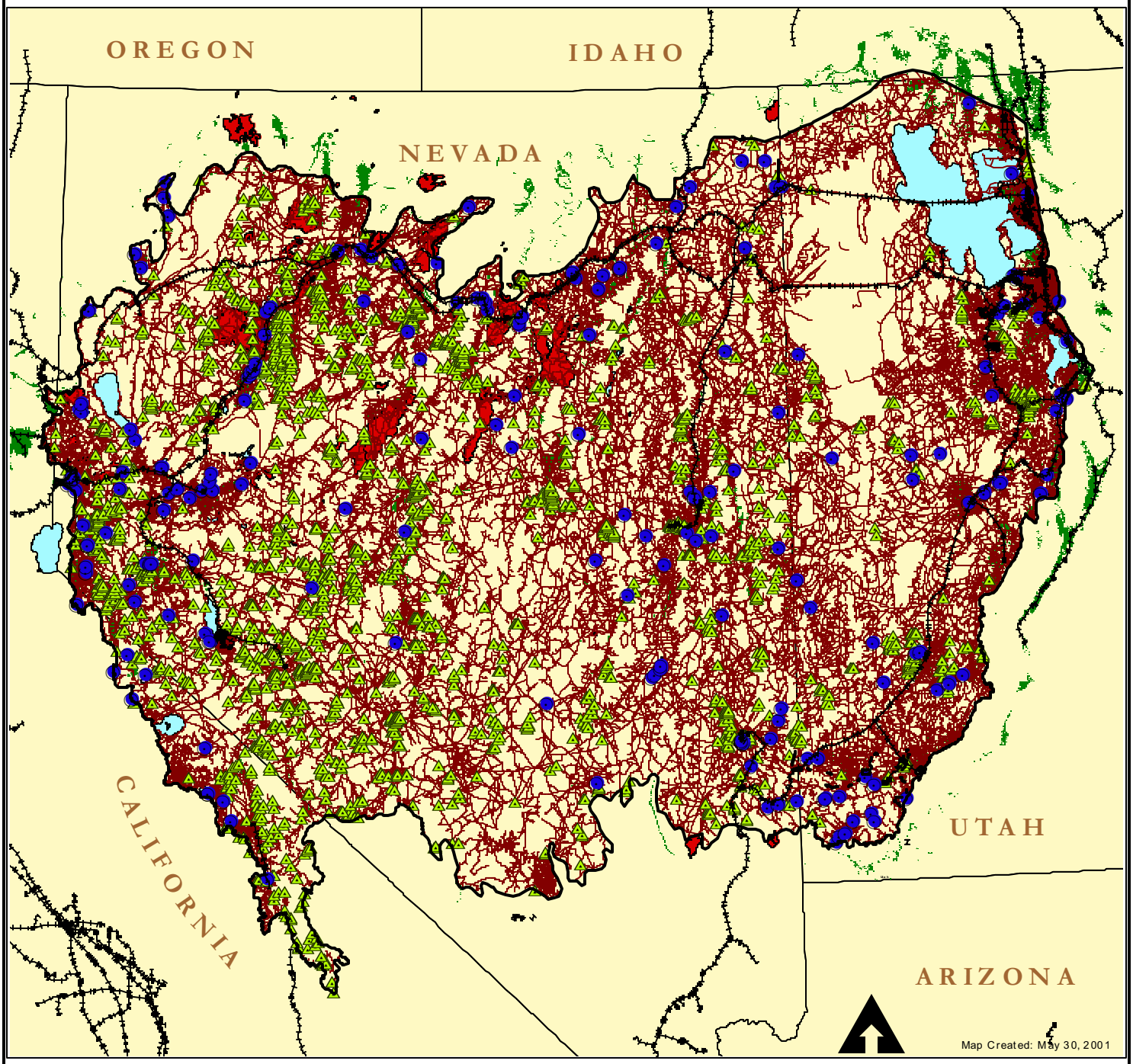
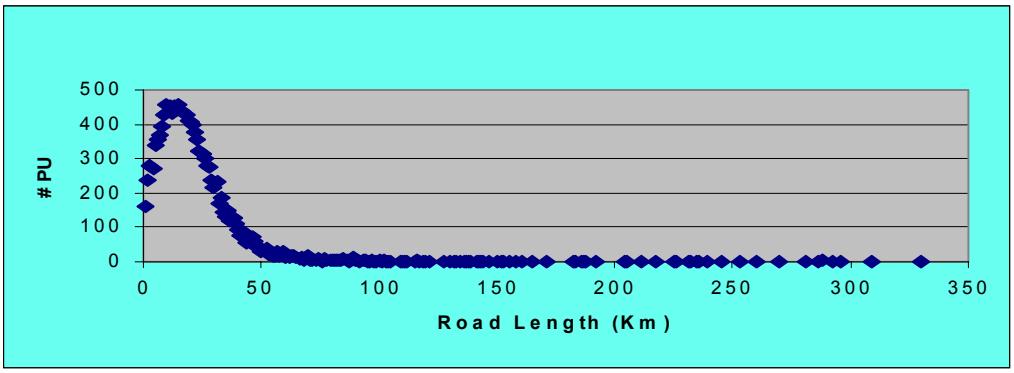


Table 8. Discounts in the suitability index score based on occurrence viability information.

Heritage Occurrence Rank	Expert Viability Estimate for Size, Condition, and Landscape Context	Discount
A	Very Good	5
A-B, AB	Very Good to Good, Good	4
B, B-C, B/C, BI, C, E, and Null	Good to Fair, and Null (no value)	3
EI	Fair	2
CD, H, H/O, I, N, O, Z, Z/H	Fair to Poor	1
D	Poor	0

Figure 19. Frequency distribution of analysis units (PU) by road length (km) present within the units.



All analysis units were assigned a uniform value of 100 points to ensure that some base value of land was taken into account in SITES optimization. The box below provides an example of the suitability index for the Great Basin situation. Figure 20 is a map depicting the suitability index for each analysis unit in the ecoregion. Lower index numbers refer to analysis units with higher viability scores combined with fewer indicators of habitat fragmentation.

Future planning teams might consider other land use factors for the suitability index as they become available. For example, the Nevada BLM recently compiled a 20-year fire history spatial layer that would be more meaningful than the one year data layer used. Grazing use records in a spatial layer also would be useful since they are tied to land use across much of the Great Basin ecoregion.

Portfolio Selection Process

The SITES program requires that each conservation target be assigned a quantitative *goal* (*e.g.,* numbers of occurrences, area, or linear distance) and a *penalty value* for not meeting that goal. While goals varied for each target (see section I), the penalty value was set at 1,000 for each target. This value approximated the maximum values assigned to hexagons in the suitability index, which built in a strong incentive for the SITES program to meet stated conservation goals. For intermediate and coarse scale targets (*sensu* Poiani and Richter 2000),

Suitability Index
—Dan Dorfman and Pat Comer

Suitability Index = SITES analysis unit costs – SITES analysis unit discounts

We increased the penalty "cost" of a SITES analysis unit if it had impacts from human use thought to fragment the landscape or reduce the long-term viability of biodiversity within it in other ways. This information became part of a suitability index, which was developed for the selection process. Road density, presence of mines, dams, agricultural (crop) land, railroads, and 1999 Nevada fires were used to calculate increases in analysis unit "costs" (*e.g.* fire enhances invasion of exotic cheatgrass). In addition to negative impacts, the suitability index also incorporates factors that reduce the "cost" of selecting a given analysis unit in the portfolio. Discounts (positive values) to the "cost" of an analysis unit include viability information (occurrence ranks of target species and expert's values for condition and landscape context of nominated sites). Together, this gave us a contiguous pattern of landscape integrity that we could use to evaluate different options of meeting the conservation goals.

Example:

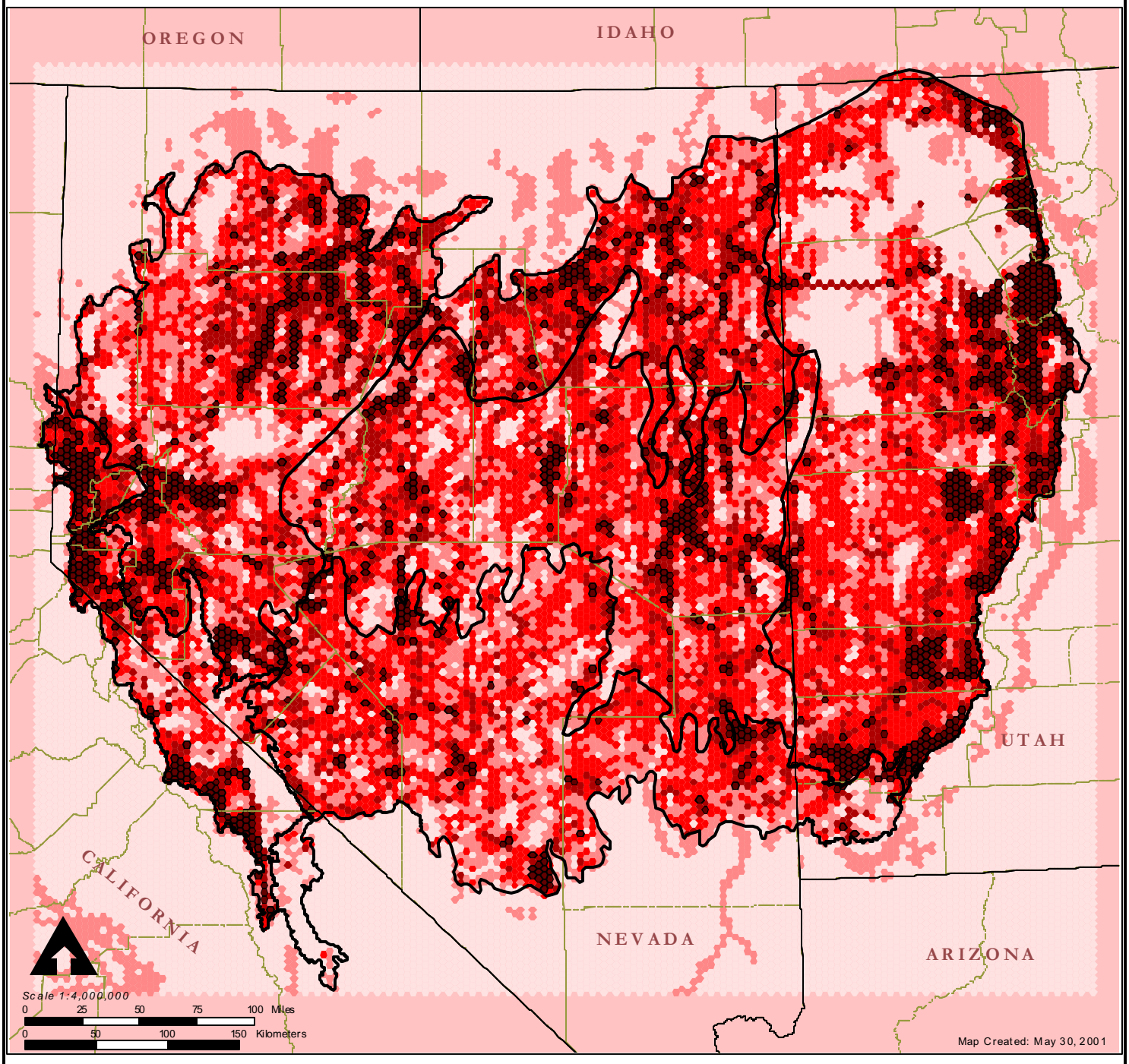
Suitability Index = [Base cost/hexagon (**100 pts**) + 15 km road length (**200 pts**) + 1 mine (**20 pts**)] – [one A-ranked target occurrence (**5 pts**)] **= 315**

a minimum size was established (*e.g.,* at least 10,000 contiguous hectares of a given sagebrush semidesert shrubland system was needed for ecological integrity) as additional input into the selection program. SITES is then required to find contiguous hexagons that contain sufficient area of each system or species habitat to count towards the target's conservation goals.

The SITES program works by randomly selecting a seed portfolio of a randomly chosen set of hexagons. It then chooses another randomly selected alternative set and compares the two to determine which one is better at meeting target goals for the least "cost". The better portfolio is kept and the process is repeated a million times per run for a total of ten runs (and the process is called simulated annealing). The final value of a portfolio is the total "cost" of all included analysis units plus any penalty factors incurred for missing targets or targets whose goals were not met. This process allows SITES to configure a portfolio which best meets our conservation goals while incurring the lowest possible conservation "cost" as defined by the suitability index.

The sheer size of the Great Basin ecoregion (29.3 million ha, 15,159 SITES analysis units) and numbers of targets and occurrences, made for an extremely complex SITES model. In an effort to reduce the complexity, and make the results more understandable, we ran SITES in sequence with portions of the total data set. The first run of SITES incorporated only local and intermediate scale target occurrences across the entire ecoregion. These targets included 534 individual species and G1 or G2 plant community targets, six small patch or linear ecological system targets, and 14 aquatic habitat targets. This set of targets was chosen for the first SITES run because, in general, existing occurrences presented the least number of options for meeting conservation goals. That is, many had too few examples to meet stated goals, so all viable examples were needed in the initial portfolio. We set goals for each of these stratified across the six sections of the ecoregion. In addition, we locked in (manually pre-selected) 847

Figure 20. Suitability index for the Great Basin.



analysis units that were in status 1 or 2 protected areas. We ran the SITES model through 10 runs of one million iterations each and selected the most efficient result. The results of this initial portfolio identified 2,188 SITES analysis units or 14.4% of the ecoregion.
Next, we ran SITES for each of the six sections of the ecoregion with the 2,188 analysis units identified in the first-run portfolio locked-in. In this second run, SITES chose the optimal portfolio for coarse and regional scale targets. Coarse and regional scale targets consisted of matrix forming and large patch ecological systems and habitats of wide-ranging species. Terrestrial ecological systems were represented with the unified vegetation map (figure 7, see section F), which combined the best available spatial data. Biophysical gradients within each of these were represented by combining the modeled systems map with ecological land units (ELUs, see section H) that made up at least 1% of the system's total area. Integrating ELUs into this SITES run allowed us to represent expected variability with each terrestrial ecological system directly into the potential reserve network. For example, the input to SITES included both the area of each ecological system (*e.g.,* sagebrush semidesert) and the system combined with its component ELUs (*e.g.*, sagebrush semidesert /elevation 1525-1980 m, young alluvium-colluvium-glacial deposit, flat, dry) as inputs to SITES. A minimum size criterion (*e.g.,* 10,000 ha) was set for each ecological system occurrence to address occurrence integrity. Individual vegetation/ELU combinations were listed with no minimum size criterion, but with a goal defined (*e.g.*, 30% of extent). This results in multiple areas, >10,000 ha in size, that together represent the natural variability of sagebrush semidesert. See sections on system goals and viability for each system group (section II) for details of assumptions and justifications of criteria.

The combined potential conservation areas (in 4,959 selected analysis units) from the two-tiered SITES analysis covered about 33% of the ecoregion, and it was based on existing known occurrences of all Great Basin conservation targets.

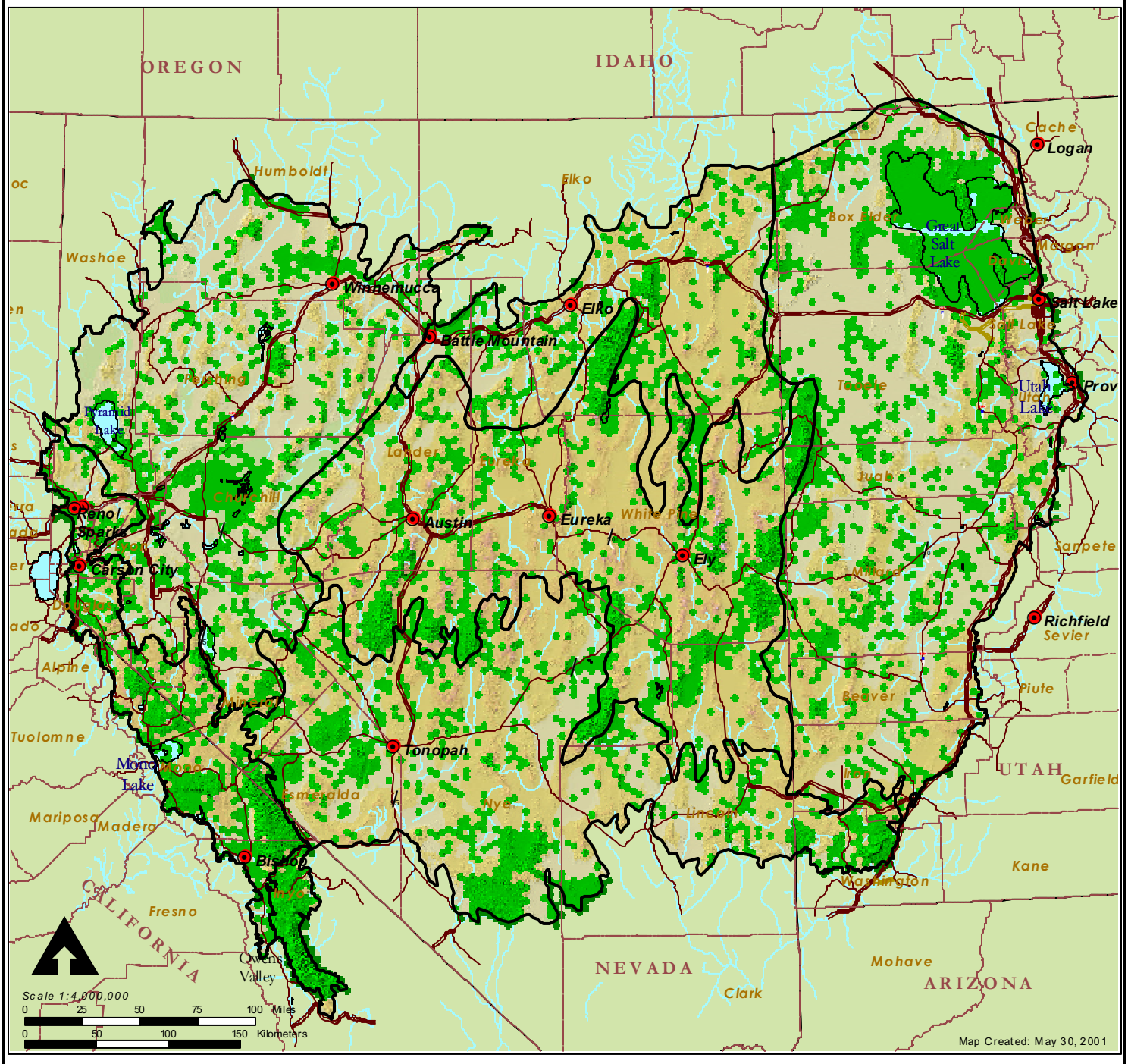
Table 9. Results of the second SITES runs for each section of the Great Basin.

Great Basin Section	Total # of SITES Analysis Units	# of SITES Analysis Units Locked In	# of SITES Analysis Units Selected
Lahontan Basin	2,917	286	802
North Central	1,633	117	425
Central Mountains	3,320	507	954
California	1,050	350	499
Tonopah	3,163	534	1,027
Bonneville Basin	4,095	573	1,252
Total	16,178	2367	4,959

L. Portfolio Results

The initial run of SITES selected 320 sites (aggregated from 2,188 analysis units) for local and intermediate scale targets and these sites were locked in for the second run stratified by the six sections of the Great Basin. The integrated results of the second run built upon the first run and identified 668 potential conservation areas (aggregated from 4,959 analysis units) in the ecoregion (figure 21). They range in size from 2,000 ha (one analysis unit hexagon) to 622,000 ha (311 hexagons).

Figure 21. Six hundred and sixty eight potential conservation areas from SITES.



By integrating the vegetation cover and ELUs, the portfolio design program simultaneously sought out areas of high conservation suitability (low "cost" of inclusion) that represent each terrestrial system in sufficiently large, viable blocks and represent all physical gradients in proportion to their natural distribution. Table 10 provides a brief summary of terrestrial matrix forming and large patch ecological systems represented within the potential conservation areas. This approach to portfolio assembly resulted in efficient representation of these ecological systems across major physical gradients.

Table 10. Ecological system representation in Great Basin potential conservation areas in order of their estimated total areal extent in the ecoregion.

Matrix Forming and Large Patch Ecological Systems	Estimated Total Area (hectares)*	Number of ELUs >100 ha	Area In Potential Conservation Areas (hectares)	Percent Estimated Total Area
Salt Desert Scrub	7,624,385	93	2,259,640	30%
Sagebrush Semidesert	7,139,093	105	1,582,225	22%
Pinyon-Juniper Woodlands	4,544,843	141	1,818,785	40%
Sagebrush Steppe	2,477,314	108	550,226	22%
Playa Lakes	1,143,106	17	475,701	42%
Badlands	1,057,184	41	251,187	24%
Greasewood Shrublands	865,207	18	214,860	25%
Semidesert Shrub Steppe	844,285	63	188,844	22%
Mountain Sagebrush Shrublands	679,516	90	185,861	27%
Montane Forest and Woodlands	230,876	56	89,369	39%
Blackbrush - Hopsage Shrublands	265,880	48	80,921	30%
Low Montane Shrublands	226,091	70	73,611	33%
Subalpine Forest and Woodlands	82,740	30	30,182	36%
Mountain Mahogany Woodlands	126,003	36	19,828	16%
Sand Dunes	31,847	13	11,692	37%
Ponderosa Pine Woodlands	4,763	3	4,763	100%
Bitterbrush Shrublands	3,491	9	2,120	61%
Total	27,346,624	1041	7,839,815	29%

* Estimated total area is minus the small flat ELUs from badland and playa lake systems.

We achieved an efficient portfolio of conservation areas by combining areas identified through this process with those locked in for small patch systems and target species. Ideally, the SITES program should be run once with all ecoregional target locations. However, since nearly all known occurrences of small patch systems and target species were required to meet their goals, running SITES in sequence had little effect on overall portfolio efficiency. Table 10 also indicates where some terrestrial systems were represented beyond their stated area goals, for example, pinyon-juniper woodlands with a 30% goal achieved 40% representation. This resulted from the need to meet representation goals for multiple conservation targets (species, communities, and systems). Systematic and detailed evaluation of vegetation/ELU relationships could begin with these over-represented ecological systems. Documented redundancy among plant associations across multiple ELUs may indicate areas for future ELU refinements. They also may indicate areas for additional efficiencies in the design and inclusion of specific conservation areas of biodiversity significance.

Goals for local and intermediate scale species conservation targets were nearly fully achieved. We failed to meet conservation goals for four animal targets that occur in either aquatic or riparian and wetlands system groups. We met only 67% of our goal set for both the western snowy plover and California floater (*Charadrius alexandrinus nivosus* and *Anodonta californiensis*). We met 75% of our goal for the Humboldt River otter (*Lutra canadensis nexa*), while we met 86% of our goal set for the Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*). All other species conservation goals were either met or exceeded.

The ecoregional planning team evaluated the results of SITES selection and design to add their personal knowledge of the Great Basin and expert interpretation to the computer program's results. Review of the SITES-selected areas revealed that 268 were relatively small (1-4 hexagons or 2,000-8,000 ha) and isolated areas captured for physical diversity of ecological system targets. These did not overlap with any information provided by experts or natural heritage program occurrences and nothing on their viability is known. The team removed them from the portfolio, but they will be retained as provisional areas in need of field inventory to assess viability, and they will be re-evaluated in future iterations as assessment data are accumulated.

Seventy-six percent of the sites nominated by the biological experts were selected by SITES for inclusion. The team added the original boundaries of these expert nominated areas to the final portfolio. This step was necessary because target data for each expert site had been attributed to one centroid analysis unit rather than to all units overlapping with the expert boundary to eliminate multiple counting target occurrences by the SITES program. This step added acreage to the final portfolio as well as some redundancy in ecological systems and their physical diversity.

We did an analysis of change in the ecological systems removed from the SITES-selected areas by eliminating the 268 small isolated sites and those added to it by expanding the selected expert sites to their original boundaries. The resulting change in extent of the ecological systems are presented in table 11. Only one system, matrix forming salt desert scrub, had a net loss of one percent of its represented estimated extent within the portfolio.

Finally, the team divided a few large SITES-selected areas into a few more distinct sites based on intuitive landscape features. For example, SITES identified a large portion of the southwest corner of the ecoregion as one continuous grouping of selected analysis units. The team separated two distinct, primarily lower elevation areas, from two other distinct, primarily higher elevation areas, and identified them as the Owens Valley-Benton Valley, Owens Lake, White Mountains, and Inyo Mountains sites. Similarly, the team aggregated some separate SITES-identified areas into more intuitive sites after adding in the original expert boundaries that provided site overlap. For example, SITES identified a North Great Salt Lake area separated from a South Great Salt Lake area by the Southern Pacific Railroad, and the team aggregated them into one Great Salt Lake site based on functionality. This step reduced the number of sites to 358 conservation areas that comprise the portfolio (figure 22). The 358 sites cover approximately 39.9% of the Great Basin. Appendix 10 is an alphanumeric listing of the portfolio sites along with their conservation targets and site attributes.

Land ownership and management within the selected conservation areas generally reflects the pattern within the ecoregion as a whole with some notable exceptions. Figure 23 is the distribution of land management and land status in the portfolio sites. The first three largest categories of land ownership for the ecoregion retain those same positions within the portfolio although their proportions change. The BLM has considerably less proportional management of

Table 11. Change in areal extent of larger ecological systems represented in the Great Basin portfolio compared to their extent within potential conservation areas determined by SITES.

Matrix Forming and Large Patch Ecological Systems	Hectares Lost From Removal of Small Areas	Hectares Gained By Addition of Original Expert Boundaries	Percent in Final Portfolio	Percent in Potential Conservation Areas	Change in Portfolio Areal Extent
Salt Desert Scrub	375,774	323,886	29%	30%	(-1.0%)
Sagebrush Semidesert	73,323	454,863	28%	22%	5.5%
Pinyon-Juniper Woodlands	65,533	631,884	52%	40%	12.5%
Sagebrush Steppe	161,485	387,572	31%	22%	9.3%
Playa Lakes	0	0	42%	42%	0.0%
Badlands	17,684	227,028	44%	24%	19.6%
Greasewood Shrublands	20,094	82,338	32%	25%	7.0%
Semidesert Shrub Steppe	31,722	112,592	32%	22%	9.9%
Mountain Sagebrush Shrublands	17,025	127,802	44%	27%	16.7%
Montane Forest and Woodlands	1,684	22,045	48%	39%	8.5%
Blackbrush - Hopsage Shrublands	2,856	10,616	33%	30%	3.4%
Low Montane Shrublands	2,837	21,300	41%	32%	8.7%
Subalpine Forest and Woodlands	0	9,648	48%	37%	11.1%
Mountain Mahogany Woodlands	1,638	16,279	27%	16%	11.4%
Sand Dunes	0	8,724	64%	37%	27.1%
Ponderosa Pine Woodlands	0	0	100%	100%	0.0%
Bitterbrush Shrublands	0	0	61%	61%	0.0%
Total	771,655	2,436,577	35%	29%	6.3%

portfolio sites (from 63% in ecoregion to 50% in portfolio) while the USFS has considerably more (9% to 15%), and the proportion of private lands ownership increases only slightly in the portfolio (16% to 17%). Together, the BLM, private lands, and USFS managed lands account for 82% of the portfolio. State and other (County, FWS, NPS, and DOE) agency lands increase proportionally in the portfolio from 4% and 2% in the ecoregion to 8% and 4%, respectively. DOD (5%) and Native American lands (1%) remain proportionally the same between the ecoregion and portfolio. Nevada holds the greatest extent of the portfolio (68.7%), followed by Utah (27.6%) and California (3.7%).

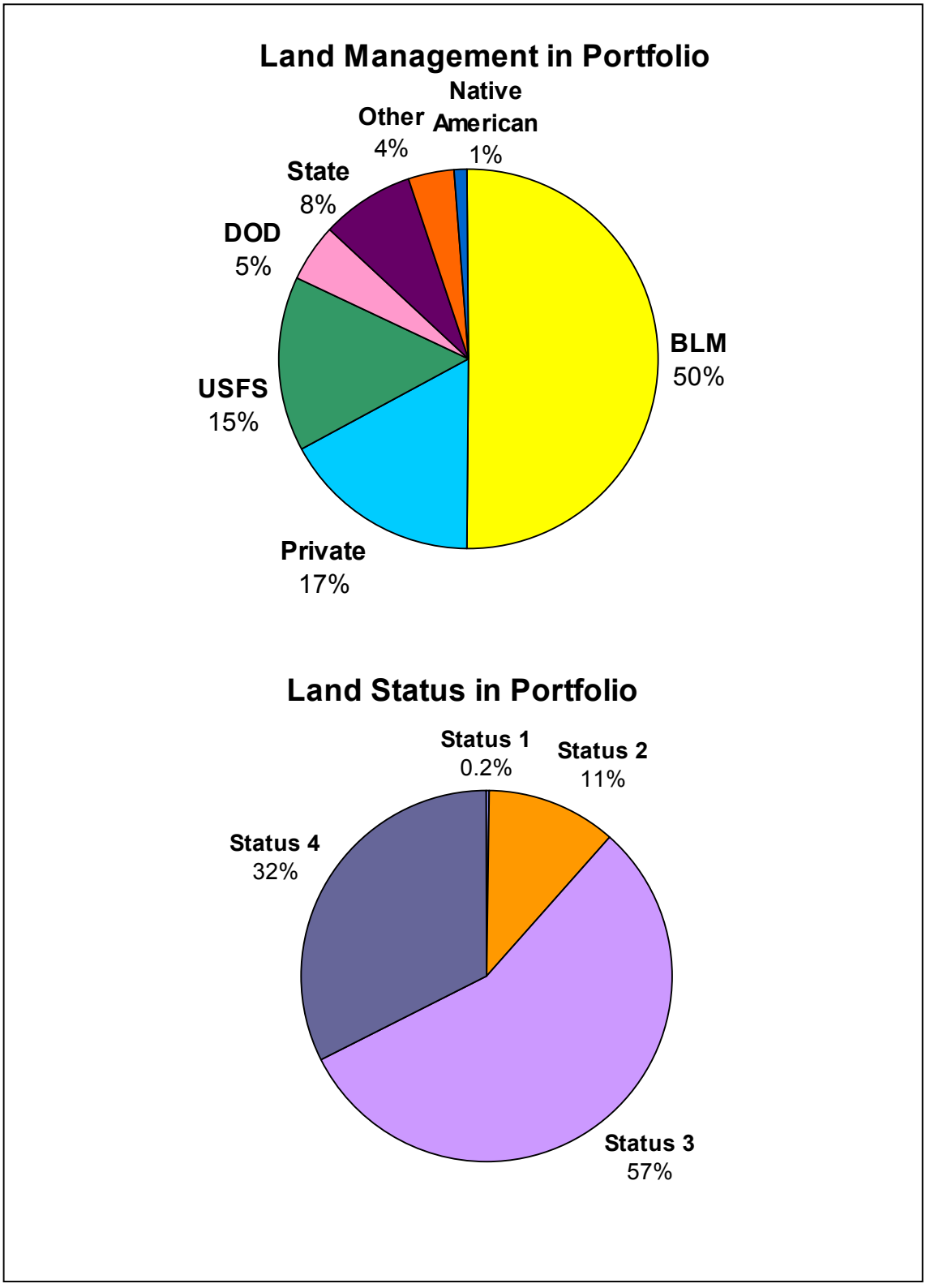
M. Action Sites

A strategy team comprised of protection and science staff convened to determine action sites and to discuss multiple-site strategies. Although every potential conservation area in the portfolio is important for conserving the collective suite of conservation targets in the Great Basin, setting priorities is necessary to first address those sites needing immediate action.

The strategy team focused primarily on landscape scale conservation areas. Portfolio sites categorized as functional landscapes typically are larger, have many conservation targets at all geographic scales, include coarse scale (matrix forming terrestrial or large river and lake aquatic) ecological systems, and include at least four Great Basin ecological system groups with


Figure 22.
Great Basin ecoregion portfolio sites
Portfolio sites
Great Basin ecoregion boundary
Roads and highways
County lines
States
Rivers and streams
Water bodies
Lahontan Basin
North Central
Bonneville Basin
Central Mountains
California
Tonopah
Scale 1:2,550,000
0 25 50 75 Miles
0 25 50 75 100 Kilometers
Map Created: June 04, 2001
Modification and revision of portfolio site data and boundaries are ongoing.
The Nature Conservancy
Saving the Last Great Places
Logan
Salt Lake City
Provo
Richfield
Winnemucca
Elko
Battle Mountain
Austin
Eureka
Ely
Tonopah
Bishop
Reno/Sparks
Carson City
Modoc
Lassen
Sierra
Placer
El Dorado
Alpine
Tuolumne
Mariposa
Madera
Fresno
Tulare
Inyo
Kane
Garfield
Piute
Sanpete
Juab
Millard
Beaver
Iron
Washington
Lincoln
Nye
Esmeralda
Mineral
Lyon
Churchill
Pershing
Humboldt
Elko
Eureka
White Pine
Lincoln
Clark
Cache
Box Elder
Davis
Tooele
Utah
Wasatch
Summit
Duchesne
Uintah

Figure 23. Distribution of land management and land status in the Great Basin portfolio.



either aquatics or riparian and wetlands systems among them. As a result, functional landscapes have more habitat, more habitat diversity, and larger populations of known and unknown species. They also have a high degree of ecological intactness, and have most or all of their key components, patterns, and processes (or they can be restored). In contrast, portfolio sites categorized as functional sites typically are smaller, with fewer conservation targets at one or two geographic scales and include three or fewer ecological system groups. Functional areas, whether landscape scale or smaller, are evaluated by their composition and structure of the targets (condition), environmental regimes and natural disturbances, minimum dynamic area, and connectivity (Poiani and Richter, 1999).

Ninety-four conservation areas, or 26% of the portfolio, are functional landscape scale sites. Almost half of them (44 sites) include unique targets that occur only at that site. The remaining 264 conservation areas are typically smaller, functional sites and sixteen of them include unique targets that occur only there. Appendix 10 includes the site type, either landscape site or functional site, for each of the portfolio sites.

We ranked the landscape sites on their conservation value, complementarity, threats, feasibility, and leveraging opportunity using a specifically designed worksheet for the task. Evaluation of the remaining functional sites in the portfolio will be made in the near future as time permits. Guidelines used for each of the evaluation factors are briefly discribed below.

Conservation value refers to the number, scale, and diversity, as well as to the health of targets at each of the potential conservation areas. Priority was given to sites with targets at multiple spatial scales, both terrestrial and aquatic targets, and more targets present. Priority also was given to sites with higher biodiversity health based on size, condition, and landscape context criteria.

Complementarity is the principle of selecting action sites that are most different from sites that are already conserved, thus they complement or add to existing conservation areas. An area is considered already conserved if its targets have high biodiversity health–measured by the criteria of size, condition, and landscape context–and low threat rankings. Priority was given to sites with targets under-represented in existing areas with conservation management.

Threat is a measure of both urgency and degree of actions that may destroy or significantly degrade targets. Priority was given to sites with greater severity and immediacy of threats.

Feasibility refers to staff capacity of TNC and partners to abate threats, the probability of success, and the financial costs of implementing needed actions. Priority was given to sites where conservation was considered attainable by these measures.

Leverage is the ability to affect conservation at other sites by undertaking conservation action at one site. Priority was given to sites where higher leverage opportunities are thought to exist.

To conduct these evaluations, we compiled experts information on threats and sources of threats to conservation targets at 145 sites (appendix 11). We identified three stresses that are considered widespread and pervasive in the Great Basin. Inappropriate grazing was identified as the most common source of threats to conservation targets. It was noted in 61% of the sites. Inappropriate grazing may include over-grazing, grazing in inappropriate habitats, or grazing at inappropriate times. Non-native plants and animals were identified as the second most common source of threats and occurred in 30% of the sites. Non-native plants impact uplands (typically cheatgrass invasions) as well as riparian and wetlands. Non-native animals are

primarily fishes and they impact Great Basin aquatic systems. Almost as common as the stresses imposed by exotic introductions are hydrologic alterations, which impacted 29% of the sites, and was the third most common threat. Hydrologic alterations include water diversions, dams, stream channelization, ground water pumping, and are tied to other sources of stress, such as grazing, urban and rural development, and mining.

Additional sources of stress were identified as less commonly occurring throughout the Great Basin. They include urban and related development, recreation, altered fire regimes, and mining. Because we had little or no threats information on about 60% of the sites in the portfolio, the team has decided to solicit additional information and feedback from conservation partners. This step has yet to be accomplished. Once done a more rigorous evaluation to rank sites will be made.

Nevertheless, based on the team's preliminary assessment, 20 top priority action sites have been identified from the Great Basin portfolio. They are listed by site number and name in the following box. These sites fall into ten theaters of action, one in California (Mono and Owens valleys), four in Nevada (Truckee-Carson rivers, Meadow Valley, White River Valley, and Ruby Mountains-Ruby Valley), and five in Utah (ancient Bonneville Lake basin, Pine and Virgin valleys, Sevier Desert, Deep Creek and Deep Creek Range, and Delta area). Figure 24 is a map identifying the 20 top priority action sites. A list of potential conservation strategies needs to be developed for these near-term action sites.

Twenty Priority Landscape Scale Action Sites in the Great Basin Ecoregion

Site Number	Site Name	Section
A013	Beaver Dam Wash-Bull Valley Mountains	Tonopah
A022	Blue Lakes-Badlands	North Central
A037	Canyon Mountains-Delta	Bonneville Basin
A038	Carson Range Front-Reno North Valleys-Long Valley	California
A039	Carson River	California
A040	Carson Sink	Lahontan Basin
A059	Deep Creek Range	Central Mountains
A106	Great Salt Lake	Bonneville Basin
A149	Little Sahara Sand Dunes	Bonneville Basin
A152	Long Valley	California
A161	Meadow Valley	Tonopah
A165	Mono Lake	California
A210	Pine Valley Mountains	Tonopah
A214	Pyramid Lake-Lower Truckee River	Lahontan Basin
A223	Rainbow Canyon	Tonopah
A232	Ruby Mountains	Central Mountains
A233	Ruby Valley	North Central
A319	Tunnel Spring Mountains-Halfway Hills-Pine Valley	Bonneville Basin
A324	Utah Lake	Bonneville Basin
A348	White River Valley	Central Mountains

Figure 24. Twenty priority actions sites in the Great Basin ecoregion.

N. Developing Strategies and Schedule for Implementation

A Great Basin implementation team needs to be identified to progress from portfolio selection to initiating next action steps to ensure conservation of priority areas. Roles and responsibilities of the implementaiton team members need to be defined. It may be programmatically efficient (from TNC Nevada's viewpoint) for the core team members to serve implementation team needs for both the Great Basin and Mojave Desert ecoregions concurrently. The team is needed to coordinate conservation efforts and to follow progress among states within the ecoregion(s) and into adjacent ecoregions. The team would coordinate and assist with:

- soliciting feedback on the portfolio of sites from the conservation community, including public partners, private land owners, academics, and practitioners;
- Great Basin conservation plan communication and outreach activities;
- identifying and refining multi-site strategies;
- building strong working relationships with key partners;
- implementing conservation strategies on sites led by key partners;
- identifying specific strategies at Conservancy-led action sites and implementing actions at those sites;
- setting priorities for anchor sites and community-based projects;
- setting priorities for inventory and research needs to fill knowledge gaps; and,
- ensuring that the next iteration of the ecoregional plan occurs in five years.

A next step in the planning process is to solicit review of the Great Basin portfolio and ecoregional plan during 2001 from important planning and implementation partners. We will include agency and academic participation in the reviews, as well as a few key individual contacts that were missed during the data gathering phase of planning. This will strengthen partner ties to portfolio results and help solidify earlier input on potential conservation areas. This step will help validate results from ecological modeling and portfolio selection, and to reduce uncertainty of some conservation areas. The portfolio review will allow us to contact some of those missed earlier because of staff and time constraints, thus adding their valuable input to the product. We participated in the Conservancy's Spring 2001 ecoregional roundtable meeting that provided a forum for peer review of the Great Basin plan by colleagues. This resulting final version of the plan is being distributed both within the Conservancy and to several key partners in late May 2001.

To ensure a broad understanding of the ecoregional analysis and to assist with next steps in carrying out needed conservation actions, the implementation team needs to have an outreach strategy. A detailed executive summary is an important product for this effort and will be available in late May 2001 also. The summary will provide a general understanding of the process and methods used to identify the Great Basin conservation blueprint, but will focus on portfolio results and next steps for implementation. The communication and outreach effort for the Great Basin will be a component of the Nevada chapter's communication plan. This will provide guidelines for communicating the results of the Great Basin conservation planning effort to the conservation community at large and to partners in particular.

To date, only preliminary strategic thinking has been done for the Great Basin ecoregion. The implementation team needs to have additional discussions regarding strategies available to reduce threats to biodiversity in the Great Basin. The most common region-wide threats, including primarily inappropriate grazing, competition by non-native species, and hydrologic alteration, and secondarily, urban sprawl, inappropriate recreation, and altered fire regimes (see section M), need to be addressed with broad multi-site strategies. The implementation team will

need to further define the context of each of the region-wide threats, propose suites of strategies to address them, evaluate the feasibility of each proposed strategy, highlight new approaches to boldly tackle them, and reiterate the use of appropriate conventional strategies.

The Great Basin ecoregion is predominantly a publicly managed ecoregion (83%), and this affords the conservation community both opportunities and challenges for achieving conservation goals. Critical strategies to engage our public partners will be needed to address the public lands. Success in this arena will provide the most powerful and efficient conservation strategy available to us—protection of large functional landscape scale sites and networks. To accomplish this it will take the commitment, support, and leadership of key federal managing agencies—the BLM, FS, DOD, FWS, and NPS, as well as some state and local agencies.

Fifty percent of the areal extent of the Great Basin portfolio is managed by the BLM. Fully 335 sites (94% of all sites) have some BLM management, while 231 sites (65%) are primarily managed by BLM (greater than 50% management). The BLM has sole management responsibility for 63 sites (18%). Many sites are unique sites that harbor the one and only site occurrence for a conservation target. Another 15% of the areal extent of the portfolio is managed by the USFS. Eighty-four sites (23%) have some USFS management, while 33 sites (9%) are primariliy managed by the USFS, that is, they manage greater than 50% of the site's extent. Three sites are managed solely by the USFS. Many of the sites managed by the USFS are mountaintops with unique biodiversity isolated by surrounding lowlands.

Clearly, to achieve mission success in the Great Basin, we need strong partnerships with BLM and the USFS. We purposefully engaged biologists and land managers at field offices of BLM and unit offices of the USFS during the data gathering phase. Now we need to engage them in a plan review, build stronger working relationships with all field offices, and work with them to identify strategies to lessen threats at conservation sites managed by the BLM and USFS. The results of the Great Basin conservation plan will be shared and the database will be available to offices of these federal agencies for their land and resource planning needs mandated by the National Environmental Policy Act of 1969, Federal Land Policy and Management Act of 1976, and National Forest Management Act of 1976. The implementation team needs to work with both agencies to identify priority sites on which the BLM and USFS could take lead roles in conservation action. Appendix 12 provides a complete list of the conservation areas managed by the BLM and USFS along with site maps.

Additionally, 5% of the areal extent of the portfolio is managed by DOD. Twenty-seven sites (8%) have some DOD management on the ground, while 128 sites (36%) fall under their special use airspace areas. The DOD is the primary land manager at 12 conservation sites. DOD has a demonstrated interest in taking action both on sites occurring on their military installations as well as at sites that fall within their special use airspace, but occur on lands managed by BLM. A DOD representative, Colonel Thomas Lillie, participated in the Spring 2001 ecoregional roundtable review of this plan. The Great Basin plan and database will be shared with DOD for their land and natural resource planning needs mandated by the National Environmental Policy Act of 1969 and the Sikes Act of 1960 as amended. Appendix 12 also provides a complete list of the conservation areas managed by the DOD in addition to a map of those sites.

The 17% of the portfolio's extent that is privately owned will need a variety of strategies that involve finding conservation buyers, making acquisitions, and developing conservation easements. The Conservancy is actively engaged in action now at several sites with a major private component and Great Basin functional landscape sites are among them (*e.g.*, Great Salt

Lake, Carson River, Pyramid Lake-Lower Truckee River). Partnerships among private landowners and land managing agencies will need to be identified at additional action sites.

For many sites in the portfolio we will engage other entities, such as other conservation organizations, local land trusts, and local interest societies to take the lead. These sites tend to be relatively small, with a fewer number of targets, and are primarily privately owned. But, among them are 16 irreplaceable sites for 19 species targets found no where else. For these sites the implementation team should soon identify appropriate partners who would be willing to make them priorities for their action. Appendix 12 also provides a list of the conservation areas with significant private land ownership.

The Great Basin strategy team will continue to work and meet during 2001 to accomplish tasks directed toward a better understanding of site-based conservation strategies, as well as multi-site strategies that span larger areas within and beyond the ecoregion. Matrix tables of site strategies will be developed in 2001. Clearly, strategies must include ways of acquiring the needed funding for implementation.

A number of implementation actions already have been initiated as a result of the ecoregional planning process. The Nevada chapter currently has DOD Legacy program funding to conduct site conservation planning at four Great Basin sites. One of these sites will likely be involved in Efroymson site conservation planning workshops scheduled for the latter half of 2001. We are currently working with the Nevada state office of BLM to explore implementation opportunities, including those through the Great Basin Restoration Initiative, which is focused on restoring the health of sagebrush ecological systems and species. It potentially offers a means of taking conservation action on a multitude of portfolio sites (both landscape scale and smaller sites). The Conservancy's Western Resource Office and the USFS Intermountain Region have initiated discussions to work on implementation activities under the 2001 memorandum of understanding. Meetings with the USFS in 2001 are scheduled to strengthen our partnership and help define common needs. The Intermountain West Joint Venture has expressed interest in conservation sites identified in the Great Basin plan for use in setting their priorities for waterfowl and wetlands conservation projects.

O. Information Gaps

The Great Basin was one of the last areas of the contiguous United States to be explored geographically (*e.g.*, Smith and Ogden were initial explorers in the 1830s and Frémont led expeditions in the 1840s). Correspondingly, the serious study of its biological diversity is recent going back a mere 130 years (Watson 1871). Basic inventories continue to reveal new species at surprising frequency (Hartman and Nelson 1998). For example, the Intermountain region (including parts of the Columbia Plateau, Colorado Plateau, and Utah High Plateaus) yielded 596 plant taxa new to science in a 20-year period (1975-1994), more than any other North American region. A recent effort to document conifer distributions in Nevada resulted in significant range extensions of 64% of the species (Charlet 1996). Conifers are large, prominent species, so new records and significant range extentions also would be expected for many of the less conspicuous and less studied taxonomic groups. A recent major effort to inventory spring systems in the Great Basin resulted in descriptions of about 60 species in the springsnail genus *Pyrgulopsis* (Hershler 1994, 1998, and 1999; Sada 2001). However, other invertebrates are poorly known, such as decomposers (ants, longhorn beetles, various flies, and termites) and predators (scorpions, assassin bugs, tiger beetles, dragonflies, robber flies, tarantula hawks). This blueprint identified numerous conservation targets, mostly plants and

invertebrates, for which no data were available. Additional survey efforts will increase our knowledge of the distributions of little studied taxonomic groups and rare species. Eventually, many species considered imperiled today may be found to be more abundant and widespread than previously believed when additional inventories are made. This will have repercussions on action site priorities.

The species occurrence information available in the three state heritage programs has many voids in the amount and quality of viability data. Visits to update historic species locations are needed to provide information on size of populations, condition of habitat, and landscape context. Continued contacts with biological experts will supplement the natural heritage databases, however feedback to the heritage programs is essential to ensure that their datasets improve. As more species become the subject of population viability analyses, we will be able to incorporate those data into refined goals for each conservation target.

The national vegetation classification system has made a good start on the terrestrial classification for this ecoregion, but it is based solely on published literature. Many rarer community descriptions, such as substrate dominated ones, are not published. Specific occurrence information of imperiled plant communities is needed for the next iteration of the Great Basin ecoregion plan. Specific occurrence information for common representative (matrix forming and large patch) communities is needed throughout the ecoregion. Filling these gaps will likely yield additional Great Basin plant communities for the national vegetation classification.

Similarly, the aquatic classification for the Great Basin is a good start, but it needs refinement and field-testing. Specific occurrences of aquatic habitats and aquatic species targets need proirity documentation because they are among the most threatened conservation targets in the desert. Aquatic invertebrate assemblages, in particular, need additional study and inventory. With specific occurrence and viability data on various aquatic habitats, we will be able to stratify goals across the ecoregion in future iterations, rather than including all of the few examples for which we had data, as we did in this initial effort.

In addition, continued efforts at refining modeled and mapped ecological systems and ELUs could improve their use as surrogates in the absence of detailed occurrences of representative plant communities. Detailed vegetation maps are being produced for areas of the Great Basin that make improvements to the GAP data. An example is a plant community dataset we obtained for the 350,000 ha (864,000 ac) Nevada Test Site, but it came at such a late point in the planning process that it precluded our ability to incorporate it into this initial assessment.

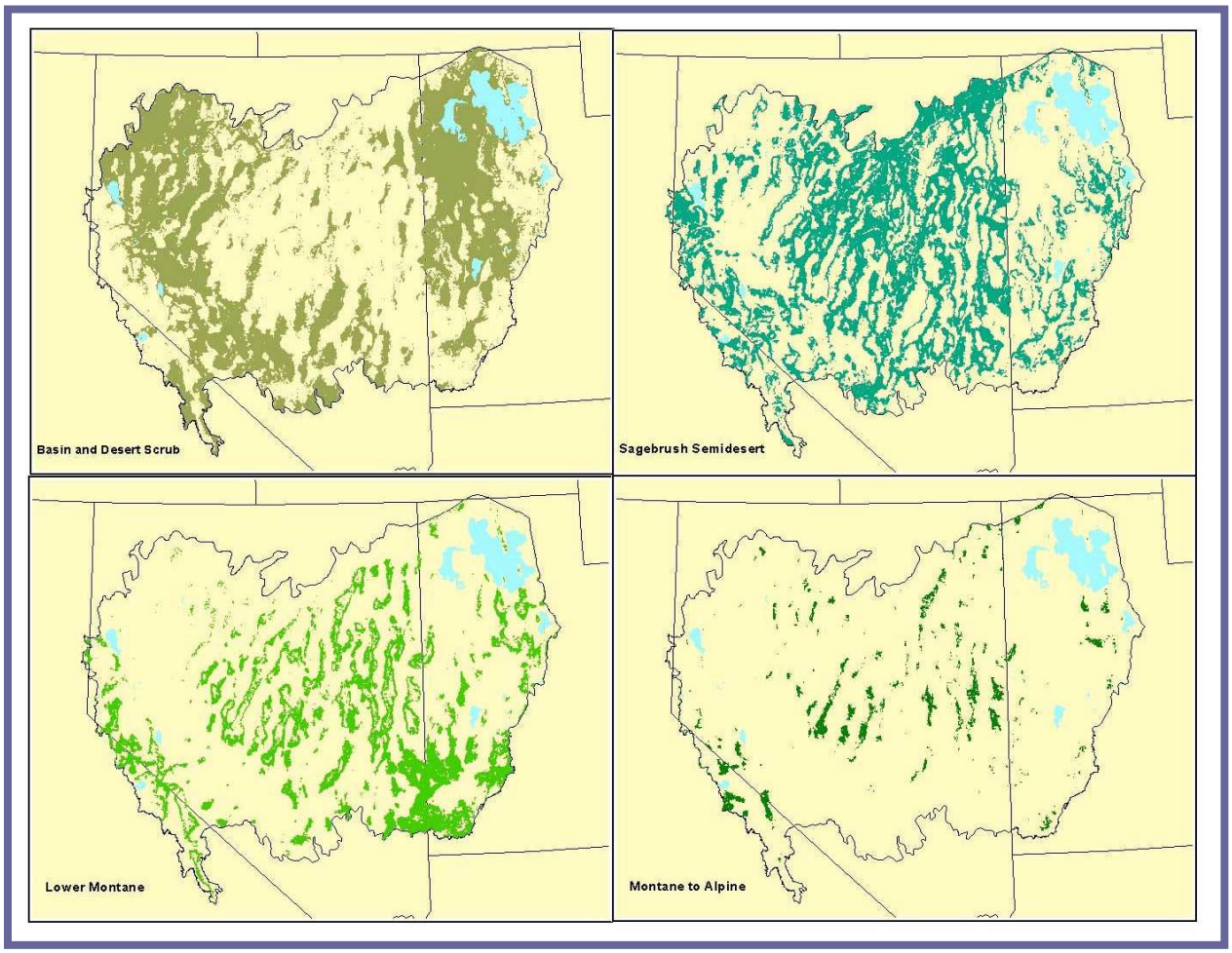
We lack viability information for ecological systems, as well as for specific plant community occurrences. Initial SITES portfolio selection results identified numerous areas for ecological systems that captured physical variation (additional ELU types) yet for these areas we have no viability data. Brief field reconnaissance visits, or rapid ecological assessments, for viability evaluations would fill these gaps and allow for their consideration in the next iteration.

II. ANALYSIS BY SYSTEM GROUPS

The biodiversity of the Great Basin, although it is a cold desert ecoregion, is remarkable. It varies from huge expanses of salt desert shrublands on the valley floors to the herbaceous alpine communities above bristlecone woodlands on its isolated mountains tops. To more readily organize and present a large amount of biological information in this document, we chose to aggregate all conservation targets into seven more or less natural system groups—six terrestrial and one aquatic group. The first four presented here are zonal system groups—that is, they occur in elevational zones because they are primarily controlled by regional climatic factors. From lowest to highest elevations, these system groups are the basins and desert scrub, sagebrush semidesert, lower montane, and montane to alpine. Together the four zonal system groups essentially define the characteristic basin and range nature of the Great Basin and they cover about 90.5% of the ecoregion's areal extent. The region-wide distribution of the four elevationally-driven system groups are illustrated in figure 25. Matrix forming ecological systems that embody the essence of this ecoregion's shrublands occur in the two lowest elevation groups, the basins and desert scrub and the sagebrush semidesert.

The latter three system groups are smaller azonal types, meaning they are not limited to any specific elevation zone because their occurrences are tied more closely to other driving factors than elevation and climate. Although they cover only about 5.9% of the ecoregion's extent, they are very important for adding to the unique character of its biodiversity. The sand dunes and badlands system group includes sparsely vegetated terrestrial habitat types that are controlled by substrate factors. The riparian and wetlands group takes in ecological systems that are controlled by hydrologic characteristics and they occur at the important interface of

Figure 25. Spatial distribution patterns of the four zonal system groups in the Great Basin ecoregion.



terrestrial-aquatic systems. The last system group, aquatics, encompasses the biodiversity of the Great Basin that is in water.

Table 12 sums general characteristics for the seven system groups.

Fifty-four, or 15%, of the 358 conservation areas in the portfolio include conservation targets present in all seven system groups. Another 81 were selected for targets in five and six of the system groups. Thus, about 38% of the portfolio is comprised of these ecologically robust sites with five or more ecological systems present and predictably these tend to be the largest sites. At the other end of the spectrum, six sites include only one system group. Five of the six are in the basins and desert scrub group, while the sixth site is in the sagebrush semidesert group. They were selected in the portfolio to capture additional biophysical diversity found in the matrix forming ecological systems of these lower elevation groups. The majority of sites (154, 43% of total) include ecological systems from three or four system groups.

Table 12. Extent and richness of ecological systems, plant communities, and species targets of the seven system groups in the Great Basin ecoregion.

Great Basin System Groups						
Group Name	**% of Great Basin Eco-region**	**# of Matrix Forming and Large Patch Systems**	**# of Small Patch and Linear Systems**	**# of All Currently Known Plant Associations**	**# of G1G2 Imperiled Plant Associations**	**# of Species Conser-vation Targets**
Basins and Desert Scrub	36.9	6	0	76	2	99
Sagebrush Semidesert	33.1	3	0	38	4	86
Lower Montane	16.9	3	0	40	4	95
Montane to Alpine	3.7	4	2	59	1	86
Sand Dunes and Badlands	2.0	1	4	10	2	107
Riparian and Wetlands	0.8	0	6	76	12	59
Aquatics	3.0	—	—	—	—	151
Total	**96.4***	**17**	**12**	**299**	**25**	**582****

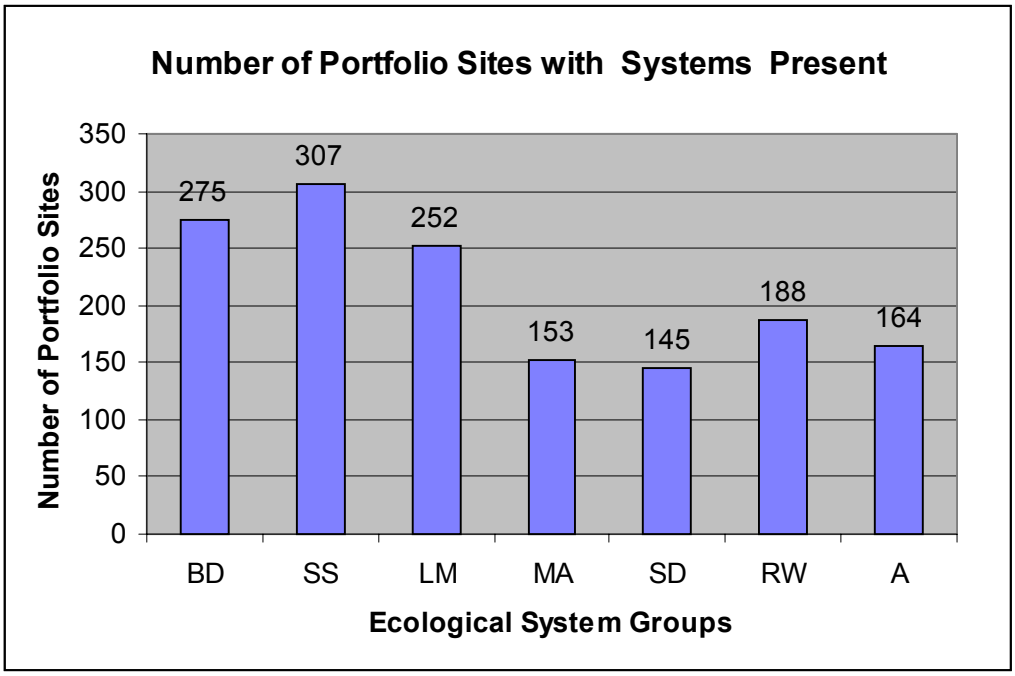
* Extent is based on the GAP cover layer. About 3.6% of the Great Basin is classified as agriculture and urban, which brings the total to 100%.

** Total # of species conservation targets is less than sum of column because there is overlap of some species that occur in more than one system group.

Figure 26 graphically depicts representation of system groups among the conservation areas. Predictably, sagebrush semidesert ecological systems are represented in the most sites, followed by basins and desert scrub, then lower montane systems. The portfolio captured a disproportionate number of sites with aquatic and riparian and wetlands systems, but this was expected given the importance of these habitats within a desert ecoregion.

Management of the public lands in the Great Basin by federal and state agencies corresponds fairly well with the seven system groups. The BLM primarily manages the lower elevation basins and desert scrub, sagebrush semidesert, and lower montane zonal groups, along with all three azonal groups—sand dunes and badlands, riparian and wetlands, and aquatics. In contrast, the USFS primarily manages higher elevations in the Great Basin including the lower montane and montane to alpine zonal groups, along with two azonal groups—riparian and wetlands and aquatics. Thus, these two key agencies primarily will be interested in the biological information presented in those respective system group sections. The DOD primarily manages lower elevations along with BLM. However, DOD special use airspace covers higher elevations as well, so they will be interested in the information presented within all system groups. The refuge system of FWS primarily manages lands within the basins and desert scrub, riparian and wetlands, and aquatics system groups, while the endangered species programs of FWS will be interested in the biological information presented in all system groups. State wildlife agencies, including California Department of Fish and Game, Nevada Division of Wildlife, and Utah Division of Wildlife Resources, will be interested in information in all seven system groups since their programs cover all lands in their respective states.

Figure 26. Representation of the seven system groups among the 358 Great Basin conservation areas. The system groups are basins and desert scrub (BD), sagebrush semidesert (SS), lower montane (LM), montane to alpine (MA), sand dunes and badlands (SD), riparian and wetlands (RW), and aquatics (A).



A. Basins and Desert Scrub

Description

The basins and desert scrub group characterizes the lowermost elevations of the ecoregion. These ecological systems occupy alluvial flats and playas on the basin floors, and alluvial fans (also called lower bajadas) and mountain-valley fans (or upper bajadas) on the surrounding piedmont slopes. This is the largest of the system groups covering about 37% of the entire ecoregion. There are six matrix or large patch ecological system conservation targets in the basins and desert scrub group. They are playa lake/ pickleweed flats, greasewood shrubland, salt desert scrub, blackbrush-hopsage shrubland, semidesert shrub steppe, and Joshua tree-mixed Mojave scrub in which we included creosote bush as well (table 13). The four common ecological systems that cover the greatest extent occur in all six geographic sections of the Great Basin. The less common latter two ecological systems, with the least extent, occur in the southern portions of the California and Tonopah sections only as they are transitional to the Mojave Desert ecoregion.

Table 13. Ecological systems of the basins and desert scrub group organized by extent within the Great Basin.

Basins and Desert Scrub				
Ecological System	**% of Great Basin**	**Patch Type**	**# of All Plant Associations**	**# of G1G2 Plant Associations**
Salt Desert Scrub	26.25	Matrix	31	1
Greasewood Shrubland	2.97	Large Patch	8	0
Semidesert Shrub Steppe	2.91	Large Patch	11	1
Playa Lake/ Pickleweed Flats	2.03	Large Patch	12	0
Blackbrush-Hopsage Shrubland	0.91	Large Patch	13	0
Joshua Tree-Mixed Mojave Scrub (incl. Creosote Bush)	0.27	Matrix	1	0

There are 99 species conservation targets in the basins and desert scrub and these include birds, terrestrial invertebrates, mammals, plants, and one ephemeral aquatic invertebrate (table 14). About half (49%) of the species targets are endemic to the ecoregion and less than one quarter (23%) are imperiled G1G2 or T1T2 taxa. Mammal targets are especially important in basins and desert scrub systems, but this is also true for the adjacent sagebrush semidesert group. Terrestrial invertebrate targets also are important in these systems, especially solitary bees and butterflies. The presence of an ephemeral aquatic invertebrate, the giant fairy shrimp, in the playa lakes system, makes this ecological system the only one that overlaps the terrestrial and aquatic types. For much of the year, and sometimes for years during extended droughts, playa lakes are dry playas seemingly devoid of life. But winter rains and snows fill playas and they become ephemeral aquatic habitats teeming with life (see aquatics section, in II. G. for more discussion).

Currently, there are 76 plant associations documented in these low elevation ecological systems in the Great Basin, including four alliances where no individual plant association was given. Two plant associations are considered imperiled: Great Basin wildrye grass herbaceous vegetation (G2G3Q) and Rocky Mountain juniper temporarily flooded woodland (G1). Stands of the latter dominate valley bottoms in the central mountains section where they occur at lower elevations and in moister alkaline soils than is typical for Rocky Mountain juniper stands.

Table 14. Conservation targets for the basins and desert scrub systems organized by taxonomic group.

Common Name	Scientific Name	Grank	Ecoregional Distribution
Plants			
EASTWOOD MILKWEED	ASCLEPIAS EASTWOODIANA	G2Q	Endemic
CALLAWAY MILKVETCH	ASTRAGALUS CALLITHRIX	G3	Endemic
MESIC MILKVETCH, MEADOW MILKVETCH	ASTRAGALUS DIVERSIFOLIUS	G3	Limited
NEEDLE MOUNTAINS MILKVETCH	ASTRAGALUS EURYLOBUS	G2	Limited
FISH SLOUGH MILK-VETCH	ASTRAGALUS LENTIGINOSUS VAR. PISCINENSIS	G5T1	Endemic
POHL MILKVETCH	ASTRAGALUS LENTIGINOSUS VAR. POHLII	G5T1	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
WINGED MILKVETCH	ASTRAGALUS PTEROCARPUS	G3	Limited
	ASTRAGALUS SERENOI VAR. SERENOI	G4T3T4	Endemic
SQUALID MILKVETCH	ASTRAGALUS SERENOI VAR. SORDESCENS	G4T2	Endemic
CURRANT MILKVETCH	ASTRAGALUS UNCIALIS	G2	Endemic
GROUND CRESCENT MILKVETCH	ASTRALAGUS CHAMAEMENISCUS	G2G3	Endemic
	ATRIPLEX BONNEVILLENSIS	G2G3Q	Endemic
INYO COUNTY STAR-TULIP	CALOCHORTUS EXCAVATUS	G3	Limited
CANE SPRING SUNCUP	CAMISSONIA MEGALANTHA	G3	Limited
NEVADA SUNCUP	CAMISSONIA NEVADENSIS	G3	Endemic
BARNEBY STEMFLOWER	CAULANTHUS BARNEBYI	G2	Limited
HALL'S MEADOW HAWKSBEARD	CREPIS RUNCINATA SSP. HALLII	G5T3?	Endemic
DOLOMITE SPRING-PARSLEY, INTERMONTAIN WAVEWING	CYMOPTERUS BASALTICUS	G2,G2G3	Endemic
COULTER BISCUITROOT	CYMOPTERUS COULTERI	G3	Limited
WALL SPRING PARSLEY	CYMOPTERUS GLOBOSUS	G3G4	Endemic
JULY GOLD	DEDECKERA EUREKENSIS	G2	Peripheral
ANTELOPE GOLDENBUSH	ERICAMERIA CERVINA	G3?	Limited
BALD DAISY	ERIGERON CALVUS	G1	Limited
MONO BUCKWHEAT	ERIOGONUM AMPULLACEUM	G3	Limited
DESERT WILD BUCKWHEAT	ERIOGONUM BATEMANII VAR. EREMICUM	G4?T2T3	Endemic
DARIN BUCKWHEAT	ERIOGONUM CONCINNUM	G2	Limited
IBEX BUCKWHEAT	ERIOGONUM NUMMULARE VAR. AMMOPHILUM	G4T1	Endemic
GRAY'S BUCKWHEAT	ERIOGONUM VILLIFLORUM	G3G4	Endemic
PAHUTE GREEN GENTIAN	FRASERA PAHUTENSIS	G3Q	Endemic
COCHRANE GILIA	GILIA HETEROSTYLA	?	Endemic
RIPLEY'S GILIA	GILIA RIPLEYI	G2G3	Peripheral
ALKALI IVESIA	IVESIA KINGII VAR. KINGII	G3T2	Limited
PINE NUT MOUNTAINS IVESIA	IVESIA PITYOCHARIS	G2	Endemic
	LOMATIUM SCABRUM VAR. TRIPINNATUM	G3G4T2T3	Peripheral
PANAMINT MTNS. LUPINE	LUPINUS MAGNIFICUS VAR. MAGNIFICUS	G3TH	Peripheral or Limited
CANDELARIA BLAZING-STAR	MENTZELIA CANDELARIAE	G3?Q	Endemic
BEAUTIFUL CHOLLA, SAND CHOLLA	OPUNTIA PULCHELLA	G4	Endemic, declining
	PEDIOMELUM MEPHITICUM	G3?	Peripheral or Limited
BEN'S BEARDTONGUE	PENSTEMON FRANKLINII	G1	Endemic
LOW BEARDTONGUE	PENSTEMON NANUS	G3	Endemic
	PERITYLE INTRICATA	G3	Peripheral or Limited
BEATLEY SCORPION PLANT	PHACELIA BEATLEYAE	G3	Peripheral
DEATH VALLEY ROUND-LEAVED PHACELIA, WEASEL PHACELIA	PHACELIA MUSTELINA	G2,G2G3	Limited
PARISH PHACELIA	PHACELIA PARISHII	G2G3	Limited
UNDESCRIBED PHACELIA 1	PHACELIA SP. 1	G2	Peripheral
NOTCH-BEAK MILKWORT	POLYGALA HETERORHYNCHA	G3Q	Limited
BLAINE PINCUSHION	SCLEROCACTUS BLAINEI	G1Q	Endemic
TONOPAH FISHHOOK CACTUS	SCLEROCACTUS NYENSIS	G1Q	Endemic
SCHLESSER PINCUSHION	SCLEROCACTUS SCHLESSERI	G1Q	Endemic
DESERT VALLEY FISHHOOK-CACTUS	SCLEROCACTUS SPINOSIOR	G2G3	Endemic
JONES GLOBE-MALLOW	SPHAERALCEA CAESPITOSA	G3	Endemic
	THELYPODIUM ROLLINISII	G2G3	Limited
CHARLESTON GROUNDDAISY	TOWNSENDIA JONESII VAR. TUMULOSA	G3T3	Peripheral

Common Name	Scientific Name	Grank	Ecoregional Distribution
Terrestrial Invertebrates (+1 Aquatic Invertebrate*)			
(bee)	ASHMEADIELLA SP. NOV.	G1	Limited
RED-LEGGED BEARDTONGUE BEE	ATOPOSMIA RUFIFEMUR	?	Limited
(bee)	ATOPOSMIA SP. NOV. 5	G1	Limited
(wasp)	BEMBIX FROMMERI	G1	Endemic
GIANT FAIRY SHRIMP*	BRANCHINECTA GIGAS*	?	Widespread, specialist
(bee)	CALLIOPSIS FILIORUM	G1	Endemic
(bee)	CALLIOPSIS HESPERIA EQUINA	?	Disjunct
(bee)	CALLIOPSIS SP. NOV	?	Limited
BIG SMOKY WOOD NYMPH	CERCYONIS OETUS ALKALORUM	G5T1	Endemic
PALLID WOOD NYMPH	CERCYONIS OETUS PALLESCENS	G5T1	Endemic
(bee)	COLLETES XEROPHILUS CISMONTANUS	?	Disjunct
	DUFOUREA OROVADA	G1	Limited
BAKING POWDER FLAT BLUE	EUPHILOTES BERNARDINO MINUTA	G5T1	Endemic
RAILROAD VALLEY SKIPPER	HESPERIA UNCAS FULVAPALLA	G4G5T1	Endemic
WHITE RIVER VALLEY SKIPPER	HESPERIA UNCAS GRANDIOSA	G4G5T1	Endemic
REESE RIVER UNCA SKIPPER	HESPERIA UNCAS REESORUM	G4G5T1	Endemic
	ICARICIA ACMON DEDECKERA	?	Limited
	MEGACHILE ASTRAGALI	?	Peripheral
(bee)	PERDITA AMPLIPENNIS	?	Limited
(bee)	PERDITA CHLORIS	?	Limited
(bee)	PERDITA EUCNIDES EUCNIDES	G2	Disjunct
(bee)	PERDITA GLABRESCENS	G1	Limited
(bee)	PERDITA HAIGI	G1	Endemic
(bee)	PERDITA NASUTA GALACTICOPTERA	G1	Limited
(bee)	PERDITA XEROPHILA FUSCICORNIS	G1	Limited
GREAT BASIN SMALL BLUE	PHILOTIELLA SPECIOSA SEPTENTRIONALIS	G4T1	Endemic
STEPTOE VALLEY CRESCENTSPOT	PHYCIODES BATESII ARENACOLOR	G5T1	Endemic
PALLID SKIPPER	POLITES SABULETI BASINENSIS	G5T2	Unknown
DARK SANDHILL SKIPPER	POLITES SABULETI NIGRESCENS	G5T2	Endemic
NEVADA ALKALI SKIPPERLING	PSEUDOCOPAEODES EUNUS FLAVUS	G3T2	Endemic
CARSON ALKALI SKIPPERLING	PSEUDOCOPAEODES EUNUS OBSCURUS	G3T1	Endemic
MONO LAKE WANDERING SKIPPER	PSEUDOCOPAEODES EUNUS SSP. NOV	G3T1	Endemic
Birds			
SWAINSON'S HAWK	BUTEO SWAINSONI	G4	Widespread, declining
LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	G5	Widespread, declining
Mammals			
UTAH PRAIRIE DOG	CYNOMYS PARVIDENS	G1	Limited
CHISEL-TOOTHED KANGAROO RAT	DIPODOMYS MICROPS	G5	Limited
DESERT VALLEY KANGAROO MOUSE	MICRODIPODOPS MEGACEPHALUS ALBIVENTER	G5T1	Endemic
FLETCHER DARK KANGAROO MOUSE	MICRODIPODOPS MEGACEPHALUS NASUTUS	G5T1	Endemic
DARK KANAGAROO MOUSE	MICRODIPODOPS MEGALOCEPHALUS	?	Unknown
PALE KANGAROO MOUSE	MICRODIPODOPS PALLIDUS	G5	Endemic
CALIFORNIA BIGHORN SHEEP	OVIS CANADENSIS CALIFORNIANA	G4T1	Limited
ROCKY MOUNTAIN BIGHORN SHEEP	OVIS CANADENSIS CANADENSIS	?	Peripheral
DESERT BIGHORN SHEEP	OVIS CANADENSIS NELSONI	G4T3	Limited
PREBLE'S SHREW	SOREX PREBLEI	G4	Unknown

Common Name	Scientific Name	Grank	Ecoregional Distribution
G1 or G2 Plant Associations			
GREAT BASIN WILDRYE GRASS	LEYMUS CINEREUS HERBACEOUS VEGETATION [PROVISIONAL]	G2G3Q	Widespread
ROCKY MOUNTAIN JUNIPER TEMPORARILY FLOODED SHRUBLAND	JUNIPERUS SCOPULORUM TEMPORARILY FLOODED SHRUBLAND	G1	Endemic
Terrestrial Ecological Systems			
BLACKBRUSH-HOPSAGE DESERT SHRUBLAND			
CREOSOTE BURSAGE			
GREASEWOOD SHRUBLAND			
JOSHUA TREE-MIXED MOJAVE SCRUB			
PICKLEWEED FLATS			
PLAYA LAKE			
SALT DESERT SCRUB			
SEMI-DESERT SHRUB STEPPE			

Plant communities characteristic of basins and desert scrubs are dominated by drought tolerant, small-leaved, often thorny, and widely-spaced shrubs. Soils are typically highly saline to slightly saline on the playas and valley bottoms, or they are upland soils generally too dry to support sagebrush. The more saline periphery of playas are dominated by halophytes (salt tolerant plant species), such as pickleweed or iodine bush (*Allenrolfea occidentalis*), while the valley bottoms with shallow ground water are dominated by big greasewood (*Sarcobatus vermiculatus*). Slightly higher topography with drier and less alkaline soil conditions support shadscale and hopsage (*Atriplex confertifolia* and *Grayia spinosa*) communities, or Bailey little greasewood (*Sarcobatus baileyi*)—a large patch community restricted to the western Great Basin. More detailed descriptions of the ecological system targets follow.

Salt Desert Scrub: This matrix forming ecological system is one of the largest systems in the Great Basin and reaches its full potential in terms of size and diversity in this ecoregion. It is dominated by shadscale, Gardner saltbush, fourwing saltbush, basin big sagebrush, winterfat, or Bailey little greasewood (*Atriplex confertifolia, A. gardneri, A. canescens gigas* form*, Artemisia tridentata* ssp*. tridentata, Krascheninnikovia lanata,* or *Sarcobatus baileyi*). Codominant shrubs include bud sagebrush, big greasewood, desert saltbush, and Nevada ephedra (*Atriplex spinescens, Sarcobatus vermiculatus, Atriplex polycarpa,* and *Ephedra nevadensis*). Limited herbaceous understory plants include ricegrass and desert saltgrass (*Oryzopsis hymenoides* and *Distichilis spicata* var*. stricta*). About 78% of the ELUs that coincide with salt desert scrub are at lower elevations between 321-1,980 m (1,050-6,500 ft), on young alluvium-colluvium-glacial deposits, on lower bajada slopes less than 2%, or flat surfaces that are generally dry upland sites, but some stands experience either intermittent flow or intermittent wet periods. In most settings, regardless of landform, the water table is well below one meter.

These shrublands are usually associated with edges of valley bottoms or alluvial slopes with medium to fine-textured soils, but they may occur on coarser soils of erosional slopes with calcareous substrates. In most cases, the soils are alkaline (pH 7.5-8.5). Contiguous vegetation is usually big sagebrush shrublands at the upper elevation margin and saltbush-greasewood shrublands on heavy soils of closed drainage basins. Shrubs are generally widely-spaced and clustered. Interspaces are usually covered with soft, rugose microphytic crusts if the soil has not been compacted by livestock or off-road vehicles (West and Young 2000).

Greasewood Shrubland: This large patch ecological system comprises the lowlands of valley bottoms where heavy clay soils and salts accumulate. Big greasewood (*Sarcobatus vermiculatus*) is the dominant shrub. It often occurs as the sole dominant or less often various codominant shrubs are present, for example, shadscale or rubber rabbitbrush (*Atriplex confertifolia* or *Chrysothamnus nauseosus*). On occasion, alkali rabbitbrush (*Chrysothamnus albidus*) dominates with Lemmon's alkaligrass (*Puccinellia lemmonii*) in the understory. The presence of herbaceous species and their abundance depends on soil characteristics and duration of inundation. This system can form small, narrow linear bands, or very large patches covering much of the valley floor where conditions are favorable. Almost all (97.5%) of the ELUs that coincide with greasewood shrublands are at lowest elevations between 321-1,980 m (1,050-6,500 ft), on young alluvium-colluvium-glacial deposits, on topographically flat or gentle slopes, and are either intermittently wet, have intermittent flow, or experience no surface flow throughout the year.

Semidesert Shrub Steppe: This ecological system consists of sparsely covered low elevation grasslands of the Great Basin. Most plant associations within this system have low total herbaceous cover, and many have a shrub or subshrub component. Dominant species include ricegrass, Nevada ephedra, galleta grass, desert needlegrass, Great Basin wildrye, western wheatgrass, bluebunch wheatgrass, various bluegrasses, and Idaho fescue (*Oryzopsis hymenoides*, *Ephedra nevadensis, Hilaria jamesii*, *Stipa speciosa*, *Leymus cinerus*, *Pascopyrum smithii*, *Pseudoroegneria spicata*, *Poa* spp., and *Festuca idahoensis*). Many (73%) of the ELUs that coincide with semidesert shrub steppe are at lowest elevations between 321-1,980 m (1,050-6,500 ft), on young alluvium-colluvium-glacial or old alluvial deposits, on lower bajadas of less than 2% slope, or flat landforms, and are dry, that is, they depend solely on rainfall for moisture.

Playa Lakes: These are wide flat expanses of dried salt and clay flats on basin floors. During the wetter Pleistocene Epoch, many basins filled with lake waters and sediments and soluble salts from the mountains washed in. Most of the lakes dried in the subsequent warm period of the Holocene and soluble salts remain in the soil profiles today. Vegetative communities that can live under these harsh conditions are typically alkaline and salt tolerant. Characteristic and dominant species include alkali seepweed, desert saltgrass, alkali sacaton, western niterwort, alkali cordgrass, iodinebush, and arrowweed (*Suaeda moquinii*, *Distichilis spicata* var. *stricta*, *Sporobolus airoides*, *Nitrophila occidentalis*, *Spartina gracilis*, *Allenrolfea occidentalis*, and *Pluchea sericea*). Nearly all playa lakes dry up cyclically, so vegetation can be non-existent, sparse, or ephemerally abundant. Almost all (98.5%) of the ELUs that coincide with playa lakes are at lowest elevations between 321-1,980 m (1,050-6,500 ft), on young alluvium-colluvium-glacial deposits, while they are always topographically flat, and are either intermittently wet, have intermittent flow, or are dry throughout the year.

Blackbrush - Hopsage Shrubland: This ecological system is transitional with the warm Mojave Desert and consists of desert shrublands dominated by blackbrush, spiny hopsage, or spiny menodora (*Coloegyne ramosissima, Grayia spinosa* or *Menodora spinescens*). Blackbrush-hopsage shrublands are restricted to the California and Tonopah sections at the southern-most edge of the ecoregion. For this discussion, the peripheral plant communities of Joshua tree and mixed Mojave scrub GAP map units, which consist of Joshua tree, creosote bush, or Mojave buckwheat (*Yucca brevifolia*, *Larrea tridentata*, or *Eriogonum fasciculatum*) dominated communities, have been included. About a third (35%) of the ELUs that occur with blackbrush-hopsage shrubland are at lowest elevations between 321-1,980 m (1,050-6,500 ft), on young alluvium-colluvium-glacial deposits, and on flat landforms that are dry. Another 42% are at lower elevations between 321-1,980 m (1,050-6,500 ft), on granitic-silicic, shale,

sandstone, or carbonate-limestone surfaces, on upper bajada and lower bajada slopes, and with northeast or southwest exposures.

Conservation Issues and Threats

Little habitat loss has occurred in basins and desert scrublands overall, with the exception of large areas of shadscale and hopsage plant communities in the Lahontan Valley of the western Great Basin. The nation's first irrigation project allowed for their conversion to agriculture fields. But, much of the irrigated land is marginal for crops and as water use efficiency strategies become more commonplace in the Lahontan Valley, these areas will be returned to desert scrub. Without proper restoration, they may be hotspots for noxious weed invasions. Juab Valley, Sevier Desert, and Beaver River, Utah also have suffered habitat losses in desert scrub systems because of agriculture related activities.

Invasive species have impacted shadscale and greasewood communities and have altered their composition and function. The most common disturbance that leads to weed invasions at these lower elevations is inappropriate levels of grazing in areas where few preferred plant species occur. Halogeton (*Halogeton glomeratus*) invades dry sites while tamarisk (*Tamarix ramosissima*) invades wetter sites. Thus, halogeton is the common invasive in upland shadscale and saltbush communities throughout the ecoregion, although more recent improved grazing management has lessened its impact. In areas where ground water is shallow, for example in greasewood communities of the lower Walker River floodplain, tamarisk has almost completely replaced the native plants.

Fire is an increasing threat to these systems that historically did not burn. The proliferation of non-native annual grasses and biennial plants is responsible. Shadscale was once considered fireproof, but with the increasing non-native component, it now burns (Young 1994).

Urbanization is increasing within desert communities, for examples, at the desert towns of Fallon, Fernley, Nephi, and Milford. Additional destruction of basin and desert scrub habitats will occur as communities expand, but in addition, degradation of habitats from fragmentation and disturbance from urban and rural related activities also will occur. Area offices of the BLM are becoming increasingly concerned about recreational related impacts to basins and desert scrub systems. Large tracts of representative basin and desert scrub are needed to adequately protect both ecological processes and patterns in these matrix forming and large patch systems.

Playas, or dry lake beds, are often defined as absolute desert. The Bonneville Salt Flats and the Black Rock Desert are the two largest and most well known absolute deserts. The perfectly flat playa sediments are where ongoing competition for the world land speed record takes place (the current land speed record made on the Black Rock playa October 13, 1997 is 763.03 miles per hour, an impressive Mach 1.02). However, playas typically are subject to more mundane off road vehicle activity by desert enthusiasts. Playas are biologically important for ephemeral aquatic species during seasonal inundations when they briefly teem with abundant invertebrate life, such as fairy shrimp and brine fly population explosions. They become instant feeding grounds for hundreds of thousands of migrating shorebirds in spring. Little is known about the global distributions and abundance of the macroinvertebrate fauna that occupy ephemerally wet playas. And virtually nothing is known about the impacts of off road vehicle activity on the resting stages of these animals.

System Conservation Goals and Viability

Salt Desert Scrub: Salt desert shrub is a matrix forming system and the GAP map coverage is 26.25% of the ecoregion. Our conservation goal is 30% of the area occupied by salt desert shrub within each section. Minimum viable size is 10,000 ha (25,000 ac), based on field mapping in Grass Valley, NV (Young *et al*. 1986). The minimum size was set lower (2,000 ha) in the SITES program to capture good locations that occur in smaller valleys and to capture the gradient of microhabitats as represented by ELUs within larger valleys. GAP polygons of this ubiquitous community were linked in continuous bands across the landscape such that estimating realistic (on the ground) occurrence sizes was not feasible from this source.

Greasewood Shrubland: This is a large patch system and the GAP map coverage is 1.51% of the ecoregion. Our conservation goal is 20% of the area occupied by greasewood shrubland within each section. Minimum viable size was set at 2,000 ha (5,000 ac). Dynamics within greasewood stands are slow and are primarily driven by the rise and fall of saline lake and ground water levels. A minimum size of 2,000 ha is thought to be sufficient for this fluctuation. Most (60%) of the GAP map patches of greasewood shrubland were between 20 and 2,000 ha in size.

Semidesert Shrub Steppe: This is a large patch system and the GAP map coverage is 2.91% of the ecoregion. Our conservation goal is 20% of the area occupied by semidesert shrub steppe within each section. Minimum viable size was set at 100 ha (250 ac). The semidesert shrub steppe naturally occupies relative small areas of deep and undeveloped sandy soils. It may have been more abundant prior to the introduction of domestic livestock grazing.

Playa Lakes: Playa lakes are a large patch system. When combined with badlands, the GAP map coverage is 3.91% of the ecoregion. Our conservation goal is 20% of the area occupied by playa lakes in each section. Minimum viable size of a playa lake system is estimated to be around 10,000 ha. We combined the playa lake and pickleweed flats GAP map units (they include the same plant communities, but they simply received different names from the state GAP programs). These communities are maintained by intra- or inter-annual cycles of flooding followed by extended drought, which favor accumulation of transported salts. The moisture supporting these intermittently flooded wetlands is usually derived off-site and they are dependent upon natural watershed function for persistence.

Blackbrush - Hopsage Shrubland: This is a large patch system and the GAP map coverage is 0.91% of the ecoregion. Our conservation goal is 25% of the area occupied by blackbrush-hopsage within each section. Minimum viable size was set at 1,000 ha, based on the Mojave Desert minimum size (3,000 ha). It was reduced to accommodate its peripheral distribution in this ecoregion, and because it may not occur in such large expansive areas. However, the GAP polygons of this community were often over 5,000 ha in size. Stands need to be large enough to not be eliminated by fire. Blackbrush does not ordinarily resprout after fire and seeds have difficulty germinating. With livestock grazing and the invasion of exotic weeds, the long term maintenance of this community may prove difficult (West and Young 2000).

Portfolio Results

The portfolio includes 275 sites identified for ecological systems, communities, and species targets of the basins and desert scrub group. Five sites were identified for conservation targets only in this system group. Table 15 lists the sites in this system group by geographic section

and their locations are given in figure 27. Refer to appendix 10 for conservation targets and attributes for each site.

Highlighted significant sites of the basins and desert scrub group include:

BLACK ROCK DESERT-SMOKE CREEK DESERT (A020)—largest absolute desert in the Lahontan Basin section; large landscape site important for desert bighorn sheep; excellent examples of saltbush, greasewood, and sagebrush communities.
DUCK CREEK RANGE-STEPTOE VALLEY (A068)—another excellent example of higher elevation valley floor communities and aquatic habitats, but with connectivity to montane ecological systems as well; high diversity of springsnails and butterflies.
FISH SPRINGS (A092)—important site in the Bonneville Basin section with salt desert and wetlands communities, and a diversity of quality aquatic habitats.
GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH (A098)—important site for sand dune systems in addition to saltbush, greasewood, and sagebrush communities; harbors a suite of 12 obligate sand beetles.
OWENS VALLEY-BENTON VALLEY (A195)—part of a functional network of sites with connectivity to Sierra Nevada and Mojave Desert ecoregions; high diversity of both terrestrial ecological systems and aquatic habitats, as well as clifflands and sand dunes; one and only site for 4 Great Basin endemics, including the Benton Valley speckled dace, Benton Valley and Fish Slough springsnail, and Fish Slough milkvetch.
RAILROAD VALLEY (A222)—significant basin floor terrestrial communities and aquatic habitats in the Tonopah section; one and only site for Lockes springsnail.
REESE RIVER (A227)—includes a diversity of both sagebrush and basins and desert scrub terrestrial ecological systems; high diversity of butterflies; only site for pallid wood nymph and Reese River unca skipper.
RAILROAD VALLEY (A222)—significant basin floor terrestrial communities and aquatic habitats in the Tonopah section; one and only site for Lockes springsnail.
STEPTOE VALLEY (A287)—excellent example of higher elevation valley floor communities and aquatic habitats; high diversity of springsnails and only site for the endemic Steptoe hydrobe.

See also highlighted sites for riparian and wetlands and aquatics groups since those highlighted sites occur within the elevational zone of the basins and desert scrub group.

Table 15. Great Basin portfolio sites identified for basins and desert scrub ecological systems.

California

A002	ANCHORITE HILLS
A023	BODIE HILLS
A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
A039	CARSON RIVER
A114	HOLBROOK JUNCTION
A128	HUNTOON SPRING
A152	LONG VALLEY
A155	LUCKY BOY PASS
A165	MONO LAKE
A184	NORTH WASSUK RANGE
A195	OWENS VALLEY-BENTON VALLEY
A250	SHEPHERD CREEK
A275	SOUTH PINE NUT MOUNTAINS
A280	SOUTH WASSUK RANGE
A328	VIRGINIA RANGE
A334	WARM SPRINGS VALLEY
A346	WHITE MOUNTAINS

Lahontan Basin

A007	ARTESIA LAKE-EAST PINE NUT MOUNTAINS
A008	AUGUSTA MOUNTAINS
A010	BALD MOUNTAIN
A012	BATTLE MOUNTAIN
A019	BLACK ROCK

A020 BLACK ROCK DESERT-SMOKE CREEK DESERT
A021 BLOWSAND MOUNTAINS-BARNETT HILLS
A024 BOLIVIA
A026 BROKEN HILLS
A028 BUFFALO SPRINGS
A029 BUFFALO VALLEY-TOBIN RANGE
A034 CALICO HILLS
A040 CARSON SINK
A058 DAISY CREEK
A073 EAST GABBS VALLEY
A083 EUGENE MOUNTAINS
A085 FAIRVIEW PEAK
A086 FAIRVIEW VALLEY
A088 FENCEMAKER
A094 FLY RANCH GEYSER-GRANITE RANGE
A098 GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
A099 GARFIELD HILLS
A125 HUMBOLDT RANGE
A126 HUMBOLDT RIVER GOLCONDA
A127 HUMBOLDT RIVER IMLAY
A132 JACKSON MOUNTAINS
A136 JERSEY SUMMIT
A142 KING LEAR PEAK
A146 KUMIVA VALLEY
A148 LAVA BEDS CREEK
A154 LOVELOCK VALLEY
A159 MASON VALLEY
A166 MONTANA MOUNTAINS
A167 MONTE CRISTO MOUNTAINS
A177 NIGHTINGALE FLAT
A178 NIGHTINGALE MOUNTAINS
A180 NORTH PYRAMID LAKE
A196 PAH RAH RANGE
A200 PARADISE VALLEY
A208 PINE FOREST RANGE
A211 PLEASANT VALLEY
A214 PYRAMID LAKE-LOWER TRUCKEE RIVER
A218 QUINN RIVER
A236 RYE PATCH
A237 SAGE HEN VALLEY
A238 SAHWAVE MOUNTAINS-LAKE RANGE
A242 SAND MOUNTAIN
A246 SCHURZ
A247 SEVENMILE SPRING
A258 SILVER STATE SAND DUNES
A266 SMOKE CREEK
A270 SOLDIER MEADOWS
A281 SPRING CREEK
A285 SQUAW VALLEY
A288 STILLWATER RANGE -DIXIE VALLEY
A292 SUGARLOAF KNOB
A294 SULPHUR
A306 THORNE DUNE
A321 UPPER ROCK CREEK
A331 WALKER LAKE-WALKER RIVER
A341 WEST GABBS VALLEY
A356 WILSON CANYON
A357 WINNEMUCCA LAKE

North Central

A005 ANTELOPE VALLEY
A006 ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
A022 BLUE LAKES-BADLANDS
A050 CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE
A064 DIXIE CREEK
A074 EAST HUMBOLDT RANGE
A102 GOSHUTE MOUNTAINS
A204 PEQUOP MOUNTAINS-TOANO DRAW
A205 PILOT CREEK VALLEY
A216 QUILICI SPRING-BUTTE VALLEY
A219 RABBIT CREEK
A233 RUBY VALLEY
A255 SHOSHONE-BEOWAWE
A287 STEPTOE VALLEY
A296 SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER
A307 THOUSAND SPRINGS CREEK HOT SPRINGS
A320 UPPER HUMBOLDT RIVER-LOWER MARYS RIVER
A326 VALLEY MOUNTAIN

Central Mountains

A030 BUTLER BASIN
A042 CAVE VALLEY-UPPER WHITE RIVER VALLEY
A048 COMINS MEADOW
A055 CURRANT MOUNTAIN
A059 DEEP CREEK RANGE
A060 DESATOYA MOUNTAINS
A061 DIAMOND PEAK
A062 DIAMOND SPRINGS
A063 DIAMOND VALLEY ALKALI FLAT
A065 DIXIE VALLEY
A068 DUCK CREEK RANGE-STEPTOE VALLEY
A076 EASTGATE-ROCK CREEK

A091	FISH CREEK SPRINGS
A097	FROST CREEK
A100	GIOCOECHEA WARM SPRINGS
A109	HANDY SPRING
A116	HOME STATION WASH
A117	HORSESHOE BASIN
A122	HOT SPRINGS HILL
A135	JAKES VALLEY
A145	KOBEH VALLEY
A174	NEW PASS
A175	NEWARK LAKE
A199	PANCAKE SUMMIT
A221	RAILROAD PASS
A227	REESE RIVER
A228	REESE RIVER VALLEY
A232	RUBY MOUNTAINS
A244	SCHELL CREEK RANGE
A254	SHOSHONE RANGE-CARICO LAKE VALLEY
A261	SIMPSON PARK MOUNTAINS-NORTH TOIYABE
A267	SNAKE RANGE
A283	SPRING VALLEY-HAMLIN VALLEY
A310	TOIYABE RANGE-BIG SMOKY VALLEY
A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
A316	TRAIL CANYON
A318	TUNGSTONIA
A340	WEST DEVILS GATE
A343	WEST NORTHUMBERLAND CANYON
A347	WHITE PINE RANGE
A348	WHITE RIVER VALLEY
A350	WHITE SAGE FLAT
A358	YELLAND DRY LAKE

Tonopah

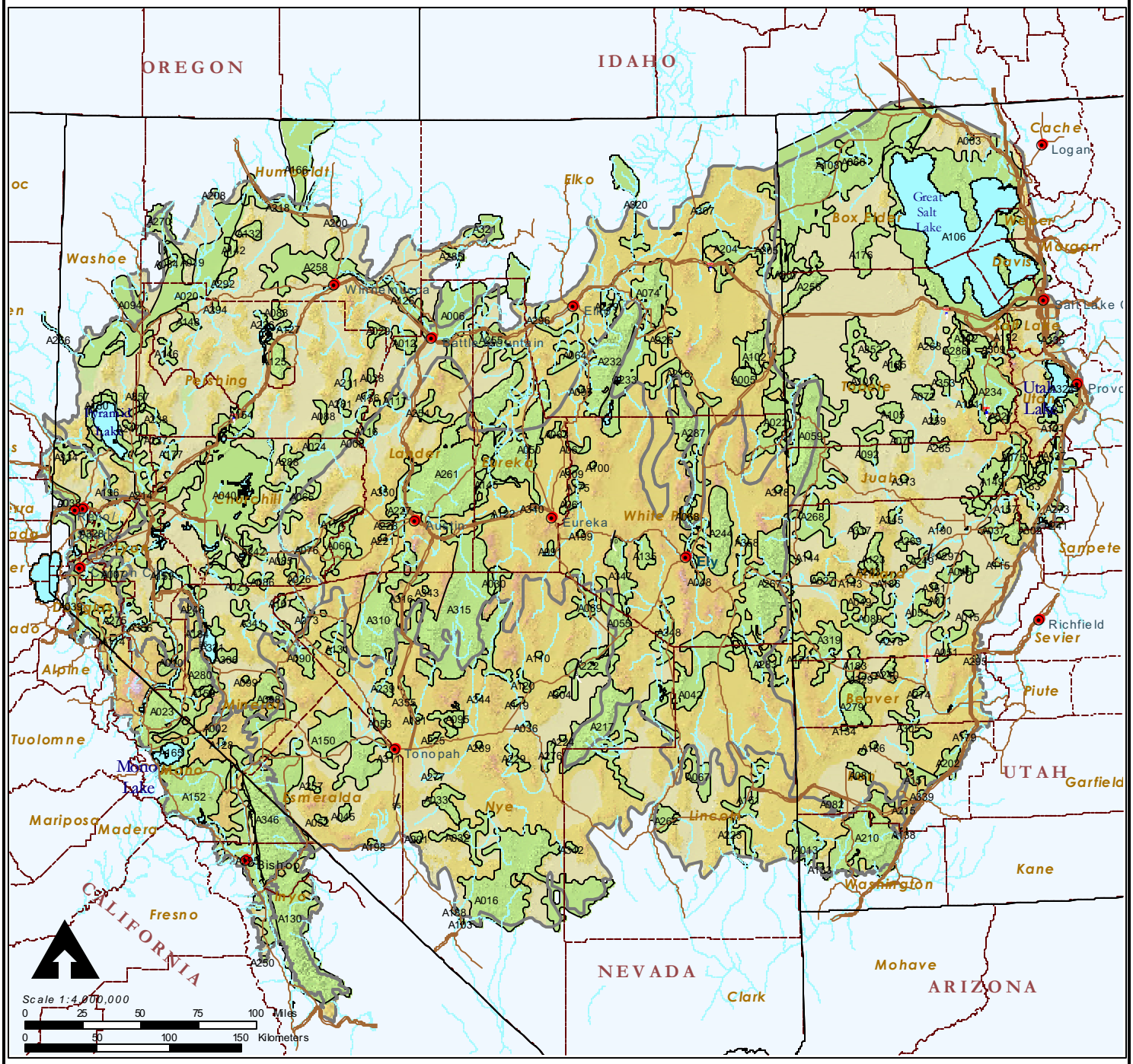
A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS
A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
A032	CACTUS FLAT
A033	CACTUS RANGE
A036	CANE SPRING
A045	CLAYTON VALLEY SAND DUNES
A052	COWCAMP
A053	CRESCENT DUNES
A067	DRY LAKE VALLEY
A069	DUCKWATER VALLEY
A090	FINGER ROCK WASH
A095	FOURMILE BASIN
A103	GOSS SPRINGS
A110	HEART HILLS
A113	HIKO SPRING
A119	HOT CREEK VALLEY
A120	HOT CREEK-PALISADE MESA
A130	INYO MOUNTAINS
A131	IONE VALLEY
A133	JACKSON SPRING
A150	LONE MOUNTAIN-MONTE CRISTO RANGE
A161	MEADOW VALLEY
A181	NORTH RALSTON VALLEY
A188	OASIS VALLEY
A197	PAHROC SUMMIT PASS
A198	PALMETTO MOUNTAINS
A210	PINE VALLEY MOUNTAINS
A217	QUINN CANYON RANGE-GRANT RANGE
A222	RAILROAD VALLEY
A223	RAINBOW CANYON
A224	RED HILL
A225	RED PEAK
A229	REVEILLE VALLEY
A239	SAN ANTONIO DUNES
A257	SILVER PEAK RANGE
A262	SIXMILE FLAT
A276	SOUTH RAILROAD VALLEY
A277	SOUTH RALSTON VALLEY
A289	STONE CABIN VALLEY
A291	STONEWALL MOUNTAIN
A304	THE WALL
A311	TONOPAH SUMMIT
A314	TOPIER CANYON
A342	WEST GROOM RANGE
A344	WEST STONE CABIN VALLEY
A355	WILLOW SPRING

Bonneville Basin

A003	ANDERSON HILL
A015	BEAVER RIDGE
A017	BLACK HILLS
A018	BLACK MOUNTAINS
A027	BUCKSKIN HILL
A037	CANYON MOUNTAINS-DELTA
A043	CEDAR CITY JUNCTION
A046	CLEAR LAKE
A049	CONFUSION RANGE
A051	COVE CREEK
A054	CRICKET MOUNTAINS
A066	DOVE CREEK HILLS
A070	DUGWAY RANGE

A071	EAST CRICKET MOUNTAINS FOOTHILLS
A072	EAST DUGWAY DUNES
A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY
A081	ESCALANTE DESERT
A082	ESCALANTE VALLEY
A089	FERGUSON DESERT-TULE VALLEY
A092	FISH SPRINGS
A096	FOURMILE WASH
A101	GOSHEN-WARM SPRINGS
A105	GRANITE PEAK
A106	GREAT SALT LAKE
A107	GREAT SALT LAKE DESERT MUD FLAT
A108	GROUSE CREEK MOUNTAINS-RAFT RIVER
A115	HOLDEN SAND DUNES
A118	HORSESHOE SPRINGS
A123	HOUSE RANGE
A134	JACKSON WASH
A137	JUAB VALLEY
A138	KANARRA
A143	KINGS CANYON
A144	KNOLL SPRINGS
A149	LITTLE SAHARA SAND DUNES
A151	LONE TREE-CEDAR VALLEY
A156	LUND FLATS
A157	LYNNDYL SAND DUNES
A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
A171	MOUNTAIN HOME RANGE
A176	NEWFOUNDLAND MOUNTAINS
A179	NORTH PAROWAN VALLEY
A182	NORTH SEVIER LAKE
A183	NORTH WAH WAH MOUNTAINS
A185	NORTH WIG SAND DUNES
A186	NORTHWEST SEVIER LAKE
A190	OLD RIVER BED
A191	ONAQUI MOUNTAINS
A192	OQUIRRH MOUNTAINS
A202	PAROWAN VALLEY
A207	PILOT RANGE
A215	QUICHAPA LAKE
A234	RUSH VALLEY
A240	SAN FRANCISCO MOUNTAINS
A241	SAN PITCH MOUNTAINS
A243	SAWTOOTH MOUNTAIN
A248	SEVIER BRIDGE RESERVOIR
A249	SEVIER DESERT
A256	SILVER ISLAND MOUNTAINS
A259	SIMPSON BUTTES
A263	SKULL VALLEY
A265	SLOW ELK HILLS
A268	SNAKE VALLEY
A269	SOAP HOLLOW
A273	SOUTH JUAB VALLEY
A274	SOUTH MILFORD
A278	SOUTH SEVIER LAKE
A279	SOUTH WAH WAH MOUNTAINS
A286	STANSBURY MOUNTAINS
A295	SULPHURDALE
A297	SWAN LAKE SALT MARSH
A302	THE COVE
A305	THERMAL HOT SPRINGS-ESCALANTE DESERT
A309	TOD PARK
A312	TOOELE VALLEY
A313	TOPAZ MOUNTAIN
A317	TULE VALLEY
A319	TUNNEL SPRING MOUNTAINS-HALFWAY
A324	UTAH LAKE
A327	VERNON
A329	WAH WAH SPRINGS
A330	WAH WAH WASH
A335	WASATCH FRONT DRAPER
A339	WEST CEDAR CITY
A345	WHIRLWIND VALLEY
A351	WHITE SAGE VALLEY
A352	WILD ISLE-GREAT SALT LAKE DESERT SAND DUNES
A353	WILLOW PATCH SPRINGS

Figure 27. Portfolio sites with basins and desert scrub systems.



Portfolio sites

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.

B. Sagebrush Semidesert

Description

Simply stated, this is the “sagebrush ocean”. It is the second largest of the system groups in the Great Basin and covers about 33% of the ecoregion. The sagebrush semidesert group occurs across the entire ecoregion in all geographic sections on lower elevation non-alkaline soils of the piedmont slopes. There are three matrix forming and large patch ecological systems in this group: sagebrush semidesert, sagebrush steppe, and bitterbrush shrubland (table 16).

Table 16. Ecological systems of the sagebrush semidesert group organized by extent within the Great Basin.

Sagebrush Semidesert				
Ecological System	**% of Great Basin**	**Patch Type**	**# of All Plant Associations**	**# of G1G2 Plant Associations**
Sagebrush Semidesert	24.59	Matrix	24	3
Sagebrush Steppe	8.54	Large Patch	9	0
Bitterbrush Shrubland	0.01	Large Patch	5	1

There are 86 species conservation targets in sagebrush semidesert. Species targets include birds, terrestrial invertebrates, mammals, and plants (table 17). Exactly half (50%) of them are endemic to the ecoregion while only 12% are imperiled species. Mammal targets are especially important in sagebrush semidesert systems. Of the ten mammal targets present, two of them occur only in this system group (pygmy rabbit and sagebrush vole). Eighty-eight percent of the terrestrial invertebrate targets occur only in this system group (13 solitary bees and two blues, mostly imperiled species). Five of the six bird targets are important sagebrush semidesert obligate species as well.

Currently, there are relatively few (38) plant associations documented in these systems in the Great Basin, including 1 alliance where no individual plant association was identified. Four of the plant associations are imperiled conservation targets: big sagebrush-Joshua tree-Utah juniper shrubland (G2G3), silver sagebrush/tufted hairgrass (G2G3), black sagebrush-antelope bitterbrush rockland (G2?), and antelope bitterbrush-big sagebrush shrubland (G1?).

Table 17. Conservation targets for the sagebrush semidesert ecological systems organized by taxonomic group.

Common Name	Scientific Name	Grank	Ecoregional Distribution
Plants			
PINYON ROCK CRESS	ARABIS DISPAR	G3	Limited
ELKO ROCKCRESS	ARABIS FALCIFRUCTA	G1G2	Peripheral
EASTWOOD MILKWEED	ASCLEPIAS EASTWOODIANA	G2Q	Endemic
CALLAWAY MILKVETCH	ASTRAGALUS CALLITHRIX	G3	Endemic
ONE-LEAFLET TORREY MILKVETCH	ASTRAGALUS CALYCOSUS VAR. MONOPHYLLIDIUS	G5T2	Endemic
CIMA MILKVETCH	ASTRAGALUS CIMAE VAR. CIMAE	G2T2	Peripheral
LESSER RUSHY MILKVETCH	ASTRAGALUS CONVALLARIUS VAR. FINITIMUS	G5T3	Endemic
MARGARET RUSHY MILKVETCH	ASTRAGALUS CONVALLARIUS VAR. MARGARETIAE	G5T2	Endemic
GILMAN MILKVETCH	ASTRAGALUS GILMANII	G3?	Limited
LONG VALLEY MILK-VETCH	ASTRAGALUS JOHANNIS-HOWELLII	G2	Endemic
POHL MILKVETCH	ASTRAGALUS LENTIGINOSUS VAR. POHLII	G5T1	Endemic
LAVIN EGGVETCH	ASTRAGALUS OOPHORUS VAR. LAVINII	G4T2	Endemic
PINK EGG MILKVETCH, LONG-CALYX EGGVETCH	ASTRAGALUS OOPHORUS VAR. LONCHOCALYX	G4T2	Endemic
PINYON MILKVETCH	ASTRAGALUS PINONIS	G2G3	Endemic
	ASTRAGALUS PURSHII VAR. PUMILIO	G5T3T4	Endemic
	ASTRAGALUS SERENOI VAR. SERENOI	G4T3T4	Endemic
SQUALID MILKVETCH	ASTRAGALUS SERENOI VAR. SORDESCENS	G4T2	Endemic
CURRANT MILKVETCH	ASTRAGALUS UNCIALIS	G2	Endemic
BARNEBY STEMFLOWER	CAULANTHUS BARNEBYI	G2	Limited
BODIE HILLS CUSICKIELLA, BODIE HILLS DRABA	CUSICKIELLA QUADRICOSTATA	G3	Endemic
DOLOMITE SPRING-PARSLEY, INTERMONTAIN WAVEWING	CYMOPTERUS BASALTICUS	G2,G2G3	Endemic
COULTER BISCUITROOT	CYMOPTERUS COULTERI	G3	Limited
WALL SPRING PARSLEY	CYMOPTERUS GLOBOSUS	G3G4	Endemic
	CYMOPTERUS PURPUREUS VAR. JONESII	G5T2T3	Limited
BALD DAISY	ERIGERON CALVUS	G1	Limited
DARIN BUCKWHEAT	ERIOGONUM CONCINNUM	G2	Limited

Common Name	Scientific Name	Grank	Ecoregional Distribution
DARROW BUCKWHEAT	ERIOGONUM DARROVII	G2G3	Limited
TOIYABE BUCKWHEAT	ERIOGONUM ESMERALDENSE VAR. TOIYABENSE	G4T2	Endemic
PAHUTE GREEN GENTIAN	FRASERA PAHUTENSIS	G3Q	Endemic
COCHRANE GILIA	GILIA HETEROSTYLA	?	Endemic
GOLDENROD SNAKEWEED	GUTIERREZIA PETRADONA	G3	Limited
SIERRA VALLEY IVESIA	IVESIA APERTA VAR. APERTA	G2T2	Peripheral or Limited
PINE NUT MOUNTAINS IVESIA	IVESIA PITYOCHARIS	G2	Endemic
WEBBER IVESIA	IVESIA WEBBERI	G2	Limited
DWARF PEPPERGRASS	LEPIDIUM NANUM	G3	Endemic
BRUNEAU RIVER PRICKLY PHLOX	LEPTODACTYLON GLABRUM	G2	Limited
HANGING BLADDERPOD	LESQUERELLA PENDULA	G2?	Endemic
MAGUIRE BITTERROOT	LEWISIA MAGUIREI	G1	Endemic
SOFT LUPINE	LUPINUS MALACOPHYLLUS	G3?	Limited
	MACHAERANTHERA GRINDELIOIDES VAR. DEPRESSA	G5T3T4	Limited
CANDELARIA BLAZING-STAR	MENTZELIA CANDELARIAE	G3?Q	Endemic
STEAMBOAT MONKEYFLOWER	MIMULUS OVATUS	G2G3Q	Endemic
	PEDIOMELUM MEPHITICUM	G3?	Peripheral or Limited
BARNEBY'S BEARDTONGUE	PENSTEMON BARNEBYI	G3	Endemic
LOW BEARDTONGUE	PENSTEMON NANUS	G3	Endemic
	PENSTEMON RUBICUNDUS	G2G3	Endemic
OBSCURE SCORPION PLANT	PHACELIA INCONSPICUA	G2	Limited
GRAYLEAF PHLOX	PHLOX GRISEOLA	G3?	Limited
MOUND PHLOX	PHLOX TUMULOSA	G3?	Endemic
WILLIAMS COMBLEAF	POLYCTENIUM WILLIAMSIAE	G2	Limited
DESERT VALLEY FISHHOOK-CACTUS	SCLEROCACTUS SPINOSIOR	G2G3	Endemic
NAKED CATCHFLY	SILENE NUDA VAR. NUDA	G3T1T2Q	Endemic
TIEHM STROGANOWIA	STROGANOWIA TIEHMII	G2	Endemic
Invertebrates			
(bee)	ANDRENA CHRYLISMIAE	G1	Endemic
(bee)	ANDRENA NEVADAE	G1	Endemic
(bee)	ANDRENA RAVENI	G2	Limited
(bee)	ASHMEADIELLA RHODOGNATHA	?	Disjunct
(bee)	ATOPOSMIA PANAMINTENSIS	?	Limited
	DIANTHIDIUM IMPLICATUM	?	Disjunct
	DIANTHIDIUM MARSHI	G1	Limited
PEAVINE BLUE	EUPHILOTES ENOPTES ARIDORUM	G5T1	Endemic
MATTONI'S BLUE	EUPHILOTES PALLESCENS MATTONI	G4T1	Limited
	HOPLITIS BIDENTICAUDA	G2	Limited
(bee)	OSMIA NIGROPILOSA	G1	Endemic
(bee)	OSMIA SP. NOV.	G1	Endemic
(bee)	PERDITA COWANIAE	?	Limited
(bee)	PERDITA EXIGUA	G1	Endemic
(bee)	PERDITA LEUCOSTOMA	?	Limited
(bee)	PERDITA NASUTA GALACTICOPTERA	G1	Limited
(bee)	PERDITA XEROPHILA FUSCICORNIS	G1	Limited
Birds			
SAGE SPARROW	AMPHISPIZA BELLI	G5	Widespread, declining
FERRUGINOUS HAWK	BUTEO REGALIS	G4	Widespread, declining

Common Name	Scientific Name	Grank	Ecoregional Distribution
SAGE GROUSE	CENTROCERCUS UROPHASIANUS	G5	Widespread, declining
NORTHERN HARRIER	CIRCUS CYANEUS	G5	Widespread, declining
SAGE THRASHER	OREOSCOPTES MONTANUS	G5	Widespread
BREWER'S SPARROW	SPIZELLA BREWERI	G5	Widespread
Mammals			
PYGMY RABBIT	BRACHYLAGUS IDAHOENSIS	G5	Limited
CHISEL-TOOTHED KANGAROO RAT	DIPODOMYS MICROPS	G5	Limited
SAGEBRUSH VOLE	LAGURUS CURTATUS	G5	Endemic or Limited
DESERT VALLEY KANGAROO MOUSE	MICRODIPODOPS MEGACEPHALUS ALBIVENTER	G5T1	Endemic
FLETCHER DARK KANGAROO MOUSE	MICRODIPODOPS MEGACEPHALUS NASUTUS	G5T1	Endemic
DARK KANAGAROO MOUSE	MICRODIPODOPS MEGALOCEPHALUS	?	Unknown
PALE KANGAROO MOUSE	MICRODIPODOPS PALLIDUS	G5	Endemic
FRINGED MYOTIS	MYOTIS THYSANODES	G5	Widespread, declining
PREBLE'S SHREW	SOREX PREBLEI	G4	Unknown
INYO SHREW	SOREX TENELLUS	G3G4	Limited
G1 or G2 Plant Associations			
SILVER SAGEBRUSH/TUFTED HAIRGRASS	ARTEMISIA CANA SSP. VISCIDULA / DESCHAMPSIA CESPITOSA SHRUBLAND	G2G3	Widespread
BLACK SAGEBRUSH – ANTELOPE BUSH GRANITE ROCKLAND	ARTEMISIA NOVA - PURSHIA GLANDULOSA ROCK DWARF-SHRUBLAND	G2?	Limited
BIG SAGEBRUSH-JOSHUA TREE-UTAH JUNIPER SHRUBLAND	ARTEMISIA TRIDENTATA-YUCCA BREVIFOLIA-JUNIPERIUS OSTEOSPERMA SHRUBLAND	G2G3	Limited
BITTERBRUSH - BIG SAGEBRUSH	PURSHIA TRIDENTATA - ARTEMISIA TRIDENTATA SSP. TRIDENTATA SHRUBLAND	G1?	Limited
Terrestrial Ecological Systems			
BITTERBRUSH SHRUBLAND			
SAGEBRUSH SEMIDESERT			
SAGEBRUSH STEPPE			

Sagebrush semidesert plant communities are dominated by shrubs or codominated by shrubs and grasses or forbs (West and Young 2000). Sagebrush is the prevalent shrub, but several taxa of sagebrush occur from lowlands to higher elevations. The most common species is big sagebrush (*Artemisia tridentata*) with its five subspecies; however, several other species and subspecies of sagebrush occur and they may be locally dominant.

Sagebrush Semidesert: This ecological system is one of the largest and most representative in the ecoregion. The sagebrush semidesert occurs on dry, non-saline valley floors, toeslopes, and lower slopes where shrublands are dominated by basin big sagebrush, Wyoming big sagebrush, black sagebrush, silver sagebrush, or low sagebrush (*Artemisia tridentata* ssp. *tridentata, A. t.* ssp*. wyomingensis, A. nova, A. cana* or *A. arbuscula*). Occasional component shrubs include varieties of rabbitbrush and ephedras, and spiny hopsage (*Chrysothamnus* spp., *Ephedra* spp*.,* and *Grayia spinosa*), while the herbaceous understory is typically limited. Shrubs are generally less densely spaced than in sagebrush steppe, and in undisturbed stands the interspaces are composed of vesicular foamy surface soils or microphytic crusts. The herbaceous understory is usually located near or under shrubs. Shrubs are commonly located on hummocks of elevated microrelief caused by differential erosion and deposition (West and Young 2000). With a few exceptions, they are all above 1,525 m (5,000 ft) and occur on

toeslopes of mountains, between shadscale shrublands on lower more saline surfaces and pinyon-juniper woodlands on higher mountain slopes.

Sagebrush Steppe: This ecological system consists of more dense sagebrush shrublands with a significant grass understory. Dominant shrub species include basin big sagebrush, Wyoming big sagebrush, and low sagebrush *(Artemisia tridentata* ssp. *tridentata, A. t*. ssp. *wyomingensis,* and *Artemisia arbuscula*). Dominant grass species vary and include Idaho fescue, Great Basin wildrye, bluebunch wheatgrass, western wheatgrass, Thurber needlegrass and Sandberg bluegrass (*Festuca idahoensis, Leymus cinerus, Pseudoroegneria spicata*, *Agropyron smithii*, *Stipa thurberiana,* and *Poa secunda*). The abundance of herbaceous plants depends on time since fire, insect outbreaks, very wet springs, and very cold and dry winters. A microphytic crust composed of mosses, lichens, and algae is found in interspaces of the perennial shrubs and grasses in high condition communities that are not or are lightly grazed. About 66% of the ELUs that coincide with the sagebrush steppe system are at moderate elevations between 1,525-2,290 m (5,200 – 7,500 ft), on young alluvium-colluvium-glacial deposits, shale, granitic, or carbonate limestone on flat or gentle bajada slopes.

Good condition sagebrush steppe communities tend to have moderate to high species diversity. Zamora and Tueller (1973) found 54 plant species in high-condition low sagebrush steppe in northern Nevada. The vegetation evolved with large browsers that mostly disappeared about 12,000 years ago. Lower numbers of gramnivore populations were present in presettlement times along with small populations of hunter-gathering Native Americans. Historically, the largest ungulate was the pronghorn, while jackrabbits, cottontails, and rodents may have been the major herbivores (Young 1994).

Bitterbrush Shrubland: This ecological system consists of shrublands that transition into and expand in the mountains. Antelope bitterbrush (*Purshia tridentata*) is the dominant species, although occasionally in the southern part, Mojave buckwheat (*Eriogonum fasciculatum*) is a codominant. This shrubland occurs in relatively small patches, usually less than 100 ha in size. The largest stands occur on the eastern flank of the Sierra Nevada. Smaller patches occur within the mountain shrub zone of many mountain ranges to the east. Almost all (97%) of the ELUs that coincide with the bitterbrush shrubland system are at low elevations between 1,525-1,980 m (5,200 – 6,500 ft), on young alluvium-colluvium-glacial deposits, old alluvium, shale or granitic substrates, on lower to upper bajada (2-25%) slopes, and with southwest to northeast exposures.

Conservation Issues and Threats

Sagebrush semidesert has been recently highlighted for needed conservation because of the decline of sagebrush obligate species. The decline of the sage grouse in particular has been highlighted because of impending listing under the Endangered Species Act. Wildlife species dependent on the sagebrush semidesert, either year-round or during the breeding season, include the sage sparrow, Brewer's sparrow, sage thrasher, sage grouse, pygmy rabbit, sagebrush vole, sagebrush lizard, and pronghorn antelope (Ritter and Paige 2000). The latter was not a conservation target for this iteration, but pronghorn might be considered as a representative wide-ranging species in future assessments.

Fire regulates the density of fire-intolerant shrubs, such as big sagebrush, in sagebrush semidesert stands (West 1983, 1988). The invasion of exotic annual grasses has increased the fire frequency in many of these stands causing a decline in the abundance of sagebrush and

other non-sprouting shrubs. Fire favors shrubs that can resprout after fire, such as rabbitbrush (West 1983). However, fire suppression in sagebrush steppe could lead to conversion to sagebrush semidesert shrublands. Overgrazing can contribute by reducing the herbaceous layer, which decreases its ability to carry fire (West 1988).

In historic times, some sagebrush steppe was converted to farmland while much was degraded by excessive livestock grazing and increased burning frequency. Grazing capacity in sagebrush shrublands had been exceeded by 1900 and the resultant quick expansion of shrubs and loss of native perennial grasses took only 10-15 years (West and Young 2000). The introduction of aggressive weeds in the late 1800s brought additional stresses to the system. Cheatgrass (*Bromus tectorum*) spread in the Great Basin from Utah in 1894 to its present distribution by 1928 and became dominant in many disturbed areas during the 1940s and 1950s. Tumble mustard (*Sisymbrium altissimum*) and Russian thistle (*Salsola kali*) have invaded areas with moderate disturbance. Complete replacement of sagebrush steppe by cheatgrass and medusahead (*Taeniantherum caput-medusae*) has occurred after repeated fire in many places. There is a more recent trend for areas dominated by these exotic grasses to be taken over by aggressive adventive biennials and perennials, such as knapweeds (*Acroptilon* spp.) and star thistles (*Centaurea* spp.). Conversion of this system has reached a level where vast areas may not have the potential to return to dominance by sagebrush and native grasses and forbs without significant breakthroughs in rangeland restoration techniques and large expenditures of time and capital for restoration activities (West and Young 2000). These non-native plant invasions likely present the most difficult challenges that land managers face today in sagebrush semidesert ecosystems.

The low shrub stature of low sagebrush makes this dwarf shrubland less susceptible to natural fire than taller sagebrush shrublands. Grazing appears to have little effect on shrub densities, but tends to decrease the importance of tall bunchgrasses and increase the cover of species of rabbitbrush, forbs, and non-native grasses. As is the case in taller sagebrush shrublands, invasion by non-native annual grasses can dramatically increase fire frequency and convert low sagebrush shrublands to non-native annual grasslands (Barbour and Major 1977).

Grazed sagebrush shrublands have been altered by seeding with non-native grass species for rangeland forage supplement. Exact acreage is unknown, but thousands of acres were seeded, typically with crested wheatgrass (*Agropyron cristatum*) to increase livestock forage. Also, grazed sagebrush semidesert usually lack altogether or lack good condition soil microfloral crust communities.

Sagebrush semidesert is destroyed and fragmented by urbanization and rural development. This has occurred historically at the west and east margins of the ecoregion in the Reno-Carson City-Minden-Gardnerville area and the Ogden-Salt Lake City-Provo area. At the west margin, bitterbrush shrublands have been heavily impacted and fragmented. Also, urbanization deep within the ecoregion is occurring as a result of human population growth and expansion and our increased ability to extract basic resources in marginal situations. Large tracts of representative sagebrush semidesert and sagebrush steppe are needed to adequately protect these matrix forming systems.

Additionally, sagebrush semidesert is being reduced in extent by the expansion of pinyon and juniper woodlands as Great Basin vegetation responds to current climate conditions and changes in fire frequency.

System Conservation Goals and Viability

Sagebrush Semidesert: This is a matrix system and the GAP map coverage is 24.59% of the ecoregion. Our conservation goal is 20% of the area occupied by sagebrush semidesert within each section. A minimum viable size of 10,000 ha was set for this system because undisturbed stands can occupy entire valley floors at higher elevations, and form continuous rings on the toeslopes and lower bajadas of lower valleys. Stands of this size are likely to survive fire by not burning entirely, and surviving shrubs can provide a seed source for regeneration.

Sagebrush Steppe: Sagebrush steppe is a large patch system. The GAP map coverage is 8.54% of the ecoregion. Our conservation goal is 20% of the area occupied by sagebrush steppe within each section. A minimum viable size for stands has been suggested at 2,000 ha, but stands in the northernmost section of the ecoregion can occupy well over 10,000 ha. Future planning teams may consider it a matrix forming system throughout the Great Basin and consequently set different system goals. Fire is a dominant process in maintaining this system in the Columbia Plateau ecoregion, but fire is less common within the Great Basin. Stands need to be large enough to survive fire and provide a seed source to burned areas.

Bitterbrush Shrubland: This is a large patch system and the GAP map coverage is 0.01% of the ecoregion. Our conservation goal is 25% of the area occupied by bitterbrush shrubland within each section. Minimum size was set at 50 ha because this system is often limited to steep, rocky slopes, and is often intermixed with pinyon-juniper woodlands and other mountain communities. Its presence is often attributed to fire. Where fire removes forest trees, bitterbrush will assume dominance and can maintain itself by its fuel production and intrinsic flammability.

Portfolio Results

The portfolio includes 307 sites identified for ecological systems, communities, and species targets of the sagebrush semidesert group. One site was identified for conservation targets only in this system group. Table 18 lists the sites in this system group by geographic section and their locations are given in figure 28. Refer to appendix 10 for conservation targets and attributes for each site.

Highlighted sites of sagebrush semidesert include:

BODIE HILLS (A023)—component of a functional network of landscape sites connected to the Sierra Nevada ecoregion and important for wide-ranging species; harbors unique fen habitats and excellent examples of imperiled plant communities.
CAVE VALLEY-UPPER WHITE RIVER VALLEY (A042)—component of a functional landscape scale network of sites important for desert bighorn sheep and sagebrush obligates; full suite of terrestrial ecological systems and has important aquatic habitats; one and only site for three endemics including the White River mottled sculpin, Butterfield springsnail, and Lake Valley springsnail.
CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE (A050)—large functional landscape site with both low and high elevation terrestrial ecological systems and aquatic habitats; sagebrush obligate species in very good condition habitats.
FOURMILE BASIN (A095)—important sagebrush and lower montane systems in the Tonopah Section harboring sagebrush obligate species.

GROUSE CREEK MOUNTAINS-RAFT RIVER MOUNTAINS (A108)—largest landscape site identified for terrestrial ecological systems and component of a functional network; very important for mosaic of sagebrush communities that harbor excellent condition sagebrush obligate targets and a diversity of raptors.
SIMPSON PARK MOUNTAINS-NORTH TOIYABE RANGE (A261)—large functional landscape site linking both low and high elevation terrestrial ecological systems; good condition sagebrush for sage grouse.
TOIYABE RANGE-BIG SMOKY VALLEY (A310)—part of a functional landscape scale network of sites important for desert bighorn sheep and sagebrush obligates; high diversity of terrestrial ecological systems and aquatic habitats; harbors very good examples of imperiled plant communities; one and only site for six Great Basin endemics including two plants (Ophir rockcress and Rollins clover), the Toiyabe spotted frog, two fishes (Big Smoky Valley speckled dace and Charnock Springs tui chub), and the Big Smoky wood nymph.

Table 18. Great Basin portfolio sites identified for sagebrush semidesert ecological systems.

California

A002	ANCHORITE HILLS
A023	BODIE HILLS
A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
A039	CARSON RIVER
A114	HOLBROOK JUNCTION
A124	HOYE CANYON
A128	HUNTOON SPRING
A152	LONG VALLEY
A155	LUCKY BOY PASS
A164	MINERAL VALLEY
A165	MONO LAKE
A184	NORTH WASSUK RANGE
A195	OWENS VALLEY-BENTON VALLEY
A230	RICKEY PEAK
A250	SHEPHERD CREEK
A264	SLINKARD VALLEY
A275	SOUTH PINE NUT MOUNTAINS
A280	SOUTH WASSUK RANGE
A299	SWEETWATER MOUNTAINS
A328	VIRGINIA RANGE
A334	WARM SPRINGS VALLEY
A338	WELLINGTON HILLS
A346	WHITE MOUNTAINS

Lahontan Basin

A007	ARTESIA LAKE-EAST PINE NUT MOUNTAINS
A008	AUGUSTA MOUNTAINS
A010	BALD MOUNTAIN
A012	BATTLE MOUNTAIN
A019	BLACK ROCK
A020	BLACK ROCK DESERT-SMOKE CREEK DESERT
A021	BLOWSAND MOUNTAINS-BARNETT HILLS
A024	BOLIVIA
A028	BUFFALO SPRINGS
A029	BUFFALO VALLEY-TOBIN RANGE
A040	CARSON SINK
A058	DAISY CREEK
A073	EAST GABBS VALLEY
A083	EUGENE MOUNTAINS
A085	FAIRVIEW PEAK
A086	FAIRVIEW VALLEY
A088	FENCEMAKER
A094	FLY RANCH GEYSER-GRANITE RANGE
A098	GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
A099	GARFIELD HILLS
A125	HUMBOLDT RANGE
A126	HUMBOLDT RIVER GOLCONDA
A127	HUMBOLDT RIVER IMLAY
A132	JACKSON MOUNTAINS
A136	JERSEY SUMMIT
A142	KING LEAR PEAK
A146	KUMIVA VALLEY
A148	LAVA BEDS CREEK
A154	LOVELOCK VALLEY
A159	MASON VALLEY
A166	MONTANA MOUNTAINS
A177	NIGHTINGALE FLAT
A180	NORTH PYRAMID LAKE
A196	PAH RAH RANGE
A208	PINE FOREST RANGE
A211	PLEASANT VALLEY

A214	PYRAMID LAKE-LOWER TRUCKEE RIVER
A218	QUINN RIVER
A237	SAGE HEN VALLEY
A238	SAHWAVE MOUNTAINS-LAKE RANGE
A242	SAND MOUNTAIN
A246	SCHURZ
A258	SILVER STATE SAND DUNES
A270	SOLDIER MEADOWS
A271	SONOMA RANGE
A281	SPRING CREEK
A285	SQUAW VALLEY
A294	SULPHUR
A306	THORNE DUNE
A321	UPPER ROCK CREEK
A331	WALKER LAKE-WALKER RIVER
A356	WILSON CANYON
A357	WINNEMUCCA LAKE

North Central

A005	ANTELOPE VALLEY
A006	ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
A022	BLUE LAKES-BADLANDS
A025	BOONE SPRING
A050	CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE
A064	DIXIE CREEK
A074	EAST HUMBOLDT RANGE
A077	EIGHTEEN MILE MARSH
A078	ELKO
A080	EMIGRANT PASS
A102	GOSHUTE MOUNTAINS
A121	HOT SPRINGS CREEK
A158	MAGGIE CREEK
A168	MOOR SUMMIT
A204	PEQUOP MOUNTAINS-TOANO DRAW
A205	PILOT CREEK VALLEY
A209	PINE RIDGE
A213	PRATHER SPRINGS
A216	QUILICI SPRING-BUTTE VALLEY
A219	RABBIT CREEK
A226	RED POINT
A233	RUBY VALLEY
A251	SHERMAN CREEK
A255	SHOSHONE-BEOWAWE
A287	STEPTOE VALLEY
A296	SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER
A303	THE NARROWS
A307	THOUSAND SPRINGS CREEK HOT SPRINGS
A320	UPPER HUMBOLDT RIVER-LOWER MARYS RIVER
A326	VALLEY MOUNTAIN
A333	WARM SPRINGS

Central Mountains

A011	BARRETT CANYON
A030	BUTLER BASIN
A031	BUTTE MOUNTAINS
A041	CATHEDRAL CANYON
A042	CAVE VALLEY-UPPER WHITE RIVER VALLEY
A048	COMINS MEADOW
A055	CURRANT MOUNTAIN
A056	CURRANT SUMMIT
A057	CURRIE GARDENS-TAYLOR CANYON
A059	DEEP CREEK RANGE
A060	DESATOYA MOUNTAINS
A061	DIAMOND PEAK
A062	DIAMOND SPRINGS
A063	DIAMOND VALLEY ALKALI FLAT
A065	DIXIE VALLEY
A068	DUCK CREEK RANGE-STEPTOE VALLEY
A076	EASTGATE-ROCK CREEK
A091	FISH CREEK SPRINGS
A093	FLAT SPRING
A097	FROST CREEK
A100	GIOCOECHEA WARM SPRINGS
A104	GOVERNMENT PEAK
A109	HANDY SPRING
A116	HOME STATION WASH
A117	HORSESHOE BASIN
A122	HOT SPRINGS HILL
A135	JAKES VALLEY
A141	KERN MOUNTAINS
A145	KOBEH VALLEY
A147	LAKE VALLEY
A153	LOOKOUT SPRINGS
A162	MELOY SPRING
A169	MOUNT LEWIS
A172	MUDHOLE SPRING
A174	NEW PASS
A175	NEWARK LAKE
A199	PANCAKE SUMMIT
A203	PATTERSON WASH
A220	RAILROAD GRADE
A221	RAILROAD PASS
A227	REESE RIVER
A228	REESE RIVER VALLEY

A232	RUBY MOUNTAINS
A235	RUTH
A244	SCHELL CREEK RANGE
A245	SCHELLBOURNE PASS
A254	SHOSHONE RANGE-CARICO LAKE VALLEY
A261	SIMPSON PARK MOUNTAINS-NORTH TOIYABE
A267	SNAKE RANGE
A282	SPRING VALLEY CREEK
A283	SPRING VALLEY-HAMLIN VALLEY
A290	STONEBERGER BASIN
A293	SULLIVAN SPRING
A310	TOIYABE RANGE-BIG SMOKY VALLEY
A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
A316	TRAIL CANYON
A318	TUNGSTONIA
A322	UPPER WHITE RIVER
A332	WARD MOUNTAIN
A340	WEST DEVILS GATE
A343	WEST NORTHUMBERLAND CANYON
A347	WHITE PINE RANGE
A348	WHITE RIVER VALLEY
A349	WHITE ROCK MOUNTAINS
A350	WHITE SAGE FLAT

Tonopah

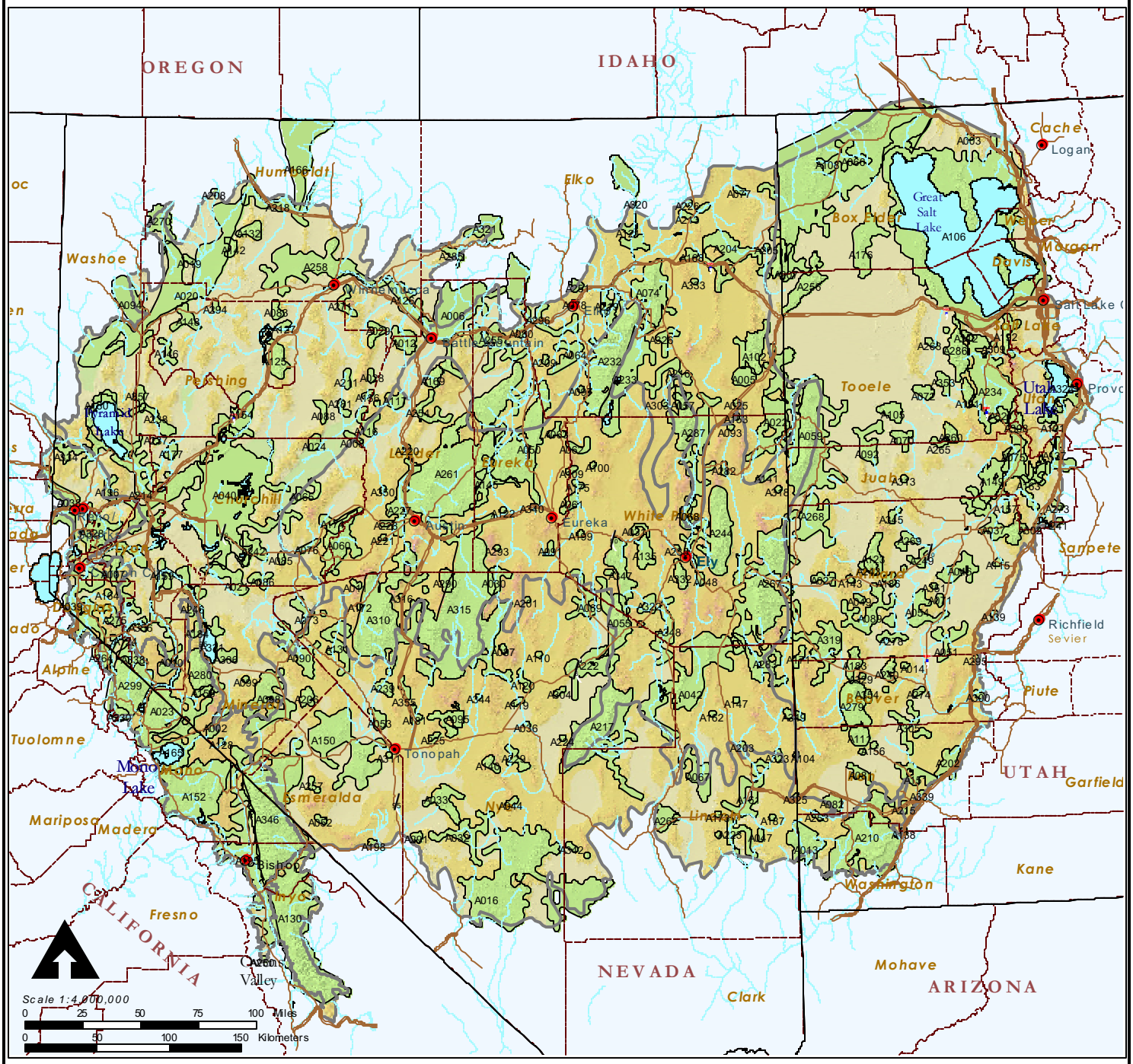
A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS
A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
A032	CACTUS FLAT
A033	CACTUS RANGE
A036	CANE SPRING
A044	CEDAR PASS
A047	CLOVER CREEK
A052	COWCAMP
A053	CRESCENT DUNES
A067	DRY LAKE VALLEY
A069	DUCKWATER VALLEY
A087	FANDANGO
A090	FINGER ROCK WASH
A095	FOURMILE BASIN
A110	HEART HILLS
A119	HOT CREEK VALLEY
A120	HOT CREEK-PALISADE MESA
A130	INYO MOUNTAINS
A131	IONE VALLEY
A140	KAWICH RANGE
A150	LONE MOUNTAIN-MONTE CRISTO RANGE
A161	MEADOW VALLEY
A173	NELSON SPRING
A181	NORTH RALSTON VALLEY
A187	OAK WELL CANYON
A197	PAHROC SUMMIT PASS
A198	PALMETTO MOUNTAINS
A201	PARK RANGE
A206	PILOT MOUNTAINS
A210	PINE VALLEY MOUNTAINS
A217	QUINN CANYON RANGE-GRANT RANGE
A222	RAILROAD VALLEY
A223	RAINBOW CANYON
A224	RED HILL
A225	RED PEAK
A229	REVEILLE VALLEY
A231	ROCK SPRINGS CANYON
A239	SAN ANTONIO DUNES
A253	SHOAL CREEK
A257	SILVER PEAK RANGE
A262	SIXMILE FLAT
A272	SOUTH GROOM RANGE
A291	STONEWALL MOUNTAIN
A304	THE WALL
A311	TONOPAH SUMMIT
A314	TOPIER CANYON
A323	URSINE
A342	WEST GROOM RANGE
A344	WEST STONE CABIN VALLEY
A355	WILLOW SPRING

Bonneville Basin

A003	ANDERSON HILL
A004	ANTELOPE SPRINGS
A014	BEAVER LAKE MOUNTAINS
A017	BLACK HILLS
A018	BLACK MOUNTAINS
A027	BUCKSKIN HILL
A037	CANYON MOUNTAINS-DELTA
A043	CEDAR CITY JUNCTION
A046	CLEAR LAKE
A049	CONFUSION RANGE
A051	COVE CREEK
A054	CRICKET MOUNTAINS
A066	DOVE CREEK HILLS
A070	DUGWAY RANGE
A071	EAST CRICKET MOUNTAINS FOOTHILLS
A072	EAST DUGWAY DUNES
A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY

A081	ESCALANTE DESERT
A082	ESCALANTE VALLEY
A089	FERGUSON DESERT-TULE VALLEY
A092	FISH SPRINGS
A096	FOURMILE WASH
A101	GOSHEN-WARM SPRINGS
A105	GRANITE PEAK
A106	GREAT SALT LAKE
A108	GROUSE CREEK MOUNTAINS-RAFT RIVER
A111	HERD PASS
A115	HOLDEN SAND DUNES
A118	HORSESHOE SPRINGS
A123	HOUSE RANGE
A134	JACKSON WASH
A137	JUAB VALLEY
A138	KANARRA
A139	KANOSH
A143	KINGS CANYON
A149	LITTLE SAHARA SAND DUNES
A151	LONE TREE-CEDAR VALLEY
A156	LUND FLATS
A157	LYNNDYL SAND DUNES
A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
A171	MOUNTAIN HOME RANGE
A176	NEWFOUNDLAND MOUNTAINS
A182	NORTH SEVIER LAKE
A183	NORTH WAH WAH MOUNTAINS
A186	NORTHWEST SEVIER LAKE
A191	ONAQUI MOUNTAINS
A192	OQUIRRH MOUNTAINS
A202	PAROWAN VALLEY
A207	PILOT RANGE
A215	QUICHAPA LAKE
A234	RUSH VALLEY
A240	SAN FRANCISCO MOUNTAINS
A241	SAN PITCH MOUNTAINS
A243	SAWTOOTH MOUNTAIN
A248	SEVIER BRIDGE RESERVOIR
A249	SEVIER DESERT
A256	SILVER ISLAND MOUNTAINS
A260	SIMPSON MOUNTAINS
A263	SKULL VALLEY
A265	SLOW ELK HILLS
A268	SNAKE VALLEY
A269	SOAP HOLLOW
A273	SOUTH JUAB VALLEY
A274	SOUTH MILFORD
A278	SOUTH SEVIER LAKE
A279	SOUTH WAH WAH MOUNTAINS
A286	STANSBURY MOUNTAINS
A295	SULPHURDALE
A300	TABLE GROUNDS
A302	THE COVE
A305	THERMAL HOT SPRINGS-ESCALANTE DESERT
A308	TINTIC MOUNTAINS
A309	TOD PARK
A312	TOOELE VALLEY
A313	TOPAZ MOUNTAIN
A319	TUNNEL SPRING MOUNTAINS-HALFWAY
A324	UTAH LAKE
A325	UVADA
A327	VERNON
A329	WAH WAH SPRINGS
A339	WEST CEDAR CITY
A345	WHIRLWIND VALLEY
A351	WHITE SAGE VALLEY
A353	WILLOW PATCH SPRINGS
A354	WILLOW SPRING

Figure 28. Portfolio sites with sagebrush semidesert systems.



Portfolio sites

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.

C. Lower Montane

Description

Lower montane ecological systems occur across middle elevations of the ecoregion in almost all geographic sections. This group covers about 17% of the ecoregion, which is the third largest coverage of the system groups. Three large patch ecological systems comprise the lower montane group: pinyon-juniper woodland, low montane shrubland, and mountain mahogany woodland (table 19). Pinyon-juniper woodlands sometimes are referred to as pygmy woodlands because the dominant trees are smaller stature species than other montane conifers. Montane shrublands include chaparral communities that are fire dependent. In contrast, mountain mahogany woodlands are fire intolerant.

Table 19. Ecological systems of the lower montane group organized by extent within the Great Basin.

Lower Montane				
Ecological System	**% of Great Basin**	**Patch Type**	**# of All Plant Associations**	**# of G1G2 Plant Associations**
Pinyon-Juniper Woodland	15.64	Large Patch	26	0
Low Montane Shrubland	0.78	Large Patch	11	3
Mountain Mahogany Woodland	0.43	Large Patch	3	1

There are 95 species conservation targets in lower montane systems and these species include birds, terrestrial invertebrates, mammals, reptiles, and plants (table 20). Half (51%) of them are endemic to the ecoregion while 19% are imperiled. Plant targets are especially important in these systems, which is also true for the higher montane and alpine systems. However, only 15% of the plant targets are considered imperiled. Notable bird targets in the lower montane group include the pinyon jay and juniper titmouse who are restricted specialists, and the gray flycatcher with more than half of its global population breeding in lower montane systems of the Great Basin.

There are 40 plant associations documented in lower montane systems in the Great Basin including 5 alliances where no individual plant association was listed. Four of the plant associations are ranked as imperiled: Parry rabbitbrush shrubland (G1?), Utah serviceberry-alderleaf mountain mahogany shrubland (G2), whiteleaf manzanita-buckbrush/Idaho fescue-Lemmon's needlegrass (G2), and curl-leaf mountain mahogany/ mountain snowberry woodland (G2).

Table 20. Conservation targets for the lower montane ecological systems organized by taxonomic group.

Common Name	Scientific Name	Grank	Ecoregional Distribution
Plants			
BODIE HILLS ROCK CRESS	ARABIS BODIENSIS	G1,G2	Limited
PINYON ROCK CRESS	ARABIS DISPAR	G3	Limited
GROUSE CREEK ROCKCRESS	ARABIS FALCATORIA	G1	Peripheral or Limited
BEATLEY MILKVETCH	ASTRAGALUS BEATLEYAE	G3	Endemic
CALLAWAY MILKVETCH	ASTRAGALUS CALLITHRIX	G3	Endemic
CIMA MILKVETCH	ASTRAGALUS CIMAE VAR. CIMAE	G2T2	Peripheral
LESSER RUSHY MILKVETCH	ASTRAGALUS CONVALLARIUS VAR. FINITIMUS	G5T3	Endemic
MARGARET RUSHY MILKVETCH	ASTRAGALUS CONVALLARIUS VAR. MARGARETIAE	G5T2	Endemic
GILMAN MILKVETCH	ASTRAGALUS GILMANII	G3?	Limited
CLOKEY EGGVETCH	ASTRAGALUS OOPHORUS VAR. CLOKEYANUS	G4T2	Peripheral
LAVIN EGGVETCH	ASTRAGALUS OOPHORUS VAR. LAVINII	G4T2	Endemic
PINK EGG MILKVETCH, LONG-CALYX EGGVETCH	ASTRAGALUS OOPHORUS VAR. LONCHOCALYX	G4T2	Endemic
PINYON MILKVETCH	ASTRAGALUS PINONIS	G2G3	Endemic
	ASTRAGALUS PURSHII VAR. PUMILIO	G5T3T4	Endemic
	ASTRAGALUS SERENOI VAR. SERENOI	G4T3T4	Endemic
SILVER REEF MILKVETCH	ASTRAGALUS STRATURENSIS	G2G3	Peripheral or Limited
TOQUIMA MILKVETCH	ASTRAGALUS TOQUIMANUS	G2	Endemic
	CASTILLEJA DISSITIFLORA	G4?	Endemic
CLOKEY PAINTBRUSH	CASTILLEJA MARTINII VAR. CLOKEYI	G3QT3	Peripheral
BARNEBY'S PAINTBRUSH	CASTILLEJA SCABRIDA VAR. BARNEBYANA	G4T?	Endemic
JAEGER'S CAULOSTRAMINA	CAULOSTRAMINA JAEGERI	G1	Endemic
BARREN VALLEY COLLOMIA	COLLOMIA RENACTA	G1Q	Limited
BODIE HILLS CUSICKIELLA, BODIE HILLS DRABA	CUSICKIELLA QUADRICOSTATA	G3	Endemic
	CYMOPTERUS PURPUREUS VAR. JONESII	G5T2T3	Limited
KASS ROCKCRESS	DRABA KASSII	G1	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
GILMAN'S GOLDENBUSH	ERICAMERIA GILMANII	G1	Limited
SHEEP FLEABANE	ERIGERON OVINUS	G2	Limited
DESERT WILD BUCKWHEAT	ERIOGONUM BATEMANII VAR. EREMICUM	G4?T2T3	Endemic
BEATLEY BUCKWHEAT	ERIOGONUM BEATLEYAE	G2Q	Endemic
DARIN BUCKWHEAT	ERIOGONUM CONCINNUM	G2	Limited
WILDROSE CANYON BUCKWHEAT	ERIOGONUM EREMICOLA	G1	Limited
TOIYABE BUCKWHEAT	ERIOGONUM ESMERALDENSE VAR. TOIYABENSE	G4T2	Endemic
PANAMINT MTNS. BUCKWHEAT	ERIOGONUM MICROTHECUM VAR. PANAMINTENSE	G5T2	Limited
IBEX BUCKWHEAT	ERIOGONUM NUMMULARE VAR. AMMOPHILUM	G4T1	Endemic
KINGSTON MOUNTAINS BEDSTRAW	GALIUM HILENDIAE SSP. KINGSTONENSE	G4QT2?	Limited
GOLDENROD SNAKEWEED	GUTIERREZIA PETRADONA	G3	Limited
INTERMOUNTAIN BITTERWEED	HYMENOXYS HELENIOIDES	G3?Q	Unknown
OSTLER'S IVESIA	IVESIA SHOCKLEYI VAR. OSTLERI	G3G4T1	Endemic
WEBBER IVESIA	IVESIA WEBBERI	G2	Limited
WASATCH JAMESIA	JAMESIA AMERICANA VAR. MACROCALYX	G5T2	Limited
DWARF PEPPERGRASS	LEPIDIUM NANUM	G3	Endemic
GOODRICH BLADDERPOD	LESQUERELLA GOODRICHII	G2G4	Endemic
HITCHCOCK BLADDERPOD	LESQUERELLA HITCHCOCKII	G3	Peripheral or Limited
MAGUIRE BITTERROOT	LEWISIA MAGUIREI	G1	Endemic
	LOMATIUM SCABRUM VAR. TRIPINNATUM	G3G4T2T3	Peripheral
	MACHAERANTHERA GRINDELIOIDES VAR. DEPRESSA	G5T3T4	Limited
	PEDIOMELUM MEPHITICUM	G3?	Peripheral or Limited
BARNEBY'S BEARDTONGUE	PENSTEMON BARNEBYI	G3	Endemic
TUNNEL SPRING BEARDTONGUE	PENSTEMON CONCINNUS	G3	Endemic
CORDELIA BEARDTONGUE	PENSTEMON FLORIBUNDUS	G1	Endemic
DESERT BEARDTONGUE	PENSTEMON HUMILIS VAR. DESERTICUS	G5T2?	Endemic
PENNELL BEARDTONGUE	PENSTEMON LEIOPHYLLUS VAR. FRANCISCI-PENNELLII	G3T2	Endemic
MOUNT MORIAH BEARDTONGUE	PENSTEMON MORIAHENSIS	G1G2	Endemic
LOW BEARDTONGUE	PENSTEMON NANUS	G3	Endemic
PAHUTE MESA BEARDTONGUE	PENSTEMON PAHUTENSIS	G3	Limited
	PENSTEMON PALMERI VAR. MACRANTHUS	G5T2?	Endemic
DAD'S PENSTEMON	PENSTEMON PATRICUS	G2Q	Endemic
PINYON PENSTEMON	PENSTEMON PINORUM	G1	Endemic
BASHFUL BEARDTONGUE	PENSTEMON PUDICUS	G1	Endemic
	PENSTEMON RUBICUNDUS	G2G3	Endemic
TIDESTROM BEARDTONGUE	PENSTEMON TIDESTROMII	G2G3	Peripheral
INYO ROCK DAISY	PERITYLE INYOENSIS	G1	Limited
BEATLEY SCORPION PLANT	PHACELIA BEATLEYAE	G3	Peripheral
LEAST PHACELIA	PHACELIA MINUTISSIMA	G2	Peripheral
DEATH VALLEY ROUND-LEAVED PHACELIA, WEASEL PHACELIA	PHACELIA MUSTELINA	G2,G2G3	Limited
GRAYLEAF PHLOX	PHLOX GRISEOLA	G3?	Limited
MOUND PHLOX	PHLOX TUMULOSA	G3?	Endemic
DESERT VALLEY FISHHOOK-CACTUS	SCLEROCACTUS SPINOSIOR	G2G3	Endemic
NAKED CATCHFLY	SILENE NUDA VAR. NUDA	G3T1T2Q	Endemic
MASONIC MTN. JEWEL-FLOWER	STREPTANTHUS OLIGANTHUS	G3	Limited
LONE MOUNTAIN TONESTUS	TONESTUS GRANITICUS	G1	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
CHARLESTON GROUNDDAISY	TOWNSENDIA JONESII VAR. TUMULOSA	G3T3	Peripheral
Invertebrates			
(bee)	CALLIOPSIS HESPERIA EQUINA	?	Disjunct
SHIELD'S BLUE	EUPHILOTES ANCILLA SHIELDSI	G5T1	Endemic
EARLY BLUE	EUPHILOTES ENOPTES PRIMAVERA	G5T1	Endemic
GIULIANI'S UNCA SKIPPER	HESPERIA UNCAS GIULIANII	G4G5T1	Unknown
	HOPLITIS SHOSHONE	?	Endemic
INTERMEDIATE COLORADO HAIRSTREAK	HYPAUROTIS CRYSALUS INTERMEDIA	G5T1	Endemic
WHITE MOUNTAINS ICARIOIDES BLUE	ICARICIA ICARIOIDES ALBIHALOS	G5T1T2	Endemic
MILL CREEK MOUNTAINSNAIL	OREOHELIX HOWARDI	G1	Endemic
SCHELL CREEK MOUNTAINSNAIL	OREOHELIX NEVADENSIS	G1	Endemic
BROADLINED SAEPIUM HAIRSTREAK	SATYRIUM SAEPIUM LATILINEA	G5T1	Limited
WHITE MOUNTAINS CLOUDY WING	THORYBES MEXICANA BLANCA	G5T2	Endemic
Reptiles			
UTAH MOUNTAIN KINGSNAKE	LAMPROPELTIS PYROMELANA INFRALABIALIS	G5T3	Unknown
MOUNTAIN SHORT-HORNED LIZARD	PHRYNOSOMA HERNANDESI	G3	Endemic
Birds			
JUNIPER TITMOUSE	BAEOLOPHUS GRISEUS	G5	Widespread
GRAY FLYCATCHER	EMPIDONAX WRIGHTII	G5	Widespread
PINYON JAY	GYMNORHINUS CYANOCEPHALUS	G5	Widespread, specialist
LEWIS'S WOODPECKER	MELANERPES LEWIS	G5	Widespread, declining
VIRGINIA'S WARBLER	VERMIVORA VIRGINIAE	G5	Widespread
Mammals			
CHISEL-TOOTHED KANGAROO RAT	DIPODOMYS MICROPS	G5	Limited
FRINGED MYOTIS	MYOTIS THYSANODES	G5	Widespread, declining
CALIFORNIA BIGHORN SHEEP	OVIS CANADENSIS CALIFORNIANA	G4T1	Limited
ROCKY MOUNTAIN BIGHORN SHEEP	OVIS CANADENSIS CANADENSIS	?	Peripheral
DESERT BIGHORN SHEEP	OVIS CANADENSIS NELSONI	G4T3	Limited
G1 or G2 Plant Associations			
UTAH SERVICEBERRY-ALDERLEAF MOUNTAIN MAHOGANY SHRUBLAND	AMELANCHIER UTAHENSIS-CERCOCARPUS MONTANUS SHRUBLAND	G2	Widespread
WHITELEAF MANZANITA-BUCKBRUSH-IDAHO FESCUE-LEMMON'S NEEDLEGRASS	ARCTOSTAPHYLOS VISCIDA - CEANOTHUS CUNEATUS / FESTUCA IDAHOENSIS - STIPA LEMMONII SHRUBLAND	G2	Peripheral
CURL-LEAF MOUNTAIN-MAHOGANY/MOUNTAIN SNOWBERRY WOODLAND	CERCOCARPUS LEDIFOLIUS/SYMPHORICARPOS OREOPHILUS WOODLAND	G2	Limited
PARRY RABBITBRUSH SHRUBLAND	CHRYSOTHAMNUS PARRYI SHRUBLAND [PROVISIONAL]	G1?	Widespread
Terrestrial Ecological Systems			
LOW MONTANE SHRUBLANDS			
MOUNTAIN MAHOGANY WOODLANDS			
PINYON-JUNIPER WOODLAND			

Shrubs or low stature trees dominate characteristic plant communities of lower montane systems. Pinyon-juniper includes several widespread pygmy conifer forest and woodland plant community types. Singleleaf pinyon pine (*Pinus monophylla*) is the dominant pine and Utah juniper (*Juniperus osteosperma*) often is the dominant juniper although it may be replaced by western juniper (*J. occidentalis*) or Rocky Mountain juniper (*J. scopulorum*) in higher or moister

areas. The understory is comprised of shrubs and grasses of the sagebrush semidesert. Shrubs include big sagebrush, antelope bitterbrush, and gooseberry species (*Artemisia tridentata* sspp., *Purshia tridentata*, and *Ribes* spp.). Pinyon-juniper is extensive throughout moderate elevations south of the Truckee and Humboldt rivers, but it is fairly sparse in the Lahontan and Bonneville basins sections. Drier, rocky sites with shallow soils tend to support mountain mahogany woodlands. More details of the ecological systems follow.

Pinyon-Juniper Woodlands: This ecological system is comprised of woodlands dominated by a mix of singleleaf pinyon pine and Utah juniper, pure or nearly pure stands of singleleaf pinyon pine, or woodlands dominated solely by Utah juniper. On the eastern and western fringes of the Great Basin, other species of pine and juniper may codominant or even dominant these woodlands. Adjacent vegetation is commonly (about 90% of the time) sagebrush steppe at the lower and upper elevation margins and sometimes montane and subalpine coniferous vegetation at the upper margin. More than half (53%) of the ELUs that coincide with pinyon-juniper woodlands are at moderate elevations between 1,525-2,900 m (5,000 – 9,500 ft), on granitic-silicic, carbonate-limestone, shale or colluvial deposits, on lower and upper bajada slopes of 2-24%, and with southwest, northeast, or relatively flat exposures.

Low Montane Shrubland: This ecological system consists of patchy shrubland communities found in the lower montane belt of mountain ranges throughout the Great Basin. Dominant species include saskatoon serviceberry, Utah serviceberry, Parry rabbitbrush, whitethorn ceanothus, snowbrush ceanothus, greenleaf manzanita, Gambel oak, and turbinella oak (*Amelanchier alnifolia, A. utahensis, Chrysothamnus parryi, Ceanothus cordulatus, C. velutinus, Arctostaphylos patula, Quercus gambelii* and *Q. turbinella*). About 46% of the ELUs that coincide with the low montane shrubland system are at moderate elevations between 1,981-2,900 m (6,500-9,500 ft), on granitic-silicic, shale, carbonate-limestone, and young alluvial deposits, on lower and upper bajada slopes of 2-25% to steeper slopes of 26-35%, and with northeast or southwest exposures.

Mountain Mahogany Woodland: This ecological system consists of woodlands and shrublands dominated by curlleaf mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*). Codominant and understory species include big sagebrush, mountain snowberry (*Symphoricarpos oreophilus*), and bluebunch wheatgrass (*Pseudoroegneria spicata*). It can form large stands on the toeslopes and steeper faces of the lower montane and foothill elevational belt, and it is typically restricted to rocky, arid slopes and ridges. These woodlands provide good cover and nesting sites for wildlife. In hotter and drier situations, it is replaced by Stansbury cliffrose (*Purshia mexicana*) communities of low montane ecological systems. Exactly half (50%) of the ELUs are at higher elevations between 2,291-2,900 m (7,500-9,500 ft), on mostly granitic-silicic substrates, on toeslopes, lower and upper bajada slopes, and ridgetops, and mostly on southwest exposures.

Conservation Issues and Threats

Higher precipitation and thermal inversions on lower montane slopes are the important ecological factors in the origin and maintenance of pinyon-juniper woodlands (Billings 1954). Pinyon-juniper communities are increasing in extent in the Great Basin, impressively in the last 150-250 years (Tausch *et al*. 1981, Miller and Rose 1995). They are expanding into adjacent steppe grasslands in many areas as a result of livestock grazing and fire suppression (Blackburn and Tueller 1970). On poor quality sites (shallow and rocky soils on steep slopes) stands were once smaller and more open as a result of recurring fires. At the same time,

however, stands on more favorable sites with gentler slopes and deeper soils, may have been large and more savanna-like with a very open upper canopy and high grass production. As trees increase in density, shrubs and herbaceous species decrease.

The number of trees per hectare, or tree density, is a good indicator of land use history in pinyon-juniper woodlands. Studies of fire scars on juniper and pinyon pines have shown that tree density in these woodlands was much lower prior to European settlement (West and Young 2000, Young and Evans 1981). Prior to 1800, stands had from one to 140 trees per acre. After about 1831, stands contained 100 to nearly 600 trees per acre (Blackburn and Tueller 1970).

Although pinyon-juniper covers more area now and stands tend to be denser, these woodlands are generally in degraded condition because of fewer bunchgrasses and increasing presence of exotics. Additionally, in the past many pinyon-juniper woodlands were chained in an effort to create better rangeland for livestock.

Most of the low montane shrublands are fire adapted plant communities that burn relatively frequently. The dominant shrubs either stump-sprout or quickly regenerate following fire. In contrast, curlleaf mountain mahogany is not fire tolerant and is replaced by shrub species such as serviceberry, oceanspray, and big sagebrush when frequent fires occur.

Tall trees of mountain mahogany are rare specimens as many of the larger ones were cut down for use as charcoal wood for smelting ores in the 19th century. Mahogany can survive on the poorest sites because they are nitrogen fixers (West and Young 2000).

Lower montane systems are important habitat for bighorn sheep. Berger (1990) studied population viability of small insular bighorn sheep. He found that population size had the greatest influence on population persistence. Populations of 100 or more individuals persisted up to 70 years, whereas populations with fewer than 50 individuals became extinct in less than 50 years. Other factors—predation, food shortage, climate severity, interspecific competition—appeared unrelated to population persistence. Larger tracts of lower montane systems with connectivity to lower elevation sagebrush semidesert or basin and desert scrub systems are more likely to harbor larger populations of bighorn sheep.

System Conservation Goals and Viability

Pinyon-Juniper Woodlands: Pinyon-juniper woodland is a large patch system. The GAP map coverage is 15.64% of the ecoregion. Because pinyon-juniper presently is increasing in the Great Basin, surmising a minimum viable size for pinyon-juniper woodlands is difficult. Our conservation goal is 10% of the area occupied by pinyon-juniper woodlands within each section. Minimum viable size was set at 2,000 ha. Stand density is more important than stand size for long term viability. The stand must be able to survive and carry frequent ground fires. Pre-European settlement stands may have been more isolated and smaller than 2,000 ha in the Great Basin because of frequent fires. Future planning teams may consider it a matrix forming system throughout the Great Basin and consequently set different system goals.

Low Montane Shrubland: This is a large patch system and the GAP map coverage is 0.78% of the ecoregion. Our conservation goal is 10% of the area occupied by low montane shrublands within each section. Minimum size was set at 100 ha, as they are often restricted to rocky outcrops and post-burn areas.

Mountain Mahogany Woodland: This is a large patch system. The GAP map coverage is 0.43% of the ecoregion. Our conservation goal is 10% of the area occupied by mountain mahogany woodlands within each section. Minimum viable size was set at 100 ha.

Portfolio Results

The portfolio includes 252 sites identified for ecological systems, communities, and species targets of the lower montane group. Table 21 lists the sites in this system group by geographic section and their locations are given in figure 29. Refer to appendix 10 for conservation targets and attributes for each site.

Highlighted significant sites of the lower montane group include:

ARTESIA LAKE-EAST PINE NUT MOUNTAINS (A007)—excellent pinyon woodlands with connectivity west to Sierra Nevada for wide-ranging species; one and only site for Churchill Narrows buckwheat; aquatic habitats important for migratory waterbirds.
BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPINT RANGE (A016)—large functional landscapes with connectivity to Mojave Desert; one and only site for Pahute green gentian; important for pinyon-juniper woodlands and low montane shrublands.
DESATOYA MOUNTAINS (A060)—high diversity of terrestrial ecological systems with excellent examples of mountain mahogany, pinyon-juniper, and low montane communities; montane riparian shrublands associated with Lahontan cutthroat trout aquatic habitats.
PINE VALLEY MOUNTAINS (A210)—a uniquely transitional site with linkage to Mojave Desert, Colorado Plateau, and Utah High Plateaus ecoregions; excellent large examples of mountain brush plant communities; harbors imperiled lower montane communities; one and only site for Pine Valley goldenbush and pinyon penstemon.
SOUTH WAH WAH MOUNTAINS (A279)—mosaics of montane systems in very good condition including mountain sagebrush, montane riparian shrublands, and pinyon-juniper woodland communities; one of a few sites for the Utah mountain kingsnake.
SOUTH WASSUK RANGE (A280)— high diversity of terrestrial ecological systems with excellent examples of pinyon-juniper, mountain mahogany, mountain sagebrush and low montane communities; montane riparian shrublands and meadows are excellent habitats for sage grouse and other sagebrush obligate species; linkage to lower elevation Walker Lake site via riparian corridors.
TUNNEL SPRING MOUNTAINS-HALFWAY HILLS-PINE VALLEY (A319)—unique assemblages of rare plant species among mosaics of montane communities; excellent Gambel oak stands; one and only site for the Bonneville saltbush.

Table 21. Great Basin portfolio sites identified for lower montane ecological systems.

California

A002	ANCHORITE HILLS
A023	BODIE HILLS
A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
A039	CARSON RIVER
A124	HOYE CANYON
A128	HUNTOON SPRING
A152	LONG VALLEY
A155	LUCKY BOY PASS
A164	MINERAL VALLEY
A165	MONO LAKE
A184	NORTH WASSUK RANGE
A195	OWENS VALLEY-BENTON VALLEY

A230 RICKEY PEAK
A264 SLINKARD VALLEY
A275 SOUTH PINE NUT MOUNTAINS
A280 SOUTH WASSUK RANGE
A299 SWEETWATER MOUNTAINS
A328 VIRGINIA RANGE
A334 WARM SPRINGS VALLEY
A338 WELLINGTON HILLS
A346 WHITE MOUNTAINS

Lahontan Basin

A007 ARTESIA LAKE-EAST PINE NUT MOUNTAINS
A008 AUGUSTA MOUNTAINS
A010 BALD MOUNTAIN
A012 BATTLE MOUNTAIN
A020 BLACK ROCK DESERT-SMOKE CREEK DESERT
A024 BOLIVIA
A029 BUFFALO VALLEY-TOBIN RANGE
A040 CARSON SINK
A058 DAISY CREEK
A083 EUGENE MOUNTAINS
A085 FAIRVIEW PEAK
A088 FENCEMAKER
A094 FLY RANCH GEYSER-GRANITE RANGE
A098 GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
A099 GARFIELD HILLS
A125 HUMBOLDT RANGE
A132 JACKSON MOUNTAINS
A142 KING LEAR PEAK
A166 MONTANA MOUNTAINS
A177 NIGHTINGALE FLAT
A180 NORTH PYRAMID LAKE
A196 PAH RAH RANGE
A214 PYRAMID LAKE-LOWER TRUCKEE RIVER
A218 QUINN RIVER
A237 SAGE HEN VALLEY
A246 SCHURZ
A258 SILVER STATE SAND DUNES
A270 SOLDIER MEADOWS
A271 SONOMA RANGE
A288 STILLWATER RANGE -DIXIE VALLEY
A321 UPPER ROCK CREEK
A331 WALKER LAKE-WALKER RIVER

North Central

A005 ANTELOPE VALLEY
A006 ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
A022 BLUE LAKES-BADLANDS
A025 BOONE SPRING
A050 CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE
A064 DIXIE CREEK
A074 EAST HUMBOLDT RANGE
A102 GOSHUTE MOUNTAINS
A168 MOOR SUMMIT
A204 PEQUOP MOUNTAINS-TOANO DRAW
A209 PINE RIDGE
A216 QUILICI SPRING-BUTTE VALLEY
A233 RUBY VALLEY
A255 SHOSHONE-BEOWAWE
A284 SPRUCE MOUNTAIN
A287 STEPTOE VALLEY
A303 THE NARROWS
A320 UPPER HUMBOLDT RIVER-LOWER MARYS RIVER
A326 VALLEY MOUNTAIN
A333 WARM SPRINGS

Central Mountains

A011 BARRETT CANYON
A030 BUTLER BASIN
A031 BUTTE MOUNTAINS
A035 CAMP VALLEY
A041 CATHEDRAL CANYON
A042 CAVE VALLEY-UPPER WHITE RIVER VALLEY
A055 CURRANT MOUNTAIN
A056 CURRANT SUMMIT
A057 CURRIE GARDENS-TAYLOR CANYON
A059 DEEP CREEK RANGE
A060 DESATOYA MOUNTAINS
A061 DIAMOND PEAK
A062 DIAMOND SPRINGS
A063 DIAMOND VALLEY ALKALI FLAT
A065 DIXIE VALLEY
A068 DUCK CREEK RANGE-STEPTOE VALLEY
A079 ELLISON CREEK
A093 FLAT SPRING
A097 FROST CREEK
A104 GOVERNMENT PEAK
A109 HANDY SPRING
A112 HIGHLAND RANGE
A116 HOME STATION WASH

A117	HORSESHOE BASIN
A122	HOT SPRINGS HILL
A135	JAKES VALLEY
A141	KERN MOUNTAINS
A145	KOBEH VALLEY
A147	LAKE VALLEY
A153	LOOKOUT SPRINGS
A162	MELOY SPRING
A169	MOUNT LEWIS
A172	MUDHOLE SPRING
A174	NEW PASS
A199	PANCAKE SUMMIT
A212	POGONIP RIDGE
A227	REESE RIVER
A232	RUBY MOUNTAINS
A235	RUTH
A244	SCHELL CREEK RANGE
A245	SCHELLBOURNE PASS
A252	SHERMAN MOUNTAIN
A254	SHOSHONE RANGE-CARICO LAKE VALLEY
A261	SIMPSON PARK MOUNTAINS-NORTH TOIYABE
A267	SNAKE RANGE
A282	SPRING VALLEY CREEK
A283	SPRING VALLEY-HAMLIN VALLEY
A290	STONEBERGER BASIN
A293	SULLIVAN SPRING
A301	TELEGRAPH PEAK
A310	TOIYABE RANGE-BIG SMOKY VALLEY
A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
A318	TUNGSTONIA
A322	UPPER WHITE RIVER
A332	WARD MOUNTAIN
A340	WEST DEVILS GATE
A347	WHITE PINE RANGE
A348	WHITE RIVER VALLEY
A349	WHITE ROCK MOUNTAINS
A350	WHITE SAGE FLAT

Tonopah

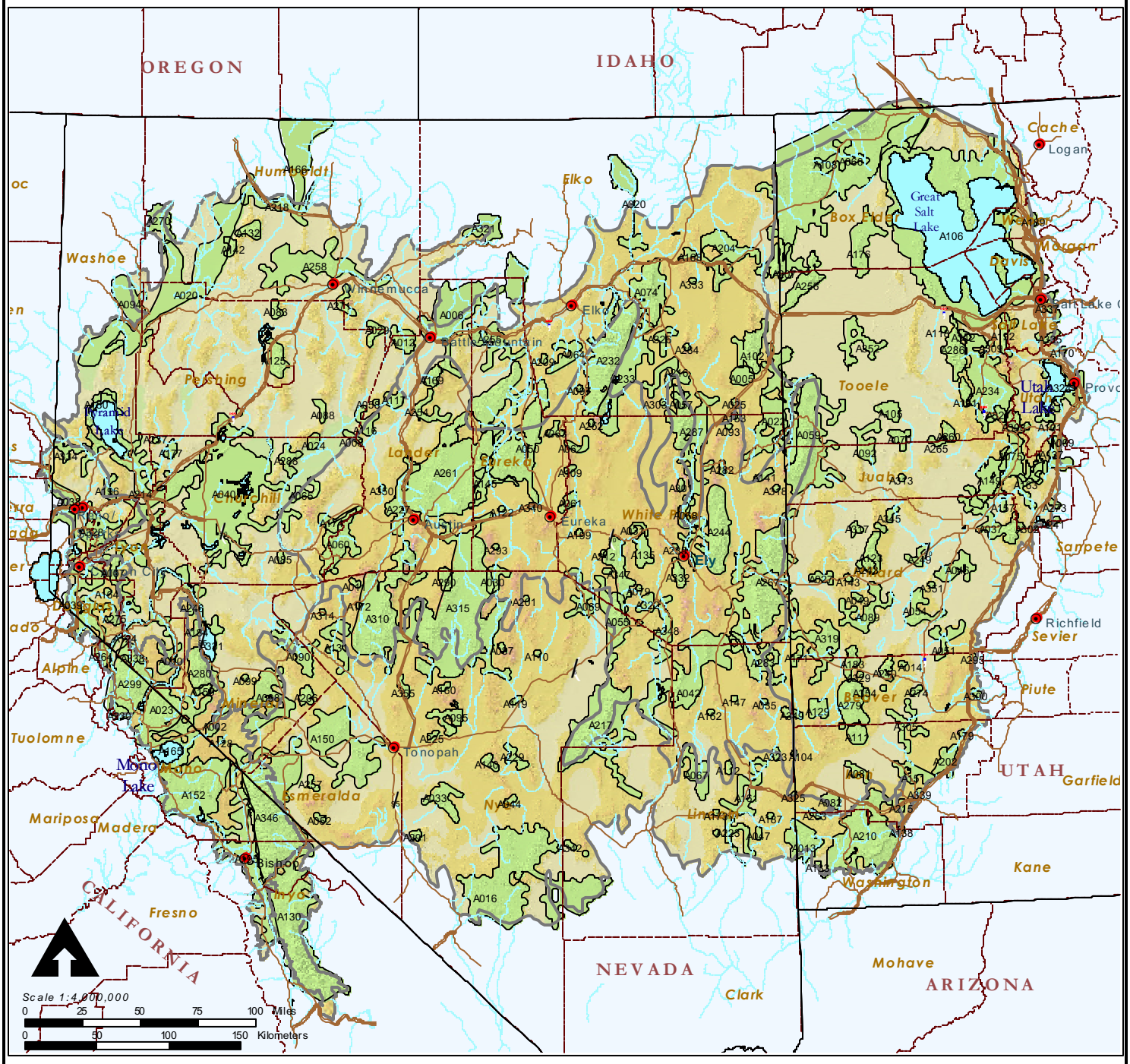
A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS
A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
A033	CACTUS RANGE
A044	CEDAR PASS
A047	CLOVER CREEK
A052	COWCAMP
A067	DRY LAKE VALLEY
A069	DUCKWATER VALLEY
A087	FANDANGO
A090	FINGER ROCK WASH
A095	FOURMILE BASIN
A110	HEART HILLS
A119	HOT CREEK VALLEY
A130	INYO MOUNTAINS
A131	IONE VALLEY
A133	JACKSON SPRING
A140	KAWICH RANGE
A150	LONE MOUNTAIN-MONTE CRISTO RANGE
A160	MCKINNEY MOUNTAINS
A161	MEADOW VALLEY
A173	NELSON SPRING
A187	OAK WELL CANYON
A201	PARK RANGE
A206	PILOT MOUNTAINS
A210	PINE VALLEY MOUNTAINS
A217	QUINN CANYON RANGE-GRANT RANGE
A223	RAINBOW CANYON
A225	RED PEAK
A229	REVEILLE VALLEY
A231	ROCK SPRINGS CANYON
A253	SHOAL CREEK
A257	SILVER PEAK RANGE
A272	SOUTH GROOM RANGE
A291	STONEWALL MOUNTAIN
A314	TOPIER CANYON
A323	URSINE
A342	WEST GROOM RANGE
A355	WILLOW SPRING

Bonneville Basin

A004	ANTELOPE SPRINGS
A009	BALD MOUNTAIN
A014	BEAVER LAKE MOUNTAINS
A018	BLACK MOUNTAINS
A027	BUCKSKIN HILL
A037	CANYON MOUNTAINS-DELTA
A043	CEDAR CITY JUNCTION
A046	CLEAR LAKE
A049	CONFUSION RANGE
A051	COVE CREEK
A054	CRICKET MOUNTAINS
A066	DOVE CREEK HILLS
A070	DUGWAY RANGE
A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY
A081	ESCALANTE DESERT
A082	ESCALANTE VALLEY

A084	EUREKA
A089	FERGUSON DESERT-TULE VALLEY
A092	FISH SPRINGS
A101	GOSHEN-WARM SPRINGS
A105	GRANITE PEAK
A106	GREAT SALT LAKE
A108	GROUSE CREEK MOUNTAINS-RAFT RIVER
A111	HERD PASS
A118	HORSESHOE SPRINGS
A123	HOUSE RANGE
A129	INDIAN PEAK
A134	JACKSON WASH
A137	JUAB VALLEY
A138	KANARRA
A143	KINGS CANYON
A149	LITTLE SAHARA SAND DUNES
A151	LONE TREE-CEDAR VALLEY
A157	LYNNDYL SAND DUNES
A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
A170	MOUNT TIMPANOGOS
A171	MOUNTAIN HOME RANGE
A176	NEWFOUNDLAND MOUNTAINS
A179	NORTH PAROWAN VALLEY
A183	NORTH WAH WAH MOUNTAINS
A189	OGDEN CANYON
A191	ONAQUI MOUNTAINS
A192	OQUIRRH MOUNTAINS
A202	PAROWAN VALLEY
A207	PILOT RANGE
A215	QUICHAPA LAKE
A234	RUSH VALLEY
A240	SAN FRANCISCO MOUNTAINS
A241	SAN PITCH MOUNTAINS
A243	SAWTOOTH MOUNTAIN
A249	SEVIER DESERT
A256	SILVER ISLAND MOUNTAINS
A260	SIMPSON MOUNTAINS
A265	SLOW ELK HILLS
A273	SOUTH JUAB VALLEY
A274	SOUTH MILFORD
A279	SOUTH WAH WAH MOUNTAINS
A286	STANSBURY MOUNTAINS
A295	SULPHURDALE
A298	SWASEY MOUNTAIN
A300	TABLE GROUNDS
A302	THE COVE
A305	THERMAL HOT SPRINGS-ESCALANTE DESERT
A308	TINTIC MOUNTAINS
A309	TOD PARK
A312	TOOELE VALLEY
A313	TOPAZ MOUNTAIN
A317	TULE VALLEY
A319	TUNNEL SPRING MOUNTAINS-HALFWAY
A324	UTAH LAKE
A325	UVADA
A327	VERNON
A329	WAH WAH SPRINGS
A335	WASATCH FRONT DRAPER
A336	WASATCH FRONT PROVO-SPRINGVILLE
A337	WASATCH FRONT SALT LAKE CITY
A339	WEST CEDAR CITY
A345	WHIRLWIND VALLEY
A351	WHITE SAGE VALLEY
A352	WILD ISLE-GREAT SALT LAKE DESERT SAND DUNES
A354	WILLOW SPRING

Figure 29. Portfolio sites with lower montane systems.



Portfolio sites

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.

D. Montane to Alpine

Description

The montane to alpine group characterizes mountaintops in the Great Basin. These ecological systems occur at the highest elevations of the ecoregion and typically in all geographic sections. The group covers only about 3.5% of the Great Basin and has the smallest extent of the zonal system groups. There are six large and small patch ecological system conservation targets in the montane to alpine group. From lower to higher montane elevations they are ponderosa pine, montane forest and woodland, montane meadow, mountain sagebrush, subalpine forest and woodland, and alpine herbaceous (table 22). These systems have relatively high endemism because of the isolating nature of the intervening valleys.

Table 22. Ecological systems of the montane to alpine group organized by extent within the Great Basin.

Montane to Alpine				
Ecological System	**% of Great Basin**	**Patch Type**	**# of All Plant Associations**	**# of G1G2 Plant Associations**
Mountain Sagebrush	2.33	Large Patch	11	0
Montane Forest and Woodland	0.79	Large Patch	28	0
Subalpine Forest and Woodland	0.28	Large Patch	9	0
Alpine Herbaceous	0.10	Small Patch	6	1
Ponderosa Pine	0.02	Large Patch	3	0
Montane Meadow	0.01	Small Patch	2	0

There are 86 species conservation targets in the montane to alpine system group. Species targets include birds, terrestrial invertebrates, mammals, one reptile, and plants (table 23). About 61% of the species are endemic to the ecoregion and almost a third (31%) of them are imperiled. The montane to alpine systems harbor the second greatest number of plant targets.

To date, there are 59 plant associations documented in these systems in the Great Basin including 4 alliances where no individual plant association was identified. Only one association is imperiled, the native sedge-mutton grass alpine grassland (G2G3).

Table 23. Conservation targets for the montane to alpine ecological systems organized by taxonomic group.

Common Name	Scientific Name	Grank	Ecoregional Distribution
Plants			
CUSICK HYSSOP	AGASTACHE CUSICKII	G3	Peripheral
BODIE HILLS ROCK CRESS	ARABIS BODIENSIS	G1,G2	Limited
GROUSE CREEK ROCKCRESS	ARABIS FALCATORIA	G1	Peripheral or Limited
OPHIR ROCKCRESS	ARABIS OPHIRA	G1G2	Endemic
PINZL'S ROCK CRESS	ARABIS PINZLIAE	G1,G2	Limited
WHEELER PEAK SANDWORT	ARENARIA CONGESTA VAR. WHEELERENSIS	G5T1?	Endemic
	ASTER KINGII VAR. BARNEBYANA	G3T1	Limited
SPINY-LEAVED MILK-VETCH	ASTRAGALUS KENTROPHYTA VAR. ELATUS	G5T4	Endemic
BROAD-POD FRECKLED MILKVETCH	ASTRAGALUS LENTIGINOSUS VAR. LATUS	G5T1	Endemic
MONO MILK-VETCH	ASTRAGALUS MONOENSIS VAR. MONOENSIS	G2T2	Peripheral or Limited
RAVEN'S MILK-VETCH	ASTRAGALUS MONOENSIS VAR. RAVENII	G2T1Q	Peripheral or Limited
CLOKEY EGGVETCH	ASTRAGALUS OOPHORUS VAR. CLOKEYANUS	G4T2	Peripheral
LAMOILLE CANYON MILKVETCH	ASTRAGALUS ROBBINSII VAR. OCCIDENTALIS	G5T2T3	Endemic
SILVER REEF MILKVETCH	ASTRAGALUS STRATURENSIS	G2G3	Peripheral or Limited
	CASTILLEJA DISSITIFLORA	G4?	Endemic
CLOKEY PAINTBRUSH	CASTILLEJA MARTINII VAR. CLOKEYI	G3QT3	Peripheral
JAEGER'S CAULOSTRAMINA	CAULOSTRAMINA JAEGERI	G1	Endemic
BRISTLECONE CRYPTANTHA	CRYPTANTHA ROOSIORUM	G1	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
GOODRICH BISCUITROOT	CYMOPTERUS GOODRICHII	G1	Endemic
DESERT WHITLOWGRASS	DRABA ARIDA	G2	Endemic
CALIFORNIA DRABA	DRABA CALIFORNICA	G2G3	Endemic
STALKED CUSICK WHITLOWGRASS	DRABA CUSICKII VAR. PEDICELLATA	G4T3?	Endemic
KASS ROCKCRESS	DRABA KASSII	G1	Endemic
WHITE MTNS. DRABA	DRABA MONOENSIS	G1	Endemic?
SNAKE RANGE WHITLOWGRASS	DRABA OREIBATA VAR. SERPENTINA	G4T1	Endemic
PENNELL DRABA	DRABA PENNELLII	G2	Endemic
MOUNTAIN DRABA	DRABA SPHAEROIDES	G2?	Limited
WHITE MOUNTAINS CUSHION DRABA	DRABA SUBUMBELLATA	G2	Limited
GILMAN'S GOLDENBUSH	ERICAMERIA GILMANII	G1	Limited
SHEEP FLEABANE	ERIGERON OVINUS	G2	Limited
WINDLOVING BUCKWHEAT	ERIOGONUM ANEMOPHILUM	G2G3	Endemic
WILDROSE CANYON BUCKWHEAT	ERIOGONUM EREMICOLA	G1	Limited
HOLMGREN BUCKWHEAT	ERIOGONUM HOLMGRENII	G1	Endemic
KING BUCKWHEAT	ERIOGONUM KINGII	G3?	Endemic
HEAVENLY BUCKWHEAT	ERIOGONUM OVALIFOLIUM VAR. CAELESTINUM	G5T2T3	Endemic
POISON CANYON STICKSEED	HACKELIA BREVICULA	G2	Endemic
DEEP CREEK STICKSEED	HACKELIA IBAPENSIS	G1	Endemic
PINE VALLEY GOLDENBUSH	HAPLOPAPPUS CRISPUS	G2	Endemic
WHITE MTNS. HORKELIA	HORKELIA HISPIDULA	G2	Endemic
INTERMOUNTAIN BITTERWEED	HYMENOXYS HELENIOIDES	G3?Q	Unknown
TOIYABE GILIA	IPOMOPSIS CONGESTA VAR. NEVADENSIS	G4T1	Endemic
SIERRA VALLEY IVESIA	IVESIA APERTA VAR. APERTA	G2T2	Peripheral or Limited
OSTLER'S IVESIA	IVESIA SHOCKLEYI VAR. OSTLERI	G3G4T1	Endemic
WASATCH JAMESIA	JAMESIA AMERICANA VAR. MACROCALYX	G5T2	Limited
BASIN JAMESIA, WAXFLOWER	JAMESIA TETRAPETALA	G2	Endemic
	LEPIDIUM MONTANUM VAR. ALPINUM	G5?T1	Limited
GOODRICH BLADDERPOD	LESQUERELLA GOODRICHII	G2G4	Endemic
HITCHCOCK BLADDERPOD	LESQUERELLA HITCHCOCKII	G3	Peripheral or Limited
MONO LAKE LUPINE	LUPINUS DURANII	G2	Limited
PENNELL BEARDTONGUE	PENSTEMON LEIOPHYLLUS VAR. FRANCISCI-PENNELLII	G3T2	Endemic
	PENSTEMON PALMERI VAR. MACRANTHUS	G5T2?	Endemic
DAD'S PENSTEMON	PENSTEMON PATRICUS	G2Q	Endemic
	PENSTEMON PROCERUS VAR. MODESTUS	G5T2T3	Endemic
RHIZOME BEARDTONGUE	PENSTEMON RHIZOMATOSUS	G1	Endemic
TIEHM BEARDTONGUE	PENSTEMON TIEHMII	G1	Endemic
SALINE VALLEY PHACELIA	PHACELIA AMABILIS	G1Q	Limited
MARSH'S BLUE GRASS	POA ABBREVIATA SSP. MARSHII	G5T2	Limited
MASON'S SKY PILOT,WHITE MOUNTAIN SKYPILOT	POLEMONIUM CHARTACEUM	G1	Endemic
MOREFIELD'S CINQUEFOIL	POTENTILLA MOREFIELDII	G1	Endemic
	POTENTILLA PENSYLVANICA VAR. PAUCIJUGA	G5T1T2Q	Limited
RUBY MOUNTAIN PRIMROSE	PRIMULA CAPILLARIS	G1	Endemic
HOUSE RANGE PRIMROSE	PRIMULA DOMENSIS	G1	Endemic
NEVADA PRIMROSE	PRIMULA NEVADENSIS	G1	Endemic
NACHLINGER CATCHFLY	SILENE NACHLINGERAE	G2	Endemic
HOLMGREN SMELOWSKIA	SMELOWSKIA HOLMGRENII	G2	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
ALPINE TONESTUS	TONESTUS ALPINUS	G2	Endemic
ROLLINS CLOVER	TRIFOLIUM ROLLINSII	G2G3Q	Endemic
Invertebrates			
KORET'S CHECKERSPOT	EUPHYDRYAS EDITHA KORETI	G5T1Q	Endemic
WHITE MOUNTAINS SKIPPER	HESPERIA MIRIAMAE LONGAEVICOLA	G3T1	Endemic
WHITE MOUNTAINS ICARIOIDES BLUE	ICARICIA ICARIOIDES ALBIHALOS	G5T1T2	Endemic
EUREKA MOUNTAINSNAIL	OREOHELIX EUREKENSIS	G1	Unknown
LYRATE MOUNTAINSNAIL	OREOHELIX HAYDENI	G2G3	Peripheral or Limited
WHITE PINE MOUNTAINSNAIL	OREOHELIX HEMPHILII	?	Endemic
MILL CREEK MOUNTAINSNAIL	OREOHELIX HOWARDI	G1	Endemic
(bee)	OSMIA TANNERI	G1	Limited
(bee)	PERDITA BOHARTORUM	?	Limited
WHITE MOUNTAINS SANDHILL SKIPPER	POLITES SABULETI ALBAMONTANA	G5T1	Endemic
GREY'S SILVERSPOT	SPEYERIA HESPERIS GREYI	G5T1	Endemic
	SPEYERIA SP. NOV.	?	Endemic
Reptiles			
MOUNTAIN SHORT-HORNED LIZARD	PHRYNOSOMA HERNANDESI	G3	Endemic
Birds			
NORTHERN GOSHAWK	ACCIPITER GENTILIS	G4	Widespread, declining
FLAMMULATED OWL	OTUS FLAMMEOLUS	G4	Widespread
CALLIOPE HUMMINGBIRD	STELLULA CALLIOPE	G5	Widespread
Mammals			
PIKA	OCHOTONA PRINCEPS SSPP.	G5T?	Limited?
INYO SHREW	SOREX TENELLUS	G3G4	Limited
BLACK BEAR	URSUS AMERICANUS	?	Peripheral
G1 or G2 Associations			
NATIVE SEDGE-MUTTON GRASS	CAREX VERNACULA - POA FENDLERIANA HERBACEOUS VEGETATION	G2G3	Limited
Terrestrial Ecological Systems			
ALPINE HERBACEOUS			
MONTANE FOREST AND WOODLAND			
MONTANE MEADOW			
MOUNTAIN SAGEBRUSH			
PONDEROSA PINE WOODLAND			
SUBALPINE FOREST AND WOODLAND			

Montane coniferous forests are not extensive in the Great Basin, although they are important in some of the larger ranges such as the Toiyabe Range, Ruby Mountains, Schell Creek Range, Snake Range, Deep Creek Range, and Pine Valley Mountains. Subalpine woodlands are much more prevalent in the higher elevations of the ranges. Open woodlands dominated by limber pine (*Pinus flexilis*), whitebark pine (*P. albicaulis*), intermountain bristlecone pine (*P. longaeva*), and Engelmann spruce (*Picea engelmannii*) are common. Many of the mountaintops of the Great Basin can only marginally support trees–approximately 100 mountain tops are named Bald Mountain as an indication of this. These areas are dominated by low sagebrush (*Artemisia arbuscula*) or mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) stands.

Hamrick *et al*. (1994) list five montane conifers as relictual species from Pleistocene times: subalpine fir, Engelmann spruce, common dwarf juniper, limber pine, and intermountain bristlecone pine (*Abies lasiocarpa, Picea engelmannii*, *Juniperus communis Pinus flexilis*, and

Pinus longaeva). The former two are limited in their distribution within the Great Basin while the latter three are widespread species. They also list five montane conifers as Holocene immigrants: Rocky Mountain ponderosa pine, Rocky Mountain Douglas fir, Rocky Mountain white fir, Rocky Mountain juniper, and singleleaf pinyon pine (*Pinus ponderosa* var*. scopulorum, Pseudotsuga menziesii* var*. glauca, Abies concolor* var*. concolor, Juniperus scopulorum,* and *Pinus monophylla)*. Again, the former two are limited in their distribution within the Great Basin while the latter three are widespread species.

Alpine plant communities occur above treeline and are very limited in extent in the Great Basin. Rocky substrates, either talus or bedrock and cliffs dominate most of the alpine, while vegetative cover is sparse (Brussard *et al.* 1998). Because of the isolated nature of the highest mountaintops in the Great Basin most of the alpine areas harbor unique species of plants. Great Basin alpine is as diverse as alpine in comparable latitudes of the Sierra Nevada and Rocky Mountains (Charlet 1991). There are several important montane and alpine areas because of their overall richness of species and specific endemic floras. These areas include the White Mountains, Inyo Mountains, Ruby Mountains, Snake Range, Deep Creek Mountains, and to a lesser extent the Sweetwater Mountains, Toiyabe Range, Toquima Range, Schell Creek Range, Grant-Quinn Canyon ranges.

Mountain Sagebrush: This ecological system consists of sagebrush shrublands dominated by mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) or sometimes by dwarf sagebrush (*Artemisia arbuscula* ssp. *longiloba*), which occupies a distinct elevational belt above other sagebrush communities in the Great Basin ecoregion. Mountain snowberry (*Symphoricarpos oreophilus*) can be a codominant shrub in a few communities. Herbaceous species include Idaho fescue, spike-fescue, Great Basin wildrye, California brome, bluebunch wheatgrass, and compact phlox (*Festuca idahoensis, Leucopoa kingii, Leymus cinereus, Bromus carinatus, Pseudoroegneria spicata*, and *Phlox condensata*). About half (52%) of the ELUs that coincide with mountain sagebrush shrublands are at higher elevations between 2,291-2,900 m (7,500 – 9,500 ft), on granitic-silicic, carbonate-limestone, or shale derived substrates, on toeslopes, lower and upper bajadas and steep slopes, and with southwest or northeast exposures.

Montane Forest and Woodlands: This ecological system consists of the diverse forested communities that occur in the mountains above the pinyon-juniper and mountain sagebrush but below the subalpine forests. Stands are dominated by a variety of conifers including Douglas fir, white fir, Jeffrey pine, lodgepole pine, and the deciduous quaking aspen (*Pseudotsuga menziesii, Abies concolor, Pinus jeffreyi, Pinus contorta,* and *Populus tremuloides*). Understory shrub components are greenleaf manzanita, snowberry, curlleaf mountain mahogany, creeping barberry, mountain big sagebrush, and common juniper (*Arctostaphylos patula, Symphoricarpos* spp*., Cercocarpus ledifolius* var*. intermontanus, Mahonia repens, Artemisia tridentata* ssp*. vaseyana*, and *Juniperus communis*. The herbaceous grass cover includes bluebunch wheatgrass, while associated forbs include common yarrow, Engelmann aster, duncecap larkspur, sticky geranium, silvery lupine, western sweet cicely, western brackenfern, western coneflower, Fendler meadowrue, western valerian, northern mule ears (*Achillea millefolium, Aster engelmannii, Delphinium occidentale, Geranium viscosissimum, Lupinus argenteus, Osmorhiza chilensis, Pteridium aquilinum, Rudbeckia occidentalis, Thalictrum fendleri, Valeriana occidentalis, Wyethia amplexicaulis*) and many others. Two-thirds (66%) of the ELUs that coincide with montane forest and woodlands are at higher elevations between 2,291-2,900 m (7,500 –9,500 ft), on granitic-silicic, carbonate-limestone, or basaltic-mafic derived substrates, on toeslope, lower and upper bajadas or steep slopes and ridgetops, and with northeast or southwest exposures.

Subalpine Forest and Woodland: This ecological system consists of the conifer forests where mountain ranges are high enough to provide habitat above montane forests. They occur to treeline at approximately 3,300 m (11,000 ft) above which stands may persist as krummholz clumps. The subalpine forest and woodland system is composed of stands dominated by subalpine fir, Engelmann spruce, whitebark pine, intermountain bristlecone pine, or limber pine (*Abies lasiocarpa, Picea engelmannii*, *Pinus albicaulis*, *Pinus longaeva*, or *Pinus flexilis*). Quaking aspen (*Populus tremuloides*) is an occasional codominant tree. The understory shrub component includes common juniper, mountain gooseberry, and mountain mahogany (*Juniperus communis*, *Ribes montigeum* and *Cercocarpus ledifolius* var*. intermontanus*). Dominant herbaceous layer species include Ross sedge and Fendler meadowrue (*Carex rossii* and *Thalictrum fenderli*). Many (70%) of the ELUs that coincide with subalpine forest and woodlands are at higher elevations between 2,291-4,406 m (7,500 –14,500 ft), on granitic-silicic or carbonate-limestone derived substrates, on upper bajadas, steep slopes, or ridgetops, and with southwest or northeast exposures.

Alpine Herbaceous: This ecological system is a low stature woody and herbaceous growth that occurs above treeline. Dominant species include shrubby cinquefoil, tufted hairgrass, Shasta sedge, spring sedge, alpine timothy, alpine avens, and cushion phlox (*Pentaphylloides floribunda, Deschampsia cespitosa, Carex straminiformis, C. vernacula, Phleum alpinum, Geum rossii*, and *Phlox pulvinata*).

Ponderosa Pine Woodland: This ecological system consists of open and park-like stands dominated by ponderosa pine (*Pinus ponderosa*). Understory shrub species include curlleaf mountain mahogany, Gambel oak, greenleaf manzanita, and antelope bitterbrush (*Cercocarpus ledifolius var. intermontanus, Quercus gambelii, Arctostaphylos patula,* and *Purshia tridentata*). Ponderosa pine woodlands are limited in the Great Basin ecoregion to the eastern slope of the Sierra Nevada (*Pinus ponderosa* var. *ponderosa*) and to the mountain ranges in the southeast quarter of the ecoregion (*Pinus ponderosa* var*. scopulorum*). They occur at the interface of dry chaparral-like shrublands with montane forest elevations. Many (83%) of the ELUs that coincide with ponderosa pine woodlands are at higher elevations between 2,291-2,900 m (7,500-9,500 ft), on granitic-silicic substrates, on lower and upper bajada slopes of 2-25%, or steeper slopes 26-35%, and with southwest exposures.

Montane Meadow: This ecological system consists of the drier meadows within the montane belt. Dominant species are Douglas sedge, Sandberg bluegrass, and mat muhly (*Carex douglasii, Poa secunda,* and *Muhlenbergia richardsonis*). The majority (80%) of the ELUs that coincide with montane meadows occur between 1,981-2,900 m (6,500 –9,500 ft) in elevation, on granitic-silicic derived substrates, and on lower to upper bajadas.

Conservation Issues and Threats

Montane islands in the Great Basin may be important for the potential resilience of the natural communities and species responses to climate change (Wharton *et al*. 1990). Many of the species that occur on montane islands of the Great Basin also occur outside the ecoregion and are not globally threatened. If extirpated from these mountaintops, these populations—some with genetic novelty—probably could not disperse and recolonize the Great Basin under current climatic conditions (Brussard *et al*. 1998).

Many mammal taxa in the Great Basin are confined to and isolated in mountaintop habitats. Many may be genetically unique populations of more widespread species. These isolated

populations were reduced, while some were extirpated, during the warm and dry conditions of the Holocene Epoch. Relict mammal populations on Great Basin mountaintops today that are extirpated, may not have the chance to recolonize under current climate conditions, and their genetic uniqueness may be lost forever (Grayson 1993).

System Conservation Goals and Viability

Mountain Sagebrush: This is a large patch system. The GAP map coverage is 2.33% of the ecoregion. Our conservation goal is 10% of the area occupied by mountain big sagebrush within each section. Minimum viable size was set at 500 ha. Mountain big sagebrush cannot resprout after fire, but it can tolerate supersaturated soils better than its lower elevational counterpart, basin big sagebrush. Stands of this size may survive fire by not burning completely, thereby leaving a seed source for regeneration.

Montane Forest and Woodlands: This is a large patch system and the GAP map coverage is 0.79% of the ecoregion. Our conservation goal is 10% of the areas occupied by montane forest and woodlands within each section. Minimum size was set at 1000 ha. At this size a montane forest can survive and recover from periodic fire and support a diversity of microhabitats and their plant associations. This size also can support a variety of small patch ecological systems, such as riparian areas, montane meadows, or seeps.

Subalpine Forest and Woodland: This is a large patch system with GAP map coverage at 0.28% of the ecoregion. Our conservation goal is 10% of the areas occupied by subalpine forest and woodlands within each section. Minimum size was set at 1,000 ha. A stand of this size may be large enough to withstand large scale disturbance, such as windthrow or fire, and can maintain a diversity of microhabitats and plant associations within it.

Alpine Herbaceous: This is a small patch system. The GAP map coverage is a mere 0.10%. Our conservation goal is six occurrences per section. No minimum size was set as they can occur naturally in very small patches. GAP map representation of the abundance of this system is inadequate because of its size. Consequently, no ELU information is provided because their representation is insufficient. However, they occur at highest elevations. Each polygon from the GAP vegetation map and occurrence information from experts was treated as a fine-filter target, that is, like a species occurrence in SITES.

Ponderosa Pine Woodland: This is a large patch system. The GAP map coverage is 0.02%. Our conservation goal is 10% of the area occupied by ponderosa pine woodlands within each section. Minimum size was set at 50 ha. Stands of ponderosa pine are limited in size and distribution in the Great Basin by a lack of summer rainfall. In addition, stand density is more important than size for long term viablility. The stand must be able to survive and carry frequent ground fires. Density of the stands depends on fire frequency. Pre-European settlement fire scars indicate stands burned almost annually in the southwest. Today many stands have an increased number of trees per area and a thick undergrowth of shrubs and grasses (Peet 2000).

Montane Meadow: This is a small patch system with GAP map coverage at 0.01% of the ecoregion. This is a low estimate because GAP underestimates small patch and linear systems. Our conservation goal is six occurrences per section. No minimum size was set as they can occur naturally in very small patches. GAP map representation of the abundance of this system is inadequate because of its size. Each polygon from the GAP vegetation map and

occurrence information from experts was treated as a fine-filter target, that is, like a species occurrence in SITES.

Portfolio Results

The portfolio includes 153 sites identified for ecological systems, communities, and species targets of the montane to alpine group. Table 24 lists the sites in this system group by geographic section and their locations are given in figure 30. Refer to appendix 10 for conservation targets and attributes for each site.

Highlighted significant sites of the montane to alpine group include:

DEEP CREEK RANGE (A059)—one and only site for high elevation endemic plants, Kass rockcress and Deep Creek stickseed; stands of old growth pinyon pine; aspen groves and subalpine conifer stands; part of a functional network with adjacent basins.
INYO MOUNTAINS (A130)—transitional to hot desert ranges with high diversity and high viability of numerous plant communities; one and only site for 6 endemics including the black toad, Inyo Mountains slender salamander, and Deep Springs fontelicella.
QUINN CANYON RANGE-GRANT RANGE (A217)—diversity of higher elevation plant communities in very good condition; functional landscape for desert bighorn sheep.
RUBY MOUNTAINS (A232)—high diversity of conifers; excellent mountain brush and alpine communities, important montane aquatic habitats; one and only site for Grey's silverspot and Ruby Mountains primrose.
SNAKE RANGE (A267)—excellent examples of higher elevation plant communities and basin aquatics; important site for diversity of bats; one and only site for Holmgren buckwheat and Wheeler Peak sandwort in alpine, and Baking Powder Flat blue and sub-globose snake springsnail in basin.
TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE (A315)—part of a functional network of sites important for wide-ranging desert bighorn sheep; Monitor Valley is important for aquatics and is the one and only site for two fishes and a aquatic mollusk.
WHITE MOUNTAINS (A346)—more conservation targets than any other site in the portfolio; high diversity and viability of plant communities; one and only site for 12 endemic taxa including four butterflies, four plants, and the Fish Lake Valley tui chub.

Table 24. Great Basin portfolio sites identified for montane to alpine ecological systems.

California

A002	ANCHORITE HILLS
A023	BODIE HILLS
A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
A039	CARSON RIVER
A124	HOYE CANYON
A152	LONG VALLEY
A155	LUCKY BOY PASS
A164	MINERAL VALLEY
A165	MONO LAKE
A184	NORTH WASSUK RANGE
A194	OWENS RIVER GORGE
A195	OWENS VALLEY-BENTON VALLEY
A230	RICKEY PEAK
A264	SLINKARD VALLEY
A275	SOUTH PINE NUT MOUNTAINS
A280	SOUTH WASSUK RANGE
A299	SWEETWATER MOUNTAINS
A328	VIRGINIA RANGE
A338	WELLINGTON HILLS
A346	WHITE MOUNTAINS

Lahontan Basin

A007	ARTESIA LAKE-EAST PINE NUT MOUNTAINS
A008	AUGUSTA MOUNTAINS
A010	BALD MOUNTAIN
A012	BATTLE MOUNTAIN
A020	BLACK ROCK DESERT-SMOKE CREEK DESERT
A024	BOLIVIA
A029	BUFFALO VALLEY-TOBIN RANGE
A040	CARSON SINK
A058	DAISY CREEK
A083	EUGENE MOUNTAINS
A098	GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
A125	HUMBOLDT RANGE
A126	HUMBOLDT RIVER GOLCONDA
A132	JACKSON MOUNTAINS
A136	JERSEY SUMMIT
A142	KING LEAR PEAK
A214	PYRAMID LAKE-LOWER TRUCKEE RIVER
A258	SILVER STATE SAND DUNES
A270	SOLDIER MEADOWS
A271	SONOMA RANGE
A288	STILLWATER RANGE -DIXIE VALLEY
A321	UPPER ROCK CREEK
A331	WALKER LAKE-WALKER RIVER

North Central

A005	ANTELOPE VALLEY
A006	ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
A022	BLUE LAKES-BADLANDS
A050	CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE
A064	DIXIE CREEK
A074	EAST HUMBOLDT RANGE
A102	GOSHUTE MOUNTAINS
A121	HOT SPRINGS CREEK
A168	MOOR SUMMIT
A204	PEQUOP MOUNTAINS-TOANO DRAW
A209	PINE RIDGE
A216	QUILICI SPRING-BUTTE VALLEY
A219	RABBIT CREEK
A233	RUBY VALLEY
A255	SHOSHONE-BEOWAWE
A284	SPRUCE MOUNTAIN
A287	STEPTOE VALLEY
A320	UPPER HUMBOLDT RIVER-LOWER MARYS RIVER

Central Mountains

A011	BARRETT CANYON
A030	BUTLER BASIN
A042	CAVE VALLEY-UPPER WHITE RIVER VALLEY
A055	CURRANT MOUNTAIN
A057	CURRIE GARDENS-TAYLOR CANYON
A059	DEEP CREEK RANGE
A060	DESATOYA MOUNTAINS
A061	DIAMOND PEAK
A062	DIAMOND SPRINGS
A063	DIAMOND VALLEY ALKALI FLAT
A068	DUCK CREEK RANGE-STEPTOE VALLEY
A104	GOVERNMENT PEAK
A109	HANDY SPRING
A112	HIGHLAND RANGE
A116	HOME STATION WASH
A117	HORSESHOE BASIN
A141	KERN MOUNTAINS
A145	KOBEH VALLEY
A169	MOUNT LEWIS

A172	MUDHOLE SPRING
A174	NEW PASS
A212	POGONIP RIDGE
A220	RAILROAD GRADE
A227	REESE RIVER
A232	RUBY MOUNTAINS
A244	SCHELL CREEK RANGE
A245	SCHELLBOURNE PASS
A252	SHERMAN MOUNTAIN
A254	SHOSHONE RANGE-CARICO LAKE VALLEY
A261	SIMPSON PARK MOUNTAINS-NORTH TOIYABE
A267	SNAKE RANGE
A290	STONEBERGER BASIN
A293	SULLIVAN SPRING
A301	TELEGRAPH PEAK
A310	TOIYABE RANGE-BIG SMOKY VALLEY
A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
A318	TUNGSTONIA
A322	UPPER WHITE RIVER
A332	WARD MOUNTAIN
A347	WHITE PINE RANGE
A348	WHITE RIVER VALLEY
A349	WHITE ROCK MOUNTAINS

Tonopah

A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
A044	CEDAR PASS
A087	FANDANGO
A130	INYO MOUNTAINS
A140	KAWICH RANGE
A150	LONE MOUNTAIN-MONTE CRISTO RANGE
A201	PARK RANGE
A206	PILOT MOUNTAINS
A210	PINE VALLEY MOUNTAINS
A217	QUINN CANYON RANGE-GRANT RANGE
A272	SOUTH GROOM RANGE

Bonneville Basin

A009	BALD MOUNTAIN
A018	BLACK MOUNTAINS
A027	BUCKSKIN HILL
A037	CANYON MOUNTAINS-DELTA
A049	CONFUSION RANGE
A066	DOVE CREEK HILLS
A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY
A084	EUREKA
A106	GREAT SALT LAKE
A108	GROUSE CREEK MOUNTAINS-RAFT RIVER
A111	HERD PASS
A123	HOUSE RANGE
A129	INDIAN PEAK
A134	JACKSON WASH
A143	KINGS CANYON
A170	MOUNT TIMPANOGOS
A183	NORTH WAH WAH MOUNTAINS
A191	ONAQUI MOUNTAINS
A192	OQUIRRH MOUNTAINS
A207	PILOT RANGE
A234	RUSH VALLEY
A240	SAN FRANCISCO MOUNTAINS
A243	SAWTOOTH MOUNTAIN
A260	SIMPSON MOUNTAINS
A268	SNAKE VALLEY
A279	SOUTH WAH WAH MOUNTAINS
A286	STANSBURY MOUNTAINS
A295	SULPHURDALE
A298	SWASEY MOUNTAIN
A300	TABLE GROUNDS
A308	TINTIC MOUNTAINS
A312	TOOELE VALLEY
A317	TULE VALLEY
A319	TUNNEL SPRING MOUNTAINS-HALFWAY
A324	UTAH LAKE
A327	VERNON
A335	WASATCH FRONT DRAPER
A336	WASATCH FRONT PROVO-SPRINGVILLE
A354	WILLOW SPRING

Figure 30. Portfolio sites with montane to alpine systems.

Portfolio sites

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.

E. Sand Dunes and Badlands

Description

Sand dunes, badlands, and other barren ecological systems comprise an azonal group that are defined moreso by substrate characteristics than by regional climatic factors. They include relictual bedrock outcrops, weathered soil patches, aeolian deposits (dunes), and other areas dominated by substrate rather than by vegetative cover. They often define unique habitats and support endemic plant and animal species. They occur in all geographic sections of the Great Basin, although sand dunes do not occur in the north central section. They cover only about 2% of the ecoregion, which is the smallest extent of all system groups. Sand dunes, badlands, clifflands and altered andesites are large and small patch ecological systems, and along with subterranean cave habitats, make up the substrate dominated system group (table 25).

Table 25. Ecological systems of the sand dunes and badlands group organized by extent within the Great Basin.

Sand Dunes and Badlands				
Ecological System	**% of Great Basin**	**Patch Type**	**# of All Plant Associations**	**# of G1G2 Plant Associations**
Badland Habitats	1.88	Small Patch	2	0
Sand Dunes	0.11	Large Patch	6	1
Cliffland Habitats	—	Small Patch	1	0
Altered Andesite Soils	—	Small Patch	1	1
Caves	—	Subterranean	0	0

There are 107 species conservation targets, including birds, terrestrial invertebrates, mammals, and plants in sand dunes and badlands systems (table 26). Only 44% of them are endemic to the ecoregion, but if targets with limited distributions mostly shared with the Mojave Desert are added, fully 88% have globally restricted distributions. Terrestrial invertebrate targets are notably important in sand dunes and badlands systems, especially in sand dunes. Scarab beetles, solitary bees, and butterflies predominate, and 31% of them are imperiled taxa. Additionally, imperiled plants are important on unusual substrates, such as altered andesites or clay badlands. About 30% of the plants in sand dunes and badlands systems are imperiled.

There are only 10 plant associations presently documented in these unique systems in the Great Basin. Two plant associations are imperiled: desert sand verbena sparse vegetation (G2G3) and ponderosa pine or jeffrey pine altered andesite woodland (G2).

Table 26. Conservation targets for the sand dunes and badlands ecological systems organized by taxonomic group.

Common Name	Scientific Name	Grank	Ecoregional Distribution
Plants			
PASSEY'S ONION	ALLIUM PASSEYI	G1	Endemic
BLACK MILK-VETCH,BLACK WOOLLYPOD	ASTRAGALUS FUNEREUS	G2	Peripheral
	ASTRAGALUS KENTROPHYTA VAR. UNGULATUS	G5T3T4	Endemic
	ASTRAGALUS LENTIGINOSUS VAR. KENNEDYI	G5T3T4	Endemic
SODAVILLE MILK-VETCH	ASTRAGALUS LENTIGINOSUS VAR. SESQUIMETRALIS	G5T1	Limited
TONOPAH MILK-VETCH	ASTRAGALUS PSEUDIODANTHUS	G2	Endemic
	ASTRAGALUS ZIONIS VAR. VIGULUS	G4?T1	Limited
GIANT FOUR-WING SALTBUSH	ATRIPLEX CANESCENS VAR. GIGANTEA	G5T1	Endemic
	CAMISSONIA GOULDII	G1	Limited
MONTE NEVA PAINTBRUSH	CASTILLEJA SALSUGINOSA	G1Q	Endemic
TECOPA BIRDSBEAK	CORDYLANTHUS TECOPENSIS	G2	Limited
MOUND CRYPTANTH	CRYPTANTHA COMPACTA	G1	Endemic
WHITE RIVER CATSEYE	CRYPTANTHA WELSHII	G3	Endemic
	CYMOPTERUS ACAULIS VAR. PARVUS	G5T2T3	Endemic
NEVADA WILLOWHERB	EPILOBIUM NEVADENSE	G2	Limited

Common Name	Scientific Name	Grank	Ecoregional Distribution
SULPHUR SPRINGS BUCKWHEAT	ERIOGONUM ARGOPHYLLUM	G1	Endemic
LEMMON BUCKWHEAT	ERIOGONUM LEMMONII	G3?	Endemic
STEAMBOAT BUCKWHEAT	ERIOGONUM OVALIFOLIUM VAR. WILLIAMSIAE	G5T1	Endemic
SCARLET BUCKWHEAT	ERIOGONUM PHOENICIUM	G1	Endemic
ALTERED ANDESITE BUCKWHEAT	ERIOGONUM ROBUSTUM	G2G3Q	Limited
LAHONTAN BASIN BUCKWHEAT	ERIOGONUM RUBRICAULE	G3	Endemic
FRISCO BUCKWHEAT	ERIOGONUM SOREDIUM	G1	Endemic
CHURCHILL NARROWS BUCKWHEAT	ERIOGONUM SP.	G1G2	Endemic
SON'S WILD BUCKWHEAT	ERIOGONUM SPATHULATUM VAR. NATUM	G3T2	Endemic
TIEHM BUCKWHEAT	ERIOGONUM TIEHMII	G1	Endemic
SUNNYSIDE GREEN GENTIAN	FRASERA GYPSICOLA	G1	Endemic
DESERT SUNFLOWER	HELIANTHUS DESERTICOLA	G2Q	Limited
ROCK PURPUSIA	IVESIA ARIZONICA VAR. SAXOSA	G4T1	Limited
OSTLER PEPPERGRASS	LEPIDIUM OSTLERI	G1	Endemic
SMOOTH STICKLEAF	MENTZELIA MOLLIS	G2	Peripheral
NEVADA ORYCTES	ORYCTES NEVADENSIS	G2,G2G3	Limited
WATSON'S OXYTHECA	OXYTHECA WATSONII	G2	Peripheral or Limited
	PENSTEMON ANGUSTIFOLIUS VAR. DULCIS	G5T2	Endemic
NEVADA DUNE BEARDTONGUE	PENSTEMON ARENARIUS	G2G3	Endemic
BROADLEAF PENSTEMON	PENSTEMON PLATYPHYLLUS	G2G3	Peripheral
REESE RIVER PHACELIA	PHACELIA GLABERRIMA	G3?	Endemic
MONO COUNTY PHACELIA	PHACELIA MONOENSIS	G3,G3Q	Limited
ALTERED ANDESITE POPCORN-FLOWER	PLAGIOBOTHRYS GLOMERATUS	G2G3	Limited
SOLDIER MEADOW CINQUEFOIL	POTENTILLA BASALTICA	G1	Limited
COTTAM'S CINQUEFOIL	POTENTILLA COTTAMII	G1	Limited
LAHONTAN INDIGOBUSH	PSOROTHAMNUS KINGII	G3	Endemic
	TETRADYMIA TETRAMERES	?	Endemic
CURRANT SUMMIT CLOVER	TRIFOLIUM ANDINUM VAR. PODOCEPHALUM	G3T1	Endemic
FRISCO CLOVER	TRIFOLIUM FRISCANUM	G1	Endemic
DEDECKER'S CLOVER	TRIFOLIUM MACILENTUM VAR. DEDECKERAE	G?T2	Peripheral
ROCK VIOLET	VIOLA LITHION	G1	Endemic
Invertebrates			
CRESCENT DUNES AEGIALIAN SCARAB	AEGIALIA CRESCENTA	G1	Endemic
HARDY'S AEGIALIAN SCARAB	AEGIALIA HARDYI	G1	Endemic
(scarab beetle)	AEGIALIA SPINOSA	?	Limited
(bee)	ANDRENA SP. NOV.	G1	Endemic
(bee)	ANDRENA TAENIATA	G2	Disjunct
(bee)	ANDRENA THORPI	G1	Endemic
(bee)	ANTHIDIUM RODECKI	?	Limited
(bee)	ANTHOPHORA AFFABILIS	?	Limited
(bee)	ANTHOPHORA SP. NOV.	G1	Endemic
(sand obligate beetle)	APHODIUS COMOSUS	?	Unknown
(bee)	APHODIUS PARAPYRIFORMIS SSP. NOV.	?	Limited
(bee)	CALLIOPSIS BARRI	?	Limited
(bee)	CALLIOPSIS PHACELIAE	?	Limited
(click beetle)	CARDIOPHORUS SPP.	?	Limited
(click beetle)	CARDIOPHORUS SSP. NOV.	?	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
(sand obligate beetle)	CHILOMETOPON PALLIDIUM	?	Limited
SAND MOUNTAIN PYGMY SCARAB	COENONYCHA PYGMAEA	G1	Endemic
(bee)	COLLETES SP. NOV. 1	G1	Limited
(bee)	COLLETES STEPHENI	?	Disjunct
(bee)	COLLETES TECTIVENTRIS	?	Disjunct
(sand obligate beetle)	EDROTES VENTRICOSUS	?	Limited
BAKING POWDER FLAT BLUE	EUPHILOTES BERNARDINO MINUTA	G5T1	Endemic
SAND MOUNTAIN BLUE	EUPHILOTES PALLESCENS ARENAMONTANA	G4T1	Endemic
HONEY LAKE BLUE	EUPHILOTES PALLESCENS CALNEVA	G4T1	Endemic
RICE'S BLUE	EUPHILOTES PALLESCENS RICEI	G4T1	Endemic
(sand obligate beetle)	EUSATTUS HIRSUTUS	?	Endemic
(sand obligate beetle)	EUSATTUS MURICATUS	?	Widespread, specialist
(bee)	HESPERAPIS KAYELLA	G1	Limited
(bee)	HESPERAPIS OLIVIAE	?	Limited
(bee)	HESPERAPIS SP. NOV.2	G1	Endemic
(sand obligate beetle)	LARIVERSIUS TIBALIS	?	Limited
(sand obligate beetle)	MECYNOTARSUS DELICATULUS	?	Limited
PARASITIC BEE	MELECTA ALEXANDERI	G1	Limited
DUNE HONEY ANT	MYRMECOCYSTUS ARENARIUS	G2?	Endemic?
(sand obligate beetle)	NIPTUS VENTRICULUS	?	Limited
(sand obligate beetle)	NOVELSIS SABULORUM	?	Endemic
(bee)	OSMIA ALPESTRIS	?	Limited
(bee)	PERDITA ARENARIA	?	Disjunct
(bee)	PERDITA CROTONIS JUABENSIS	G1	Endemic
(bee)	PERDITA SP. NOV. 3	G1	Endemic
(bee)	PERDITA VESCA	?	Limited
(predatory beetle)	PHILOTHRIS SSP. NOV.	?	Limited
(sand obligate beetle)	RHADINE MYRMECODES	?	Limited
CRESCENT DUNES SERICAN SCARAB	SERICA AMMOMENISCO	G1	Endemic
HUMBOLDT SERICAN SCARAB	SERICA HUMBOLDTI	G1	Endemic
SAND MOUNTAIN SERICAN SCARAB	SERICA PSAMMOBUNUS	G1	Endemic
(sand obligate cricket)	STENOPELMATUS SSP. NOV	?	Endemic
	TEGRODERA LATECINCTA	?	Limited
(sand obligate beetle)	TETRAGONODERUS PALLIDUS	?	Limited
(sand dune obligate)	TRIMERITROPIS BARNAMI	G1?	Limited
	TROGLODERUS COSTATUS	?	Limited
Birds			
PRAIRIE FALCON	FALCO MEXICANUS	G5	Widespread
PEREGRINE FALCON	FALCO PEREGRINUS	G4,G3	Widespread
BLACK ROSY-FINCH	LEUCOSTICTE ATRATA	G4	Limited
Mammals			
PALLID BAT	ANTROZOUS PALLIDUS	G5	Widespread, declining
TOWNSEND'S BIG-EARED BAT	CORYNORHINUS TOWNSENDII	G4	Widespread, declining
DESERT KANGAROO RAT	DIPODOMYS DESERTI	G5	Limited
SPOTTED BAT	EUDERMA MACULATUM	G4	Unknown
SILVER-HAIRED BAT	LASIONYCTERIS NOCTIVAGANS	G5	Widespread, declining
HOARY BAT	LASIURUS CINEREUS	G5	Widespread, declining
DESERT VALLEY KANGAROO MOUSE	MICRODIPODOPS MEGACEPHALUS ALBIVENTER	G5T1	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
BRAZILIAN FREE-TAILED BAT	TADARIDA BRASILIENSIS	G5	Unknown
G1 or G2 Plant Associations			
DESERT SAND-VERBENA	ABRONIA VILLOSA SPARSE VEGETATION [PROVISIONAL]	G2G3	Limited
PONDEROSA PINE OR JEFFREY PINE ALTERED ANDESITE WOODLAND	PINUS SPP. (P. PONDEROSA, P JEFFREYI) ALTERED ANDESITE WOODLAND	G2	Limited
Terrestrial Ecological Systems			
ALTERED ANDESITE SOILS			
BADLANDS			
CAVES			
CLIFFLANDS			
SAND DUNES			

Dunes are variable in size, shape, and texture. Coarse textured dunes are comprised of sand, while fine textured dunes are called mud dunes. Sand dunes are stratified across the entire Great Basin although they are most prevalent in the Lahontan and Bonneville basins where large sources of sand are present. Large patch natural communities occur on sand dunes, although dunes are generally small in extent, isolated, dynamic, and of recent origin having formed during the Holocene Epoch. Sand dunes, both unconsolidated and consolidated, harbor a diversity of plants and animals, many of which are endemic.

Badlands: Vegetation found within this system is often dominated by unique plant species or it may be dominated by non-vascular lichens or cryptogamic species. Vascular plants include grasses, such as alkali muhly (*Muhlenbergia asperifolia*). Badlands are found at all elevations, although low and moderate elevations are more common, and on steep bedrock outcroppings, ridgetops, windswept barrens, or on less steep alluvial and colluvial deposits.

Mono pumice barrens occur in eastern California on the western edge of the Great Basin. They harbor a unique herbaceous flora along with the most extensive stands of pure Jeffrey pine (*Pinus jeffreyi*) forest in the ecoregion.

Altered andesite soils are a special case of hydrothermally-altered badlands in the western Great Basin with vegetation dominated by relictual conifer species. The conifers are able to maintain dominance over typical Great Basin shrublands and woodlands because of their competitive advantage on the nutrient poor and acidic soils (Billings 1990).

Sand Dunes: This ecological system consists of stabilized to partially stabilized sand dunes dominated by desert sandverbena, big greasewood, daleas, ricegrass, fourwing saltbush, and four-part horsebrush (*Abronia villosa*, *Sarcobatus vermiculatus*, *Psorothamnus* spp., *Oryzopsis hymenoides*, *Atriplex canescens,* and *Tetradymia tetrameres*). Sand dunes occur between 321-1,980 m (1,050-6,500 ft) in elevation, on young alluvium-colluvium deposits or on eolian sand. Sand dunes are constantly being eroded and reformed by the prevailing wind. Plant cover, therefore, is sparse. Water is held for long periods of time just under the surface, which allows shrubs to successfully root and persist through long droughts. Large dunes are often barren at their tops, due to shifting sand and an unreachable water table. Some plant species have adaptations to this environment, for example, fourwing saltbush varies widely in its chromosomal content and response to the shifting dune environment. In some locations, fourwing saltbush grows four times as fast as normal plants, and its roots have adapted to develop photosynthetic tissue if exposed to sunlight.

Clifflands: Vertical and near-vertical clifflands are small patch habitats scattered throughout the ecoregion that often harbor unique biodiversity. Bats and falcons are important animal species that use cliffland habitats.

Conservation Issues and Threats

An abundance of small isolated barren clay knolls occur throughout the ecoregion. The geologic composition of these knolls often is less than ideal for plant growth and typical plants from the matrix sagebrush and salt desert plant communities are unable to compete. These are classic sites for unique plant species to have evolved in relative isolation, and although the faunas essentially are unstudied, many likely have unique animals as well.

Sand dunes are harsh environments and many species have evolved special adaptations to withstand the particular hazards of a moving sand substrate. Terrestrial invertebrates, specifically beetles and solitary bees, are the best studied groups of animals at present so our species conservation targets are skewed. Many depend on dune vegetation for adult or larval forage and cover.

The greatest threat to badlands and sand dunes is off-road vehicle use. They are popular recreational sites because of their open nature and they are used heavily for miltary training. The naturally small extent and isolated distributions of these patch environments add to the threat.

Hydrothermally altered andesites of the western Great Basin support small patch relictual examples of montane conifer woodlands within the matrix forming sagebrush semidesert or pinyon-juniper woodland. Billings (1950, 1990) documented the present occurrence of about 140 isolated stands in western Nevada and studied their origin and maintenance. A few endemic plant species occur in these isolated patch communities. Virtually nothing is known of their faunas. Off-road vehicle use and urbanization are the greatest threats to their existence, primarily degrading their quality, but in a few instances some have been completely destroyed.

Steamboat Hot Springs south of Reno includes mostly barren sinter soils in upland areas surrounding the active steam vents. It is a geologically young area currently undergoing the natural processes of hydrothermal soil alteration that lead to the formation of the older hydrothermally altered andesite patches. Rather than supporting a stand of montane conifers it harbors the only known occurrence of a unique species of buckwheat (*Eriogonum ovalifolium* var. *williamsiae*). Geothermal power production occurs on site and has impacted the buckwheat population by destroying some habitat. A conservation agreement with the State of Nevada and the geothermal lessee at the site provides some degree of protection. Similar rare plant and edaphically controlled habitat patches occur elsewhere in the Great Basin, for examples, Sulphur Hot Springs, Monte Neva Hot Springs, Hot Springs Hill, and Soldier Meadows.

System Conservation Goals and Viability

Badlands: This is a large patch system. When combined with playa lakes, the GAP map coverage is 3.91% of the ecoregion and our estimate of 1.88% is just for badlands. Our conservation goal is 20% of the area occupied by badlands in each section. No minimum size

criterion was set, as stands are entirely driven by presence of substrate. Badlands systems may harbor rare plant species and also may serve as a natural barrier to weed invasion.

Sand Dunes: Sand dunes are a large patch system. The GAP map coverage is 0.11% of the ecoregion. Our conservation goal is 20% of the area occupied by sand dunes within each section. A minimum size of 500 ha was set based on the representative polygons of sand dunes from the GAP coverage. Several polygons were less than 300 ha in size, and many were greater than 1,000 ha. Minimum population size for kangaroo rats and other rodents and minimum dynamic area of dune erosion and creation should be considered in site conservation planning for preserves that include sand dune systems.

Conservation goals and minimum size viability criteria for clifflands and caves were not set because of a lack of information on their abundance and distribution in the Great Basin. Future iterations of the blueprint should include goals for them as information becomes available.

Portfolio Results

The portfolio includes 145 sites identified for ecological systems, communities, and species targets of the sand dunes and badlands group. Table 27 lists the sites in this system group by geographic section and their locations are given in figure 31. Refer to appendix 10 for conservation targets and attributes for each site.

Highlighted significant sites of the sand dunes and badlands group include:

BLOWSAND MOUNTAINS-BARNETT HILLS (A021)—excellent example of Lahontan indigobush dune community; high diversity of dune invertebrates including beetles, solitary bees, crickets and ants; suite of 14 sand dune obligate beetles.
CRESCENT DUNES (A053)—important large dune system in the Tonopah section; suite of 11 sand dune obligate beetles; one and only site for the Crescent Dunes serican scarab.
GOSHUTE MOUNTAINS (A102)—significant migratory concentrations of raptors when 14,000-22,000 individuals converge annually in clifflands; important area for Cooper's hawk, northern goshawk, ferruginous hawk, prairie falcon, and peregrine falcon; includes excellent examples of a diversity of terrestrial mountain ecological systems.
LITTLE SAHARA SAND DUNES (A149)—important large dune system in the Bonneville Basin section; excellent example of giant four-wing saltbush community; suite of 9 sand dune obligate beetles.
SAND MOUNTAIN (A242)—one and only site for the Sand Mountain blue and two endemic sand bees; suite of 17 sand obligate solitary bee species.
SILVER STATE SAND DUNES (A258)—important large dune system in the Lahontan Basin section; suite of 12 sand dune obligate beetles; distinctive riparian plant swales among the dune system; one and only site for three endemics including the Humboldt serican scarab, Rice's blue, and a solitary bee.

Table 27. Great Basin portfolio sites identified for sand dunes and badlands ecological systems.

California

A023	BODIE HILLS
A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
A039	CARSON RIVER
A152	LONG VALLEY
A165	MONO LAKE
A184	NORTH WASSUK RANGE
A194	OWENS RIVER GORGE
A195	OWENS VALLEY-BENTON VALLEY
A264	SLINKARD VALLEY
A275	SOUTH PINE NUT MOUNTAINS
A280	SOUTH WASSUK RANGE
A299	SWEETWATER MOUNTAINS
A328	VIRGINIA RANGE
A346	WHITE MOUNTAINS

Lahontan Basin

A007	ARTESIA LAKE-EAST PINE NUT MOUNTAINS
A010	BALD MOUNTAIN
A012	BATTLE MOUNTAIN
A020	BLACK ROCK DESERT-SMOKE CREEK DESERT
A021	BLOWSAND MOUNTAINS-BARNETT HILLS
A040	CARSON SINK
A073	EAST GABBS VALLEY
A085	FAIRVIEW PEAK
A088	FENCEMAKER
A094	FLY RANCH GEYSER-GRANITE RANGE
A098	GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
A099	GARFIELD HILLS
A125	HUMBOLDT RANGE
A154	LOVELOCK VALLEY
A167	MONTE CRISTO MOUNTAINS
A177	NIGHTINGALE FLAT
A180	NORTH PYRAMID LAKE
A196	PAH RAH RANGE
A214	PYRAMID LAKE-LOWER TRUCKEE RIVER
A236	RYE PATCH
A237	SAGE HEN VALLEY
A242	SAND MOUNTAIN
A246	SCHURZ
A258	SILVER STATE SAND DUNES
A270	SOLDIER MEADOWS
A285	SQUAW VALLEY
A306	THORNE DUNE
A321	UPPER ROCK CREEK
A331	WALKER LAKE-WALKER RIVER
A341	WEST GABBS VALLEY
A356	WILSON CANYON

North Central

A005	ANTELOPE VALLEY
A006	ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
A022	BLUE LAKES-BADLANDS
A074	EAST HUMBOLDT RANGE
A078	ELKO
A102	GOSHUTE MOUNTAINS
A168	MOOR SUMMIT
A204	PEQUOP MOUNTAINS-TOANO DRAW
A233	RUBY VALLEY
A287	STEPTOE VALLEY
A296	SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER

Central Mountains

A042	CAVE VALLEY-UPPER WHITE RIVER VALLEY
A055	CURRANT MOUNTAIN
A056	CURRANT SUMMIT
A059	DEEP CREEK RANGE
A060	DESATOYA MOUNTAINS
A063	DIAMOND VALLEY ALKALI FLAT
A068	DUCK CREEK RANGE-STEPTOE VALLEY
A116	HOME STATION WASH
A122	HOT SPRINGS HILL
A203	PATTERSON WASH
A212	POGONIP RIDGE
A220	RAILROAD GRADE
A227	REESE RIVER
A228	REESE RIVER VALLEY
A232	RUBY MOUNTAINS
A244	SCHELL CREEK RANGE
A267	SNAKE RANGE
A310	TOIYABE RANGE-BIG SMOKY VALLEY
A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
A343	WEST NORTHUMBERLAND CANYON
A347	WHITE PINE RANGE
A348	WHITE RIVER VALLEY

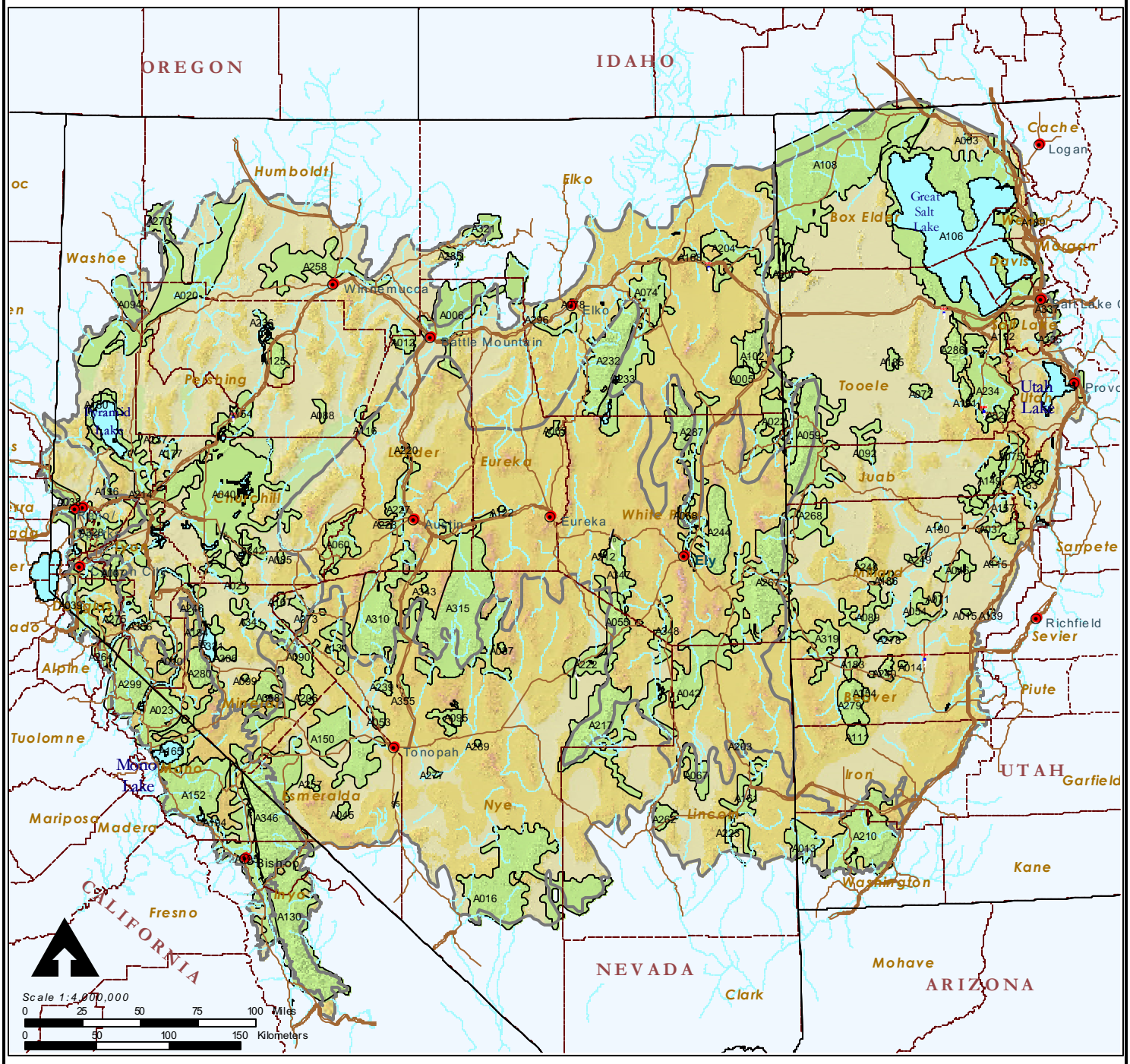
Tonopah

A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS
A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
A045	CLAYTON VALLEY SAND DUNES
A053	CRESCENT DUNES
A067	DRY LAKE VALLEY
A087	FANDANGO
A090	FINGER ROCK WASH
A095	FOURMILE BASIN
A130	INYO MOUNTAINS
A131	IONE VALLEY
A150	LONE MOUNTAIN-MONTE CRISTO RANGE
A161	MEADOW VALLEY
A197	PAHROC SUMMIT PASS
A206	PILOT MOUNTAINS
A210	PINE VALLEY MOUNTAINS
A217	QUINN CANYON RANGE-GRANT RANGE
A222	RAILROAD VALLEY
A223	RAINBOW CANYON
A239	SAN ANTONIO DUNES
A257	SILVER PEAK RANGE
A262	SIXMILE FLAT
A277	SOUTH RALSTON VALLEY
A289	STONE CABIN VALLEY
A314	TOPIER CANYON
A355	WILLOW SPRING

Bonneville Basin

A003	ANDERSON HILL
A014	BEAVER LAKE MOUNTAINS
A015	BEAVER RIDGE
A037	CANYON MOUNTAINS-DELTA
A046	CLEAR LAKE
A054	CRICKET MOUNTAINS
A071	EAST CRICKET MOUNTAINS FOOTHILLS
A072	EAST DUGWAY DUNES
A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY
A089	FERGUSON DESERT-TULE VALLEY
A092	FISH SPRINGS
A106	GREAT SALT LAKE
A108	GROUSE CREEK MOUNTAINS-RAFT RIVER
A111	HERD PASS
A115	HOLDEN SAND DUNES
A139	KANOSH
A149	LITTLE SAHARA SAND DUNES
A157	LYNNDYL SAND DUNES
A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
A183	NORTH WAH WAH MOUNTAINS
A185	NORTH WIG SAND DUNES
A186	NORTHWEST SEVIER LAKE
A189	OGDEN CANYON
A190	OLD RIVER BED
A191	ONAQUI MOUNTAINS
A192	OQUIRRH MOUNTAINS
A207	PILOT RANGE
A234	RUSH VALLEY
A240	SAN FRANCISCO MOUNTAINS
A243	SAWTOOTH MOUNTAIN
A249	SEVIER DESERT
A268	SNAKE VALLEY
A278	SOUTH SEVIER LAKE
A279	SOUTH WAH WAH MOUNTAINS
A286	STANSBURY MOUNTAINS
A319	TUNNEL SPRING MOUNTAINS-HALFWAY
A327	VERNON
A330	WAH WAH WASH
A335	WASATCH FRONT DRAPER
A336	WASATCH FRONT PROVO-SPRINGVILLE
A337	WASATCH FRONT SALT LAKE CITY
A354	WILLOW SPRING

Figure 31. Portfolio sites with sand dunes and badlands systems.



Portfolio sites

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.

F. Riparian and Wetlands

Description

Riparian and wetlands group is transitional between terrestrial ecological systems and aquatic habitats. They occur in all geographic sections of the ecoregion, although they cover less than 1% of the entire ecoregion. Riparian and wetlands include five linear or small patch ecological systems: desert riparian shrubland and woodland, montane riparian shrubland, montane riparian woodland, wet meadow, and freshwater marsh (table 28). Additionally, fen and bog habitats, which are very small relictual areas from wetter times, are included.

Table 28. Ecological systems of the riparian and wetlands group organized by extent within the Great Basin.

Riparian and Wetlands				
Ecological System	**% of Great Basin**	**Patch Type**	**# of All Plant Associations**	**# of G1G2 Plant Associations**
Freshwater Marsh	0.57	Small Patch	14	2
Desert Riparian Shrubland and Woodland	0.14	Linear	9	4
Montane Riparian Shrubland and Woodland (combined)	0.02	Linear	33	5
Wet Meadow	0.02	Small Patch	19	1
Fen and Bog Habitats	—	Small Patch	1	0

There are only 58 species conservation targets in riparian and wetlands, the least of all system groups. They include amphibians, birds, terrestrial invertebrates, mammals, reptiles, and plants (table 29). Only 31% of them are endemic to the ecoregion, while a mere 7% are imperiled. This supports the hypothesis that riparian and wetland systems are comprised of ubiquitous species and rarely harbor globally restricted or rare taxa. Nevertheless, bird and amphibian targets are especially important in these wetter systems because of their dependence on these specialized habitats. This system group has more bird and amphibian conservation targets than any other group. Riparian areas support the highest densities of breeding birds in the Great Basin. Wetlands support phenomenally high densities of water birds. All of the ecoregion's amphibian targets occur in these systems.

Additionally, there are 76 plant associations documented in riparian and wetland systems in the Great Basin, which ties with basins and desert scrub for more associations than any other system group at present. Twelve are considered imperiled and they are listed in table 29. The importance and conservation value of riparian and wetland systems lies at the higher organizational level of ecological systems because of their overall functional value.

Table 29. Conservation targets for the riparian and wetlands ecological systems organized by taxonomic group.

Common Name	Scientific Name	Grank	Ecoregional Distribution
Plants			
MESIC MILKVETCH, MEADOW MILKVETCH	ASTRAGALUS DIVERSIFOLIUS	G3	Limited
FISH SLOUGH MILK-VETCH	ASTRAGALUS LENTIGINOSUS VAR. PISCINENSIS	G5T1	Endemic
LAMOILLE CANYON MILKVETCH	ASTRAGALUS ROBBINSII VAR. OCCIDENTALIS	G5T2T3	Endemic
INYO COUNTY STAR-TULIP	CALOCHORTUS EXCAVATUS	G3	Limited
HALL'S MEADOW HAWKSBEARD	CREPIS RUNCINATA SSP. HALLII	G5T3?	Endemic
SMALL YELLOW LADY'S-SLIPPER	CYPRIPEDIUM CALCEOLUS SSP. PARVIFLORUM	G5T?	Widespread, declining
CLUSTERED LADY'S-SLIPPER	CYPRIPEDIUM FASCICULATUM	G4	Widespread, declining
HOT SPRINGS FIMBRISTYLIS	FIMBRISTYLIS THERMALIS	G4?	Limited
ALKALI IVESIA	IVESIA KINGII VAR. KINGII	G3T2	Limited
	LEPIDIUM INTEGRIFOLIUM VAR. HETEROPHYLLUM	G2T1?	Limited
SALINE VALLEY PHACELIA	PHACELIA AMABILIS	G1Q	Limited
OWENS VALLEY CHECKERBLOOM	SIDALCEA COVILLEI	G2	Limited
UTE LADIES' TRESSES	SPIRANTHES DILUVIALIS	G2	Disjunct, declining
Invertebrates			
CARSON VALLEY WOOD NYMPH	CERCYONIS PEGALA CARSONENSIS	G5T2	Endemic
WHITE RIVER WOOD NYMPH	CERCYONIS PEGALA PLUVIALIS	G5T2	Endemic
NEVADA VICEROY	LIMENITIS ARCHIPPUS LAHONTANI	G5T2	Endemic
WHITE MOUNTAINS ADMIRAL	LIMENITIS LORQUINI PALLIDAFACIES	G5T1T2	Endemic
WHITE MOUNTAINS RUDDY COPPER	LYCAENA RUBIDUS INCANUS	G5T1T2	Endemic
GREAT BASIN YUMA SKIPPER	OCHLODES YUMA LUTEA	G3T2T3	Limited
HUMBOLDT RIVER CRESCENTSPOT	PHYCIODES PULCHELLA SHOSHONE	G5T2	Endemic
VALLEY CRESCENTSPOT	PHYCIODES PULCHELLA VALLIS	G5T3T4	Endemic
WHITE MOUNTAIN SAEPIOLUS BLUE	PLEBEJUS SAEPIOLUS ALBOMONTANUS	G5T1T2	Endemic
CARSON VALLEY SANDHILL SKIPPER	POLITES SABULETI GENOA	G5T2	Endemic
	PTERONARCYS PRIINCEPS	?	Peripheral

Common Name	Scientific Name	Grank	Ecoregional Distribution
PALLID SYLVINUS HAIRSTREAK	SATYRIUM SYLVINUS MEGAPALLIDUM	G5T2T3	Endemic
APACHE SILVERSPOT	SPEYERIA NOKOMIS APACHEANA	G4T3	Endemic
CARSON VALLEY SILVERSPOT	SPEYERIA NOKOMIS CARSONENSIS	G4T2	Limited
Amphibians			
INYO MOUNTAINS SLENDER SALAMANDER	BATRACHOSEPS CAMPI	G2	Endemic?
BLACK TOAD	BUFO EXSUL	G1	Endemic
OWENS VALLEY WEB-TOED SALAMANDER	HYDROMANTES SP.1	G1?	Limited
TOIYABE SPOTTED FROG	RANA LUTEIVENTRIS SSP.	G4T?	Endemic
MOUNTAIN YELLOW-LEGGED FROG	RANA MUSCOSA	G3	Peripheral
NORTHERN LEOPARD FROG	RANA PIPIENS SSP.	G5T?	Endemic
Reptiles			
NORTHWESTERN POND TURTLE	CLEMMYS MARMORATA MARMORATA	G3T3	Disjunct
PANAMINT ALLIGATOR LIZARD	ELGARIA PANAMINTINA	G1G2	Limited
Birds			
COOPER'S HAWK	ACCIPITER COOPERII	G4	Widespread, declining
NORTHERN GOSHAWK	ACCIPITER GENTILIS	G4	Widespread, declining
REDHEAD	AYTHYA AMERICANA	G5	Widespread, migratory concentration
WESTERN SNOWY PLOVER	CHARADRIUS ALEXANDRINUS NIVOSUS	G4T2, G4T3,G4	Widespread, specialist
NORTHERN HARRIER	CIRCUS CYANEUS	G5	Widespread, declining
WESTERN YELLOW-BILLED CUCKOO	COCCYZUS AMERICANUS OCCIDENTALIS	G5T2T3	Peripheral
SOUTHWESTERN WILLOW FLYCATCHER	EMPIDONAX TRAILLII EXTIMUS	G5T2	Peripheral
GREATER SANDHILL CRANE	GRUS CANADENSIS	G5	Widespread, migratory concentration
BLUE GROSBEAK	GUIRACA CAERULEA	G5	Peripheral
YELLOW-BREASTED CHAT	ICTERIA VIRENS	G5	Peripheral
LEAST BITTERN	IXOBRYCHUS EXILIS	G5	Peripheral
CALIFORNIA GULL	LARUS CALIFORNICUS	G5	Disjunct, colonial
FRANKLIN'S GULL	LARUS PIPIXCAN	G4G5	Disjunct
LONG-BILLED CURLEW	NUMENIUS AMERICANUS	G5	Widespread, declining
AMERICAN WHITE PELICAN	PELECANUS ERYTHRORHYNCHOS	G3	Widespread, migratory concentration
WILSON'S PHALAROPE	PHALAROPUS TRICOLOR	G5	Widespread, migratory concentration
WHITE-FACED IBIS	PLEGADIS CHIHI	G5	Widespread, migratory concentration
EARED GREBE	PODICEPS AURITUS	G5	Widespread, migratory concentration
AMERICAN AVOCET	RECURVIROSTRA AMERICANA	G5	Widespread, migratory concentration
Mammals			
WESTERN RED BAT	LASIURUS BLOSSEVILLII	G5	Unknown
WHITE-TAILED JACK RABBIT	LEPUS TOWNSENDII	?	Widespread
HUMBOLDT RIVER OTTER	LUTRA CANADENSIS NEXA	?	Limited
OWENS VALLEY VOLE	MICROTUS CALIFORNICUS VALLICOLA	G5T1	Peripheral or Limited
G1 or G2 Plant Associations			
SILVER SAGEBRUSH / GREAT BASIN LYME GRASS	ARTEMISIA CANA / LEYMUS CINEREUS SHRUBLAND	G1?	Limited
SILVER SAGEBRUSH/TUFTED HAIRGRASS	ARTEMISIA CANA SSP. VISCIDULA / DESCHAMPSIA CESPITOSA SHRUBLAND	G2G3	Widespread
WATER BIRCH/REDOSIER DOGWOOD	BETULA OCCIDENTALIS / CORNUS SERICEA SHRUBLAND	G2G3	Widespread

Common Name	Scientific Name	Grank	Ecoregional Distribution
SCENTED SHOOTING STAR-WESTERN COLUMBINE SEEP	DODECATHEON REDOLENS -AQUILEGIA FORMOSA HERBACEOUS VEGETATION [PROVISIONAL]	G2?	Limited
	PENTAPHYLLOIDES FLORIBUNDA SHRUBLAND [PROVISIONAL]	G2?	Widespread
NARROW-LEAF COTTONWOOD/FRAGRANT SUMAC	POPULUS ANGUSTIFOLIA / RHUS TRILOBATA FOREST	G2G3	Widespread
FREMONT'S COTTONWOOD - BOX ELDER	POPULUS FREMONTII - ACER NEGUNDO FOREST	G2Q	Peripheral
SAGO PONDWEED – HORNED PONDWEED	POTAMOGETON PECTINATUS - ZANNICHELLIA PALUSTRIS HERBACEOUS VEGETATION	G1Q	Widespread
DITCHGRASS	RUPPIA (CIRRHOSA, MARITIMA) HERBACEOUS VEGETATION [PROVISIONAL]	G1G3	Limited
GEYER'S WILLOW	SALIX GEYERIANA / MESIC GRAMINOIDS SHRUBLAND	G2G3	Widespread
ARROYO WILLOW-VELVET ASH	SALIX LAEVIGATA - FRAXINUS VELUTINA WOODLAND	G1G2	Limited
ARROYO WILLOW/BARREN	SALIX LASIOLEPIS / BARREN SHRUBLAND	G2?	Limited
Terrestrial Ecological Systems			
DESERT RIPARIAN SHRUBLAND AND WOODLAND			
FEN AND BOG			
FRESHWATER MARSH			
MONTANE RIPARIAN SHRUBLAND AND WOODLAND			
WET MEADOW			

The areal extent of riparian and wetland communities in this desert ecoregion is exceedingly small, but they are exceedingly important for many species. They are considered biodiversity hotspots because the water, cover, and food availability are attractive and often essential to wildlife. For example, about 80% of the birds and 70% of the butterflies in the Great Basin are associated with riparian areas (Dobkin 1998; Brussard and Austin 1993). Riparian obligate bird conservation targets include yellow-breasted chat, blue grosbeak, southwestern willow flycatcher, and western yellow-billed cuckoo. Their breeding presence in riparian areas indicates quality riparian vegetation with complex horizontal and vertical structure for cover. Great Basin wetlands harbor additional bird conservation targets. Wetlands associated with rivers or ephemeral and perennial alkaline lakes concentrate colonies of California gull, Franklin's gull, Wilson's phalarope, white-faced ibis, eared grebe, and American avocet. They also are very important for migrant targets, including western snowy plover and long-billed curlew, and for breeding targets such as the least bittern.

In the intermountain valleys, desert riparian communities occur along the major water drainages and on some smaller streams. Also, small patch riparian and wetland communities occur in association with isolated springs and seeps or along the shorelines of terminal lakes. Higher in the mountains, montane riparian communities occur in linear fashion along the major and minor stream courses and as small patch communities in montane meadows. The montane riparian system provides habitat for the little known Owens Valley web-toed salamander (*Hydromantes* sp.). The lower elevation riparian communities are comprised of shrublands dominated by willows, buffaloberry, and wild rose, or they are woodlands and gallery forests dominated by cottonwoods. The wetlands are comprised of graminoids such as rushes, sedges, spikerushes, and grasses. Higher elevation riparian communities are comprised of shrublands again dominated by willows and chokecherry, or they are woodlands dominated by cottonwoods and

aspen. Riparian and wetland communities often intermix to form complex spatial patterns, particularly in lower elevations where stream channels braid.

Desert and montane riparian woodlands tend to have low tree diversity. Typically, a cottonwood species (*Populus* spp.) and one or two willow species (*Salix* spp.) predominate. The trees parallel the primary channel and, when present secondary channels, in a linear pattern. The youngest trees tend to be closest to the channel. Understory may be dense or open and park-like. It may be composed of woody shrubs, such as rose and buffaloberry ((*Rosa* sp. and *Shepherdia argentia*), or grasses and forbs. In wider alluvial floodplains of larger river systems, Great Basin riparian may develop broad gallery forests of Frémont cottonwood. Riparian shrublands are often in association with riparian woodlands, which are structurally shorter and often more open communities and tend to be dominated by multiple-stemmed species, such as willows, birch, and dogwood (*Betula* and *Cornus* spp.). Riparian or stringer meadows, dominated by a high cover of herbaceous plants, also intersperse.

Where floodplains widen and drainages are low gradient, or near the terminus of stream and river systems, wet meadows and marshes occur. Emergent vegetation composed of cattails, bulrushes, sedges, rushes, and spikerushes (*Typha, Scirpus, Carex*, *Juncus,* and *Eleocharis* spp.) characterize these wetlands.

Riparian areas also provide quality habitat for other obligate riparian specialist animals and other non-obligate species. Riparian and wetland obligates include salamanders, toads, and frogs. The rarer Great Basin riparian obligates include the Inyo Mountains slender salamander, Owens Valley web-toed salamander (*Hydromantes* sp. nov.), black toad, and the genetically distinct Toiyabe spotted frog.

Freshwater Marsh: This ecological system consists of permanently flooded and permanently saturated wetlands dominated by duckweeds, pondweeds, azollas, ditchgrass, bulrushes, cattails, and common reed (*Lemna*, *Potamogeton*, *Azolla*, *Ruppia Scirpus*, *Typha*, and *Phragmites* spp.). These are wetlands with standing water for most of the growing season and most of the year. Stands occur in ditches, rivers, streams, channels, and ponds from sea level to 2,300 m (7,545 ft) elevation. It occupies basins where the water table may remain relatively high, but can drop below the soil surface late in the growing season. Soils are deep, poorly drained, muck, peat, or mineral. Wettest sites are typically dominated by common cattail (*Typha latifolia*), while drier sites support herbaceous communities dominated by sedges, Kentucky bluegrass (*Carex* spp., *Poa pratensis*) or other grasses. Alkaline tolerant communities are included in the playa lake system.

Desert Riparian Shrubland and Woodland: This ecological system consists of vegetation that grows on small, flashy intermittent and ephemeral streams, as well as along large perennial rivers. Dominant trees include Frémont cottonwood, Goodding willow, and arroyo willow with boxelder and velvet ash (*Populus fremontii, Salix gooddingii*, and *S. lasiolepis, Acer negundo* and *Fraxinus velutina*) in the south. Shrub dominants include Geyer willow, silver buffaloberry, and coyote willow (*Salix geyeriana*, *Shepherdia argentea*, and *Salix exigua*). These woodlands occur as small isolated stands or as linear bands that parallel stream channels. Sites are flat to gently sloping and occur in lower canyons in desert mountains, on alluvial fans, and in valleys. Substrates are generally well drained, coarse-textured soils derived from stratified alluvium composed of sand, loam, gravel and cobbles. The soils may be slightly alkaline and saline. This vegetation is dependent on annual or periodic flooding or an annual rise in the water table for growth and reproduction.

Montane Riparian Shrubland and Woodland: Montane riparian shrublands and montane riparian woodlands were combined into one type for the purpose of crosswalking to GAP vegetation map units. Montane riparian shrublands occur as narrow bands of shrubs lining swift-flowing montane creeks and streams, tall willow carrs on broad floodplains of low-gradient meandering reaches of montane streams, and low-stature willow carrs in broad snow-melt fed basins in the subalpine. Typical dominant species include mountain alder, silver sagebrush, western water birch, western dogwood, Woods wildrose, Booth willow, Drummond willow, Geyer willow, arroyo willow, Lemmon willow, yellow willow, and Wolf willow (*Alnus incana, Artemisia cana, Betula occidentalis, Cornus sericea, Rosa woodsii, Salix boothii, S. drummondiana, S. geyeriana, S. lasiolepis, S. lemmonii, S. lutea,* and *S. wolfii*). Typical understory components vary from dense graminoids and forbs to bare alluvial cobbles. Montane riparian shrublands depend on perennial or intermittently available moisture, avoid drought periods by having phreatophytic roots, and respond positively to flooding disturbance.

Montane riparian woodland is similar to the above in physical setting and ecological processes. It contains the narrow-leaved cottonwoods and conifers that line montane streams. This system is almost always narrow, whereas montane shrublands can be very wide. Dominant species include black cottonwood, narrowleaf cottonwood, quaking aspen, and black oak (*Populus balsamifera, P. angustifolia, P. tremuloides*, and *Quercus kelloggii*) with various shrubby understory components including western dogwood, skunkbush sumac, Woods wildrose, mountain alder, and several willows (*Cornus sericea, Rhus trilobata, Rosa woodsii*, *Alnus incana, Salix* spp.). Montane woodlands, particularly those dominated by cottonwoods, are dependent on flooding disturbance for reproduction and re-establishment, and on periodic and annual rise in groundwater levels for general maintenance.

Wet Meadow: This ecological system consists of entirely herbaceous vegetation on seasonally saturated to temporarily flooded areas. Dominant species include sedges, wildryes, monkeyflowers, rushes, spikerushes, and tufted hairgrass (*Carex*, *Leymus*, *Mimulus*, *Juncus*, *Eleocharis* spp., and *Deschampsia cespitosa*). Stands are found on relatively mesic, gentle to moderate slopes, such as terraces, uplands from toeslopes to the shoulder of the slope, broad valleys, mesic patches in semi-arid shrublands and seepage sites. Sites are often more mesic than surrounding habitats. Soils are typically deep, fine textured loams and clays, that may be only 40 cm deep on some sites. They may be saline or non-saline with pH of 7-10. Parent material includes alluvium and colluvium derived from limestone or basalt and loess.

Conservation Issues and Threats

Much of the riparian has been degraded or destroyed from water diversions, livestock grazing, and agriculture. Degraded riparian is comprised of widespread ecological generalists and introduced species that are adapted to highly disturbed conditions. Composition and structure of degraded riparian is diminished. Many parts of the Walker River are now dominated by non-native aggressive tamarisk (*Tamarix* spp.) where the composition, structure, and function of this major river course has been dramatically altered. Tamarisk uses more water, create more saline conditions, and tolerate more frequent fires than the native cottonwoods and willows. Other areas have been invaded by Russian olive (*Elaeagnus angustifolia*), which also alters riparian structure and composition.

Restoration is costly and time consuming, but it is possible in smaller isolated areas, and there have been lasting restoration successes at isolated spring systems.

Desert riparian vegetation occurs on floodplains that naturally undergo lateral adjustments as they meander and form new alignments. This process is important for new recruitment of riparian plant species. Inappropriate development in floodplains destroys riparian habitat, while flood control projects curtail the natural meandering process.

Montane riparian vegetation has had a history of poor grazing management, which has degraded, and in some cases, destroyed montane riparian systems by eventually lowering the water table.

Riparian associated butterflies evolved and diversified in these isolated wet Great Basin habitats since the Holocene Epoch (Austin 1985, 1992). For example, the common wood nymph butterfly has differentiated into nine endemic subspecies within Great Basin riparian habitats (Austin 1992).

System Conservation Goals and Viability

Freshwater Marsh: This is a small patch system. The GAP map coverage is 0.57% of the ecoregion, which is a low estimate because GAP underestimates small patch and linear systems. While this system can occur as large expansive in some valley bottoms, many occurrences are typically much smaller. Our conservation goal is six occurrences per section. No minimum size was set as they can occur naturally in very small patches. GAP map representation of the abundance of this system is inadequate because of its size. Therefore, no ELU information is provided because their representation is insufficient. Each polygon from the GAP vegetation map and occurrence information from experts was treated as a fine-filter target in SITES.

Desert Riparian Shrubland and Woodland: Desert riparian shrubland and woodland is a linear ecological system. The GAP map coverage is 0.14% of the ecoregion, which is a low estimate because GAP underestimates small patch and linear systems. Our conservation goal is six occurrences per section. A minimum size was set at 4 miles long and 0.5 - 1 mile wide, which equals 517- 1,035 ha (1,280 – 2,560 ac). Stands of this size would likely contain sufficient internal variability to capture characteristic biophysical gradients and survive natural flooding disturbance processes. An unaltered hydrologic regime is key to maintaining the diversity and viability of desert riparian areas. Each polygon from the GAP vegetation map and occurrence information from experts was treated as a fine-filter target, that is, like a species occurrence in SITES.

Montane Riparian Shrubland and Woodland: Montane riparian shrubland and woodlands are a small patch or linear system. The GAP coverage is 0.02% of the ecoregion, which is a low estimate because GAP underestimates small patch and linear systems. Our conservation goal is six occurrences per section. A minimum size was set at >1 mile long and 0.25 mile wide, which equals > 65 ha (60 ac). Stands of this size would likely contain sufficient internal variability to capture characteristic biophysical gradients and survive natural flooding disturbance processes. An unaltered hydrologic regime is key to maintaining the diversity and viability of montane riparian areas. GAP map representation of the abundance of this system is inadequate because of its size. Therefore, no ELU information is provided because their representation is insufficient. Each polygon from the GAP vegetation map and occurrence information from experts was treated as a fine-filter target in SITES.

Wet Meadow: Wet meadow is a small patch system. The GAP map coverage is 0.02% of the ecoregion, which is a low estimate because GAP underestimates small patch and linear systems. Our conservation goal is six occurrences per section. No minimum size was set as they can occur naturally in very small patches. GAP map representation of the abundance of this system is inadequate because of its size. Consequently, no ELU information is provided because their representation is insufficient. Each polygon from the GAP vegetation map and occurrence information from experts was treated as a fine-filter target in SITES.

Portfolio Results

The portfolio includes 188 sites identified for ecological systems, communities, and species targets of the riparian and wetlands group. Table 30 lists the sites in this system group by geographic section and their locations are given in figure 32. Refer to appendix 10 for conservation targets and attributes for each site.

Highlighted significant sites of riparian and wetlands include:

CARSON RIVER (A039)—part of a functional network that connects to the Sierra Nevada ecoregion; excellent examples of spring-fed freshwater marsh systems; four endemic butterflies and the one and only site for two of them–Carson Valley wood nymph and Carson Valley sandhill skipper; important desert riparian shrublands habitat for numerous breeding and migratory bird targets.
MASON VALLEY (A159)—very good examples of freshwater marsh systems and desert riparian shrublands and woodlands that are important for breeding and migratory birds.
MEADOW VALLEY (A161)—ribbons of wet meadows and desert riparian shrublands habitats among transitional desert uplands; important for several migratory waterbirds; one and only site for the Big Spring spinedace, and for Schlesser pincushion.
PYRAMID LAKE-LOWER TRUCKEE RIVER (A214)—excellent examples of remaining Frémont cottonwood forests; important riparian habitats for breeding and migratory birds; spawning habitats for endangered cui-ui and threatened Lahontan cutthroat trout.
RAINBOW CANYON (A223)—ribbons of desert riparian shrublands and freshwater marshs among transitional desert uplands; important for several migratory waterbirds; important for Meadow Valley Wash desert sucker and Meadow Valley speckled dace.
WALKER LAKE-WALKER RIVER (A331)— part of functional network connecting Sierra Nevada; very good condition freshwater and brackish marshes; important desert riparian shrublands for breeding and migratory birds; Lahontan cutthroat trout river system.

Table 30. Great Basin portfolio sites identified for riparian and wetlands ecological systems.

California	
A023	BODIE HILLS
A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
A039	CARSON RIVER
A114	HOLBROOK JUNCTION
A124	HOYE CANYON
A152	LONG VALLEY
A164	MINERAL VALLEY
A165	MONO LAKE
A195	OWENS VALLEY-BENTON VALLEY
A230	RICKEY PEAK
A250	SHEPHERD CREEK
A264	SLINKARD VALLEY
A275	SOUTH PINE NUT MOUNTAINS
A280	SOUTH WASSUK RANGE
A299	SWEETWATER MOUNTAINS
A328	VIRGINIA RANGE
A334	WARM SPRINGS VALLEY
A338	WELLINGTON HILLS

A346 WHITE MOUNTAINS

Lahontan Basin

A007 ARTESIA LAKE-EAST PINE NUT MOUNTAINS
A008 AUGUSTA MOUNTAINS
A012 BATTLE MOUNTAIN
A020 BLACK ROCK DESERT-SMOKE CREEK DESERT
A024 BOLIVIA
A028 BUFFALO SPRINGS
A029 BUFFALO VALLEY-TOBIN RANGE
A040 CARSON SINK
A094 FLY RANCH GEYSER-GRANITE RANGE
A098 GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
A125 HUMBOLDT RANGE
A126 HUMBOLDT RIVER GOLCONDA
A127 HUMBOLDT RIVER IMLAY
A132 JACKSON MOUNTAINS
A154 LOVELOCK VALLEY
A159 MASON VALLEY
A180 NORTH PYRAMID LAKE
A196 PAH RAH RANGE
A214 PYRAMID LAKE-LOWER TRUCKEE RIVER
A218 QUINN RIVER
A236 RYE PATCH
A246 SCHURZ
A258 SILVER STATE SAND DUNES
A266 SMOKE CREEK
A270 SOLDIER MEADOWS
A271 SONOMA RANGE
A285 SQUAW VALLEY
A288 STILLWATER RANGE -DIXIE VALLEY
A321 UPPER ROCK CREEK
A331 WALKER LAKE-WALKER RIVER
A356 WILSON CANYON

North Central

A005 ANTELOPE VALLEY
A006 ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
A022 BLUE LAKES-BADLANDS
A050 CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE
A064 DIXIE CREEK
A074 EAST HUMBOLDT RANGE
A077 EIGHTEEN MILE MARSH
A102 GOSHUTE MOUNTAINS
A193 OWENS LAKE
A204 PEQUOP MOUNTAINS-TOANO DRAW
A213 PRATHER SPRINGS
A216 QUILICI SPRING-BUTTE VALLEY
A219 RABBIT CREEK
A226 RED POINT
A233 RUBY VALLEY
A251 SHERMAN CREEK
A255 SHOSHONE-BEOWAWE
A287 STEPTOE VALLEY
A296 SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER
A320 UPPER HUMBOLDT RIVER-LOWER MARYS RIVER
A333 WARM SPRINGS

Central Mountains

A011 BARRETT CANYON
A030 BUTLER BASIN
A035 CAMP VALLEY
A041 CATHEDRAL CANYON
A042 CAVE VALLEY-UPPER WHITE RIVER VALLEY
A048 COMINS MEADOW
A055 CURRANT MOUNTAIN
A057 CURRIE GARDENS-TAYLOR CANYON
A059 DEEP CREEK RANGE
A060 DESATOYA MOUNTAINS
A061 DIAMOND PEAK
A063 DIAMOND VALLEY ALKALI FLAT
A065 DIXIE VALLEY
A068 DUCK CREEK RANGE-STEPTOE VALLEY
A091 FISH CREEK SPRINGS
A100 GIOCOECHEA WARM SPRINGS
A104 GOVERNMENT PEAK
A117 HORSESHOE BASIN
A145 KOBEH VALLEY
A172 MUDHOLE SPRING
A174 NEW PASS
A175 NEWARK LAKE
A212 POGONIP RIDGE
A227 REESE RIVER
A232 RUBY MOUNTAINS
A244 SCHELL CREEK RANGE
A245 SCHELLBOURNE PASS
A252 SHERMAN MOUNTAIN
A254 SHOSHONE RANGE-CARICO LAKE VALLEY
A261 SIMPSON PARK MOUNTAINS-NORTH TOIYABE
A267 SNAKE RANGE

A290	STONEBERGER BASIN
A293	SULLIVAN SPRING
A301	TELEGRAPH PEAK
A310	TOIYABE RANGE-BIG SMOKY VALLEY
A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
A316	TRAIL CANYON
A322	UPPER WHITE RIVER
A332	WARD MOUNTAIN
A340	WEST DEVILS GATE
A347	WHITE PINE RANGE
A348	WHITE RIVER VALLEY
A358	YELLAND DRY LAKE

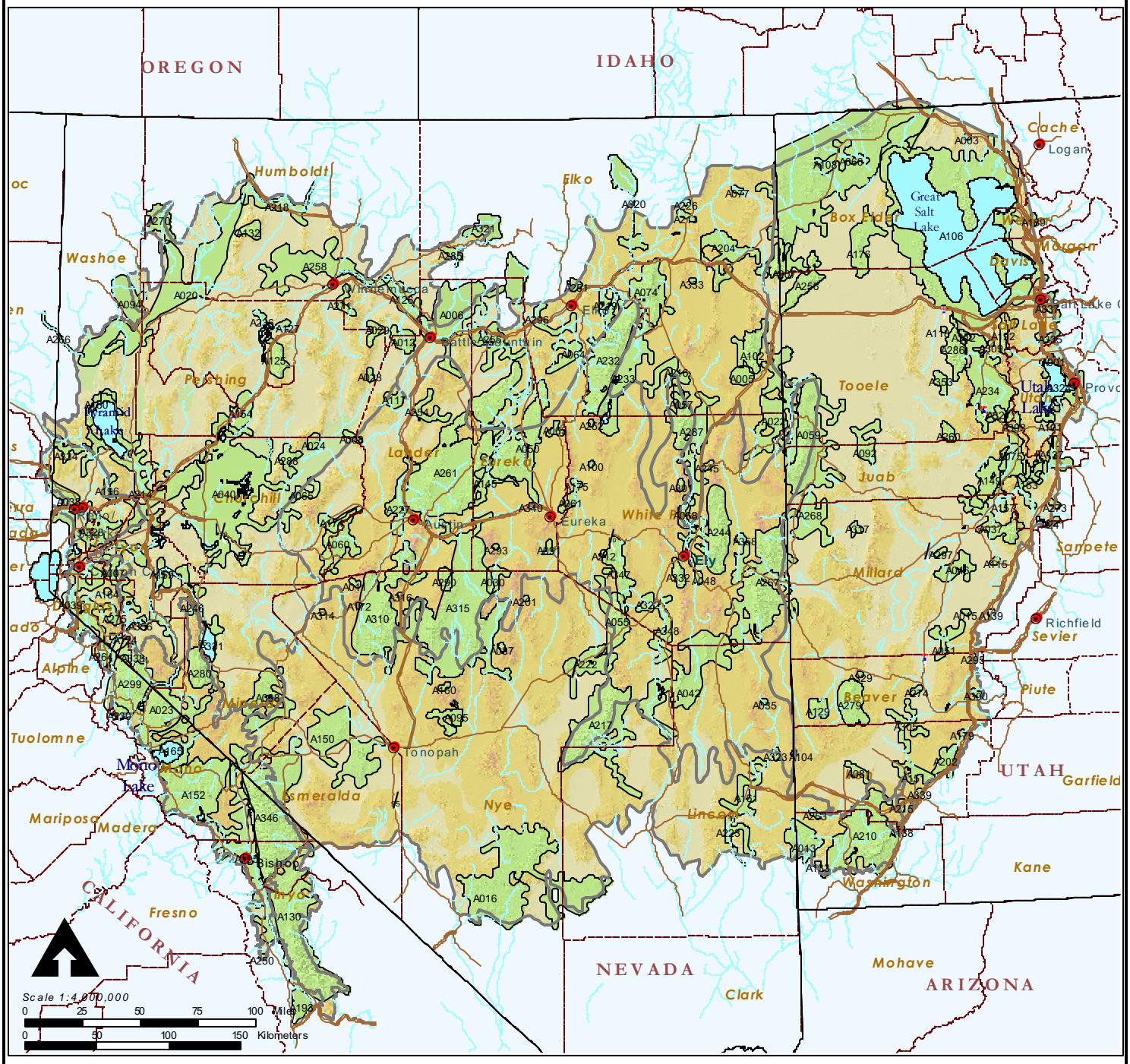
Tonopah

A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS
A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
A087	FANDANGO
A095	FOURMILE BASIN
A130	INYO MOUNTAINS
A133	JACKSON SPRING
A150	LONE MOUNTAIN-MONTE CRISTO RANGE
A160	MCKINNEY MOUNTAINS
A161	MEADOW VALLEY
A201	PARK RANGE
A210	PINE VALLEY MOUNTAINS
A217	QUINN CANYON RANGE-GRANT RANGE
A222	RAILROAD VALLEY
A223	RAINBOW CANYON
A253	SHOAL CREEK
A314	TOPIER CANYON
A323	URSINE

Bonneville Basin

A001	AMERICAN FORK
A003	ANDERSON HILL
A015	BEAVER RIDGE
A018	BLACK MOUNTAINS
A037	CANYON MOUNTAINS-DELTA
A043	CEDAR CITY JUNCTION
A046	CLEAR LAKE
A051	COVE CREEK
A066	DOVE CREEK HILLS
A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY
A081	ESCALANTE DESERT
A092	FISH SPRINGS
A101	GOSHEN-WARM SPRINGS
A106	GREAT SALT LAKE
A108	GROUSE CREEK MOUNTAINS-RAFT RIVER
A115	HOLDEN SAND DUNES
A118	HORSESHOE SPRINGS
A129	INDIAN PEAK
A137	JUAB VALLEY
A138	KANARRA
A139	KANOSH
A149	LITTLE SAHARA SAND DUNES
A151	LONE TREE-CEDAR VALLEY
A157	LYNNDYL SAND DUNES
A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
A176	NEWFOUNDLAND MOUNTAINS
A179	NORTH PAROWAN VALLEY
A189	OGDEN CANYON
A192	OQUIRRH MOUNTAINS
A202	PAROWAN VALLEY
A207	PILOT RANGE
A215	QUICHAPA LAKE
A234	RUSH VALLEY
A241	SAN PITCH MOUNTAINS
A256	SILVER ISLAND MOUNTAINS
A260	SIMPSON MOUNTAINS
A268	SNAKE VALLEY
A273	SOUTH JUAB VALLEY
A274	SOUTH MILFORD
A279	SOUTH WAH WAH MOUNTAINS
A286	STANSBURY MOUNTAINS
A295	SULPHURDALE
A297	SWAN LAKE SALT MARSH
A300	TABLE GROUNDS
A305	THERMAL HOT SPRINGS-ESCALANTE DESERT
A308	TINTIC MOUNTAINS
A309	TOD PARK
A312	TOOELE VALLEY
A317	TULE VALLEY
A324	UTAH LAKE
A327	VERNON
A329	WAH WAH SPRINGS
A335	WASATCH FRONT DRAPER
A336	WASATCH FRONT PROVO-SPRINGVILLE
A337	WASATCH FRONT SALT LAKE CITY
A339	WEST CEDAR CITY
A353	WILLOW PATCH SPRINGS

Figure 32. Portfolio sites with riparian and wetlands systems.



Portfolio sites

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.

G. Aquatics

Description

Great Basin aquatic ecological systems fall into four basic categories based on duration and movement of water—permanent standing, permanent flowing, ephemeral standing, and ephemeral flowing aquatic types. These categories are the basis for a preliminary aquatic classification system developed for the Great Basin ecoregion (table 31). However, it also was useful to describe them in nine familiar habitat types (table 31). Refinement of the preliminary aquatics classification system is needed for future iterations of the plan.

Terminal lakes, which are classic landscape features of the internally drained Great Basin, and montane pools and lakes are habitats of permanent standing waters. Rivers and their major tributaries, springs and springbrooks, low gradient streams, and high gradient streams are the four habitat types of permanent flowing waters. Playa lakes and smaller ephemeral pools are aquatic habitats of ephemeral standing waters. And, ephemeral or intermittent creeks and streams at all elevations are habitats of ephemeral flowing waters. The aquatic types occur in all geographic sections of the ecoregion and at all elevations. Although the ecoregion is a desert, terminal lakes cover almost 3% of its areal extent, which is just a bit less than the montane to alpine zonal system group.

Table 31. Ecological systems of the aquatics group with detailed aquatic types and subtypes, and general habitats.

Aquatics		
Ecological System	**Aquatic Types and (Subtypes)**	**General Habitat Categories***
Permanent Standing Waters	Highly Alkaline Terminal Lake (chloride, carbonate)	Terminal Lakes
	Slightly Alkaline Terminal Lake (chloride, carbonate)	
	Spring-fed Desert Lake	
	Spring Pool (cold, thermal, hot)	Springs & Springbrooks
	Desert Scrub Pool	Desert/Montane Pools & Lakes
	Montane Lake	
	Subalpine/Alpine Lake	
Permanent Flowing Waters	River & Major Tributary	Rivers & Major Tributaries
	Medium-size Runoff Stream	High-gradient Streams Low-gradient Streams
	Small-size Runoff Stream	
	Alpine Glacial-melt Stream	
	Medium-size Spring & Outflow Stream (cold, thermal, hot)	Springs & Springbrooks
	Small -size Spring & Outflow Stream (cold, thermal, hot)	
Ephemeral Standing Waters	Alkaline Playa Lake (chloride, carbonate, sulfide)	Ephemeral Playa Lakes
	Desert Scrub Pool	Ephemeral Pools
	Spring Pool & Seep	
	Rock Pool	
Ephemeral Flowing Waters	Spring Pool & Springbrook	Ephemeral Springbrooks, Creeks, & Streams
	Intermittent Desert Wash	
	Intermittent Scrub Stream	
	Intermittent Conifer Forest Stream	
	Intermittent Alpine Stream	

There are 151 species conservation targets in aquatic systems, the most number of target species of all system groups, which highlights the biological significance of aquatic systems within this desert ecoregion. The targets include amphibians, aquatic invertebrates, fishes, one mammal, and one reptile (table 32). Aquatic habitats occupy separate and often minute drainages within the Great Basin and are fully isolated from neighboring drainages. Isolation of aquatic habitats since the Pleistocene Epoch has provided a forum for the evolution of neo-endemics in terminal lakes, spring systems, streams, and rivers. Consequently, fishes and aquatic invertebrates are astoundingly diverse and rare in the Great Basin's desert environment (Hershler 1994; Hubbs and Miller 1948). Sixty-four percent of the targets are endemic to the ecoregion, and 78% are imperiled. Mollusks (primarily springsnails), which have been subjects of recent inventories, and fishes make up the majority of the endemic and imperiled species. Additionally, other aquatic invertebrates and amphibian targets are important because of their

dependence on specialized wet habitats. All of the ecoregion's amphibian targets occur in aquatic systems, as well as in the riparian and wetlands group.

Table 32. Conservation targets for the aquatics ecological systems organized by taxonomic group.

Common Name	Scientific Name	Grank	Ecoregional Distribution
Other Invertebrates			
MONO BRINE SHRIMP	ARTEMIA MONICA	G1	Endemic
(mayfly)	BAETISCA LACUSTRIS	G?	Disjunct
GIANT FAIRY SHRIMP	BRANCHINECTA GIGAS	?	Widespread, specialist
	CAENIS LATIPENNIS	G?	Disjunct
(stonefly)	CAPNIA HORNIGI	G1	Endemic
INYO MOUNTAIN STONEFLY	CAPNIA INYO	G2?	Limited
MONO WINTER STONEFLY	CAPNIA MONO	G2	Limited
UINTAH WINTER STONEFLY	CAPNIA UINTAHI	G?	Disjunct, specialist
COMMON WINTER STONEFLY	CAPNURA INTERMONTANA	G?	Limited
(stonefly)	CAPNURA WANICA	G?	Disjunct
UTAH HYDROPORUS DIVING BEETLE	HYDROPORUS UTAHENSIS	G1	Endemic
	HYDROSCAPHA NATANS	?	Limited
TRAVERTINE BAND-THIGH DIVING BEETLE	HYGROTUS FONTINALIS	G1	Endemic
	NITZSCHIA MONOENSIS	?	Endemic
	POTAMOCYPRIS SSP. NOV	?	Endemic?
(stonefly)	PTERONARCYS PRINCEPS	G4	Peripheral, specialist
	STYGOBROMUS SSP. NOV	?	Endemic
WINTER STONEFLY	UTACAPNIA LEMONIANA	G?	Disjunct, specialist
	UTAPERLA SOPLADORA	G?	Disjunct
Mollusks			
CALIFORNIA FLOATER	ANODONTA CALIFORNIENSIS	G3G4	Widespread, declining
STEPTOE HYDROBE	EREMOPYRGUS EGANENSIS	G1	Endemic
DALL PEBBLESNAIL	FLUMINICOLA DALLI	G1	Endemic
BONNEVILLE BASIN PEBBLESNAIL	FLUMINICOLA SP 21	G2	Limited?
(PEBBLESNAIL)	FLUMINICOLA TURBINIFORMIS	?	Limited
VIRGINIA MOUNTAINS PEBBLESNAIL	FLUMINICOLA VIRGINIUS	G1	Endemic
DEEP SPRINGS FONTELICELLA	FONTELICELLA SP	G1	Endemic
	PHYSA MEGALOCHLAMYS	G3	Unknown
	PHYSA SKINNERI	G?	Unknown
UTAH PHYSA	PHYSELLA UTAHENSIS	G1	Limited
COARSE RAMS-HORN	PLANORBELLA BINNEYI	G?	Unknown
LAMB RAMS-HORN	PLANORBELLA OREGONENSIS	G2	Peripheral or Limited
SHARP SPRITE	PROMENETUS EXACUOUS	G?	Peripheral
BENTON VALLEY (=AAHRDAHL'S) SPRINGSNAIL	PYRGULOPSIS AARDAHLI	G1	Endemic
DUCKWATER SPRINGSNAIL	PYRGULOPSIS ALOBA	G1	Endemic
SOUTHERN DUCKWATER SPRINGSNAIL	PYRGULOPSIS ANATINA	G1	Endemic
LONGITUDINAL GLAND SPRINGSNAIL	PYRGULOPSIS ANGUINA	G1	Endemic
ELONGATE CAIN SPRING SPRINGSNAIL	PYRGULOPSIS AUGUSTAE	G1	Endemic
PLEASANT VALLEY SPRINGSNAIL	PYRGULOPSIS AURATA	G1	Endemic
LARGE GLAND CARICO SPRINGSNAIL	PYRGULOPSIS BASIGLANS	G1	Endemic
SMALL GLAND CARICO SPRINGSNAIL	PYRGULOPSIS BIFURCATA	G1	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
FLAG SPRINGSNAIL	PYRGULOPSIS BREVILOBA	G1	Endemic
BRUE'S SPRINGSNAIL	PYRGULOPSIS BRUESI	G1	Endemic
	PYRGULOPSIS BRYANTWALHERI	G1	Endemic
TRANSVERSE GLAND SPRINGSNAIL	PYRGULOPSIS CRUCIGLANS	G1	Endemic
DIXIE VALLEY SPRINGSNAIL	PYRGULOPSIS DIXENSIS	G1	Endemic
	PYRGULOPSIS EREMICA	?	Limited
EMIGRANT SPRINGSNAIL	PYRGULOPSIS GRACILIS	G1	Endemic
HAMLIN VALLEY SPRINGSNAIL	PYRGULOPSIS HAMLINENSIS	G1	Endemic
UPPER THOUSAND SPRING SPRINGSNAIL	PYRGULOPSIS HOVINGHI	G1	Endemic
HUBBS SPRINGSNAIL	PYRGULOPSIS HUBBSI	G1	Endemic
HUMBOLDT SPRINGSNAIL	PYRGULOPSIS HUMBOLDTENSIS	G1	Limited
	PYRGULOPSIS IMPERIALIS	G1	Endemic
TOQUERVILLE SPRINGSNAIL	PYRGULOPSIS KOLOBENSIS	G?	Limited
LANDYES SPRINGSNAIL	PYRGULOPSIS LANDYEI	G1	Endemic
BUTTERFIELD SPRINGSNAIL	PYRGULOPSIS LATA	G1	Endemic
CRITTENDEN SPRINGSNAIL	PYRGULOPSIS LENTIGLANS	G1	Endemic
ELKO SPRINGSNAIL	PYRGULOPSIS LEPORINA	G1	Endemic or Limited
SQUAT MUD MEADOWS SPRINGSNAIL	PYRGULOPSIS LIMARIA	G1	Endemic
LOCKES SPRINGSNAIL	PYRGULOPSIS LOCKENSIS	G1	Endemic
	PYRGULOPSIS LONGAE	G1	Endemic
WESTERN LAHONTAN SPRINGSNAIL	PYRGULOPSIS LONGIGLANS	G2G3	Endemic
HARDY SPRINGSNAIL	PYRGULOPSIS MARCIDA	G2	Endemic
PAHRANAGAT PEBBLESNAIL	PYRGULOPSIS MERRIAMI	G1	Endemic
	PYRGULOPSIS MICROCOCCUS	G3?	Limited
NORTHERN SOLDIER MEADOW SPRINGSNAIL	PYRGULOPSIS MILITARIS	G1	Limited
TWENTYONE MILE SPRINGSNAIL	PYRGULOPSIS MILLENARIA	G1	Endemic
CAMP VALLEY SPRINGSNAIL	PYRGULOPSIS MONTANA	G1	Endemic
NERITIFORM STEPTOE RANCH SPRINGSNAIL	PYRGULOPSIS NERITELLA	G1	Endemic
NINEMILE SPRINGSNAIL	PYRGULOPSIS NONARIA	G?	Endemic
ELONGATE MUD MEADOWS SPRINGSNAIL	PYRGULOPSIS NOTIDICOLA	G1	Endemic
SUB-GLOBOSE STEPTOE RANCH SPRINGSNAIL	PYRGULOPSIS ORBICULATA	G1	Endemic
OWENS VALLEY SPRINGSNAIL	PYRGULOPSIS OWENSENSIS	G1G2,G1	Endemic
BIG WARM SPRING SPRINGSNAIL	PYRGULOPSIS PAPILLATA	G1	Endemic
BIFID DUCT SPRINGSNAIL	PYRGULOPSIS PECULIARIS	G?,G2?	Endemic
ANTELOPE VALLEY SPRINGSNAIL	PYRGULOPSIS PELLITA	G1	Endemic
FISH SLOUGH SPRINGSNAIL	PYRGULOPSIS PERTURBATA	G1G2	Endemic
OVATE CAIN SPRING SPRINGSNAIL	PYRGULOPSIS PICTILIS	G1	Endemic
FLAT-TOPPED STEPTOE SPRINGSNAIL	PYRGULOPSIS PLANULATA	G1	Endemic
SADA'S SPRINGSNAIL	PYRGULOPSIS SADAI	G1G2	Endemic
WHITE RIVER VALLEY SPRINGSNAIL	PYRGULOPSIS SATHOS	G1G2	Endemic
SUB-GLOBOSE SNAKE SPRINGSNAIL	PYRGULOPSIS SAXATILIS	G1	Endemic
NORTHERN STEPTOE SPRINGSNAIL	PYRGULOPSIS SERRATA	G1	Endemic
STERILE BASIN SPRINGSNAIL	PYRGULOPSIS STERILIS	G1	Endemic
LAKE VALLEY SPRINGSNAIL	PYRGULOPSIS SUBLATA	G1	Endemic
SOUTHERN STEPTOE SPRINGSNAIL	PYRGULOPSIS SULCATA	G1	Endemic
SOUTHERN BONNEVILLE SPRINGSNAIL	PYRGULOPSIS TRANSVERSA	G?	Endemic or Limited
SOUTHERN SOLDIER MEADOW	PYRGULOPSIS UMBILICATA	G1	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
SPRINGSNAIL			
NORTHWEST BONNEVILLE SPRINGSNAIL	PYRGULOPSIS VARIEGATA	G2	Limited
DUCKWATER WARM SPRINGS SPRINGSNAIL	PYRGULOPSIS VILLACAMPAE	G1	Endemic
VINYARD'S SPRINGSNAIL	PYRGULOPSIS VINYARDI	G1	Endemic?
WONG'S SPRINGSNAIL	PYRGULOPSIS WONGI	G1G2	Endemic or Limited
FAT-WHORLED PONDSNAIL	STAGNICOLA BONNEVILLENSIS	G1	Endemic
GRATED TYRONIA	TRYONIA CLATHRATA	G2	Peripheral or Limited
MONITOR VALLEY TRYONIA	TRYONIA MONITORAE	G1	Endemic
DESERT TRYONIA	TRYONIA PROTEA	G3G4	Widespread, specialist
DESERT VALVATA	VALVATA UTAHENSIS	G1	Limited?
Fishes			
DESERT SUCKER	CATOSTOMUS CLARKI	G3G4	Widespread
WHITE RIVER DESERT SUCKER	CATOSTOMUS CLARKI INTERMEDIUS	G3G4T1T2Q	Endemic
MEADOW VALLEY WASH DESERT SUCKER	CATOSTOMUS CLARKI SSP. 2	G3G4T2	Endemic
OWENS SUCKER	CATOSTOMUS FUMEIVENTRIS	G3	Endemic
CUI-UI	CHASMISTES CUJUS	G1	Endemic
JUNE SUCKER	CHASMISTES LIORUS	G1	Endemic
WHITE RIVER MOTTLED SCULPIN	COTTUS SP. 3 (BAIRDI)	G1	Endemic
PRESTON WHITE RIVER SPRINGFISH	CRENICHTHYS BAILEYI ALBIVALLIS	G2T1	Endemic
HIKO WHITE RIVER SPRINGFISH	CRENICHTHYS BAILEYI GRANDIS	G2T1	Limited
MOORMAN WHITE RIVER SPRINGFISH	CRENICHTHYS BAILEYI THERMOPHILUS	G2T1	Endemic
RAILROAD VALLEY SPRINGFISH	CRENICHTHYS NEVADAE	G2	Endemic
OWENS PUPFISH	CYPRINODON RADIOSUS	G1	Limited
PAHRUMP POOLFISH	EMPETRICHTHYS LATOS LATOS	G1T1	Introduced
DESERT DACE	EREMICHTHYS ACROS	G1	Endemic
INDEPENDENCE VALLEY TUI CHUB	GILA BICOLOR ISOLATA	G4T1	Endemic
DUCKWATER CREEK TUI CHUB (also, HOT CREEK TUI CHUB, RAILROAD VALLEY TUI CHUB)	GILA BICOLOR NEVADAE	G4T1	Endemic?
NEWARK VALLEY TUI CHUB/FISH CREEK SPRINGS TUI CHUB	GILA BICOLOR NEWARKENSIS	G4T1	Endemic
OWENS TUI CHUB	GILA BICOLOR SNYDERI	G4T1	Limited
CHARNOCK SPRINGS TUI CHUB	GILA BICOLOR SSP. 10	G4TH	Endemic
FISH LAKE VALLEY TUI CHUB	GILA BICOLOR SSP. 4	G4T1	Endemic
LITTLE FISH LAKE VALLEY TUI CHUB	GILA BICOLOR SSP. 6	G4T1	Endemic?
BIG SMOKY VALLEY TUI CHUB	GILA BICOLOR SSP. 8	G4T1	Endemic
DIXIE VALLEY TUI CHUB	GILA BICOLOR SSP. 9	G4T1	Endemic?
LEATHERSIDE CHUB	GILA COPEI	G3G4	Limited?
BONYTAIL CHUB	GILA ELEGANS	G1	Peripheral or Limited
PAHRANAGAT ROUNDTAIL CHUB	GILA ROBUSTA JORDANI	G3T1	Limited
LEAST CHUB	IOTICHTHYS PHLEGETHONTIS	G1	Limited
WHITE RIVER SPINEDACE	LEPIDOMEDA ALBIVALLIS	G1	Endemic
VIRGIN SPINEDACE	LEPIDOMEDA MOLLISPINIS	G1	Limited
BIG SPRING SPINEDACE	LEPIDOMEDA MOLLISPINIS PRATENSIS	G1T1	Endemic
LAHONTAN CUTTHROAT TROUT	ONCORHYNCHUS CLARKI HENSHAWI	G4T2,T3,G4T3	Limited
PAIUTE CUTTHROAT TROUT	ONCORHYNCHUS CLARKI SELENIRIS	G4T1T2	Limited
BONNEVILLE CUTTHROAT TROUT	ONCORHYNCHUS CLARKI UTAH	G4T2	Endemic?
RELICT DACE	RELICTUS SOLITARIUS	G2G3	Endemic
LAHONTAN SPECKLED DACE	RHINCHTHYS OSCULUS ROBUSTUS	?	Endemic

Common Name	Scientific Name	Grank	Ecoregional Distribution
BIG SMOKY VALLEY SPECKLED DACE	RHINICHTHYS OSCULUS LARIVERSI	G5T1	Endemic
INDEPENDENCE VALLEY SPECKLED DACE	RHINICHTHYS OSCULUS LETHOPORUS	G5T1	Endemic
CLOVER VALLEY SPECKLED DACE	RHINICHTHYS OSCULUS OLIGOPORUS	G5T1	Endemic
BENTON VALLEY SPECKLED DACE	RHINICHTHYS OSCULUS SSP. BV	G5T1	Endemic
LONG VALLEY SPECKLED DACE	RHINICHTHYS OSCULUS SSP.	G5T1	Endemic
MEADOW VALLEY SPECKLED DACE	RHINICHTHYS OSCULUS SSP. 2 MV	G5T2	Limited
OWEN'S SPECKLED DACE	RHINICHTHYS OSCULUS SSP. 2 OW	G5T1T2	Limited
WHITE RIVER SPECKLED DACE	RHINICHTHYS OSCULUS SSP. 7	G5T2T3	Endemic
PAHRANAGAT SPECKLED DACE (also PAHRANAGAT DACE)	RHINICHTHYS OSCULUS VELIFER	G5T1	Endemic?
MONITOR VALLEY SPECKLED DACE	RHINICHTHYS OSCULUS	G5T1	Endemic
Amphibians			
INYO MOUNTAINS SLENDER SALAMANDER	BATRACHOSEPS CAMPI	G2	Endemic?
BLACK TOAD	BUFO EXSUL	G1	Endemic
OWENS VALLEY WEB-TOED SALAMANDER	HYDROMANTES SP.1	G1?	Limited
TOIYABE SPOTTED FROG	RANA LUTEIVENTRIS SSP.	G4T?	Endemic
MOUNTAIN YELLOW-LEGGED FROG	RANA MUSCOSA	G3	Peripheral
NORTHERN LEOPARD FROG	RANA PIPIENS SSP.	G5T?	Endemic
Reptiles			
NORTHWESTERN POND TURTLE	CLEMMYS MARMORATA MARMORATA	G3T3	Disjunct
Mammals			
HUMBOLDT RIVER OTTER	LUTRA CANADENSIS NEXA	?	Limited
Aquatic Ecological Systems			
ALKALINE PLAYA LAKE, CARBONATE WATERS			
ALKALINE PLAYA LAKE, CHLORIDE WATERS			
ALKALINE PLAYA LAKE, SULFIDE WATERS			
ALPINE GLACIAL-MELT STREAM			
DESERT SCRUB POOL			
EPHEMERAL DESERT SCRUB POOL			
EPHEMERAL ROCK POOL			
EPHEMERAL SPRING POOL & SEEP			
HIGHLY ALKALINE TERMINAL LAKE, CARBONATE WATERS			
HIGHLY ALKALINE TERMINAL LAKE, CHLORIDE WATERS			
INTERMITTENT ALPINE STREAM			
INTERMITTENT CONIFER FOREST STREAM			
INTERMITTENT DESERT WASH			
INTERMITTENT SCRUB STREAM			
MEDIUM-SIZE RUNOFF STREAM			
MEDIUM-SIZE SPRING & OUTFLOW STREAM, COLD SPRING & SPRINGBROOK			
MEDIUM-SIZE SPRING & OUTFLOW STREAM, HOT SPRING & SPRINGBROOK			
MEDIUM-SIZE SPRING & OUTFLOW STREAM, THERMAL SPRING & SPRINGBROOK			
MONTANE LAKE			
RIVER & MAJOR TRIBUTARY			
SLIGHTLY ALKALINE TERMINAL LAKE, CARBONATE WATERS			
SLIGHTLY ALKALINE TERMINAL LAKE, CHLORIDE WATERS			
SMALL-SIZE RUNOFF STREAM			
SMALL-SIZE SPRING & OUTFLOD STREAM, COLD SPRING & SPRINGBROOK			
SMALL-SIZE SPRING & OUTFLOD STREAM, HOT SPRING & SPRINGBROOK			

Common Name	Scientific Name	Grank	Ecoregional Distribution
SMALL-SIZE SPRING & OUTFLOD STREAM, THERMAL SPRING & SPRINGBROOK			
SPRING POOL & SPRINGBROOK			
SPRING POOL, COLD SPRING			
SPRING POOL, HOT SPRING			
SPRING POOL, THERMAL SPRING			
SPRING-FED DESERT LAKE			
SUBALPINE/ALPINE LAKE			

Terminal lakes are unique to the Basin and Range province, which includes the Great Basin, Columbia Plateau, and Mojave Desert ecoregions. The largest terminal lakes occur in the Great Basin. All of the Great Basin's terminal lakes are biologically important. The largest ones are Great Salt Lake, Pyramid Lake, Mono Lake, Walker Lake, and Utah Lake. Additionally, Stillwater Marsh and Ruby Lakes are smaller, biologically important terminal aquatic systems. Water and salinity levels in these lakes have varied since the wet pluvial period of the last ice age. Highly alkaline terminal lakes, such as Great Salt Lake and Mono Lake are fishless, while the slightly alkaline lakes harbor unique fishes. The littoral zone, or near-shore lake bottom area, of terminal lakes are microhabitats for brine flies and brine shrimp.

Playa lakes intermittently fill with water creating seasonal wetlands and aquatic habitats. They are in numerous valleys in this ecoregion and sometimes extensive. The largest Great Basin playa is the Black Rock Desert, > 404,700 ha (> 1 million ac) in extent. Bonneville Salt Flats, Carson Sink, Humboldt Sink, and Sevier Desert are other large examples. Ephemeral bodies of standing water teem with life temporarily and become important ecologically for migrating and resident shorebirds and water birds. Crustaceans and insects explode in numbers and provide temporary foraging for opportunistic birds.

Springs and springbrooks are prevalent thoughout the ecoregion, but they are generally small and isolated, occurring individually or in spring complexes. They may be cold, thermal, or hot. They often have rare and endemic faunas.

Conservation Issues and Threats

Great Basin fishes and other aquatic life have a tenuous hold on survival under natural conditions because their desert environment is harsh. Streams are small and experience a wide range of temperature fluctuations from 32 to 90ºF, dissolved oxygen concentrations can be very low, and discharge ranges from torrents to trickles (Sada 2000). Terminal and playa lakes are alkaline, physiologically stressful, and periodically dry. Human-caused stresses to aquatic systems have aggravated their predicament. Almost all aquatic habitats have been physically or biologically altered.

Habitat modification, from diversions, dams, channeled waterways, and overgrazed riparian corridors, is the greatest threat to fishes (Deacon 1979). Competition, predation, and hybridization, primarily from the introduction of exotic species, is the second greatest threat to desert fishes. Non-native fish, such as rainbow trout, brown trout, largemouth bass, mosquitofish, and most species of sunfish, have been abundantly introduced. Ground water reserves are pumped at rates greatly exceeding natural aquifer recharge rates resulting in depleted aquifers and reduced habitats.

Flows of many Great Basin streams are diverted before they reach terminal lakes. This has caused some to become more saline (Walker Lake) or to completely dry up (Winnemucca Lake and Sevier Lake). Agricultural diversions of the Truckee River reduced flows more than 50% which caused Pyramid Lake levels to decline more than 70 ft and created a delta at the river's mouth. The delta blocked spawning fish passage to the river while lowered flows and higher river temperatures caused fish egg mortality. Recent management actions and higher than average precipitation and runoff have reversed some declining trends.

Grazing has removed riparian and upland vegetation, caused trampled banks, altered stream courses, and caused more frequent and more violent flooding because of destabilized watersheds. The habitats of Paiute, Lahontan and Bonneville cutthroat trout have been negatively impacted by livestock grazing, which has been cited as a primary cause of declining numbers for all three trout (Horning 1996). Paiute cutthroat trout also have declined because of hybridization with rainbow and Lahontan cutthroat trout.

Numerous small isolated aquatic systems mean that large conservation areas are not possible. Because water is scarce in the desert and people take an inordinate amount from natural systems, ground water and surface water issues are complex and expensive to resolve.

The health of aquatic habitats, especially those in desert environments, continues to decline (Williams *et al*. 1989). As a consequence, an increasing number of desert fishes are being federally listed while none has warranted removal from the federal list because of successful recovery. Conservation activities need to focus more on entire aquatic systems, rather than the traditional species orientation, to reverse this trend (Williams *et al*. 1989). In very rare situations where aquatic species are critically imperiled and in jeopardy of extinction, a possible necessary component to habitat restoration is establishment of temporary refugia (Andersen and Deacon 1996).

System Conservation Goals and Viability

Because of the scarcity of aquatic habitats in the Great Basin and their importance for numerous conservation targets, our conservation goals are strict. We set conservation goals at 100% of all known viable and feasibly restorable occurrences of aquatic species targets. For aquatic habitats that were noted as important for their biological value, we also set 100% conservation goals because of their limited extent within this desert ecoregion. Aquatic habitats noted for their biological importance included habitats that harbored aquatic species conservation targets, habitats with a noted diversity of aquatic species or fish assemblages that individually were not necessarily conservation targets, and habitats that harbored aquatic species indicative of healthful, high quality water. Stratification is not an issue for setting goals.

Portfolio Results

The portfolio includes 164 sites identified for ecological systems and species targets of the aquatics group. Table 33 lists the sites in this system group by geographic section and their locations are given in figure 33. Refer to appendix 10 for conservation targets and attributes for each site.

Highlighted significant aquatics sites include:

CARSON SINK (A040)—Lahontan Valley has globally significant concentrations of Wilson's phalarope, eared grebe, and American avocet; 10-100 million migratory birds; part of the Western Hemispheric Shorebird Reserve Network; excellent example of large ephemeral terminal playa lake; includes sand dune systems with 12 obligate beetles and several dune plants.
GREAT SALT LAKE (A106)—largest terminal lake; largest breeding colony of California gulls; largest concentrations of migratory waterbirds (Wilson's phalarope, eared grebe, and American avocet); part of the Western Hemispheric Shorebird Reserve Network; includes several aquatic mollusk genera.
MONO LAKE (A165)—fishless terminal lake with endemic Mono Lake brine shrimp; nearly a million migratory birds depend on alkali flies and brine shrimp; up to 750,000 eared grebes gather at one time in the fall before migrating south; part of the Western Hemispheric Shorebird Reserve Network; includes sand dune system with suite of 12 obligate beetles; Indiana Summit has 64,000 ac of nearly pure Jeffrey pine woodland on pumice soils.
PYRAMID LAKE-LOWER TRUCKEE RIVER (A214)—Pyramid Lake is premier example of terminal lake with fish; endemic cui-ui and Hardscrabble springsnail; large American white pelican colony with about 25,000 individuals; high diversity of small mammals (heteromyids) and very important for diversity of bats; see also riparian and wetlands highlights.
RUBY VALLEY (A233)—Ruby Marshes is largest example of spring-fed terminal lake with densest concentration of redheads in the world (20,000 pairs); Franklin Lake is the best unaltered ephemeral wetland with more than a quarter million water birds and shorebirds; Sulphur Hot Springs has endemic aquatic invertebrate and plant.
SOLDIER MEADOWS (A270)—hot springs complex with endemic desert dace and five endemic or limited springsnails (squat Mud Meadows, western Lahontan, northern Soldier Meadows, elongate Mud Meadows, and southern Soldier Meadows springsnails); best populations of Soldier Meadows cinquefoil.
WHITE RIVER VALLEY (A348)—isolated endemic fishes, including White River desert sucker, White River mottled sculpin, Preston White River springfish, Moorman White River springfish, and White River speckled dace; isolated endemic springsnails, including Emigrant, Butterfield, Hardy, Pahranagat, and White River Valley springsnails; basin floors include alkaline substrate habitats for endemic plants and butterflies.

Table 33. Great Basin portfolio sites identified for aquatic ecological systems.

California

A023	BODIE HILLS
A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
A039	CARSON RIVER
A128	HUNTOON SPRING
A152	LONG VALLEY
A165	MONO LAKE
A194	OWENS RIVER GORGE
A195	OWENS VALLEY-BENTON VALLEY
A230	RICKEY PEAK
A264	SLINKARD VALLEY
A280	SOUTH WASSUK RANGE
A299	SWEETWATER MOUNTAINS
A334	WARM SPRINGS VALLEY
A338	WELLINGTON HILLS
A346	WHITE MOUNTAINS

Lahontan Basin

A007	ARTESIA LAKE-EAST PINE NUT MOUNTAINS
A008	AUGUSTA MOUNTAINS
A012	BATTLE MOUNTAIN
A020	BLACK ROCK DESERT-SMOKE CREEK DESERT
A028	BUFFALO SPRINGS
A034	CALICO HILLS
A040	CARSON SINK
A058	DAISY CREEK

A094	FLY RANCH GEYSER-GRANITE RANGE
A098	GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
A127	HUMBOLDT RIVER IMLAY
A132	JACKSON MOUNTAINS
A159	MASON VALLEY
A166	MONTANA MOUNTAINS
A180	NORTH PYRAMID LAKE
A200	PARADISE VALLEY
A211	PLEASANT VALLEY
A214	PYRAMID LAKE-LOWER TRUCKEE RIVER
A238	SAHWAVE MOUNTAINS-LAKE RANGE
A247	SEVENMILE SPRING
A258	SILVER STATE SAND DUNES
A266	SMOKE CREEK
A270	SOLDIER MEADOWS
A281	SPRING CREEK
A285	SQUAW VALLEY
A321	UPPER ROCK CREEK
A331	WALKER LAKE-WALKER RIVER
A357	WINNEMUCCA LAKE

North Central

A005	ANTELOPE VALLEY
A006	ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
A022	BLUE LAKES-BADLANDS
A025	BOONE SPRING
A050	CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE
A064	DIXIE CREEK
A074	EAST HUMBOLDT RANGE
A077	EIGHTEEN MILE MARSH
A102	GOSHUTE MOUNTAINS
A121	HOT SPRINGS CREEK
A158	MAGGIE CREEK
A193	OWENS LAKE
A204	PEQUOP MOUNTAINS-TOANO DRAW
A213	PRATHER SPRINGS
A216	QUILICI SPRING-BUTTE VALLEY
A219	RABBIT CREEK
A233	RUBY VALLEY
A251	SHERMAN CREEK
A255	SHOSHONE-BEOWAWE
A287	STEPTOE VALLEY
A296	SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER
A303	THE NARROWS
A320	UPPER HUMBOLDT RIVER-LOWER MARYS RIVER
A333	WARM SPRINGS

Central Mountains

A030	BUTLER BASIN
A035	CAMP VALLEY
A042	CAVE VALLEY-UPPER WHITE RIVER VALLEY
A055	CURRANT MOUNTAIN
A057	CURRIE GARDENS-TAYLOR CANYON
A059	DEEP CREEK RANGE
A060	DESATOYA MOUNTAINS
A061	DIAMOND PEAK
A063	DIAMOND VALLEY ALKALI FLAT
A068	DUCK CREEK RANGE-STEPTOE VALLEY
A079	ELLISON CREEK
A091	FISH CREEK SPRINGS
A093	FLAT SPRING
A100	GIOCOECHEA WARM SPRINGS
A109	HANDY SPRING
A122	HOT SPRINGS HILL
A153	LOOKOUT SPRINGS
A162	MELOY SPRING
A169	MOUNT LEWIS
A174	NEW PASS
A227	REESE RIVER
A232	RUBY MOUNTAINS
A244	SCHELL CREEK RANGE
A254	SHOSHONE RANGE-CARICO LAKE VALLEY
A261	SIMPSON PARK MOUNTAINS-NORTH TOIYABE
A267	SNAKE RANGE
A282	SPRING VALLEY CREEK
A290	STONEBERGER BASIN
A293	SULLIVAN SPRING
A310	TOIYABE RANGE-BIG SMOKY VALLEY
A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
A316	TRAIL CANYON
A322	UPPER WHITE RIVER
A347	WHITE PINE RANGE
A348	WHITE RIVER VALLEY
A349	WHITE ROCK MOUNTAINS

Tonopah

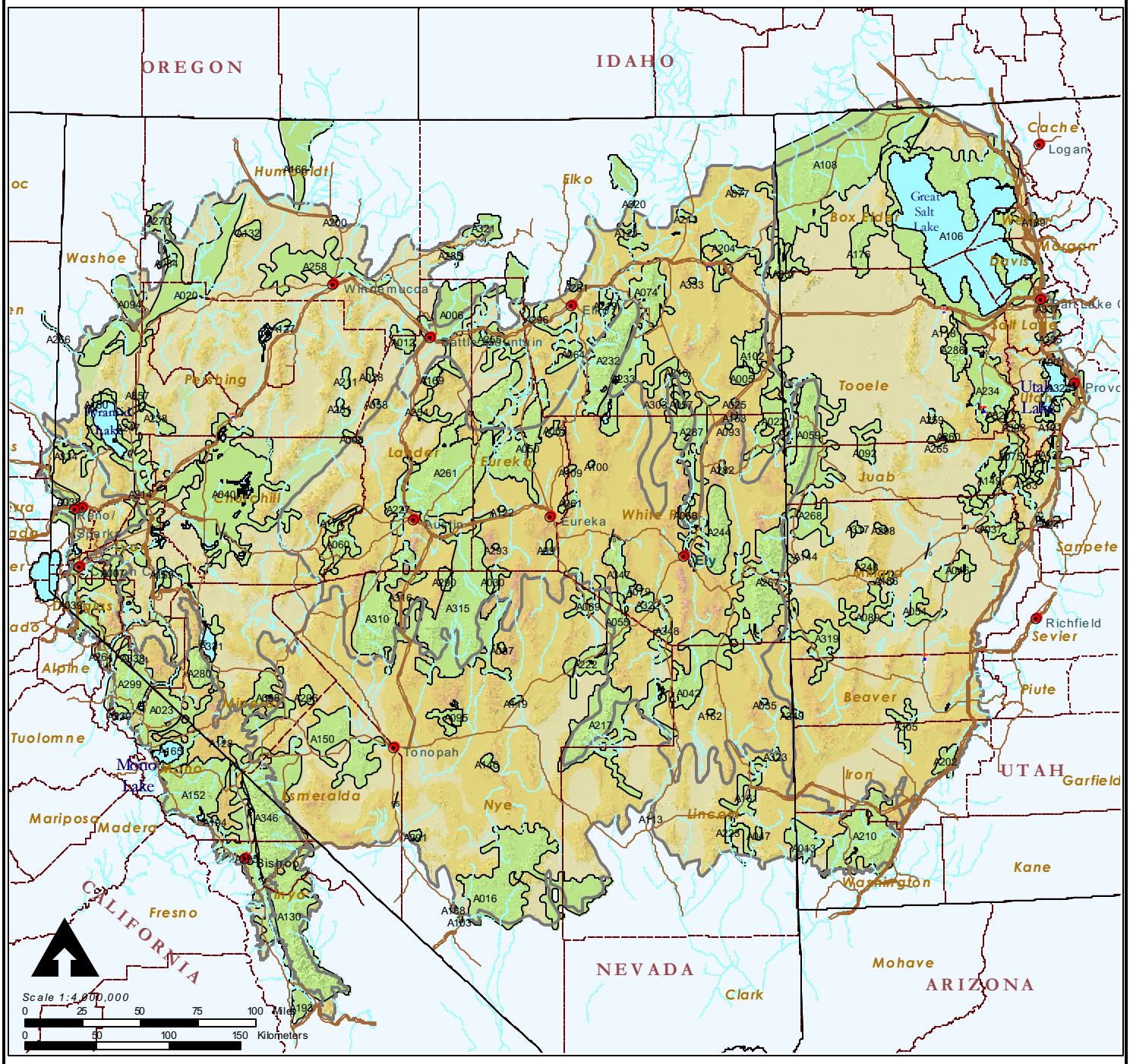
A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS

A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
A047	CLOVER CREEK
A069	DUCKWATER VALLEY
A087	FANDANGO
A095	FOURMILE BASIN
A103	GOSS SPRINGS
A113	HIKO SPRING
A119	HOT CREEK VALLEY
A130	INYO MOUNTAINS
A140	KAWICH RANGE
A150	LONE MOUNTAIN-MONTE CRISTO RANGE
A161	MEADOW VALLEY
A188	OASIS VALLEY
A206	PILOT MOUNTAINS
A210	PINE VALLEY MOUNTAINS
A217	QUINN CANYON RANGE-GRANT RANGE
A222	RAILROAD VALLEY
A223	RAINBOW CANYON
A291	STONEWALL MOUNTAIN
A323	URSINE

Bonneville Basin

A001	AMERICAN FORK
A017	BLACK HILLS
A037	CANYON MOUNTAINS-DELTA
A046	CLEAR LAKE
A054	CRICKET MOUNTAINS
A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY
A089	FERGUSON DESERT-TULE VALLEY
A092	FISH SPRINGS
A101	GOSHEN-WARM SPRINGS
A106	GREAT SALT LAKE
A108	GROUSE CREEk MOUNTAINS – RAFT R.
A118	HORSESHOE SPRINGS
A137	JUAB VALLEY
A144	KNOLL SPRINGS
A149	LITTLE SAHARA SAND DUNES
A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
A176	NEWFOUNDLAND MOUNTAINS
A186	NORTHWEST SEVIER LAKE
A189	OGDEN CANYON
A202	PAROWAN VALLEY
A207	PILOT RANGE
A234	RUSH VALLEY
A241	SAN PITCH MOUNTAINS
A243	SAWTOOTH MOUNTAIN
A248	SEVIER BRIDGE RESERVOIR
A259	SIMPSON BUTTES
A260	SIMPSON MOUNTAINS
A265	SLOW ELK HILLS
A268	SNAKE VALLEY
A286	STANSBURY MOUNTAINS
A298	SWASEY MOUNTAIN
A305	THERMAL HOT SPRINGS-ESCALANTE DESERT
A308	TINTIC MOUNTAINS
A317	TULE VALLEY
A319	TUNNEL SPRING MOUNTAINS-HALFWAY
A324	UTAH LAKE
A327	VERNON
A335	WASATCH FRONT DRAPER
A336	WASATCH FRONT PROVO-SPRINGVILLE
A337	WASATCH FRONT SALT LAKE CITY

Figure 33. Portfolio sites with aquatic systems.



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IV. APPENDICES

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APPENDIX 1. Great Basin Alliances and Associations Organized by Ecological Systems

Alliance	*Association*	*Grank*
Playa Lake		
DISTICHLIS SPICATA INTERMITTENTLY FLOODED HERBACEOUS ALLIANCE	DISTICHLIS SPICATA - LEPIDIUM PERFOLIATUM HERBACEOUS VEGETATION	GM
SUAEDA MOQUINII INTERMITTENTLY FLOODED SHRUBLAND ALLIANCE	SUAEDA MOQUINII SHRUBLAND	G5
SPOROBOLUS AIROIDES INTERMITTENTLY FLOODED HERBACEOUS ALLIANCE	SPOROBOLUS AIROIDES - DISTICHLIS SPICATA HERBACEOUS VEGETATION	G3G5
SPARTINA GRACILIS SEASONALLY FLOODED HERBACEOUS ALLIANCE	SPARTINA GRACILIS HERBACEOUS VEGETATION	GU
DISTICHLIS SPICATA INTERMITTENTLY FLOODED HERBACEOUS ALLIANCE	DISTICHLIS SPICATA - JUNCUS BALTICUS HERBACEOUS VEGETATION	G?
	DISTICHLIS SPICATA HERBACEOUS VEGETATION	G5
DISTICHLIS SPICATA - (HORDEUM JUBATUM) TEMPORARILY FLOODED HERBACEOUS ALLIANCE	DISTICHLIS SPICATA MIXED HERB HERBACEOUS VEGETATION	G3G5
PLUCHEA SERICEA SEASONALLY FLOODED SHRUBLAND ALLIANCE	PLUCHEA SERICEA SHRUBLAND [PROVISIONAL]	G3?
SPARSE VEGETATION	GREAT BASIN PLAYA LAKE BED	G?
LEYMUS TRITICOIDES TEMPORARILY FLOODED HERBACEOUS ALLIANCE	LEYMUS TRITICOIDES - CAREX SPP. HERBACEOUS VEGETATION	G4?
ALLENROLFEA OCCIDENTALIS SHRUBLAND ALLIANCE	ALLENROLFEA OCCIDENTALIS SHRUBLAND	G3
	ALLENROLFEA OCCIDENTALIS / ATRIPLEX GARDNERI SHRUBLAND	G4?
Greasewood Shrubland		
SARCOBATUS VERMICULATUS INTERMITTENTLY FLOODED SHRUBLAND ALLIANCE	SARCOBATUS VERMICULATUS -ATRIPLEX PARRYI/DISTICHLIS SPICATA SHRUBLAND	G?
	SARCOBATUS VERMICULATUS / ATRIPLEX CONFERTIFOLIA - (ARTEMISIA SPINESCENS, SUAEDA MOQUINII) SHRUBLAND	G5Q
	SARCOBATUS VERMICULATUS / CHRYSOTHAMNUS NAUSEOSUS SHRUBLAND	G5
	SARCOBATUS VERMICULATUS / ELYMUS ELYMOIDES SHRUBLAND	G4
	SARCOBATUS VERMICULATUS -ATRIPLEX GARDNERI SHRUBLAND	G4
	SARCOBATUS VERMICULATUS SHRUBLAND	G5
	SARCOBATUS VERMICULATUS - PSOROTHAMNUS POLYDENIUS SHRUBLAND	G?
	SARCOBATUS VERMICULATUS / ORYZOPSIS HYMENOIDES SHRUBLAND	G4
Salt Desert Scrub		
ARTEMESIA SPINESCENS DWARF-SHRUBLAND ALLIANCE	ARTEMISIA SPINESCENS DWARF-SHRUBLAND	G3G4
ATRIPLEX PARRYI SHRUBLAND ALLIANCE	ATRIPLEX PARRYI SHRUBLAND PLACEHOLDER	G3
ATRIPLEX (LENTIFORMIS POLYCARPA) SHRUBLAND ALLIANCE	ATRIPLEX (LENTIFORMIS POLYCARPA) SHRUBLAND ALLIANCE -- PLACEHOLDER	G3
ARTEMISIA TRIDENTATA INTERMITTENTLY FLOODED SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA / DISTICHLIS SPICATA SHRUBLAND	G5
JUNIPERUS SCOPULORUM TEMPORARILY FLOODED WOODLAND		
ATRIPLEX CANESCENS SHRUBLAND ALLIANCE	ATRIPLEX CANESCENS - ARTEMISIA TRIDENTATA SHRUBLAND	G3G5
	ATRIPLEX CANESCENS - KRASCHENINNIKOVIA LANATA SHRUBLAND	G5
	ATRIPLEX CANESCENS / SPOROBOLUS AIROIDES SHRUBLAND	G5Q
SARCOBATUS BAILEYI SHRUBLAND ALLIANCE	SARCOBATUS BAILEYI / ATRIPLEX CONFERTIFOLIA SHRUBLAND	G4
ATRIPLEX CANESCENS SHRUBLAND ALLIANCE	ATRIPLEX CANESCENS SHRUBLAND	G5

Alliance	*Association*	*Grank*
ATRIPLEX CONFERTIFOLIA SHRUBLAND ALLIANCE	ATRIPLEX CONFERTIFOLIA - ARTEMISIA SPINESCENS / KRASCHENINNIKOVIA LANATA SHRUBLAND	G5Q
	ATRIPLEX CONFERTIFOLIA - ARTEMISIA SPINESCENS / SARCOBATUS VERMICULATUS SHRUBLAND	G5Q
CHRYSOTHAMNUS ALBIDUS SHRUBLAND ALLIANCE	CHRYSOTHAMNUS ALBIDUS/PUCCINELLIA NUTALLIANA	G3
ATRIPLEX CONFERTIFOLIA SHRUBLAND ALLIANCE	ATRIPLEX CONFERTIFOLIA - EPHEDRA NEVADENSIS SHRUBLAND	G5
	ATRIPLEX CONFERTIFOLIA - ARTEMISIA SPINESCENS / ORYZOPSIS HYMENOIDES SHRUBLAND	G5Q
	ATRIPLEX CONFERTIFOLIA - KRASCHENINNIKOVIA LANATA SHRUBLAND	G3G5
	ATRIPLEX CONFERTIFOLIA - LYCIUM ANDERSONII SHRUBLAND	G3
	ATRIPLEX CONFERTIFOLIA - LYCIUM PALLIDUM / MIRABILIS PUDICA SHRUBLAND	G3G4Q
	ATRIPLEX CONFERTIFOLIA - LYCIUM SHOCKLEYI SHRUBLAND	G4
	ATRIPLEX CONFERTIFOLIA - SARCOBATUS VERMICULATUS SHRUBLAND	G5
	ATRIPLEX CONFERTIFOLIA / ELYMUS ELYMOIDES SHRUBLAND	G3G5
	ATRIPLEX CONFERTIFOLIA / HILARIA JAMESII SHRUBLAND	G3G5
	ATRIPLEX CONFERTIFOLIA / KOCHIA AMERICANA SHRUBLAND	G3G5
	ATRIPLEX CONFERTIFOLIA / ORYZOPSIS HYMENOIDES SHRUBLAND	G3?
	ATRIPLEX CONFERTIFOLIA GREAT BASIN SHRUBLAND	G5
ATRIPLEX GARDNERI DWARF-SHRUBLAND ALLIANCE	ATRIPLEX GARDNERI DWARF-SHRUBLAND	G3G5
KRASCHENINNIKOVIA LANATA DWARF-SHRUBLAND ALLIANCE	KRASCHENINNIKOVIA LANATA / ORYZOPSIS HYMENOIDES DWARF-SHRUBLAND	G4
	KRASCHENINNIKOVIA LANATA DWARF-SHRUBLAND [PROVISIONAL]	G5Q
ATRIPLEX CONFERTIFOLIA SHRUBLAND ALLIANCE	ATRIPLEX CONFERTIFOLIA - ATRIPLEX POLYCARPA SHRUBLAND	G5
	ATRIPLEX CONFERTIFOLIA - ARTEMISIA SPINESCENS SHRUBLAND	G5
PSOROTHAMNUS ARBORESCENS SHRUBLAND		G3
Blackbrush-Hopsage Desert Shrubland		
GRAYIA SPINOSA SHRUBLAND ALLIANCE	GRAYIA SPINOSA / ARTEMISIA NOVA / STIPA SPECIOSA SHRUBLAND	G4
COLEOGYNE RAMOSISSIMA SHRUBLAND ALLIANCE	COLEOGYNE RAMOSISSIMA - ERIOGONUM FASCICULATUM SHRUBLAND	G5
	COLEOGYNE RAMOSISSIMA SHRUBLAND	G4G5
GRAYIA SPINOSA - EPHEDRA VIRIDIS SHRUBLAND ALLIANCE	GRAYIA SPINOSA - EPHEDRA VIRIDIS SHRUBLAND	G5
GRAYIA SPINOSA INTERMITTENTLY FLOODED SHRUBLAND ALLIANCE	GRAYIA SPINOSA - LYCIUM ANDERSONII SHRUBLAND	G5
	GRAYIA SPINOSA - LYCIUM PALLIDUM SHRUBLAND	G5
GRAYIA SPINOSA SHRUBLAND ALLIANCE	GRAYIA SPINOSA - MENODORA SPINESCENS SHRUBLAND	G5
	GRAYIA SPINOSA - PRUNUS ANDERSONII SHRUBLAND	G4
MENODORA SPINESCENS SHRUBLAND	MENODORA SPINESCENS SHRUBLAND [PROVISIONAL]	G4?
GRAYIA SPINOSA SHRUBLAND ALLIANCE	GRAYIA SPINOSA / ARTEMISIA SPINESCENS SHRUBLAND	G5
	GRAYIA SPINOSA / ORYZOPSIS HYMENOIDES SHRUBLAND	G4
LARREA TRIDENTATA SHRUBLAND ALLIANCE	LARREA TRIDENTATA - ATRIPLEX CONFERTIFOLIA SHRUBLAND	G5
YUCCA BREVIFOLIA WOODLAND SHRUBLAND ALLIANCE	YUCCA BREVIFOLIA WOODED SHRUBLAND ALLIANCE	G4

Alliance	*Association*	*Grank*
Semi-Desert Shrub Steppe		
FESTUCA IDAHOENSIS HERBACEOUS ALLIANCE	FESTUCA IDAHOENSIS - CAREX HOODII HERBACEOUS	G3G4
POA NEVADENSIS HERBACEOUS ALLIANCE		n/a
PASCOPYRUM SMITHII HERBACEOUS ALLIANCE	PASCOPYRUM SMITHII HERBACEOUS VEGETATION [PROVISIONAL]	G3G5Q
LEYMUS CINEREUS HERBACEOUS ALLIANCE	LEYMUS CINEREUS HERBACEOUS VEGETATION [PROVISIONAL]	G2G3Q
HILARIA JAMESII HERBACEOUS ALLIANCE	HILARIA JAMESII HERBACEOUS VEGETATION	G2G4
PSEUDOROEGNERIA SPICATA HERBACEOUS ALLIANCE	PSEUDOROEGNERIA SPICATA - STIPA COMATA HERBACEOUS VEGETATION	G4
ORYZOPSIS HYMENOIDES SHRUB HERBACEOUS ALLIANCE	EPHEDRA VIRIDIS VAR. VIRIDIS / ORYZOPSIS HYMENOIDES - SPOROBOLUS CRYPTANDRUS SHRUB HERBACEOUS VEGETATION	G2G4
STIPA SPECIOSA HERBACEOUS ALLIANCE	STIPA SPECIOSA HERBACEOUS VEGETATION [PROVISIONAL]	G3
ORYZOPSIS HYMENOIDES SHRUB HERBACEOUS ALLIANCE	EPHEDRA VIRIDIS VAR. VIRIDIS / ORYZOPSIS HYMENOIDES - BOUTELOUA GRACILIS SHRUB HERBACEOUS VEGETATION	G2G4
EPHEDRA NEVADENSIS SHRUBLAND ALLIANCE	EPHEDRA NEVADENSIS / ORYZOPSIS HYMENOIDES SHRUBLAND	G4
POA CUSICKII HERBACEOUS ALLIANCE		n/a
Sagebrush Semidesert		
ARTEMISIA TRIDENTATA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA / CHRYSOTHAMNUS NAUSEOSUS SHRUBLAND	G5
ARTEMISIA PYGMAEA DWARF-SHRUBLAND ALLIANCE	ARTEMISIA PYGMAEA DWARF-SHRUBLAND	G3G4
CHRYSOTHAMNUS NAUSEOSUS SHRUBLAND ALLIANCE	CHRYSOTHAMNUS NAUSEOSUS SHRUBLAND PLACEHOLDER	G5
ARTEMISIA NOVA DWARF-SHRUBLAND ALLIANCE	ARTEMISIA NOVA - PURSHIA GLANDULOSA ROCK DWARF-SHRUBLAND	G2?
EPHEDRA NEVADENSIS - ARTEMISIA TRIDENTATA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA - EPHEDRA NEVADENSIS SHRUBLAND	G5
ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS / POA SECUNDA (RE: P. SANDBERGII) SHRUBLAND	G3G5
ARTEMISIA TRIDENTATA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA - GRAYIA SPINOSA SHRUBLAND	G5
	ARTEMISIA TRIDENTATA / CHRYSOTHAMNUS VISCIDIFLORUS / POA SECUNDA SHRUBLAND	G5
ARTEMISIA NOVA DWARF-SHRUBLAND ALLIANCE	ARTEMISIA NOVA / STIPA COMATA DWARF-SHRUBLAND	G3?
	ARTEMISIA NOVA / HILARIA JAMESII DWARF-SHRUBLAND	G3G5
	ARTEMISIA NOVA / ORYZOPSIS HYMENOIDES DWARF-SHRUBLAND	G4G5
	ARTEMISIA NOVA / PSEUDOROEGNERIA SPICATA DWARF-SHRUBLAND	G4G5
ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS - ATRIPLEX CONFERTIFOLIA SHRUBLAND	G3G5
ARTEMISIA NOVA DWARF-SHRUBLAND ALLIANCE	ARTEMISIA NOVA - (ATRIPLEX CONFERTIFOLIA) / ELYMUS ELYMOIDES DWARF-SHRUBLAND	G4G5
ARTEMISIA CANA SHRUBLAND ALLIANCE (SS)	ARTEMISIA CANA SSP. VISCIDULA / DESCHAMPSIA CESPITOSA SHRUBLAND	G2G3
ARTEMISIA NOVA DWARF-SHRUBLAND ALLIANCE	ARTEMISIA NOVA-ERICAMERIA NANA DWARF SHRUBLAND	G3
ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS / ELYMUS ELYMOIDES (RE: SITANION HYSTRIX) SHRUBLAND	G5Q
EPHEDRA VIRIDIS - ARTEMISIA TRIDENTATA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA - EPHEDRA VIRIDIS SHRUBLAND	G5
ARTEMISIA ARBUSCULA DWARF-SHRUBLAND ALLIANCE (SS)	ARTEMISIA ARBUSCULA SSP. LONGILOBA DWARF-SHRUBLAND	G4G5
ARTEMISIA TRIDENTATA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. TRIDENTATA/ STIPA COMATA SHRUBLAND	G4Q
	ARTEMISIA TRIDENTATA / ORYZOPSIS HYMENOIDES SHRUBLAND	G3G5

Alliance	*Association*	*Grank*
ARTEMISIA TRIDENTATA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA / HILARIA JAMESII SHRUBLAND	G5
	ARTEMISIA TRIDENTATA-YUCCA BREVIFOLIA-JUNIPERIUS OSTEOSPERMA SHRUBLAND	G2G3
ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS / BOUTELOUA GRACILIS SHRUBLAND	G5
Sagebrush Steppe		
ARTEMISIA TRIDENTATA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. VASEYANA / STIPA COMATA	G3
ARTEMISIA ARBUSCULA DWARF-SHRUB HERBACEOUS ALLIANCE	ARTEMISIA ARBUSCULA / STIPA THURBERIANA DWARF-SHRUB HERBACEOUS VEGETATION	G4G5
ARTEMISIA TRIDENTATA SHRUB TALL HERBACEOUS ALLIANCE	ARTEMISIA TRIDENTATA / LEYMUS CINEREUS SHRUB HERBACEOUS VEGETATION	G2G4
ARTEMISIA ARBUSCULA DWARF-SHRUB HERBACEOUS ALLIANCE	ARTEMISIA ARBUSCULA / FESTUCA IDAHOENSIS DWARF-SHRUB HERBACEOUS VEGETATION	G5
	ARTEMISIA ARBUSCULA / POA SECUNDA (SSP. SECUNDA RE:SANBERGII) DWARF-SHRUB HERBACEOUS VEGETATION	G5
	ARTEMISIA ARBUSCULA / PSEUDOROEGNERIA SPICATA DWARF-SHRUB HERBACEOUS VEGETATION	G5
ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS SHRUB HERBACEOUS ALLIANCE	ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS / PSEUDOROEGNERIA SPICATA SHRUB HERBACEOUS VEGETATION	G4
ARTEMISIA TRIDENTATA SSP. TRIDENTATA SHRUB HERBACEOUS ALLIANCE	ARTEMISIA TRIDENTATA SSP. TRIDENTATA / PSEUDOROEGNERIA SPICATA SHRUB HERBACEOUS VEGETATION	G2G4
ARTEMISIA TRIDENTATA SHRUB HERBACEOUS ALLIANCE	ARTEMISIA TRIDENTATA / FESTUCA IDAHOENSIS SHRUB HERBACEOUS VEGETATION	G4Q
Bitterbrush Shrubland		
PURSHIA TRIDENTATA SHRUBLAND ALLIANCE	PURSHIA TRIDENTATA SHRUBLAND [PROVISIONAL]	G3?
PURSHIA GLANDULOSA SPARSE SHRUBLAND		
PURSHIA MEXICANA SHRUBLAND ALLIANCE	PURSHIA MEXICANA / PSEUDOROEGNERIA SPICATA SHRUBLAND	G2G4
ERIOGONUM FASCICULATUM SHRUBLAND ALLIANCE	ERIOGONUM FASCICULATUM PURSHIA GLANDULOSA SHRUBLAND	G4
PURSHIA TRIDENTATA SHRUBLAND ALLIANCE	PURSHIA TRIDENTATA - ARTEMISIA TRIDENTATA SSP. TRIDENTATA SHRUBLAND	G1?
Low Montane Shrublands		
AMELANCHIER ALNIFOLIA SHRUBLAND ALLIANCE		G4
AMELANCHIER UTAHENSIS SHRUBLAND ALLIANCE	AMELANCHIER UTAHENSIS-CERCOCARPUS MONTANUS SHRUBLAND	G2
CEANOTHUS CORDULATUS SHRUBLAND ALLIANCE	CEANOTHUS CORDULATUS SHRUBLAND [PROVISIONAL]	G3?
AMELANCHIER UTAHENSIS SHRUBLAND ALLIANCE	AMELANCHIER UTAHENSIS SHRUBLAND	G4
CEANOTHUS VELUTINUS SHRUBLAND ALLIANCE		n/a
QUERCUS GAMBELII SHRUBLAND ALLIANCE		n/a
ARCTOSTAPHYLOS VISCIDA SHRUBLAND ALLIANCE	ARCTOSTAPHYLOS VISCIDA - CEANOTHUS CUNEATUS / FESTUCA IDAHOENSIS - STIPA LEMMONII SHRUBLAND	G2
ARCTOSTAPHYLOS PATULA SHRUBLAND ALLIANCE	ARCTOSTAPHYLOS PATULA / CEANOTHUS VELUTINUS - CEANOTHUS PROSTRATUS SHRUBLAND	G3
CHRYSOTHAMNUS PARRYI SHRUBLAND ALLIANCE	CHRYSOTHAMNUS PARRYI SHRUBLAND [PROVISIONAL]	G1?
CEANOTHUS LEUCODERMIS SHRUBLAND ALLIANCE	CEANOTHUS LEUCODERMIS SHRUBLAND [PROVISIONAL]	G4?
QUERCUS TURBINELLA SHRUBLAND ALLIANCE	QUERCUS TURBINELLA - GARRY FLACENSCENS - ARCTOSTAPHYLOS PUNGENS	G4
Mountain Mahogany Woodlands		

Alliance	*Association*	*Grank*
CERCOCARPUS LEDIFOLIUS SHRUBLAND ALLIANCE	CERCOCARPUS LEDIFOLIUS/SYMPHORICARPOS OREOPHILUS WOODLAND	G2
	CERCOCARPUS LEDIFOLIUS / PSEUDOROEGNERIA SPICATA SHRUBLAND	G4Q
CERCOCARPUS LEDIFOLIUS WOODLAND ALLIANCE	CERCOCARPUS LEDIFOLIUS / ARTEMISIA TRIDENTATA WOODLAND	G3G4
Pinyon-Juniper Woodland		
JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	JUNIPERUS OSTEOSPERMA / ARTEMISIA NOVA / ORYZOPSIS HYMENOIDES WOODLAND	G4G5
	JUNIPERUS OSTEOSPERMA / ARTEMISIA NOVA - (PURSHIA TRIDENTATA) WOODLAND	G5?
	JUNIPERUS OSTEOSPERMA / ARTEMISIA NOVA / ROCK WOODLAND	G5
PINUS MONOPHYLLA - JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	PINUS MONOPHYLLA - (JUNIPERUS SPP.) / ARTEMISIA TRIDENTATA SPP. VASEYANA / PSEUDOROEGNERIA SPICATA WOODLAND	G5
JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	JUNIPERUS OSTEOSPERMA - (ARTEMISIA TRIDENTATA SSP. VASEYANA) / SPARSE UNDERSTORY WOODLAND	G?Q
	JUNIPERUS OSTEOSPERMA / ARTEMISIA TRIDENTATA SSP.TRIDENTATA / MIXED GRASS WOODLAND	G4G5
PINUS MONOPHYLLA - JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	PINUS MONOPHYLLA - JUNIPERUS OSTEOSPERMA/CERCOCARPUS INTRICATUS SPARSE WOODLAND	G?
JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	JUNIPERUS OSTEOSPERMA / ARTEMISIA TRIDENTATA SSP.VASEYANA / ORYZOPSIS HYMENOIDES WOODLAND	G4G5
	JUNIPERUS OSTEOSPERMA / CERCOCARPUS INTRICATUS WOODLAND	G?
PINUS MONOPHYLLA - JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	PINUS MONOPHYLLA - (JUNIPERUS SPP.) / ARTEMISIA NOVA / ORYZOPSIS HYMENOIDES WOODLAND	G5
PINUS EDULIS - (JUNIPERUS SPP.) WOODLAND ALLIANCE	PINUS EDULIS - JUNIPERUS SPP / ARTEMISIA TRIDENTATA SSP. VASEYANA WOODLAND	G5
PINUS MONOPHYLLA - JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	PINUS MONOPHYLLA - (JUNIPERUS SPP.) / ARTEMISIA TRIDENTATA SSP. TRIDENTATA / MIXED GRASS WOODLAND	G5
	PINUS MONOPHYLLA - (JUNIPERUS SPP.)/ARTEMISIA NOVA/ORZYKOPSIS HYMENOIDES WOODLAND	G5
	PINUS MONOPHYLLA / AMELANCHIER ALNIFOLIA / ARCTOSTAPHYLOS PATULA WOODLAND	G3G4
QUERCUS TURBINELLA SHRUBLAND ALLIANCE	QUERCUS TURBINELLA - JUNIPERUS OSTEOSPERMA SHRUBLAND	G?
JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	JUNIPERUS OSTEOSPERMA / PSEUDOROEGNERIA SPICATA WOODLAND	G4
JUNIPERUS SCOPULORUM WOODLAND ALLIANCE		n/a
PINUS MONOPHYLLA - JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	PINUS MONOPHYLLA / CERCOCARPUS LEDIFOLIUS WOODLAND	G5
JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	JUNIPERUS OSTEOSPERMA/ARTEMISIA ARBUSCULA	G5
	JUNIPERUS OSTEOSPERMA/STIPA COMATA WOODLAND	G3
PINUS MONOPHYLLA WOODLAND ALLIANCE	PINUS MONOPHYLLA WOODLAND	G5
	PINUS MONOPHYLLA/ARTEMISIA TRIDENTATA SSP. VASEYANA/ELYMUS CLYMOIDES	G3
	PINUS MONOPHYLLA/ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS/ELYMUS ELYMOIDES	G3
	PINUS MONOPHYLLA/PURSHIA TRIDENTATA/GRASS	G3
JUNIPERUS OCCIDENTALIS WOODLAND ALLIANCE		n/a
PINUS MONOPHYLLA - JUNIPERUS OSTEOSPERMA WOODLAND ALLIANCE	PINUS MONOPHYLLA - (JUNIPERUS SPP.) / ARTEMISIA TRIDENTATA SSP. WYOMINGENSIS - (PURSHIA TRIDENTATA) / MIXED GRASS WOODLAND [PROVISIONAL]	G5Q

Alliance	*Association*	*Grank*
Ponderosa Pine Woodland		
PINUS PONDEROSA WOODLAND ALLIANCE	PINUS PONDEROSA / CERCOCARPUS LEDIFOLIUS WOODLAND	G4
	PINUS PONDEROSA / QUERCUS GAMBELII WOODLAND	G5
	PINUS PONDEROSA / ARCTOSTAPHYLOS PATULA - PURSHIA TRIDENTATA WOODLAND	G3
Montane Forest and Woodland		
POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES / SYMPHORICARPOS OREOPHILUS / THALICTRUM FENDLERI	
PINUS JEFFREYI FOREST ALLIANCE		
PICEA PUNGENS FOREST ALLIANCE	PICEA PUNGENS / MAHONIA REPENS FOREST	G5
PINUS FLEXILIS - POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES - PINUS FLEXILIS FOREST	G3
ABIES CONCOLOR - POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES - ABIES CONCOLOR / SYMPHORICARPOS OREOPHILUS FOREST	G4G5
PICEA PUNGENS - POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES - PICEA PUNGENS FOREST	G3G4
PINUS CONTORTA - POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES - PINUS CONTORTA / JUNIPERUS COMMUNIS FOREST	G4G5
PINUS PONDEROSA - POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES - PINUS PONDEROSA ROCKY MOUNTAIN FOREST	G3G4
POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES / ARTEMISIA TRIDENTATA FOREST	G3G4
	POPULUS TREMULOIDES / JUNIPERUS COMMUNIS / CAREX GEYERI FOREST	G4G5
	POPULUS TREMULOIDES / SYMPHORICARPOS OREOPHILUS / TALL FORBS FOREST	G3G5
PSEUDOTSUGA MENZIESII FOREST ALLIANCE	PSEUDOTSUGA MENZIESII - ABIES CONCOLOR - POPULUS TREMULOIDES	
POPULUS TREMULOIDES - PSEUDOTSUGA MENZIESII FOREST ALLIANCE	POPULUS TREMULOIDES - PSEUDOTSUGA MENZIESII / SYMPHORICARPOS OREOPHILUS FOREST	G3G4
ABIES CONCOLOR SSP. CONCOLOR FOREST ALLIANCE	ABIES CONCOLOR - PINUS PONDEROSA - PINUS LONGAEVA	G?
	ABIES CONCOLOR/SYMPHORICARPOS OREOPHILUS FOREST	G5
	ABIES CONCOLOR/MAHONIA REPENS FOREST	G5
ABIES CONCOLOR WOODLAND ALLIANCE	ABIES CONCOLOR/CERCOCARPUS LEDIFOLIUS WOODLAND	G4
ABIES CONCOLOR SSP. CONCOLOR FOREST ALLIANCE	ABIES CONCOLOR/ARCTOSTAPHYLOS PATULA FOREST	G5
ABIES CONCOLOR - POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES - ABIES CONCOLOR/ARCTOSTPHYLOS PATULA FOREST	G4
PSEUDOTSUGA MENZIESII FOREST ALLIANCE	PSEUDOTSUGA MENZIESII / ARCTOSTAPHYLOS PATULA FOREST	G4
PICEA PUNGENS SEASONALLY FLOODED FOREST ALLIANCE	PICEA PUNGENS / EQUISETUM ARVENSE FOREST	G3?
PINUS CONTORTA SSP. MURRAYANA FOREST ALLIANCE		n/a
PINUS JEFFREYI WOODLAND ALLIANCE	PINUS JEFFREYI - PSEUDOTSUGA MENZIESII / ARCTOSTAPHYLOS VISCIDA WOODLAND	G3
	PINUS JEFFREYI WOODLAND	G?
PICEA PUNGENS FOREST ALLIANCE	PICEA PUNGENS / JUNIPERUS COMMUNIS FOREST	G4G5
	PICEA PUNGENS / PSEUDOROEGNERIA SPICATA FOREST	G4?
ABIES CONCOLOR SSP. LOWIANA FOREST ALLIANCE		n/a
PINUS JEFFREYI WOODLAND ALLIANCE	PINUS JEFFREYI - PINUS MONTICOLA / ARCTOSTAPHYLOS NEVADENSIS WOODLAND	G3
Montane Meadow		
POA SECUNDA HERBACEOUS ALLIANCE	POA SECUNDA-MUHLENBERGIA RICHARDSONIS HERBACEOUS VEGETATION	G?

Alliance	*Association*	*Grank*
CAREX DOUGLASII HERBACEOUS ALLIANCE	CAREX DOUGLASII HERBACEOUS VEGETATION	G4
Mountain Sagebrush		
ARTEMISIA TRIDENTATA SSP. VASEYANA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. VASEYANA/PHLOX CONDENSATA	
	ARTEMISIA TRIDENTATA SSP. VASEYANA - SYMPHORICARPOS OREOPHILUS / BROMUS CARINATUS SHRUBLAND	G5?
ARTEMISIA ARBUSCULA DWARF-SHRUBLAND ALLIANCE	ARTEMISIA ARBUSCULA SSP. LONGILOBA DWARF-SHRUBLAND	G4G5
ARTEMISIA TRIDENTATA SSP. VASEYANA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. VASEYANA - SYMPHORICARPOS OREOPHILUS / ELYMUS TRACHYCAULUS SSP. TRACHYCAULUS SHRUBLAND	G3G4
	ARTEMISIA TRIDENTATA SSP. VASEYANA / LEYMUS CINEREUS SHRUBLAND	G4?
	ARTEMISIA TRIDENTATA SSP. VASEYANA / FESTUCA KINGII - KOELERIA MACRANTHA SHRUBLAND	G4
ARTEMISIA TRIDENTATA SSP. VASEYANA SHRUB HERBACEOUS ALLIANCE	ARTEMISIA TRIDENTATA SSP. VASEYANA / FESTUCA IDAHOENSIS SHRUB HERBACEOUS VEGETATION	G5
ARTEMISIA ARBUSCULA DWARF-SHRUBLAND ALLIANCE	ARTEMISIA ARBUSCULA SSP. LONGILOBA / FESTUCA IDAHOENSIS DWARF-SHRUBLAND	G3?
ARTEMISIA TRIDENTATA SSP. VASEYANA SHRUBLAND ALLIANCE	ARTEMISIA TRIDENTATA SSP. VASEYANA / FESTUCA IDAHOENSIS - BROMUS CARINATUS SHRUBLAND	G4Q
	ARTEMISIA TRIDENTATA SSP. VASEYANA - SYMPHORICARPOS OREOPHILUS / PSEUDOROEGNERIA SPICATA SHRUBLAND	G5?
	ARTEMISIA TRIDENTATA SSP. VASEYANA / PSEUDOROEGNERIA SPICATA SHRUBLAND	G5
Subalpine Forest and Woodland		
PINUS ALBICAULIS FOREST ALLIANCE	PINUS ALBICAULIS - PINUS CONTORTA / PENSTEMON LAETUS FOREST	G3
PICEA ENGELMANNII FOREST ALLIANCE	PICEA ENGELMANNII / RIBES MONTIGENUM FOREST	G5?
ABIES LASIOCARPA - POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES - ABIES LASIOCARPA / THALICTRUM FENDLERI FOREST	G4G5
	POPULUS TREMULOIDES - ABIES LASIOCARPA / JUNIPERUS COMMUNIS FOREST	G3G4
PINUS LONGAEVA WOODLAND ALLIANCE	PINUS LONGAEVA - (PINUS FLEXILIS) WOODLAND	G3G4
ABIES MAGNIFICA FOREST ALLIANCE		n/a
PINUS FLEXILIS WOODLAND ALLIANCE	PINUS FLEXILIS WOODLAND	G4
ABIES LASIOCARPA - POPULUS TREMULOIDES FOREST ALLIANCE	POPULUS TREMULOIDES - ABIES LASIOCARPA / CAREX ROSSII FOREST	G5
PINUS FLEXILIS WOODLAND ALLIANCE	PINUS FLEXILIS/CERCARPUS LEDIFOLIUS WOODLAND	G4
Alpine Herbaceous		
PHLEUM ALPINUM HERBACEOUS ALLIANCE	PHLEUM ALPINUM - ACHILLEA MILLEFOLIUM HERBACEOUS VEGETATION	G5
CAREX STRAMINIFORMIS HERBACEOUS ALLIANCE	CAREX STRAMINIFORMIS HERBACEOUS VEGETATION	G3?
CAREX VERNACULA HERBACEOUS ALLIANCE	CAREX VERNACULA - POA FENDLERIANA HERBACEOUS VEGETATION	G2G3
PENTAPHYLLOIDES FLORIBUNDA TEMPORARILY FLOODED SHRUBLAND ALLIANCE (A)	PENTAPHYLLOIDES FLORIBUNDA / DESCHAMPSIA CESPITOSA SHRUBLAND	G4
PHLOX PULVINATA HERBACEOUS ALLIANCE	PHLOX PULVINATA HERBACEOUS	G4
GEUM ROSSII HERBACEOUS ALLIANCE	GEUM ROSSII HERBACEOUS VEGETATION	G4G5Q
Sand Dunes		
ORYZOPSIS HYMENOIDES HERBACEOUS ALLIANCE	ORYZOPSIS HYMENOIDES - SPOROBOLUS CONTRACTUS HERBACEOUS VEGETATION	G2G4

Alliance	*Association*	*Grank*
ATRIPLEX CANESCENS SHRUBLAND ALLIANCE (SD)	ATRIPLEX CANESCENS VAR. GIGANTEA SHRUBLAND	
TETRADYMIA TETRAMERES SPARSE SHRUBLAND ALLIANCE	TETRADYMIA TETRAMERES DUNE SHRUBLAND	G3Q
PSOROTHAMNUS POLYDENIUS SHRUBLAND ALLIANCE	PSOROTHAMNUS POLYDENIUS VAR. POLYDENIUS / ORYZOPSIS HYMENOIDES SHRUBLAND	G3G4
ABRONIA VILLOSA SPARSELY VEGETATED ALLIANCE	ABRONIA VILLOSA SPARSE VEGETATION [PROVISIONAL]	G2G3
SARCOBATUS VERMICULATUS SHRUBLAND ALLIANCE	SARCOBATUS VERMICULATUS DUNE SHRUBLAND	G5Q
Badlands		
MUHLENBERGIA ASPERIFOLIA INTERMITTENTLY FLOODED HERBACEOUS VEGETATION	MUHLENBERGIA ASPERIFOLIA HERBACEOUS VEGETATION	GU
NON-VASCULAR DOMINATED BADLAND	NON-VASULAR DOMINATEDBADLAND	GU
Clifflands		
CERCOCARPUS INTRICATUS SPARSE SHRUBLAND	CERCOCARPUS INTRICATUS SHRUBLAND	G3
Altered Andesite Soils		
ANDESITE PINE DOMINATED WOODLAND ALLIANCE	PINUS SPP. (P. PONDEROSA, P JEFFREYI) ALTERED ANDESITE WOODLAND	G2
Desert Riparian Shrubland and Woodland		
SALIX LAEVIGATA TEMPORARILY FLOODED WOODLAND ALLIANCE	SALIX LAEVIGATA - FRAXINUS VELUTINA WOODLAND	G1G2
SALIX LASIOLEPIS TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX LASIOLEPIS / BARREN SHRUBLAND	G2?
PENTAPHYLLOIDES FLORIBUNDA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	PENTAPHYLLOIDES FLORIBUNDA SHRUBLAND [PROVISIONAL]	G2?
SALIX GOODINGII TEMPORARILY FLOODED WOODLAND ALLIANCE	SALIX GOODINGII WOODLAND [PROVISIONAL]	G3
SALIX EXIGUA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX EXIGUA (ROSA WOODSII) SHRUBLAND	G5
POPULUS FREMONTII SEASONALLY FLOODED WOODLAND ALLIANCE	POPULUS FREMONTII / SALIX GEYERIANA WOODLAND	G3?
	POPULUS FREMONTII / LEYMUS TRITICOIDES WOODLAND	G?
	POPULUS FREMONTII - ACER NEGUNDO FOREST	G2Q
SHEPHERDIA ARGENTEA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SHEPHARDIA ARGENTEA SHRUBLAND	
Montane Riparian Shrubland		
PENTAPHYLLOIDES FLORIBUNDA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	PENTAPHYLLOIDES FLORIBUNDA SHRUBLAND [PROVISIONAL]	G5
ROSA WOODSII TEMPORARILY FLOODED SHRUBLAND ALLIANCE	ROSA WOODSII SHRUBLAND	G5
CORNUS SERICEA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	CORNUS SERICEA - SALIX (BOOTHII, BEBBIANA, LASIANDRA) SHRUBLAND [PROVISIONAL]	G4?
	CORNUS SERICEA SHRUBLAND [PROVISIONAL]	G4
ALNUS INCANA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	ALNUS INCANA / CORNUS SERICEA SHRUBLAND	G3G4
BETULA OCCIDENTALIS TEMPORARILY FLOODED SHRUBLAND ALLIANCE	BETULA OCCIDENTALIS FRAXINUS VELUTINA SHRUBLAND	
ARTEMISIA CANA SHRUBLAND ALLIANCE	ARTEMISIA CANA SSP. VISCIDULA / FESTUCA IDAHOENSIS SHRUBLAND	G3
	ARTEMISIA CANA SSP. VISCIDULA / DESCHAMPSIA CESPITOSA SHRUBLAND	G2G3
ARTEMISIA CANA INTERMITTENTLY FLOODED SHRUBLAND ALLIANCE	ARTEMISIA CANA / LEYMUS CINEREUS SHRUBLAND	G1?
BETULA OCCIDENTALIS SEASONALLY FLOODED SHRUBLAND ALLIANCE	BETULA OCCIDENTALIS / MESIC GRAMINOIDS SHRUBLAND	G3

Alliance	*Association*	*Grank*
BETULA OCCIDENTALIS TEMPORARILY FLOODED SHRUBLAND ALLIANCE	BETULA OCCIDENTALIS / MESIC FORBS SHRUBLAND	G3
SALIX GEYERIANA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX GEYERIANA / MESIC GRAMINOIDS SHRUBLAND	G2G3
BETULA OCCIDENTALIS TEMPORARILY FLOODED SHRUBLAND ALLIANCE	BETULA OCCIDENTALIS / CORNUS SERICEA SHRUBLAND	G2G3
SALIX DRUMMONDIANA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX DRUMMONDIANA SHRUBLAND [PROVISIONAL]	G3Q
SALIX WOLFII TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX WOLFII / CAREX AQUATILUS SHRUBLAND	G4
SALIX LUTEA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX LUTEA / ROSA WOODSII SHRUBLAND	G3?
SALIX LUTEA SEASONAILY FLOODED SHRUBLAND ALLIANCE	SALIX LUTEA / MESIC GRAMINOID SHRUBLAND	G4
SALIX LUTEA TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX LUTEA / MESIC FORB SHRUBLAND	G3?
SALIX LEMMONII TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX LEMMONII / MESIC-TALL FORB SHRUBLAND	G3?
	SALIX LEMMONII / BENCH SHRUBLAND	G3?
SALIX LASIOLEPIS TEMPORARILY FLOODED COLD-DECIDUOUS WOODLAND	SALIX LASIOLEPIS / ROSA WOODSIA VAR. ULTRAMONTANA SHRUBLAND	G3Q
SALIX BOOTHII TEMPORARILY FLOODED SHRUBLAND ALLIANCE	SALIX BOOTHII / MESIC FORB SHRUBLAND	G3
Montane Riparian Woodland		
POPULUS ANGUSTIFOLIA SEASONALLY FLOODED ALLIANCE	POPULUS ANGUSTIFOLIA / BETULA OCCIDENTALIS	G3
	POPULUS ANGUSTIFOLIA / SALIX SPP.	G5
PINUS PONDEROSA TEMPORARILY FLOODED WOODLAND	PINUS PONDEROSA FLOODED WOODLAND [PROVISIONAL]	G3
POPULUS TREMULOIDES SEASONALLY FLOODED ALLIANCE	POPULUS TREMULOIDES / BETULA OCCIDENTALIS	G3
POPULUS ANGUSTIFOLIA TEMPORARILY FLOODED WOODLAND ALLIANCE	POPULUS ANGUSTIFOLIA / CORNUS SERICEA WOODLAND	G4
POPULUS ANGUSTIFOLIA TEMPORARILY FLOODED FOREST ALLIANCE	POPULUS ANGUSTIFOLIA / RHUS TRILOBATA FOREST	G2G3
POPULUS BALSAMIFERA SSP. TRICHOCARPA TEMPORARILY FLOODED FOREST ALLIANCE	POPULUS BALSAMIFERA SSP. TRICHOCARPA / MIXED HERBS FOREST	G3?
QUERCUS KELLOGGII TEMPORARILY FLOODED WOODLAND ALLIANCE	QUERCUS KELLOGGII WOODLAND [PROVISIONAL]	G4?
POPULUS BALSAMIFERA SSP. TRICHOCARPA TEMPORARILY FLOODED FOREST ALLIANCE	POPULUS BALSAMIFERA SSP. TRICHOCARPA / ALNUS INCANA FOREST	G3
POPULUS TREMULOIDES WOODLAND ALLIANCE	POPULUS TREMULOIDES / ROSA WOODSII WOODLAND	G4?
POPULUS TREMULOIDES SEASONALLY FLOODED ALLIANCE	POPULUS TREMULOIDES / SALIX SPP.	G4
Wet Meadow		
DESCHAMPSIA CESPITOSA SEASONALLY FLOODED HERBACEOUS ALLIANCE	DESCHAMPSIA CESPITOSA HERBACEOUS VEGETATION	G4?
DODECATHEON REDOLENS SATURATED OR SUBPOLAR GRASSLAND ALLIANCE	DODECATHEON REDOLENS -AQUILEGIA FORMOSA HERBACEOUS VEGETATION [PROVISIONAL]	G2?
CAREX NEBRASCENSIS SEASONALLY FLOODED HERBACEOUS ALLIANCE	CAREX NEBRASCENSIS HERBACEOUS VEGETATION	G4
ELEOCHARIS QUINQUEFLORA SEASONALLY FLOODED HERBACEOUS ALLIANCE	ELEOCHARIS QUINQUEFLORA - CAREX SCOPULORUM HERBACEOUS VEGETATION	G3G4
ELEOCHARIS (MONTEVIDENSIS, PALUSTRIS, QUINQUEFLORA) SEASONALLY FLOODED HERBACEOUS ALLIANCE	ELEOCHARIS (MONTEVIDENSIS, PALUSTRIS, QUINQUEFLORA) HERBACEOUS VEGETATION [PROVISIONAL]	G5
ELEOCHARIS ACICULARIS SEASONALLY FLOODED HERBACEOUS ALLIANCE	ELEOCHARIS ACICULARIS HERBACEOUS VEGETATION	G4?
CAREX SCOPULORUM SEASONALLY FLOODED HERBACEOUS ALLIANCE	CAREX SCOPULORUM HERBACEOUS VEGETATION	G5
CAREX (ROSTRATA, UTRICULATA) SEASONALLY FLOODED HERBACEOUS ALLIANCE	CAREX ROSTRATA HERBACEOUS VEGETATION	G5
ELEOCHARIS PALUSTRIS SEASONALLY FLOODED HERBACEOUS ALLIANCE	ELEOCHARIS PALUSTRIS - JUNCUS BALTICUS HERBACEOUS VEGETATION	G2G4

Alliance	*Association*	*Grank*
ELEOCHARIS PALUSTRIS SEASONALLY FLOODED HERBACEOUS ALLIANCE	ELEOCHARIS PALUSTRIS - DISTICHLIS SPICATA HERBACEOUS VEGETATION	G2G4
CAREX AQUATILIS SEASONALLY FLOODED HERBACEOUS ALLIANCE	CAREX AQUATILIS HERBACEOUS VEGETATION	G5
CAREX SIMULATA SATURATED HERBACEOUS ALLIANCE	CAREX SIMULATA HERBACEOUS VEGETATION	G4
MIMULUS PRIMULOIDES TEMPORARILY FLOODED HERBACEOUS ALLIANCE	MIMULUS PRIMULOIDES - CAREX SCOPULORUM HERBACEOUS VEGETATION	G4
LEDUM GLANDULOSUM SHRUBLAND	LEDUM GLANDULOSUM	G4
POA SECUNDA SEASONALLY FLOODED HERBACEOUS ALLIANCE	POA SECUNDA HERBACEOUS VEGETATION	G4?
JUNCUS BALTICUS SEASONALLY FLOODED HERBACEOUS ALLIANCE	JUNCUS BALTICUS - (IRIS MISSOURIENSIS) HERBACEOUS VEGETATION	G5
VERATRUM CALIFORNICUM TEMPORARILY FLOODED HERBACEOUS ALLIANCE	VERATRUM CALIFORNICUM - JUNCUS NEVADENSIS HERBACEOUS VEGETATION	G3G4
LEYMUS TRITICOIDES TEMPORARILY FLOODED HERBACEOUS ALLIANCE (RW)	LEYMUS TRITICOIDES - CAREX SPP. HERBACEOUS VEGETATION	G4?
CAREX MICROPTERA SEASONALLY FLOODED HERBACEOUS ALLIANCE	CAREX MICROPTERA HERBACEOUS VEGETATION	G4
Freshwater Marsh		
PHRAGMITES AUSTRALIS SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE	PHRAGMITES AUSTRALIS TEMPERATE HERBACEOUS VEGETATION	G5
LEMNA SPP. HERBACEOUS ALLIANCE	LEMNA SPP. HERBACEOUS VEGETATION [PROVISIONAL]	G3?
RUPPIA (CIRRHOSA, MARITIMA) PERMANENTLY FLOODED HERBACEOUS ALLIANCE	RUPPIA (CIRRHOSA, MARITIMA) HERBACEOUS VEGETATION [PROVISIONAL]	G1G3
POTAMOGETON PECTINATUS PERMANENTLY FLOODED HERBACEOUS VEGETATION	POTAMOGETON PECTINATUS - ZANNICHELLIA PALUSTRIS HERBACEOUS VEGETATION	G1Q
TYPHA DOMINGENSIS SEASONALLY FLOODED TEMPERATE HERBACEOUS ALLIANCE	TYPHA DOMINGENSIS - (SCRIPUS ACUTUS) HERBACEOUS VEGETATION	G5?
BACOPA EISENII SATURATED HERBACEOUS ALLIANCE	BACOPA EISENII HERBACEOUS VEGETATION	G?
AZOLLA (FILCULOIDES, MEXICANA) HERBACEOUS ALLIANCE	AZOLLA (FILCULOIDES, MEXICANA) HERBACEOUS VEGETATION [PROVISIONAL]	G3?
SCIRPUS ACUTUS - (SCIRPUS TABERNAEMONTANI) SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE	SCIRPUS ACUTUS HERBACEOUS VEGETATION	G5
SCIRPUS AMERICANUS SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE	SCIRPUS AMERICANUS - ELEOCHARIS PALUSTRIS HERBACEOUS VEGETATION	G2G4
SCIRPUS MARITIMUS SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE	SCIRPUS MARITIMUS HERBACEOUS VEGETATION	G4
SCIRPUS PUNGENS SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE	SCIRPUS PUNGENS HERBACEOUS VEGETATION	G2G4
SCIRPUS TABERNAEMONTANI SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE	SCIRPUS TABERNAEMONTANI TEMPERATE HERBACEOUS VEGETATION	G4
TYPHA (ANGUSTIFOLIA, LATIFOLIA) - (SCIRPUS SPP.) SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE	TYPHA LATIFOLIA WESTERN HERBACEOUS VEGETATION	G5
POTAMOGETON (DIVERSIFOLIUS - FILIFORMIS) PERMANENTLY FLOODED HERBACEOUS VEGETATION	POTAMOGETON FILIFORMIS HERBACEOUS VEGETATION	G?
Fen		
KALMIA MICROPHYLLA SATURATED DWARF SHRUBLAND ALLIANCE	KALMIA MICROPHYLLA SATURATED DWARF SHRUBLAND	G3G4

Appendix 2. Great Basin Terrestrial Ecological Systems.

Ecological System	Patch Type	Total Cover (ha)	% of Ecoregion
Playa Lakes and Pickleweed Flats	Large Patch	1,039,404	3.55%
Greasewood Shrubland	Large Patch	870,623	2.97%
Salt Desert Scrub	Matrix Forming	7,695,151	26.25%
Blackbush - Hopsage Shrubland	Large Patch	267,327	0.91%
Semidesert Scrub Steppe	Large Patch	854,036	2.91%
Joshua Tree-Mixed Mojave Scrub	Matrix Forming	79,325	0.27%
Sagebrush Semidesert	Matrix Forming	7,209,291	24.59%
Sagebrush Steppe	Large Patch	2,502,700	8.54%
Bitterbrush Shrubland	Large Patch	3,489	0.01%
Low Montane Shrubland	Large Patch	227,198	0.78%
Mountain Mahogany Woodland	Large Patch	126,428	0.43%
Pinyon-Juniper Woodland	Large Patch	4,586,276	15.64%
Ponderosa Pine	Large Patch	4,761	0.02%
Montane Forest and Woodland	Large Patch	231,958	0.79%
Montane Meadow	Small Patch	4,127	0.01%
Mountain Sagebrush	Large Patch	683,090	2.33%
Subalpine Forest and Woodland	Large Patch	82,918	0.28%
Alpine Herbaceous	Small Patch	28,086	0.10%
Sand Dune Habitats	Large Patch	31,968	0.11%
Badland Habitats	Small Patch	550,758	1.88%
Cliffland Habitats	Small Patch	—	—
Altered Andesite Soil Habitats	Small Patch	—	—
Cave Habitats	Subterranean	—	—
Desert Riparian Shrubland and Woodland	Linear	39,945	0.14%
Montane Riparian Shrubland and Woodland	Linear	5,475	0.02%
Wet Meadow	Small Patch	6,424	0.02%
Freshwater Marsh	Small Patch	166,251	0.57%
Fen and Bog Habitats	Small Patch	—	—

Appendix 3. Patch Size Characteristics for Terrestrial Ecological Systems.

Within a given area, natural terrestrial ecological systems may be categorized into four types of systems on the basis of their current or historical patterns of occurrence, as correlated with the distribution and extent of landscape features and ecological processes. These types are identified as matrix systems, large patch systems, small patch systems, and linear systems.

Matrix

Systems that form extensive and contiguous cover may be categorized as matrix (or matrix forming) systems. Matrix systems occur on the most extensive landforms and typically include high ecological variability. Individual occurrences of the matrix type typically range in size from 2,000 to 500,000 hectares. In a typical ecoregion, the aggregate of all matrix systems covers, or historically covered, as much as 80-90% of the natural vegetation of the ecoregion. Matrix systems are often influenced by large scale processes (*e.g.*, climate patterns, fire, and windthrow). However, the size of a given natural disturbance patch is small, relative to the entire occurrence. These systems often provide important habitat for large area-dependent fauna, including many bird species.

Large Patch

Systems that form large areas of interrupted cover may be categorized as large patch systems. Individual occurrences of this system typically range in size from 50 to 2,000 hectares. Like matrix systems, large patch systems are influenced by large scale processes, but these tend to be modified by specific site features that influence the system. Individual disturbance patches tend to include a large proportion of the total occurrence, relative to matrix systems. Large patch systems are associated with environmental conditions that are more specific than those of matrix systems, and that are less common or less extensive in the landscape. In a typical ecoregion, the aggregate of all large patch systems covers, or historically covered, as much as 20% of the natural vegetation of the ecoregion.

Small Patch

Systems that support small, discrete biotic assemblages may be categorized as small patch systems. Individual occurrences of this system type typically range in size from 1 to 50 hectares. Small patch systems occur in very specific ecological settings, such as on specialized landform types or in unusual microhabitats. Small patch systems are typically restricted in their distribution by localized, small scale ecological processes that can be quite different from the large scale processes operating in the overall landscape. The specialized conditions of small patch systems, however, are often influenced by the maintenance of ecological processes in the surrounding matrix and large patch systems. In a typical ecoregion, the aggregate of all small patch systems covers, or historically covered, only as much as 5% of the natural vegetation of the ecoregion. In many ecoregions, small patch systems contain a disproportionately large percentage of the total flora, and also support a specific and restricted set of associated fauna (*e.g.,* invertebrates or herpetofauna) dependent on specialized conditions.

Linear

Systems that form as linear strips are often, but not always, ecotonal between terrestrial and aquatic systems. Examples include coastal beach strands, bedrock lakeshores, and narrow riparian systems. Similar to small patch systems, linear systems occur in very specific ecological settings, and the aggregate of all linear systems covers, or historically covered, only a small percentage of the natural vegetation of the ecoregion. They also tend to support a

specific and restricted set of associated flora and fauna. Linear systems differ from small patch systems in that both local scale processes and broad-scale processes, such as lake/ocean currents, or riverine flow regimes strongly influence system structure and function. This characteristic often leaves these systems highly vulnerable to alterations in the land and water-scape happening a significant distance from a given occurrence.

Appendix 4. Global Rank Definitions, Criteria for Global Rank Summaries, and Endangered Species Act Definitions.

Global Rank Definitions from the Association for Biodiversity Information (Natural Heritage Program Network and Conservation Data Centers):

Global or Trinomial (Subspecific) Rank	Qualitative Factors	Quantitative Definition
G1 or T1	Critically imperiled because of extreme rarity, imminent threats, and/or biological factors	Generally with 5 or fewer occurrences, and/or less than 1,000 individuals, and/or less than 2,000 acres in extent
G2 or T2	Imperiled because of rarity and/or other demonstrable factors	Generally with 6-20 occurrences, and/or 1,000-3,000 individuals, and/or 2,000-10,000 acres in extent
G3 or T3	Rare and local throughout its range, or with very restricted range, or otherwise vulnerable to extinction	Generally with 21-100 occurrences, and/or 3,000-10,000 individuals, and/or 10,000-50,000 acres in extent
G4 or T4	Apparently secure, though frequently quite rare in parts of its range, especially at its periphery	Generally with greater than 100 occurrences, and/or greater than 10,000 individuals, and/or greater than 50,000 acres in extent
G5 or T5	Demonstrably secure, though frequently quite rare in parts of its range, especially at its periphery	With greater than 100 occurrences, and/or greater than 10,000 individuals, and/or greater than 50,000 acres in extent

Criteria for Global Rank Summaries

Combined Global Rank	Global Rank Designations from CA, NV, and UT Heritage Programs
G1	G1; G1,G2; G1?; G1G2; G1G2,G1; G1Q; G1T1; G2T1; G2T1?; G2T1Q; G3G4T1; G3G4T1T2Q; G3T1; G3T1T2Q; G4?T1; G4G5T1; G4T1; G4T1T2; G5?T1; G5T1; G5T1?; G5T1Q; G5T1T2; G5T1T2Q
G2	G?,G2?; G?T2; G1G3; G2; G2,G2G3; G2?; G2G3; G2G3Q; G2Q; G2T2; G3G4T2; G3G4T2T3; G3T2; G3T2T3; G4?T2T3; G4QT2?; G4T2; G4T2,G4T3,G4; ;G4T2,T3,G4T3; G5T2; G5T2?; G5T2T3
G3	G2G4; G3; G3,G3Q; G3?; G3?Q; G3G4; G3G4Q; G3Q; G3QT3; G3T3; G3TH; G4,G3; G4T3; G4T3?; G4T3T4; G5T3; G5T3?; G5T3T4
G4	G3G5; G3G5Q; G4; G4?; G4G5; G4G5Q; G4Q; G4T?; G4TH; G5T4
G5	G5; G5?; G5Q; G5T?
Unknown	?; G?; G?Q; GM; GU

Endangered Species Act Definitions from U.S. Department of Interior, Fish and Wildlife Service, Endangered Species Act of 1973 as amended:

Status of Great Basin Targets	Definition
LE	Listed endangered, imminent jeopardy of extinction in all or a significant portion of its range
LT	Listed threatened, imminent jeopardy of becoming in the foreseeable future if present trends continue
PE	Proposed endangered
PT	Proposed threatened
C	Candidate species for which FWS has sufficient data on biological vulnerability and threats to support proposals to list as threatened or endangered under ESA, however, proposed rules have not been issued because such actions are precluded at present by other listing activity
AT	Proposed reclassification from listed endangered to listed threatened
DM	Delisted taxon, recovered, and being monitored during first five years
SAT	Similarity of appearance to a listed threatened species

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
AMPHIBIANS				
Batrachoseps campi	Inyo Mountains slender salamander	G2	Endemic?	
Bufo exsul	Black toad	G1	Endemic	
Hydromantes sp.1	Owens Valley web-toed salamander	G1?	Limited	
Rana luteiventris ssp.	Toiyabe spotted frog	G4T?	Endemic	C1
Rana muscosa	Mountain yellow-legged frog	G3	Peripheral	PE
Rana pipiens ssp.	Northern leopard frog	G5T?	Endemic	
BIRDS				
Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining	
Accipiter gentilis	Northern Goshawk	G4	Widespread, declining	
Amphispiza belli	Sage Sparrow	G5	Widespread, declining	
Aythya americana	Redhead	G5	Widespread, migratory concentration	
Baeolophus griseus	Juniper Titmouse	G5	Widespread	
Buteo regalis	Ferruginous Hawk	G4	Widespread, declining	
Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining	
Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining	
Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist	T
Circus cyaneus	Northern Harrier	G5	Widespread, declining	
Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo	G5T2T3	Peripheral	
Empidonax traillii extimus	Southwestern Willow Flycatcher	G5T2	Peripheral	E
Empidonax wrightii	Gray Flycatcher	G5	Widespread	
Falco mexicanus	Prairie Falcon	G5	Widespread	
Falco peregrinus	Peregrine Falcon	G4,G3	Widespread	DM
Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration	
Guiraca caerulea	Blue Grosbeak	G5	Peripheral	
Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist	
Icteria virens	Yellow-Breasted Chat	G5	Peripheral	
Ixobrychus exilis	Least Bittern	G5	Peripheral	
Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining	
Larus californicus	California Gull	G5	Disjunct, colonial	
Larus pipixcan	Franklin's Gull	G4G5	Disjunct	
Leucosticte atrata	Black Rosy-Finch	G4	Limited	
Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining	
Numenius americanus	Long-Billed Curlew	G5	Widespread, declining	
Oreoscoptes montanus	Sage Thrasher	G5	Widespread	
Otus flammeolus	Flammulated Owl	G4	Widespread	
Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration	
Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration	
Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration	
Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration	
Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration	
Spizella breweri	Brewer's Sparrow	G5	Widespread	
Stellula calliope	Calliope Hummingbird	G5	Widespread	
Vermivora virginiae	Virginia's Warbler	G5	Widespread	
FISHES				
Catostomus clarki	Desert sucker	G3G4	Widespread	
Catostomus clarki intermedius	White River Desert sucker	G3G4T1T2Q	Endemic	
Catostomus clarki ssp. 2	Meadow Valley Wash Desert sucker	G3G4T2	Endemic	
Catostomus fumeiventris	Owens sucker	G3	Endemic	
Chasmistes cujus	Cui-ui	G1	Endemic	E

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
Chasmistes liorus	June sucker	G1	Endemic	E
Cottus sp. 3 (bairdi)	White River Mottled sculpin	G1	Endemic	
Crenichthys baileyi albivallis	Preston White River springfish	G2T1	Endemic	
Crenichthys baileyi grandis	Hiko White River springfish	G2T1	Limited	E
Crenichthys baileyi thermophilus	Moorman White River springfish	G2T1	Endemic	
Crenichthys nevadae	Railroad Valley springfish	G2	Endemic	T
Cyprinodon radiosus	Owens pupfish	G1	Limited	E
Empetrichthys latos latos	Pahrump poolfish	G1T1	Introduced	AT, E
Eremichthys acros	Desert dace	G1	Endemic	T
Gila bicolor isolata	Independence Valley tui chub	G4T1	Endemic	
Gila bicolor nevadae	Duckwater Creek tui chub/ Hot Creek tui chub/ Railroad Valley tui chub)	G4T1	Endemic?	
Gila bicolor newarkensis	Newark Valley tui chub/Fish Creek Springs tui chub	G4T1	Endemic	
Gila bicolor snyderi	Owens tui chub	G4T1	Limited	E
Gila bicolor ssp. 10	Charnock springs tui chub	G4TH	Endemic	
Gila bicolor ssp. 4	Fish Lake Valley tui chub	G4T1	Endemic	
Gila bicolor ssp. 6	Little Fish Lake Valley tui chub	G4T1	Endemic?	
Gila bicolor ssp. 8	Big Smoky Valley tui chub	G4T1	Endemic	
Gila bicolor ssp. 9	Dixie Valley tui chub	G4T1	Endemic?	
Gila copei	Leatherside chub	G3G4	Limited?	
Gila elegans	Bonytail chub	G1	Peripheral or Limited	E
Gila robusta jordani	Pahranagat roundtail chub	G3T1	Limited	E
Iotichthys phlegethontis	Least chub	G1	Limited	
Lepidomeda albivallis	White River spinedace	G1	Endemic	E
Lepidomeda mollispinis	Virgin spinedace	G1	Limited	
Lepidomeda mollispinis pratensis	Big Spring spinedace	G1T1	Endemic	T
Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited	T
Oncorhynchus clarki seleniris	Paiute cutthroat trout	G4T1T2	Limited	T
Oncorhynchus clarki utah	Bonneville cutthroat trout	G4T2	Endemic?	
Relictus solitarius	Relict dace	G2G3	Endemic	
Rhinchthys osculus robustus	Lahontan speckled dace	?	Endemic	
Rhinichthys osculus	Monitor Valley speckled dace	G5T1	Endemic	
Rhinichthys osculus lariversi	Big Smoky Valley speckled dace	G5T1	Endemic	
Rhinichthys osculus lethoporus	Independence Valley speckled dace	G5T1	Endemic	E
Rhinichthys osculus oligoporus	Clover Valley speckled dace	G5T1	Endemic	E
Rhinichthys osculus sp. bv	Benton Valley speckled dace	G5T1	Endemic	
Rhinichthys osculus ssp.	Long Valley speckled dace	G5T1	Endemic	
Rhinichthys osculus ssp. 2 mv	Meadow Valley speckled dace	G5T2	Limited	
Rhinichthys osculus ssp. 2 ow	Owen's speckled dace	G5T1T2	Limited	
Rhinichthys osculus ssp. 7	White River speckled dace	G5T2T3	Endemic	
Rhinichthys osculus velifer	Pahranagat speckled dace/ Pahranagat dace	G5T1	Endemic?	
INVERTEBRATES (SEE ALSO MOLLUSKS)				
Aegialia crescenta	Crescent Dunes aegialian scarab	G1	Endemic	
Aegialia hardyi	Hardy's aegialian scarab	G1	Endemic	
Aegialia spinosa	(Scarab beetle)	?	Limited	
Andrena chrylismiae	(Bee)	G1	Endemic	
Andrena nevadae	(Bee)	G1	Endemic	
Andrena raveni	(Bee)	G2	Limited	
Andrena sp. nov.	(Bee)	G1	Endemic	
Andrena taeniata	(Bee)	G2	Disjunct	
Andrena thorpi	(Bee)	G1	Endemic	

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
Anthidium rodecki	(Bee)	?	Limited	
Anthophora affabilis	(Bee)	?	Limited	
Anthophora sp. nov.	(Bee)	G1	Endemic	
Aphodius comosus	(Sand obligate beetle)	?	Unknown	
Aphodius parapyriformis ssp. nov.	(Bee)	?	Limited	
Artemia monica	Mono brine shrimp	G1	Endemic	
Ashmeadiella rhodognatha	(Bee)	?	Disjunct	
Ashmeadiella sp. nov.	(Bee)	G1	Limited	
Atoposmia panamintensis	(Bee)	?	Limited	
Atoposmia rufifemur	Red-legged beardtongue bee	?	Limited	
Atoposmia sp. nov. 3	(Bee)	G1	Limited	
Atoposmia sp. nov. 5	(Bee)	G1	Limited	
Baetisca lacustris	(Mayfly)	G?	Disjunct	
Bembix frommeri	(Wasp)	G1	Endemic	
Branchinecta gigas	Giant fairy shrimp	?	Widespread, specialist	
Caenis latipennis		G?	Disjunct	
Calliopsis barri	(Bee)	?	Limited	
Calliopsis filiorum	(Bee)	G1	Endemic	
Calliopsis hesperia equina	(Bee)	?	Disjunct	
Calliopsis phaceliae	(Bee)	?	Limited	
Calliopsis sp. nov	(Bee)	?	Limited	
Capnia hornigi	(Stonefly)	G1	Endemic	
Capnia inyo	Inyo mountain stonefly	G2?	Limited	
Capnia mono	Mono winter stonefly	G2	Limited	
Capnia uintahi	Uintah winter stonefly	G?	Disjunct, specialist	
Capnura intermontana	Common winter stonefly	G?	Limited	
Capnura wanica	(Stonefly)	G?	Disjunct	
Cardiophorus spp.	(Click beetle)	?	Limited	
Cardiophorus ssp. nov.	(Click beetle)	?	Endemic	
Cercyonis oetus alkalorum	Big Smoky wood nymph	G5T1	Endemic	
Cercyonis oetus pallescens	Pallid wood nymph	G5T1	Endemic	
Cercyonis pegala carsonensis	Carson Valley wood nymph	G5T2	Endemic	
Cercyonis pegala pluvialis	White River wood nymph	G5T2	Endemic	
Chilometopon pallidium	(Sand obligate beetle)	?	Limited	
Coenonycha pygmaea	Sand Mountain pygmy scarab	G1	Endemic	
Colletes ciliatoides	(Bee)	?	Limited	
Colletes sp. nov. 1	(Bee)	G1	Limited	
Colletes stepheni	(Bee)	?	Disjunct	
Colletes tectiventris	(Bee)	?	Disjunct	
Colletes xerophilus cismontanus	(Bee)	?	Disjunct	
Dianthidium implicatum		?	Disjunct	
Dianthidium marshi		G1	Limited	
Dufourea orovada		G1	Limited	
Edrotes ventricosus	(Sand obligate beetle)	?	Limited	
Euphilotes ancilla shieldsi	Shield's blue	G5T1	Endemic	
Euphilotes bernardino minuta	Baking Powder Flat Blue	G5T1	Endemic	
Euphilotes enoptes aridorum	Peavine blue	G5T1	Endemic	
Euphilotes enoptes primavera	Early blue	G5T1	Endemic	
Euphilotes pallescens arenamontana	Sand Mountain blue	G4T1	Endemic	
Euphilotes pallescens calneva	Honey Lake blue	G4T1	Endemic	
Euphilotes pallescens mattoni	Mattoni's blue	G4T1	Limited	
Euphilotes pallescens ricei	Rice's blue	G4T1	Endemic	
Euphydryas editha koreti	Koret's checkerspot	G5T1Q	Endemic	

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
Eusattus hirsutus	(Sand obligate beetle)	?	Endemic	
Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist	
Hesperapis kayella	(Bee)	G1	Limited	
Hesperapis oliviae	(Bee)	?	Limited	
Hesperapis sp. nov.2	(Bee)	G1	Endemic	
Hesperia miriamae longaevicola	White Mountains skipper	G3T1	Endemic	
Hesperia uncas fulvapalla	Railroad Valley skipper	G4G5T1	Endemic	
Hesperia uncas giulianii	Giuliani's unca skipper	G4G5T1	Unknown	
Hesperia uncas grandiosa	White River Valley skipper	G4G5T1	Endemic	
Hesperia uncas reesorum	Reese River unca skipper	G4G5T1	Endemic	
Hoplitis bidenticauda		G2	Limited	
Hoplitis shoshone		?	Endemic	
Hydroporus utahensis	Utah Hydroporus diving beetle	G1	Endemic	
Hydroscapha natans		?	Limited	
Hygrotus fontinalis	Travertine band-thigh diving beetle	G1	Endemic	
Hypaurotis crysalus intermedia	Intermediate Colorado hairstreak	G5T1	Endemic	
Icaricia acmon dedeckera		?	Limited	
Icaricia icarioides albihalos	White Mountains icarioides blue	G5T1T2	Endemic	
Lariversius tibalis	(Sand obligate beetle)	?	Limited	
Limenitis archippus lahontani	Nevada viceroy	G5T2	Endemic	
Limenitis lorquini pallidafacies	White Mountains admiral	G5T1T2	Endemic	
Lycaena rubidus incanus	White Mountains ruddy copper	G5T1T2	Endemic	
Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited	
Megachile astragali		?	Peripheral	
Melecta alexanderi	Parasitic bee	G1	Limited	
Myrmecocystus arenarius	Dune honey ant	G2?	Endemic?	
Niptus ventriculus	(Sand obligate beetle)	?	Limited	
Nitzschia monoensis		?	Endemic	
Novelsis sabulorum	(Sand obligate beetle)	?	Endemic	
Ochlodes yuma lutea	Great Basin yuma skipper	G3T2T3	Limited	
Oreohelix eurekensis	Eureka mountainsnail	G1	Unknown	
Oreohelix haydeni	Lyrate mountainsnail	G2G3	Peripheral or Limited	
Oreohelix hemphilii	White Pine mountainsnail	?	Endemic	
Oreohelix howardi	Mill Creek mountainsnail	G1	Endemic	
Oreohelix nevadensis	Schell Creek mountainsnail	G1	Endemic	
Osmia alpestris	(Bee)	?	Limited	
Osmia nigropilosa	(Bee)	G1	Endemic	
Osmia sp. nov.	(Bee)	G1	Endemic	
Osmia tanneri	(Bee)	G1	Limited	
Perdita amplipennis	(Bee)	?	Limited	
Perdita arenaria	(Bee)	?	Disjunct	
Perdita aridella	(Bee)	?	Limited	
Perdita bohartorum	(Bee)	?	Limited	
Perdita chloris	(Bee)	?	Limited	
Perdita cleomellae	(Bee)	?	Disjunct	
Perdita cowaniae	(Bee)	?	Limited	
Perdita crotonis juabensis	(Bee)	G1	Endemic	
Perdita eucnides eucnides	(Bee)	G2	Disjunct	
Perdita exigua	(Bee)	G1	Endemic	
Perdita glabrescens	(Bee)	G1	Limited	
Perdita haigi	(Bee)	G1	Endemic	
Perdita haplura	(Bee)	?	Limited	
Perdita hirticeps apicata	(Bee)	?	Limited	

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
Perdita latior	(Bee)	?	Limited	
Perdita leucostoma	(Bee)	?	Limited	
Perdita mormonica	(Bee)	?	Limited	
Perdita nasuta galacticoptera	(Bee)	G1	Limited	
Perdita sp. nov. 3	(Bee)	G1	Endemic	
Perdita vesca	(Bee)	?	Limited	
Perdita xerophila fuscicornis	(Bee)	G1	Limited	
Philothris ssp. nov.	(Predatory beetle)	?	Limited	
Philotiella speciosa septentrionalis	Great Basin small blue	G4T1	Endemic	
Phyciodes batesii arenacolor	Steptoe Valley crescentspot	G5T1	Endemic	
Phyciodes pulchella shoshone	Humboldt River crescentspot	G5T2	Endemic	
Phyciodes pulchella vallis	Valley crescentspot	G5T3T4	Endemic	
Plebejus saepiolus albomontanus	White Mountain saepiolus blue	G5T1T2	Endemic	
Polites sabuleti albamontana	White Mountains sandhill skipper	G5T1	Endemic	
Polites sabuleti basinensis	Pallid skipper	G5T2	Unknown	
Polites sabuleti genoa	Carson Valley sandhill skipper	G5T2	Endemic	
Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic	
Potamocypris ssp. nov		?	Endemic?	
Pseudocopaeodes eunus flavus	Nevada alkali skipperling	G3T2	Endemic	
Pseudocopaeodes eunus obscurus	Carson alkali skipperling	G3T1	Endemic	C1
Pseudocopaeodes eunus ssp. nov	Mono Lake wandering skipper	G3T1	Endemic	
Pteronarcys priinceps		?	Peripheral	
Pteronarcys princeps	Giant stonefly	G4	Peripheral, specialist	
Rhadine myrmecodes	(Sand obligate beetle)	?	Limited	
Satyrium saepium latilinea	Broadlined saepium hairstreak	G5T1	Limited	
Satyrium sylvinus megapallidum	Pallid sylvinus hairstreak	G5T2T3	Endemic	
Serica ammomenisco	Crescent Dunes serican scarab	G1	Endemic	
Serica humboldti	Humboldt serican scarab	G1	Endemic	
Serica psammobunus	Sand Mountain serican scarab	G1	Endemic	
Speyeria hesperis greyi	Grey's silverspot	G5T1	Endemic	
Speyeria nokomis apacheana	Apache silverspot	G4T3	Endemic	
Speyeria nokomis carsonensis	Carson Valley silverspot	G4T2	Limited	
Speyeria sp. nov.		?	Endemic	
Stenopelmatus ssp. nov	(Sand obligate cricket)	?	Endemic	
Stygobromus sp. nov. (Owens Valley)	(aquatic amphipod)	?	Endemic	
Stygobromus sp. nov. (Ruby Marsh)	(aquatic amphipod)	?	Endemic	
Tegrodera latecincta		?	Limited	
Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited	
Thorybes mexicana blanca	White Mountains cloudy wing	G5T2	Endemic	
Trimeritropis barnami	(Sand dune obligate)	G1?	Limited	
Trogloderus costatus		?	Limited	
Utacapnia lemoniana	Winter stonefly	G?	Disjunct, specialist	
Utaperla sopladora		G?	Disjunct	
MAMMALS				
Antrozous pallidus	Pallid bat	G5	Widespread, declining	
Brachylagus idahoensis	Pygmy rabbit	G5	Limited	
Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining	
Cynomys parvidens	Utah prairie dog	G1	Limited	T
Dipodomys deserti	Desert kangaroo rat	G5	Limited	
Dipodomys microps	Chisel-toothed kangaroo rat	G5	Limited	
Euderma maculatum	Spotted bat	G4	Unknown	
Lagurus curtatus	Sagebrush vole	G5	Endemic or Limited	
Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining	

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
Lasiurus blossevillii	Western red bat	G5	Unknown	
Lasiurus cinereus	Hoary bat	G5	Widespread, declining	
Lepus townsendii	White-tailed jack rabbit	?	Widespread	
Lutra canadensis nexa	Humboldt River otter	?	Limited	
Microdipodops megacephalus albiventer	Desert Valley kangaroo mouse	G5T1	Endemic	
Microdipodops megacephalus nasutus	Fletcher dark kangaroo mouse	G5T1	Endemic	
Microdipodops megalocephalus	Dark kanagaroo mouse	?	Unknown	
Microdipodops pallidus	Pale kangaroo mouse	G5	Endemic	
Microtus californicus vallicola	Owens valley vole	G5T1	Peripheral or Limited	
Myotis thysanodes	Fringed myotis	G5	Widespread, declining	
Ochotona princeps sspp.	Pika	G5T?	Limited?	
Ovis canadensis californiana	California bighorn sheep	G4T1	Limited	E
Ovis canadensis canadensis	Rocky Mountain bighorn sheep	?	Peripheral	
Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited	
Sorex preblei	Preble's shrew	G4	Unknown	
Sorex tenellus	Inyo shrew	G3G4	Limited	
Tadarida brasiliensis	Brazilian free-tailed bat	G5	Unknown	
Ursus americanus	Black bear	G5	Peripheral	SAT
MOLLUSKS				
Anodonta californiensis	California floater	G3G4	Widespread, declining	
Eremopyrgus eganensis	Steptoe hydrobe	G1	Endemic	
Fluminicola dalli	Dall pebblesnail	G1	Endemic	
Fluminicola sp 21	Bonneville Basin pebblesnail	G2	Limited?	
Fluminicola turbiniformis	(Pebblesnail)	?	Limited	
Fluminicola virginius	Virginia Mountains pebblesnail	G1	Endemic	
Fontelicella sp	Deep Springs fontelicella	G1	Endemic	
Physa megalochlamys		G3	Unknown	
Physa skinneri		G?	Unknown	
Physella utahensis	Utah physa	G1	Limited	
Planorbella binneyi	Coarse rams-horn	G?	Unknown	
Planorbella oregonensis	Lamb rams-horn	G2	Peripheral or Limited	
Promenetus exacuous	Sharp sprite	G?	Peripheral	
Pyrgulopsis aardahli	Benton Valley springsnail/ Aahrdahl's springsnail	G1	Endemic	
Pyrgulopsis aloba	Duckwater springsnail	G1	Endemic	
Pyrgulopsis anatina	Southern Duckwater springsnail	G1	Endemic	
Pyrgulopsis anguina	Longitudinal gland springsnail	G1	Endemic	
Pyrgulopsis augustae	Elongate Cain Spring springsnail	G1	Endemic	
Pyrgulopsis aurata	Pleasant Valley springsnail	G1	Endemic	
Pyrgulopsis basiglans	Large gland Carico springsnail	G1	Endemic	
Pyrgulopsis bifurcata	Small gland Carico springsnail	G1	Endemic	
Pyrgulopsis breviloba	Flag springsnail	G1	Endemic	
Pyrgulopsis bruesi	Brue's springsnail	G1	Endemic	
Pyrgulopsis bryantwalkeri		G1	Endemic	
Pyrgulopsis cruciglans	Transverse gland springsnail	G1	Endemic	
Pyrgulopsis dixiensis	Dixie Valley springsnail	G1	Endemic	
Pyrgulopsis eremica		?	Limited	
Pyrgulopsis gracilis	Emigrant springsnail	G1	Endemic	
Pyrgulopsis hamlinensis	Hamlin Valley springsnail	G1	Endemic	
Pyrgulopsis hovinghi	Upper Thousand Spring springsnail	G1	Endemic	
Pyrgulopsis hubbsi	Hubbs springsnail	G1	Endemic	
Pyrgulopsis humboldtensis	Humboldt springsnail	G1	Limited	
Pyrgulopsis imperialis		G1	Endemic	

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited	
Pyrgulopsis landyei	Landyes springsnail	G1	Endemic	
Pyrgulopsis lata	Butterfield springsnail	G1	Endemic	
Pyrgulopsis lentiglans	Crittenden springsnail	G1	Endemic	
Pyrgulopsis leporina	Elko springsnail	G1	Endemic or Limited	
Pyrgulopsis limaria	Squat Mud Meadows springsnail	G1	Endemic	
Pyrgulopsis lockensis	Lockes springsnail	G1	Endemic	
Pyrgulopsis longae		G1	Endemic	
Pyrgulopsis longiglans	Western Lahontan springsnail	G2G3	Endemic	
Pyrgulopsis marcida	Hardy springsnail	G2	Endemic	
Pyrgulopsis merriami	Pahranagat pebblesnail	G1	Endemic	
Pyrgulopsis micrococcus		G3?	Limited	
Pyrgulopsis militaris	Northern Soldier Meadow springsnail	G1	Limited	
Pyrgulopsis millenaria	Twentyone Mile springsnail	G1	Endemic	
Pyrgulopsis montana	Camp Valley springsnail	G1	Endemic	
Pyrgulopsis neritella	Neritiform Steptoe Ranch springsnail	G1	Endemic	
Pyrgulopsis nonaria	Ninemile springsnail	G?	Endemic	
Pyrgulopsis notidicola	Elongate Mud Meadows springsnail	G1	Endemic	
Pyrgulopsis orbiculata	Sub-globose Steptoe Ranch springsnail	G1	Endemic	
Pyrgulopsis owensensis	Owens Valley springsnail	G1G2,G1	Endemic	
Pyrgulopsis papillata	Big Warm Spring springsnail	G1	Endemic	
Pyrgulopsis peculiaris	Bifid duct springsnail	G?,G2?	Endemic	
Pyrgulopsis pellita	Antelope Valley springsnail	G1	Endemic	
Pyrgulopsis perturbata	Fish Slough springsnail	G1G2	Endemic	
Pyrgulopsis pictilis	Ovate Cain Spring springsnail	G1	Endemic	
Pyrgulopsis planulata	Flat-topped Steptoe springsnail	G1	Endemic	
Pyrgulopsis sadai	Sada's springsnail	G1G2	Endemic	
Pyrgulopsis sathos	White River Valley springsnail	G1G2	Endemic	
Pyrgulopsis saxatilis	Sub-globose Snake springsnail	G1	Endemic	
Pyrgulopsis serrata	Northern Steptoe springsnail	G1	Endemic	
Pyrgulopsis sterilis	Sterile Basin springsnail	G1	Endemic	
Pyrgulopsis sublata	Lake Valley springsnail	G1	Endemic	
Pyrgulopsis sulcata	Southern Steptoe springsnail	G1	Endemic	
Pyrgulopsis transversa	Southern Bonneville springsnail	G?	Endemic or Limited	
Pyrgulopsis umbilicata	Southern Soldier Meadow springsnail	G1	Endemic	
Pyrgulopsis variegata	Northwest Bonneville springsnail	G2	Limited	
Pyrgulopsis villacampae	Duckwater Warm Springs springsnail	G1	Endemic	
Pyrgulopsis vinyardi	Vinyard's springsnail	G1	Endemic?	
Pyrgulopsis wongi	Wong's springsnail	G1G2	Endemic or Limited	
Stagnicola bonnevillensis	Fat-whorled pondsnail	G1	Endemic	C1
Tryonia clathrata	Grated tyronia	G2	Peripheral or Limited	PT
Tryonia monitorae	Monitor Valley tryonia	G1	Endemic	
Tryonia protea	Desert tryonia	G3G4	Widespread, specialist	
Valvata utahensis	Desert valvata	G1	Limited?	E
PLANTS				
Agastache cusickii	Cusick hyssop	G3	Peripheral	
Allium passeyi	Passey's onion	G1	Endemic	
Arabis bodiensis	Bodie Hills rock cress	G1,G2	Limited	
Arabis dispar	Pinyon rock cress	G3	Limited	
Arabis falcatoria	Grouse Creek rockcress	G1	Peripheral or Limited	
Arabis falcifructa	Elko rockcress	G1G2	Peripheral	
Arabis ophira	Ophir rockcress	G1G2	Endemic	
Arabis pinzliae	Pinzl's rock cress	G1,G2	Limited	

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Scientific Name	Common Name	Grank	Distribution	ESA Status
Arenaria congesta var. wheelerensis	Wheeler peak sandwort	G5T1?	Endemic	
Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic	
Aster kingii var. barnebyana		G3T1	Limited	
Astragalus beatleyae	Beatley milkvetch	G3	Endemic	
Astragalus callithrix	Callaway milkvetch	G3	Endemic	
Astragalus calycosus var. monophyllidius	One-leaflet torrey milkvetch	G5T2	Endemic	
Astragalus cimae var. cimae	Cima milkvetch	G2T2	Peripheral	
Astragalus convallarius var. finitimus	Lesser rushy milkvetch	G5T3	Endemic	
Astragalus convallarius var. margaretiae	Margaret rushy milkvetch	G5T2	Endemic	
Astragalus diversifolius	Mesic milkvetch, meadow milkvetch	G3	Limited	
Astragalus eurylobus	Needle Mountains milkvetch	G2	Limited	
Astragalus funereus	Black milk-vetch, black woollypod	G2	Peripheral	
Astragalus gilmanii	Gilman milkvetch	G3?	Limited	
Astragalus johannis-howellii	Long Valley milk-vetch	G2	Endemic	
Astragalus kentrophyta var. elatus	Spiny-leaved milk-vetch	G5T4	Endemic	
Astragalus kentrophyta var. ungulatus		G5T3T4	Endemic	
Astragalus lentiginosus var kennedyi		G5T3T4	Endemic	
Astragalus lentiginosus var. latus	Broad-pod freckled milkvetch	G5T1	Endemic	
Astragalus lentiginosus var. piscinensis	Fish Slough milk-vetch	G5T1	Endemic	T
Astragalus lentiginosus var. pohlii	Pohl milkvetch	G5T1	Endemic	
Astragalus lentiginosus var. sesquimetralis	Sodaville milk-vetch	G5T1	Limited	
Astragalus monoensis var. monoensis	Mono milk-vetch	G2T2	Peripheral or Limited	
Astragalus monoensis var. ravenii	Raven's milk-vetch	G2T1Q	Peripheral or Limited	
Astragalus oophorus var. clokeyanus	Clokey eggvetch	G4T2	Peripheral	
Astragalus oophorus var. lavinii	Lavin eggvetch	G4T2	Endemic	
Astragalus oophorus var. lonchocalyx	Pink egg milkvetch, long-calyx eggvetch	G4T2	Endemic	
Astragalus pinonis	Pinyon milkvetch	G2G3	Endemic	
Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic	
Astragalus pterocarpus	Winged milkvetch	G3	Limited	
Astragalus purshii var. pumilio		G5T3T4	Endemic	
Astragalus robbinsii var. occidentalis	Lamoille canyon milkvetch	G5T2T3	Endemic	
Astragalus serenoi var. serenoi		G4T3T4	Endemic	
Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic	
Astragalus straturensis	Silver reef milkvetch	G2G3	Peripheral or Limited	
Astragalus toquimanus	Toquima milkvetch	G2	Endemic	
Astragalus uncialis	Currant milkvetch	G2	Endemic	
Astragalus zionis var. vigulus		G4?T1	Limited	
Astralagus chamaemeniscus	Ground crescent milkvetch	G2G3	Endemic	
Atriplex bonnevillensis		G2G3Q	Endemic	
Atriplex canescens var. gigantea	Giant four-wing saltbush	G5T1	Endemic	
Calochortus excavatus	Inyo County star-tulip	G3	Limited	
Camissonia gouldii		G1	Limited	
Camissonia megalantha	Cane Spring suncup	G3	Limited	
Camissonia nevadensis	Nevada suncup	G3	Endemic	
Castilleja dissitiflora		G4?	Endemic	
Castilleja martinii var. clokeyi	Clokey paintbrush	G3QT3	Peripheral	
Castilleja salsuginosa	Monte Neva paintbrush	G1Q	Endemic	
Castilleja scabrida var. barnebyana	Barneby's paintbrush	G4T?	Endemic	
Caulanthus barnebyi	Barneby stemflower	G2	Limited	
Caulostramina jaegeri	Jaeger's caulostramina	G1	Endemic	
Collomia renacta	Barren Valley collomia	G1Q	Limited	
Cordylanthus tecopensis	Tecopa birdsbeak	G2	Limited	
Crepis runcinata ssp. hallii	Hall's meadow hawksbeard	G5T3?	Endemic	

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
Cryptantha compacta	Mound cryptanth	G1	Endemic	
Cryptantha roosiorum	Bristlecone cryptantha	G1	Endemic	
Cryptantha welshii	White River catseye	G3	Endemic	
Cusickiella quadricostata	Bodie Hills cusickiella, Bodie Hills draba	G3	Endemic	
Cymopterus acaulis var. parvus		G5T2T3	Endemic	
Cymopterus basalticus	Dolomite spring-parsley, intermountain wavewing	G2,G2G3	Endemic	
Cymopterus coulteri	Coulter biscuitroot	G3	Limited	
Cymopterus globosus	Wall Spring parsley	G3G4	Endemic	
Cymopterus goodrichii	Goodrich biscuitroot	G1	Endemic	
Cymopterus purpureus var. jonesii		G5T2T3	Limited	
Cypripedium calceolus ssp. parviflorum	Small yellow lady's-slipper	G5T?	Widespread, declining	
Cypripedium fasciculatum	Clustered lady's-slipper	G4	Widespread, declining	
Dedeckera eurekensis	July gold	G2	Peripheral	
Draba arida	Desert whitlowgrass	G2	Endemic	
Draba californica	California draba	G2G3	Endemic	
Draba cusickii var. pedicellata	Stalked cusick whitlowgrass	G4T3?	Endemic	
Draba kassii	Kass rockcress	G1	Endemic	
Draba monoensis	White Mountains draba	G1	Endemic?	
Draba oreibata var. serpentina	Snake Range whitlowgrass	G4T1	Endemic	
Draba pennellii	Pennell draba	G2	Endemic	
Draba sphaeroides	Mountain draba	G2?	Limited	
Draba subumbellata	White Mountains cushion draba	G2	Limited	
Epilobium nevadense	Nevada willowherb	G2	Limited	
Ericameria cervina	Antelope goldenbush	G3?	Limited	
Ericameria gilmanii	Gilman's goldenbush	G1	Limited	
Erigeron calvus	Bald daisy	G1	Limited	
Erigeron ovinus	Sheep fleabane	G2	Limited	
Eriogonum ampullaceum	Mono buckwheat	G3	Limited	
Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic	
Eriogonum argophyllum	Sulphur Springs buckwheat	G1	Endemic	C1
Eriogonum batemanii var. eremicum	Desert wild buckwheat	G4?T2T3	Endemic	
Eriogonum beatleyae	Beatley buckwheat	G2Q	Endemic	
Eriogonum concinnum	Darin buckwheat	G2	Limited	
Eriogonum darrovii	Darrow buckwheat	G2G3	Limited	
Eriogonum eremicola	Wildrose canyon buckwheat	G1	Limited	
Eriogonum esmeraldense var. toiyabense	Toiyabe buckwheat	G4T2	Endemic	
Eriogonum holmgrenii	Holmgren buckwheat	G1	Endemic	
Eriogonum kingii	King buckwheat	G3?	Endemic	
Eriogonum lemmonii	Lemmon buckwheat	G3?	Endemic	
Eriogonum microthecum var. panamintense	Panamint Mountains buckwheat	G5T2	Limited	
Eriogonum nummulare var. ammophilum	Ibex buckwheat	G4T1	Endemic	
Eriogonum ovalifolium var. caelestinum	Heavenly buckwheat	G5T2T3	Endemic	
Eriogonum ovalifolium var. williamsiae	Steamboat buckwheat	G5T1	Endemic	E
Eriogonum phoenicium	Scarlet buckwheat	G1	Endemic	
Eriogonum robustum	Altered andesite buckwheat	G2G3Q	Limited	
Eriogonum rubricaule	Lahontan Basin buckwheat	G3	Endemic	
Eriogonum soredium	Frisco buckwheat	G1	Endemic	
Eriogonum sp.	Churchill Narrows buckwheat	G1G2	Endemic	
Eriogonum spathulatum var. natum	Son's wild buckwheat	G3T2	Endemic	
Eriogonum tiehmii	Tiehm buckwheat	G1	Endemic	
Eriogonum villiflorum	Gray's buckwheat	G3G4	Endemic	
Fimbristylis thermalis	Hot springs fimbristylis	G4?	Limited	
Frasera gypsicola	Sunnyside green gentian	G1	Endemic	

Appendix 5. Species Conservation Targets for the Great Basin Ecoregion.

Scientific Name	Common Name	Grank	Distribution	ESA Status
Frasera pahutensis	Pahute green gentian	G3Q	Endemic	
Galium hilendiae ssp. kingstonense	Kingston Mountains bedstraw	G4QT2?	Limited	
Gilia heterostyla	Cochrane gilia	?	Endemic	
Gilia ripleyi	Ripley's gilia	G2G3	Peripheral	
Gutierrezia petradona	Goldenrod snakeweed	G3	Limited	
Hackelia brevicula	Poison Canyon stickseed	G2	Endemic	
Hackelia ibapensis	Deep Creek stickseed	G1	Endemic	
Haplopappus crispus	Pine Valley goldenbush	G2	Endemic	
Helianthus deserticola	Desert sunflower	G2Q	Limited	
Horkelia hispidula	White Mountains horkelia	G2	Endemic	
Hymenoxys helenioides	Intermountain bitterweed	G3?Q	Unknown	
Ipomopsis congesta var. nevadensis	Toiyabe gilia	G4T1	Endemic	
Ivesia aperta var. aperta	Sierra Valley ivesia	G2T2	Peripheral or Limited	
Ivesia arizonica var. saxosa	Rock purpusia	G4T1	Limited	
Ivesia kingii var. kingii	Alkali ivesia	G3T2	Limited	
Ivesia pityocharis	Pine Nut Mountains ivesia	G2	Endemic	
Ivesia shockleyi var. ostleri	Ostler's ivesia	G3G4T1	Endemic	
Ivesia webberi	Webber ivesia	G2	Limited	
Jamesia americana var. macrocalyx	Wasatch jamesia	G5T2	Limited	
Jamesia tetrapetala	Basin jamesia, waxflower	G2	Endemic	
Lepidium integrifolium var. heterophyllum		G2T1?	Limited	
Lepidium montanum var. alpinum		G5?T1	Limited	
Lepidium nanum	Dwarf peppergrass	G3	Endemic	
Lepidium ostleri	Ostler peppergrass	G1	Endemic	
Leptodactylon glabrum	Bruneau river prickly phlox	G2	Limited	
Lesquerella goodrichii	Goodrich bladderpod	G2G4	Endemic	
Lesquerella hitchcockii	Hitchcock bladderpod	G3	Peripheral or Limited	
Lesquerella pendula	Hanging bladderpod	G2?	Endemic	
Lewisia maguirei	Maguire bitterroot	G1	Endemic	
Lomatium scabrum var. tripinnatum		G3G4T2T3	Peripheral	
Lupinus duranii	Mono Lake lupine	G2	Limited	
Lupinus magnificus var. magnificus	Panamint Mountains lupine	G3TH	Peripheral or Limited	
Lupinus malacophyllus	Soft lupine	G3?	Limited	
Machaeranthera grindelioides var. depressa		G5T3T4	Limited	
Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic	
Mentzelia mollis	Smooth stickleaf	G2	Peripheral	
Mimulus ovatus	Steamboat monkeyflower	G2G3Q	Endemic	
Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining	
Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited	
Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited	
Pediomelum mephiticum		G3?	Peripheral or Limited	
Penstemon angustifolius var. dulcis		G5T2	Endemic	
Penstemon arenarius	Nevada dune beardtongue	G2G3	Endemic	
Penstemon barnebyi	Barneby's beardtongue	G3	Endemic	
Penstemon concinnus	Tunnel spring beardtongue	G3	Endemic	
Penstemon floribundus	Cordelia beardtongue	G1	Endemic	
Penstemon franklinii	Ben's beardtongue	G1	Endemic	
Penstemon humilis var. deserticus	Desert beardtongue	G5T2?	Endemic	
Penstemon leiophyllus var. francisci-pennellii	Pennell beardtongue	G3T2	Endemic	
Penstemon moriahensis	Mount Moriah beardtongue	G1G2	Endemic	
Penstemon nanus	Low beardtongue	G3	Endemic	
Penstemon pahutensis	Pahute Mesa beardtongue	G3	Limited	
Penstemon palmeri var. macranthus		G5T2?	Endemic	

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Scientific Name	Common Name	Grank	Distribution	ESA Status
Penstemon patricus	Dad's penstemon	G2Q	Endemic	
Penstemon pinorum	Pinyon penstemon	G1	Endemic	
Penstemon platyphyllus	Broadleaf penstemon	G2G3	Peripheral	
Penstemon procerus var. modestus		G5T2T3	Endemic	
Penstemon pudicus	Bashful beardtongue	G1	Endemic	
Penstemon rhizomatosus	Rhizome beardtongue	G1	Endemic	
Penstemon rubicundus	Wassuk Beardtongue	G2G3	Endemic	
Penstemon tidestromii	Tidestrom beardtongue	G2G3	Peripheral	
Penstemon tiehmii	Tiehm beardtongue	G1	Endemic	
Perityle intricata		G3	Peripheral or Limited	
Perityle inyoensis	Inyo rock daisy	G1	Limited	
Phacelia amabilis	Saline Valley phacelia	G1Q	Limited	
Phacelia beatleyae	Beatley scorpion plant	G3	Peripheral	
Phacelia glaberrima	Reese River phacelia	G3?	Endemic	
Phacelia inconspicua	Obscure scorpion plant	G2	Limited	
Phacelia minutissima	Least phacelia	G2	Peripheral	
Phacelia monoensis	Mono County phacelia	G3,G3Q	Limited	
Phacelia mustelina	Death Valley round-leaved phacelia, weasel phacelia	G2,G2G3	Limited	
Phacelia parishii	Parish phacelia	G2G3	Limited	
Phacelia sp. 1	Undescribed phacelia 1	G2	Peripheral	
Phlox griseola	Grayleaf phlox	G3?	Limited	
Phlox tumulosa	Mound phlox	G3?	Endemic	
Plagiobothrys glomeratus	Altered andesite popcorn-flower	G2G3	Limited	
Poa abbreviata ssp. marshii	Marsh's blue grass	G5T2	Limited	
Polemonium chartaceum	Mason's sky pilot, White Mountain skypilot	G1	Endemic	
Polyctenium williamsiae	Williams combleaf	G2	Limited	
Polygala heterorhyncha	Notch-beak milkwort	G3Q	Limited	
Potentilla basaltica	Soldier Meadow cinquefoil	G1	Limited	
Potentilla cottamii	Cottam's cinquefoil	G1	Limited	
Potentilla morefieldii	Morefield's cinquefoil	G1	Endemic	
Potentilla pensylvanica var. paucijuga		G5T1T2Q	Limited	
Primula capillaris	Ruby Mountain primrose	G1	Endemic	
Primula domensis	House Range primrose	G1	Endemic	
Primula nevadensis	Nevada primrose	G1	Endemic	
Psorothamnus kingii	Lahontan indigobush	G3	Endemic	
Sclerocactus blainei	Blaine pincushion	G1Q	Endemic	
Sclerocactus nyensis	Tonopah fishhook cactus	G1Q	Endemic	
Sclerocactus schlesseri	Schlesser pincushion	G1Q	Endemic	
Sclerocactus spinosior	Desert Valley fishhook-cactus	G2G3	Endemic	
Sidalcea covillei	Owens Valley checkerbloom	G2	Limited	
Silene nachlingerae	Nachlinger catchfly	G2	Endemic	
Silene nuda var. nuda	Naked catchfly	G3T1T2Q	Endemic	
Smelowskia holmgrenii	Holmgren smelowskia	G2	Endemic	
Sphaeralcea caespitosa	Jones globe-mallow	G3	Endemic	
Spiranthes diluvialis	Ute ladies' tresses	G2	Disjunct, declining	
Streptanthus oliganthus	Masonic Mountain jewel-flower	G3	Limited	
Stroganowia tiehmii	Tiehm stroganowia	G2	Endemic	
Tetradymia tetrameres		?	Endemic	
Thelypodium rollinisii		G2G3	Limited	
Tonestus alpinus	Alpine tonestus	G2	Endemic	
Tonestus graniticus	Lone Mountain tonestus	G1	Endemic	
Townsendia jonesii var. tumulosa	Charleston grounddaisy	G3T3	Peripheral	

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Scientific Name	Common Name	Grank	Distribution	ESA Status
Trifolium andinum var. podocephalum	Currant Summit clover	G3T1	Endemic	
Trifolium friscanum	Frisco clover	G1	Endemic	
Trifolium macilentum var. dedeckerae	Dedecker's clover	G?T2	Peripheral	
Trifolium rollinsii	Rollins clover	G2G3Q	Endemic	
Viola lithion	Rock violet	G1	Endemic	
REPTILES				
Clemmys marmorata marmorata	Northwestern pond turtle	G3T3	Disjunct	
Elgaria panamintina	Panamint alligator lizard	G1G2	Limited	
Lampropeltis pyromelana infralabialis	Utah mountain kingsnake	G5T3	Unknown	
Phrynosoma hernandesi	Mountain short-horned lizard	G3	Endemic	

Appendix 6. Individual and Agency Contacts for the Great Basin Planning Process

	Name	*Department/Institution*	*Provided Expert Input for GB Plan*
Bureau of Land Management	STEVE ADDINGTON	BISHOP FIELD OFFICE	
	JOHN ANDERSON	ARIZONA STATE OFFICE	
	LORI ARMSTRONG	RICHFIELD FIELD OFFICE	Yes
	JOHN AXTELL	CARSON CITY FIELD OFFICE	Yes
	MARK BARBER	ELY FIELD OFFICE	Yes
	MIKE BASKERVILLE	TONOPAH AREA	Yes
	ARNOLD BERGLUND	WINNEMUCCA FIELD OFFICE	Yes
	RON BOLANDER	UTAH STATE OFFICE	
	RICK BRIGHAM	CARSON CITY FIELD OFFICE	Yes
	LANCE BROWN	TONOPAH AREA	Yes
	BOB BROWN	ELY FIELD OFFICE	Yes
	JACK BROWN	SALT LAKE FIELD OFFICE	
	ALAN BUEHLER	TONOPAH AREA	
	GLENN CARPENTER	SALT LAKE FIELD OFFICE	Yes
	PAUL CHAPMAN	KANAB FIELD OFFICE	
	PETE CHRISTENSEN	WINNEMUCCA FIELD OFFICE	Yes
	BRETT COVLIN	ELY FIELD OFFICE	Yes
	DUANE CRIMMINS	BATTLE MTN FIELD OFFICE	Yes
	JIM CRISP	ST. GEORGE FIELD OFFICE	
	SHANE DEFOREST	ELY FIELD OFFICE	Yes
	WALT DEVAURS	CARSON CITY FIELD OFFICE	Yes
	DOUG DODGE	BISHOP FIELD OFFICE	
	BILL DROTT	SALT LAKE FIELD OFFICE	Yes
	MARK DUFF		
	BILL DUNN	ELY FIELD OFFICE	Yes
	CAROL EVANS	ELKO FIELD OFFICE	Yes
	JOY FATOOH	BISHOP FIELD OFFICE	
	BILL FISHER	TONOPAH AREA	
	GARY FOULKES	BATTLE MTN FIELD OFFICE	Yes
	WENDY FUELL	WINNEMUCCA FIELD OFFICE	Yes
	LARRY GREENWOOD	RICHFIELD FIELD OFFICE	
	ANNE HALFORD	BISHOP FIELD OFFICE	Yes
	JACK HAMBY	TONOPAH AREA	Yes
	RODD HARDY	SALT LAKE FIELD OFFICE	Yes
	DAN JACQUET	CARSON CITY FIELD OFFICE	Yes
	GARY KIDD	SALT LAKE FIELD OFFICE	Yes
	GENE KOLKMAN	ELY FIELD OFFICE	
	CHIP KRAMER	TONOPAH AREA	Yes
	KATRINA LEAVITT	CARSON CITY FIELD OFFICE	Yes
	LETICIA LISTER	ELKO FIELD OFFICE	
	JOHN LONGINETTI	ELY FIELD OFFICE	
	BILL LUTGENS	BATTLE MTN FIELD OFFICE	Yes

	Name	Department/Institution	Provided Expert Input for GB Plan
Bureau of Land Management	CRAIG MACKINNON	TONOPAH AREA	
	MIKE MAIN	ELY FIELD OFFICE	Yes
	CAROL MARCHIO	ELKO FIELD OFFICE	Yes
	ROBERT MARCHIO	ELKO FIELD OFFICE	Yes
	GAYLE MARRS-SMITH	LAS VEGAS FIELD OFFICE	
	KATHY MCKINSTAY	ELKO FIELD OFFICE	Yes
	RANDY MCNATT, DR.	NV STATE OFFICE	
	ROBERT MEANS	ELKO FIELD OFFICE	Yes
	MELANIE MENDENHALL	HOUSE RANGE/WARM SPRING FIELD OFFICE	
	VALERIE METSCHER	TONOPAH AREA	
	MIKE NELSON	SALT LAKE FIELD OFFICE	Yes
	STEVE NELSON	BISHOP FIELD OFFICE	
	SARA NEWMAN	ELKO FIELD OFFICE	Yes
	MIKE PERKINS	ELY FIELD OFFICE	Yes
	JIM PERKINS	ELY FIELD OFFICE	
	MARC POINTEL	TONOPAH AREA	Yes
	ROY PRICE	ELKO FIELD OFFICE	Yes
	JIM RAMAKKA	ROSEBURG DISTRICT OFFICE	
	MARK (TIM) RASH	LAS VEGAS FIELD OFFICE	
	JOE RATLIFF	BATTLE MTN FIELD OFFICE	Yes
	HARRY RHEA	ELY FIELD OFFICE	
	SKIP RITTER	ELKO FIELD OFFICE	Yes
	CHRIS ROSS	NV STATE OFFICE	
	TERRY RUSSI	BISHOP FIELD OFFICE	Yes
	GARY SCHOOLCRAFT	EAGLE LAKE FIELD OFFICE	
	ALAN SHEPHERD	CALIENTE FIELD STATION	Yes
	MIKE STAMM	BATTLE MTN FIELD OFFICE	Yes
	ART TATE	CEDAR CITY FIELD OFFICE	
	BRUCE THOMPSON	ELKO FIELD OFFICE	
	STEEP WEISS	CARSON CITY FIELD OFFICE	Yes
	KEN WILKINSON	ELKO FIELD OFFICE	Yes
	SALLY WISELY	UTAH STATE OFFICE	
	TRACEY WOLFE	CARSON CITY FIELD OFFICE	Yes
	JEFF WRIGHT	TONOPAH AREA	
	MIKE ZELINSKI	WINNEMUCCA FIELD OFFICE	Yes
Department of Defense	SCOTT BATES	DUGWAY PROVING GROUNDS	
	MARCUS BLOOD	HILL AIR FORCE BASE	Yes
	ESTER HUTCHINSON	FALLON NAVAL AIR STATION	Yes
	JOHN MARTIN	DUGWAY PROVING GROUNDS	Yes
	HERMAN MILSAP	HAWTHORNE ARMY DEPOT	
	JIM PURRELL	HAWTHORNE ARMY DEPOT	
	ERIC WATKINS		Yes

	Name	*Department/Institution*	*Provided Expert Input for GB Plan*
Fish & Wildlife Service	JANET BAIR	FWS, SOUTHERN NEVADA FIELD OFFICE	
	LAURA BERGLUND	FWS, NORTHERN NEVADA FIELD OFFICE	
	MICHAEL BURROUGHS	FWS, SOUTHERN NEVADA FIELD OFFICE	
	STEPHANIE BYERS	FWS, NORTHERN NEVADA FIELD OFFICE	Yes
	PAT COFFIN	FWS, NORTHERN NEVADA FIELD OFFICE	Yes
	YVETTE CONVERSE	FWS,	
	WILLIAM COWAN	FWS, NORTHERN NEVADA FIELD OFFICE	Yes
	RICHARD DUNCAN	FWS, NORTHERN NEVADA FIELD OFFICE	Yes
	MARYJO ELPERS	FWS, NORTHERN NEVADA FIELD OFFICE	Yes
	GINA GLENNE	FWS, SOUTHERN NEVADA FIELD OFFICE	
	JESS GOURLEY	FWS,	Yes
	JIM HARVEY	FWS, NORTHERN NEVADA FIELD OFFICE	Yes
	MARCY HAWORTH	FWS, NORTHERN NEVADA FIELD OFFICE	Yes
	LISA HEKI	FWS, NORTHERN NEVADA FIELD OFFICE	Yes
	BILL HENRY	STILL WATER NWR	
	JEFF MACKEY	RUBY LAKE NWR	
	CHRIS MULLEN, DR.	NORTHERN NEVADA FIELD OFFICE	
	AL PFISTER	NORTHERN NEVADA FIELD OFFICE	Yes
	JODY SAWASAKI	NORTHERN NEVADA FIELD OFFICE	Yes
	SELENA WEDON	NORTHERN NEVADA FIELD OFFICE	Yes
	ROBERT WILLIAMS	NORTHERN NEVADA FIELD OFFICE	Yes
	LARRY ZEIGENFUSS		
Forest Service	KEVIN ACTHLEY	NORTHEAST ECOUNIT	
	KELLY AMY	NORTHEAST ECOUNIT	Yes
	SCOTT BELL	NORTHEAST ECOUNIT	Yes
	ELIZABETH BERGSTROM	HUMBOLDT-TOIYABE NF	
	JOHN BRACK	CENTRAL NV ECOUNIT	Yes
	BOB CAMPBELL	FISHLAKE NF	
	LORETTA CARTNER	CENTRAL NV ECOUNIT	Yes
	JEAN CHAMBERS, DR.	USDA	Yes
	BOB CHRISTENSEN	CENTRAL NV ECOUNIT	Yes
	DOUG CLARKE	NORTHEAST ECOUNIT	Yes
	ALEXIA COCHRANE	CENTRAL NV ECOUNIT	Yes
	JACK COLWELL	NORTHEAST ECOUNIT	
	RICK CONNELL	HUMBOLDT-TOIYABE NF	Yes
	DON DUFF	REGIONAL OFFICE	
	JASON DUNHAM		
	SUE FARLEY	CENTRAL NV ECOUNIT	Yes
	BRETT GLOVER	NORTHEAST ECOUNIT	Yes
	SHEREL GOODRICH	ASHLEY NF	
	JERRY GREVSTAD	HUMBOLDT-TOIYABE NF	Yes
	JOHN HANEY	NORTHEAST ECOUNIT	Yes

	Name	Department/Institution	Provided Expert Input for GB Plan
Forest Service	CHERI HOWELL	NORTHEAST ECOUNIT	Yes
	JOELLEN KEIL	INYO NATIONAL FOREST	
	RON KEIL	INYO NATIONAL FOREST	
	DAVE KINATEDER	CENTRAL NV ECOUNIT	Yes
	STANLEY KITCHEN, DR.	USDA	Yes
	MARY MANNING	REGIONAL OFFICE	
	DAVE MCMORRAN	CENTRAL NV ECOUNIT	Yes
	JUANITA MENDIVE	NORTHEAST ECOUNIT	
	SUSAN MEYER, DR.	USDA, ROCKY MOUNTAIN RESEARCH STATION, SHRUB SCIENCE LABORATORY	Yes
	CONNIE MILLAR	PSW RANGE AND EXPERIMENT STATION	
	VERGIL MINK	CENTRAL NV ECOUNIT	Yes
	DEANNA NELSON	HEBER RANGER DISTRICT; UINTA NF	
	KATHLEEN NELSON	INYO NATIONAL FOREST	
	TERRY NEVIUS	CENTRAL NV ECOUNIT	Yes
	KATHY NOLINA	INYO NATIONAL FOREST	
	CHRYS OLSON	NORTHEAST ECOUNIT	
	WAYNE PADGETT	WASATCH-CACHE NATIONAL FOREST	Yes
	JAY PENCE	CENTRAL NV ECOUNIT	Yes
	RICHARD PERLOFF	INYO NATIONAL FOREST	Yes
	LARRY RANDALL	CENTRAL NV ECOUNIT	Yes
	JENNY SCANLAND	HUMBOLDT-TOIYABE NF	
	STEVE SCHACHT	CENTRAL NV ECOUNIT	Yes
	STACEY SCOTT	PLUMAS NATIONAL FOREST	
	PAT SHANLEY	HUMBOLDT-TOIYABE NF	
	LISA SIMS	SIERRA ECOUNIT	
	JOHN SPECK	NORTHEAST ECOUNIT	
	ROBIN TAUSCH, DR.	USDA	Yes
	MARY WAGNER	DIXIE NATIONAL FOREST	
	DAVE WEIXELMAN	HUMBOLDT-TOIYABE NF	Yes
	BONNIE WHALEN	NORTHEAST ECOUNIT	Yes
	JIM WHELAN	CENTRAL NV ECOUNIT	
	STEVE WILLIAMS	NORTHEAST ECOUNIT	
	ALMA WINWARD	REGIONAL OFFICE	
	DESI ZAMUDIO	HUMBOLDT-TOIYABE NF	Yes
	KAREN ZAMUDIO	HUMBOLDT-TOIYABE NF	Yes
Other Federal Agencies	JAYNE BELNAP	NPS	
	DAVE BRADFORD, DR.	EPA	
	JANE BRIN-BOX	USGS	
	BRUCE BURY	USGS	
	TODD ESCUE	USGS	Yes
	BECKY MILLS	NPS	
	DAVE RIDER	EPA	

	Name	Department/Institution	Provided Expert Input for GB Plan
Other Federal Agencies	PETE RISSLER	USGS-BRD	
	GARY SCOPPETTONE, DR.	USGS-BRD	
	CATINA SEVIDAL	BOR	
	SEAN SHEA	USGS-BRD	
	JOE SIROTNAK	NPS	Yes
	TOD WILLIAMS	NPS	
State Agencies	MATTHEW ANDERSON	UTDWR	
	BILL BATES	UTDWR	
	CURT BAUGHMAN	NDOW	Yes
	DAWNE BECKER	CDFG	
	KRAIG BECKSTRAND	NDOW	Yes
	PETE BRADLEY	NDOW	Yes
	GLENN CLEMMER, DR.	NVDCNR	Yes
	ANITA COOK	NDOW	
	CHRIS CROOKSHANKS	NDOW	Yes
	GAIL DURHAM	NDF	
	SID EATON	NDOW	Yes
	JOHN ELLIOT	NDOW	
	DUANE (SWEDE) ERICKSON	NDOW	
	BEN FRANKLIN	UTDWR	Yes
	RICK FRIDELL	UTDWR	
	KIM GOODWIN	NVDCNR	
	KEN GRAY	NDOW	
	BRAD HARDENBROOK	NDOW	Yes
	DALE HEPWORTH	UTDWR	
	GARY HERRON	NDOW	
	TODD HOGREFE	UTDWR	Yes
	FRANK HOWE	UTDWR	Yes
	MIKE HUDSON	UTDWR	
	GARY JOHNSON	NDOW	
	JEFF KNIGHT	NV AGRICULTURAL EXTENSION	
	MATT LORNE	NDOT	
	JIM LUSK	NDOW	
	ERIC MISKOW	NVDCNR	
	DEAN MITCHELL	UTDWR	
	JIM MOREFIELD, DR.	NVDCNR	Yes
	CRAIG MORITMER	NDOW	
	LARRY NEEL	NDOW	Yes
	JENNIFER NEWMARK	NVDCNR	
	GEORGE OLIVER	UTDWR	Yes
	JIM PARRISH	UTDWR	
	STEVE PERMINTER	CDFG	

	Name	Department/Institution	Provided Expert Input for GB Plan
State Agencies	ALLAN PICKARD	CDFG	
	PHIL PISTER	CDFG	Yes
	MIKE PODBORNY	NDOW	Yes
	DENISE RACINE	CDFG	
	NORM SAAKE	NDOW	Yes
	MIKE SEVON	NDOW	
	SAXON SHARPE	NV WATER PLANNING	
	TERI SLATAUSKI	NDOW	Yes
	JERRY STEIN	NDOW	Yes
	SAN STIVER	NDOW	
	LARRY TESKE	NDOW	Yes
	PAUL THOMPSON	UTDWR	
	CHARLIE THOMPSON	UTDWR	
	CRIS TOMLINSON	NDOW	Yes
	TONY WASLEY	NDOW	Yes
	JOE WILLIAMS	NDOW	
	KRISSY WILSON	UTDWR	
	DARREL WONG	CDFG	Yes
Local Agencies	MARK HOLDEN	CENTRAL UTAH PROJECT	
	PAULA HUBBARD	LADWP	
	STEVE INGRAM	LADWP	
	KRIS KELLIHER	CENTRAL UTAH PROJECT	
	SALLY MANNING	INYO COUNTY	Yes
	DAVE MARTIN	LADWP	
	LYNDA NELSON	WASHOE COUNTY	
Tribal Governments	ELVEDA MARTINEZ	WALKER RIVER PAIUTE TRIBE	
Universities & Colleges	ELIZABETH AMMON	UNR	
	MIKE ASHLEY	UNR	Yes
	DUANE ATWOOD, DR.	BYU	
	JEANINE AUGER	UNR	Yes
	GARY BAIRD	BYU	
	MARILYN BANTA	UNR	
	MARY BARKWORTH	USU	
	RICHARD BAUMANN, DR.	BYU	Yes
	JON BECKMAN	UNR	Yes
	ERIK BEEVER, DR.	UNR	Yes
	JOEL BERGER, DR.	UNR	
	BOB BLANK, DR.	USDA, AGRICULTURAL RESEARCH SERVICE	Yes
	JIM BOWNS	SOUTHERN UTAH UNIVERSITY	
	HUGH BRITTEN, DR.	UNIVERSITY OF SD	
	PETER BRUSSARD, DR.	UNR	Yes

	Name	*Department/Institution*	*Provided Expert Input for GB Plan*
Universities & Colleges	DAVID CHARLET, DR.	COMMUNITY COLLEGE OF SOUTHERN NEVADA	Yes
	JORDON CLARK	UC, SANTA BARBARA CAMPUS	
	TODD CROWL, DR.	USU	Yes
	JIM DOBROWOLSKI	USU	
	STEVE ELLSWORTH, DR.	SIERRA NEVADA COLLEGE	Yes
	DON ERMAN, DR.	UC, DAVIS CAMPUS	
	BOBBY ESPINOZA	UNR	Yes
	TED EVANS	USU	
	CRAIG FEE	UNIVERSITY OF MI	
	ERICA FLEISHMAN, DR.	STANFORD UNIVERSITY	
	GREG FORBES, DR.	JORNADA LTER	
	TERRY GRISWALD, DR.	USU	Yes
	KIMBALL HARPER	BYU	
	CHUCK HAWKINS	USU	
	KEN HEIL	SAN JUAN COLLEGE	
	DAVID HERBST, DR.	UC, SIERRA NEVADA AQUATIC RESEARCH LAB	Yes
	LARRY HIGGINS	DIXIE COLLEGE	
	BOB HILDEBRAND	USU	Yes
	STEVE JENKINS, DR.	UNR	
	JOHN KADLEC	USU	
	FREDERICK KNOWLTON	USU	
	TIMOTHY LAWLOR, DR.	CA STATE UNIV, HUMBOLDT	
	PATRICK LEARY	COMMUNITY COLLEGE OF SOUTHERN NEVADA	Yes
	DAVE LIGHTFOOT, DR.	UNIVERSITY OF NM	
	BILL LONGLAND, DR.	USDA, AGRICULTURAL RESEARCH SERVICE	Yes
	JAMES MACMAHON, DR.	USU	Yes
	DICK MACMILLEN, DR.	UC, IRVINE CAMPUS (EMERITUS)	
	D MEADOWS, DR.	WEBER STATE UNIVERSITY	
	MIKE MEEUWIG	UNR	
	DENNIS MURPHY, DR.	UNR	
	MARILYN MYERS	UC,	
	RILEY NELSON, DR.	BYU	Yes
	HELEN NEVILLE	UNR	Yes
	BECKY NIELL	UNR	Yes
	KEN NUSSEAR	UNR	Yes
	LEW ORING, DR.	UNR	
	BRENT PALMER	SOUTHERN UTAH UNIVERSITY	
	MICHAEL PARKER, DR.	SOUTHERN OR STATE COLLEGE	
	BRUCE PAVLIK, DR.	MILLS COLLEGE	
	MARY PEACOCK, DR.	UNR	Yes

	Name	*Department/Institution*	*Provided Expert Input for GB Plan*
Universities & Colleges	MARK PORTS	GREAT BASIN COLLEGE	Yes
	HEATHER POWELL		Yes
	DANIEL PRITCHETT	UC, WHITE MOUNTAIN RESEARCH STATION	Yes
	MATT RAHN	UNR	Yes
	DAVE RHODE	DRI	
	BRETT RIDDLE	UNLV	
	JAVIER RODRIGUES	UC, BERKELEY, MUSEUM OF VERTEBRATE ZOOLOGY	
	WILLIAM ROMEY	SOUTHERN UTAH UNIVERSITY	
	CHRIS ROSAMOND	UNR	
	RICHARD RUST, DR.	UNR	Yes
	ROBERT SCHROETER	UC, DAVIS CAMPUS	
	TERRY SCHWANER	SOUTHERN UTAH UNIVERSITY	
	ANDY SHELDON	UNIVERSITY OF MT	
	WILLIAM SHEPARD, DR.	CA STATE	
	LEILA SHULTZ, DR.	USU, HARVARD UNIV	
	ERIC SIMANDLE	UNR	Yes
	JACK SITES	BYU	
	LARRY ST. CLAIR	BYU	
	PETER STARKWEATHER, DR.	UNLV	
	DOUG STONE	UC, BERKELEY CAMPUS	
	SHERM SWANSON, DR.	UNR	
	JOE SZEWSZAK, DR.	UC, WHITE MOUNTAIN RESEARCH STATION	Yes
	SUSAN SZEWSZAK, DR.	UC, WHITE MOUNTAIN RESEARCH STATION	Yes
	VINCENT TEPEDINO, DR.	USU	Yes
	TRENT TOLOR	USU	Yes
	DICK TRACY, DR.	UNR	Yes
	PAUL TUELLER	UNR	
	RENEE VAN BUREN	UTAH VALLEY CC	
	STEVE VANDERWALL, DR.	UNR	
	MARK VINSON	USU	Yes
	DAVE WAKE	UC, BERKELEY CAMPUS	
	JOY WARD, DR.	UNIVERSITY OF UT	
	STAN WELSH, DR.	BYU	Yes
	NEIL WEST, DR.	USU	Yes
	CLAYTON WHITE	BYU	
	WALT WHITFORD, DR.	NM STATE	
	MIKE WINDHAM	UNIVERSITY OF UT	
	MICHAEL WOLFE, DR.	USU	Yes
	JIM YOUNG, DR.	USDA, AGRICULTURAL RESEARCH SERVICE	

	Name	Department/Institution	Provided Expert Input for GB Plan
Museums	GEORGE AUSTIN, DR.	NEVADA STATE MUSEUM	Yes
	GEORGE BAUMGARDNER	NEVADA STATE MUSEUM	
	ROBERT (BOB) CHEW, DR.	AMERICAN MUSEUM FIELD STATION	
	ROBERT HERSHLER, DR.	SMITHSONIAN INSTITUTION	
	ANN PINZL	NEVADA STATE MUSEUM	
	ERIC RICKART	UT MUSEUM OF NATURAL HISTORY	
	JENS VINDUM	CAL ACADEMY OF SCIENCES	
Organizations	GRANT BALLARD	POINT REYES BIRD OBSERVATORY	
	GRAHAM CHISHOLM, DR.	TNC, NEVADA STATE OFFICE	Yes
	PAT COMER, DR.	TNC, CONSERVATION SCIENCE DIVISION	
	TED FLOYD, DR.	GREAT BASIN BIRD OBSERVATORY	Yes
	SACHA HEATH	POINT REYES BIRD OBSERVATORY	
	ALYSON HEYREND	TNC, HOME OFFICE	
	JOHN HUMKE	TNC, GOVERNMENT RELATIONS	
	CATHIE JEAN	TNC, MT NATURAL HERITAGE PROGRAM	
	TERI KNIGHT, DR.	TNC, NEVADA STATE OFFICE	
	DAVE MARSHALL	OR BREEDING BIRD ATLAS	
	CRAIG MAYER	TNC, CALIFORNIA DIVISION OFFICE	
	JIM MOORE	TNC, NEVADA STATE OFFICE	Yes
	JAN NACHLINGER	TNC, NEVADA STATE OFFICE	Yes
	JOEL PETERSON	TNC, UTAH STATE OFFICE	
	CHUCK RUMSEY	TNC, NEVADA STATE OFFICE	
	DAVE SHUFORD	POINT REYES BIRD OBSERVATORY	
	JEFF SMITH, DR.	HAWKWATCH INTERNATIONAL	
	ROSE STRICKLAND	SIERRA CLUB	
	CHRISTINE TAM	TNC, CALIFORNIA DIVISION OFFICE	
	JOEL TUHY	TNC, UTAH STATE OFFICE	Yes
	LAURA VALUTIS	TNC, CONSERVATION SCIENCE DIVISION	
	PAM WEIANT	TNC, CALIFORNIA DIVISION OFFICE	
Private Firms	DAVE ANDERSON	BECHTEL	
	KENT OSTLER	BECHTEL	Yes
	AL REUTER	CORTEZ GOLD MINE	Yes
	JEFF SPALDING	DAMES & MOORE	
Independent Biologists	MARTI AIKEN		
	MARK BAGLEY		Yes
	ART BAILE		
	ROBERT BECHTEL		
	FLOYD BERO		
	BRUCE BOYD		Yes
	PAT BROWN		
	GLENN CLIFTON		Yes
	JIM COLE		

	Name	Department/Institution	Provided Expert Input for GB Plan
Independent Biologists	RICK COLLINS		
	MARY DEDECKER		
	JIM EIDEL		Yes
	ANGELA EVENDEN, DR.		
	ROBERT GORDON		
	CHAD GOURLEY		
	DERHAM GULIANI		Yes
	JUDY HARPEL		
	TOM HEINDEL		
	DAN HEINZ		
	KERRY HEISE		
	JOHN HIATT		
	STEVE HOFFMANN		
	PAUL HOLDEN, DR.		
	PETER HOVINGH, DR.		
	LAURA HUFFMAN		
	GARY IVEY		
	ROBERT JELLISON, DR.		
	SHERM JENSEN		Yes
	ROBERT JOHNSON		
	RON KASS		
	TOM KENNEDY		
	BRUCE KHUNS		
	DON KING		
	DONALD KLEBENOW, DR		
	ED KLEINER		
	DAVID KUNTZ		
	ALVIN MCLANE		
	PHIL MEDICA		
	PAUL OPLER		
	JANE PERKINS		
	DONALD SADA, DR.		Yes
	FRANK (BUDDY) SMITH		Yes
	ARNOLD (JERRY) TIEHM		Yes
	RICH VALDEZ		
	ROBERT WARRICK		
	JOHN WEHEUSEN		

Appendix 7. List of Designated Areas in the Great Basin and their Land Status Categories

	Land Status	*Area Name*	*Type*
Bureau of Land Management	2.5	Antelope Range	Wilderness Study Area
	2.5	Augusta Mountains	Wilderness Study Area
	2.5	Big Hollow	Wilderness Inventory Unit
	2.5	Black Ridge	Wilderness Inventory Unit
	2.5	Black Rock Desert	Wilderness Study Area
	4	Black Rock Desert - High Rock Canyon Emigrant Trails	National Conservation Area
	2.5	Blue Eagle	Wilderness Study Area
	2.5	Bluebell	Wilderness Study Area
	2.5	Bodie	Wilderness Study Area
	3	Bodie Bowl	ACEC
	2.5	Bodie Mountain	Wilderness Study Area
	2	Bonneville Salt Flats	ACEC
	2.5	Burbank Canyons	Wilderness Study Area
	2.5	Calico Mountains	Wilderness Study Area
	2.5	Casa Diablo	Wilderness Study Area
	2.5	Cedar Mountains	Wilderness Study Area
	2.5	Cedar Mountains	Wilderness Inventory Unit
	2.5	Cedar Ridge	Wilderness Study Area
	3	Central Pacific RR	ACEC
	2.5	Central Wah Wah Mountains	Wilderness Inventory Unit
	2.5	Cerro Gordo	Wilderness Study Area
	2.5	Chidago Canyon	Wilderness Study Area
	2.5	China Mountain	Wilderness Study Area
	2.5	Clan Alpine Mountains	Wilderness Study Area
	2.5	Conger Mountain	Wilderness Inventory Unit
	2.5	Conger Mountain	Wilderness Study Area
	2	Conway Summit	ACEC
	2.5	Cottonwood Canyon	Wilderness Study Area
	2.5	Cougar Canyon	Wilderness Study Area
	2.5	Cougar Canyon	Wilderness Inventory Unit
	2.5	Crater Mountain	Wilderness Study Area
	2	Crater Mountain	ACEC
	2.5	Deep Creek Mountains	Wilderness Inventory Unit
	2.5	Deep Creek Mountains	Wilderness Study Area
	2.5	Desatoya Mountains	Wilderness Study Area
	2	Donner/Bettridge Creek	ACEC
	2.5	Dry Valley Rim	Wilderness Study Area
	2.5	Dugway Mountains	Wilderness Inventory Unit
	2.5	East Fork High Rock Canyon	Wilderness Study Area
	2.5	Excelsior	Wilderness Study Area
	2.5	Far South Egans	Wilderness Study Area

Appendix 7. List of Designated Areas in the Great Basin and their Land Status Categories

	Land Status	*Area Name*	*Type*
Bureau of Land Management	2.5	Fish Slough	Wilderness Study Area
	2	Fish Slough	ACEC
	2.5	Fish Springs	Wilderness Inventory Unit
	2.5	Fish Springs	Wilderness Study Area
	2.5	Fortification Range	Wilderness Study Area
	2	Fossil Mountain	ACEC
	2.5	Fox Range	Wilderness Study Area
	2.5	Gabbs Valley Range	Wilderness Study Area
	2	Gandy Mountain Caves	ACEC
	2	Gandy Salt Marsh	ACEC
	2.5	Goshute Canyon	Wilderness Study Area
	2.5	Goshute Peak	Wilderness Study Area
	2.5	Granite Mountains	Wilderness Study Area
	2.5	Granite Peak	Wilderness Inventory Unit
	2.5	High Rock Canyon	Wilderness Study Area
	2.5	High Rock Lake	Wilderness Study Area
	2	Horseshoe Springs	ACEC
	2.5	Howell Peak	Wilderness Study Area
	2.5	Howell Peak	Wilderness Inventory Unit
	2	Incandescent Rocks	ACEC
	2.5	Independence Creek	Wilderness Study Area
	2.5	Job Peak	Wilderness Study Area
	2.5	Kawich Range	Wilderness Study Area
	2	Keynot Peak	ACEC
	2.5	King Top	Wilderness Study Area
	2.5	King Top	Wilderness Inventory Unit
	2	Laketown Canyon	ACEC
	2.5	Little High Rock Canyon	Wilderness Study Area
	2.5	Marble Canyon	Wilderness Study Area
	2.5	Masonic Mountain	Wilderness Study Area
	2.5	Morey Peak	Wilderness Study Area
	2.5	Mormon Meadow	Wilderness Study Area
	2.5	Mount Biedeman	Wilderness Study Area
	2.5	Mount Grafton	Wilderness Study Area
	2.5	Mount Limbo	Wilderness Study Area
	2.5	Newfoundland Mountains	Wilderness Inventory Unit
	2.5	North Black Rock Range	Wilderness Study Area
	2.5	North Jackson Mountains	Wilderness Study Area
	2.5	North Stansbury Mountains	Wilderness Study Area
	2.5	North Stansbury Mountains	Wilderness Inventory Unit
	2.5	North Wah Wah Mountains	Wilderness Inventory Unit
	2.5	Notch Peak	Wilderness Inventory Unit

Appendix 7. List of Designated Areas in the Great Basin and their Land Status Categories

	Land Status	*Area Name*	*Type*
Bureau of Land Management	2.5	Notch Peak	Wilderness Study Area
	2.5	Oquirrh Mountains	Wilderness Inventory Unit
	2	Osgood Mountains Milkvetch	ACEC
	2.5	Pahute Peak	Wilderness Study Area
	2.5	Palisade Mesa	Wilderness Study Area
	2.5	Park Range	Wilderness Study Area
	2.5	Parsnip Peak	Wilderness Study Area
	3	Pavant Butte	ACEC
	2.5	Pilot Range	Wilderness Inventory Unit
	2.5	Pole Creek	Wilderness Study Area
	2.5	Poodle Mountains	Wilderness Study Area
	2.5	Rawhide Mountain	Wilderness Study Area
	2.5	Red Mountain	Wilderness Inventory Unit
	2.5	Red Mountain	Wilderness Study Area
	2.5	Red Spring	Wilderness Study Area
	2.5	Riordan's Well	Wilderness Study Area
	2.5	Roberts Mountain	Wilderness Study Area
	2.5	Rockwell	Wilderness Inventory Unit
	2.5	Rockwell	Wilderness Study Area
	2	Rockwell	ACEC
	2	Salt Lake	ACEC
	2.5	Scott's Basin	Wilderness Study Area
	2.5	Selenite Mountains	Wilderness Study Area
	2.5	Silver Island Mountains	Wilderness Inventory Unit
	2.5	Silver Peak Range	Wilderness Study Area
	2.5	Simpson Park	Wilderness Study Area
	2.5	Slinkard	Wilderness Study Area
	2	Slinkard Valley	ACEC
	3	Soldier Meadows	ACEC
	2.5	South Egan Range	Wilderness Study Area
	2.5	South Jackson Mountains	Wilderness Study Area
	2.5	South Pahroc Range	Wilderness Study Area
	2.5	South Pequop Mountains	Wilderness Study Area
	2.5	South Reveille	Wilderness Study Area
	2.5	Southern Inyo	Wilderness Study Area
	3	Steamboat Springs Geyser Basin	ACEC
	2	Stewart Valley	ACEC
	2.5	Stillwater Range	Wilderness Study Area
	2.5	Swasey Mountain	Wilderness Study Area
	2.5	Swasey Mountain	Wilderness Inventory Unit
	2.5	Symmes Creek	Wilderness Study Area
	2	Tabernacle Hill	ACEC

Appendix 7. List of Designated Areas in the Great Basin and their Land Status Categories

	Land Status	*Area Name*	*Type*
Bureau of Land Management	2.5	Table Mountain	Wilderness Study Area
	2.5	The Narrows	Wilderness Inventory Unit
	2.5	The Wall	Wilderness Study Area
	2.5	Tobin Range	Wilderness Study Area
	3	Travertine Hot Springs	ACEC
	2.5	Tunnel Spring	Wilderness Study Area
	2.5	Twin Peaks	Wilderness Study Area
	2.5	Volcanic Tablelands	Wilderness Study Area
	2	Wah Wah Mountain	ACEC
	2.5	Wah Wah Mountains	Wilderness Study Area
	2.5	Walford Springs	Wilderness Study Area
	2.5	Weepah Spring	Wilderness Study Area
	2.5	White Rock Range	Wilderness Study Area
	2.5	White Rock Range	Wilderness Inventory Unit
	2.5	White Rock Range	Wilderness Study Area
	2.5	Worthington Mountains	Wilderness Study Area
Bureau of Land Management/Nellis Air Force Base	2	Timber Mountain Caldera	ACEC
Bureau of Land Management/U.S. Forest Service	2.5	Fandango	Wilderness Study Area
U.S. Forest Service	2	Alta Toquima	Wilderness
	1	Ancient Bristlecone Pine Forest	Botanical Special Interest Area
	2	Arc Dome	Wilderness
	1	Bald Mountain	RNA
	2	Boundary Peak	Wilderness
	1	Browse	RNA
	2	Currant Mountain	Wilderness
	2	Deseret Peak	Wilderness
	1	Desert Range	RNA
	2	East Humboldt Range	Wilderness
	2	Grant Range	Wilderness
	1	Hole-in-the-Mountain	RNA
	2.5	Hoover	Potential Wilderness
	2	Hoover	Wilderness
	1	Indiana Summit	RNA
	2	Inyo Mountains	Wilderness
	1	Jaks Spring Pinyon	RNA
	1	McAfee Meadow	Potential RNA
	3	Mono Basin	National Forest Scenic Area
	2	Mount Jefferson	RNA
	2	Mount Moriah Table	RNA
	2	Mount Moriah Wilderness	Wilderness
	2	Mount Rose Wilderness	Wilderness

Appendix 7. List of Designated Areas in the Great Basin and their Land Status Categories

	Land Status	*Area Name*	*Type*
U.S. Forest Service	1	North-South Schell Peaks	RNA
	1	Partridge Mountain	RNA
	1	Pearl Peak	RNA
	2	Pine Valley Mountains	Wilderness
	2	Quinn Canyon Range	Wilderness
	1	Red Butte Canyon	RNA
	2	Ruby Mountains Wilderness	Wilderness
	2	Seitz Canyon / Echo Lake	RNA
	1	Sentenial Meadow	RNA
	2	Table Mountain	Wilderness
	1	Troy Peak	RNA
	1	Whippoorwill Flat	RNA
	1	White Mountain	RNA
	1	White Pine Peak	RNA
U.S. Fish & Wildlife Service	2	Anaho Island	National Wildlife Refuge
	2	Bear River Migratory Bird Refuge	National Wildlife Refuge
	2	Desert	National Wildlife Refuge
	2	Fallon	National Wildlife Refuge
	2	Fish Springs	National Wildlife Refuge
U.S. Fish & Wildlife Service/Bureau of Reclamation	2	Stillwater	National Wildlife Refuge
U.S. Fist & Wildlife Service/Private	2	Ruby Lake	National Wildlife Refuge
Department of Defense	4	Camp Williams Military Res.	Military Reserve
	4	Dugway Proving Grounds	Military Reserve
	4	Fallon Naval Air Station	Military Reserve
	4	Hawthorne Army Depot	Military Reserve
	4	Hill Air Force Range/Utah Test and Training Range	Military Reserve
	4	Miscellaneous Military Lands	Military Reserve
	4	Miscellaneous Military Lands	Military Reserve
	4	Miscellaneous Military Lands	Military Reserve
	4	Miscellaneous Military Lands	Military Reserve
	4	Miscellaneous Military Lands	Military Reserve
	4	Miscellaneous Military Lands	Military Reserve
	4	Miscellaneous Military Lands	Military Reserve
	4	Miscellaneous Military Lands	Military Reserve
	4	Nellis Air Force Base	Military Reserve
	4	Tooele Army Depot	Military Reserve
	4	Wendover Air Force Range	Military Reserve
Department of Energy	4	Miscellaneous Department of Energy Lands	Atomic Energy Commission Lands
	4	Miscellaneous Department of Energy Lands	Atomic Energy Commission Lands

Appendix 7. List of Designated Areas in the Great Basin and their Land Status Categories

	Land Status	*Area Name*	*Type*
Department of Energy	4	Miscellaneous Department of Energy Lands	Atomic Energy Commission Lands
	4	Miscellaneous Department of Energy Lands	Atomic Energy Commission Lands
	4	Miscellaneous Department of Energy Lands	Atomic Energy Commission Lands
	4	Nevada Test Site	Atomic Energy Test Site
National Park Service	2	Great Basin	National Park
State of California	3	Bodie Bowl	State Park
	2	Hallelujah Junction	State Wildlife Area
	2	Honey Lake	State Wildlife Area
	2	Little Antelope Valley	State Wildlife Area
	2	Mono Lake Tufa State Reserve	State Reserve
	2	Slinkard	State Wildlife Area
State of Nevada	2	Alkali Lake	Wildlife Management Area
	3	Beaver Dam	State Park
	3	Berlin-Ichthyosaur	State Park
	3	Cathedral Gorge	State Park
	3	Cave Lake	State Park
	3	Dayton	State Park
	3	Echo Canyon	State Park
	2	Fernley	Wildlife Management Area
	2	Franklin Lake	Wildlife Management Area
	2	Humboldt	Wildlife Management Area
	3	Kershaw-Ryan	State Park
	2	Key Pittman	Wildlife Management Area
	3	Lake Tahoe Nevada	State Park
	2	Mason Valley	Wildlife Management Area
	2	Railroad Valley	Wildlife Management Area
	4	Rye Patch	State Recreation Area
	2	Sleeper	Wildlife Management Area
	3	Spring Mountain Ranch	State Park
	3	Spring Valley	State Park
	2	Steptoe Valley	Wildlife Management Area
	2	Stillwater	Wildlife Management Area
	3	Washoe Lake	State Park
	2	Wayne E. Kirch	Wildlife Management Area
State of Utah	3	Antelope Island	State Park
	2	Blue Lake	Wildlife Management Area
	2	Blue Lake	Wildlife Management Area
	2	Clear Lake	Wildlife Management Area
	2	Farmington Bay	Wildlife Management Area
	3	Great Salt Lake	State Park

Appendix 7. List of Designated Areas in the Great Basin and their Land Status Categories

	Land Status	*Area Name*	*Type*
State of Utah	2	Harold Crane	Wildlife Management Area
	2	Howard Slough	Wildlife Management Area
	2	Howard Slough	Wildlife Management Area
	2	Indian Peak	Wildlife Management Area
	2	Indian Peak	Wildlife Management Area
	2	James Walter Fitzgerald	Wildlife Management Area
	2	James Walter Fitzgerald	Wildlife Management Area
	2	Locomotive Springs	Wildlife Management Area
	3	Minersville	State Park
	2	Ogden Bay	Wildlife Management Area
	2	Ogden Bay	Wildlife Management Area
	2	Public Shooting Grounds	Wildlife Management Area
	2	Salt Creek	Wildlife Management Area
	3	Snow Canyon	State Park
	2	Timple Springs	Wildlife Management Area
	3	Willard Bay	State Park

Appendix 8. Great Basin Lithology Groups Used in the Ecological Land Unit Assessment.

GEOLOGY CLASS	CALIFORNIA FORMATIONS	NEVADA FORMATIONS	UTAH FORMATIONS	IDAHO FORMATIONS
OLD ALLUVIUM		QToa	Qao	
YOUNG ALLUVIUM-COLLUVIUM-GLACIAL DEPOSIT	Q, Qls, Qg, Pc	Qa, Qls, Qm, Qp, QTs	Qa, QT, Qg, Qls, Ql, Qs, Qm	alluvium, lake sediments and playa
EOLEAN SAND	Qs		Qe	
GRANITIC-SILICIC	gr-m, grCz, grMz, mv, sch, Qrv, Qrvp, Mzv, Tvp, m, Pz, Qvp, Ca	CZq, Jgr, Kgr, KJim, MZgr, Tgr, Ta1, Ta2, Ta3, TJgr, Tt1, Tt2, Tt3, Trt, Tri, TRgr, Tr3, TRk, TRlgr, Tr1, Tr2, Xm, JPu, TRPvs, Zqs, Tbr, Qta, Zw	C1, Pci, PCs, PCm, Ji, Ti, Tmr, Tpr, Tmi, Tma, Tmv, Tov, Qr, Tvu	mixed miogeosynclinal
SANDSTONE	K, C, Ec, SO, Tc, QPc	Ch, Csc, Css, Dsl, JTRa, Ks, Jd, Jv, MDmc, Se, TKs, Tksu, TRPd, Ts1, Ts2, QTs, QTr, Ths, PPa	JTR, JR2, K1, K2, K3, T1, T3, T5, J2, P1	sandstone
BASALTIC-MAFIC	gb, Qv, Qvp, Ti, Tv, Pzv	Jgb, QTb, Tb, Tba, Tbg, Tob, Tmi, Kjd, Mzv, Tts	Qb, Tmb, Tpb, Qv	
ULTRAMAFIC		PZsp		
CARBONATE - LIMESTONE	D, ls, pC	Cc, DCc, Dc, Mc, M1, Occ, Oc, PPc, PPcd, Pcd, PMc, Pc, Pc+, Sc, SOc, St, TRPs, TRc, Dt	D, C2, C3, M2, PN, O, S, TR1, J1, PNP, P2	mixed carbonate and shale
SHALE	Pm, TR, J	Ot, Ds, MDs, Oct, OCt, Psc, CZs, DCsv, Ks, TRmt, Ts3, JTRs, JTRsv, PMh, TRch, Os, Osv, Ss, Ct	J2, M3, TR2, T2, T4, Tk	

Appendix 9. Ecological Land Units of the Great Basin

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
1552	321-1524 m, Sandstone, Lower Bajada, Int. Wet
1560	321-1524 m, Sandstone, Flat, Dry
1561	321-1524 m, Sandstone, Flat, Int. Flow
1562	321-1524 m, Sandstone, Flat, Int. Wet
1571	321-1524 m, Sandstone, Canyon, NE exposure
1572	321-1524 m, Sandstone, Canyon, SW exposure
1580	321-1524 m, Sandstone, Toe Slope, Dry
1582	321-1524 m, Sandstone, Toe Slope, Int. Wet
1590	321-1524 m, Sandstone, Water
1610	321-1524 m, Basaltic-Mafic, Ridgetop
1621	321-1524 m, Basaltic-Mafic, Cliff, NE exposure
1622	321-1524 m, Basaltic-Mafic, Cliff, SW exposure
1631	321-1524 m, Basaltic-Mafic, Steep Slope, NE exposure
1632	321-1524 m, Basaltic-Mafic, Steep Slope, SW exposure
1641	321-1524 m, Basaltic-Mafic, Upper Bajada, NE exposure
1642	321-1524 m, Basaltic-Mafic, Upper Bajada, SW exposure
1650	321-1524 m, Basaltic-Mafic, Lower Bajada, Dry
1651	321-1524 m, Basaltic-Mafic, Lower Bajada, Int. Flow
1652	321-1524 m, Basaltic-Mafic, Lower Bajada, Int. Wet
1660	321-1524 m, Basaltic-Mafic, Flat, Dry
1661	321-1524 m, Basaltic-Mafic, Flat, Int. Flow
1662	321-1524 m, Basaltic-Mafic, Flat, Int. Wet
1671	321-1524 m, Basaltic-Mafic, Canyon, NE exposure
1672	321-1524 m, Basaltic-Mafic, Canyon, SW exposure
1680	321-1524 m, Basaltic-Mafic, Toe Slope, Dry
1681	321-1524 m, Basaltic-Mafic, Toe Slope, Int. Flow
1682	321-1524 m, Basaltic-Mafic, Toe Slope, Int. Wet
1690	321-1524 m, Basaltic-Mafic, Water
1810	321-1524 m, Carbonate-Limestone, Ridgetop
1821	321-1524 m, Carbonate-Limestone, Cliff, NE exposure
1822	321-1524 m, Carbonate-Limestone, Cliff, SW exposure
1831	321-1524 m, Carbonate-Limestone, Steep Slope, NE exposure
1832	321-1524 m, Carbonate-Limestone, Steep Slope, SW exposure
1841	321-1524 m, Carbonate-Limestone, Upper Bajada, NE exposure
1842	321-1524 m, Carbonate-Limestone, Upper Bajada, SW exposure
1850	321-1524 m, Carbonate-Limestone, Lower Bajada, Dry
1851	321-1524 m, Carbonate-Limestone, Lower Bajada, Int. Flow
1852	321-1524 m, Carbonate-Limestone, Lower Bajada, Int. Wet
1860	321-1524 m, Carbonate-Limestone, Flat, Dry
1861	321-1524 m, Carbonate-Limestone, Flat, Int. Flow
1862	321-1524 m, Carbonate-Limestone, Flat, Int. Wet

Appendix 9. Ecological Land Units of the Great Basin

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
1871	321-1524 m, Carbonate-Limestone, Canyon, NE exposure
1872	321-1524 m, Carbonate-Limestone, Canyon, SW exposure
1880	321-1524 m, Carbonate-Limestone, Toe Slope, Dry
1881	321-1524 m, Carbonate-Limestone, Toe Slope, Int. Flow
1890	321-1524 m, Carbonate-Limestone, Water
1910	321-1524 m, Shale, Ridgetop
1921	321-1524 m, Shale, Cliff, NE exposure
1922	321-1524 m, Shale, Cliff, SW exposure
1931	321-1524 m, Shale, Steep Slope, NE exposure
1932	321-1524 m, Shale, Steep Slope, SW exposure
1941	321-1524 m, Shale, Upper Bajada, NE exposure
1942	321-1524 m, Shale, Upper Bajada, SW exposure
1950	321-1524 m, Shale, Lower Bajada, Dry
1951	321-1524 m, Shale, Lower Bajada, Int. Flow
1952	321-1524 m, Shale, Lower Bajada, Int. Wet
1960	321-1524 m, Shale, Flat, Dry
1961	321-1524 m, Shale, Flat, Int. Flow
1962	321-1524 m, Shale, Flat, Int. Wet
1971	321-1524 m, Shale, Canyon, NE exposure
1972	321-1524 m, Shale, Canyon, SW exposure
1980	321-1524 m, Shale, Toe Slope, Dry
1981	321-1524 m, Shale, Toe Slope, Int. Flow
1982	321-1524 m, Shale, Toe Slope, Int. Wet
1990	321-1524 m, Shale, Water
2010	1525-1980 m, Water, Ridgetop
2041	1525-1980 m, Water, Upper Bajada, NE exposure
2042	1525-1980 m, Water, Upper Bajada, SW exposure
2050	1525-1980 m, Water, Lower Bajada, Dry
2051	1525-1980 m, Water, Lower Bajada, Int. Flow
2052	1525-1980 m, Water, Lower Bajada, Int. Wet
2060	1525-1980 m, Water, Flat, Dry
2061	1525-1980 m, Water, Flat, Int. Flow
2062	1525-1980 m, Water, Flat, Int. Wet
2080	1525-1980 m, Water, Toe Slope, Dry
2090	1525-1980 m, Water, Water
2110	1525-1980 m, Old Alluvium, Ridgetop
2121	1525-1980 m, Old Alluvium, Cliff, NE exposure
2122	1525-1980 m, Old Alluvium, Cliff, SW exposure
2131	1525-1980 m, Old Alluvium, Steep Slope, NE exposure
2132	1525-1980 m, Old Alluvium, Steep Slope, SW exposure
2141	1525-1980 m, Old Alluvium, Upper Bajada, NE exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
2142	1525-1980 m, Old Alluvium, Upper Bajada, SW exposure
2150	1525-1980 m, Old Alluvium, Lower Bajada, Dry
2151	1525-1980 m, Old Alluvium, Lower Bajada, Int. Flow
2152	1525-1980 m, Old Alluvium, Lower Bajada, Int. Wet
2160	1525-1980 m, Old Alluvium, Flat, Dry
2161	1525-1980 m, Old Alluvium, Flat, Int. Flow
2162	1525-1980 m, Old Alluvium, Flat, Int. Wet
2171	1525-1980 m, Old Alluvium, Canyon, NE exposure
2172	1525-1980 m, Old Alluvium, Canyon, SW exposure
2180	1525-1980 m, Old Alluvium, Toe Slope, Dry
2181	1525-1980 m, Old Alluvium, Toe Slope, Int. Flow
2182	1525-1980 m, Old Alluvium, Toe Slope, Int. Wet
2190	1525-1980 m, Old Alluvium, Water
2210	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Ridgetop
2221	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, NE exposure
2222	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, SW exposure
2231	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, NE exposure
2232	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, SW exposure
2241	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, NE exposure
2242	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, SW exposure
2250	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Dry
2251	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Flow
2252	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Wet
2260	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Dry
2261	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Int. Flow
2262	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Int. Wet
2271	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, NE exposure
2272	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, SW exposure
2280	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Dry
2281	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Flow
2282	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Wet
2290	1525-1980 m, Young Alluvium-Colluvium-Glacial Deposit, Water
2310	1525-1980 m, Eolian Sand, Ridgetop
2321	1525-1980 m, Eolian Sand, Cliff, NE exposure
2331	1525-1980 m, Eolian Sand, Steep Slope, NE exposure
2332	1525-1980 m, Eolian Sand, Steep Slope, SW exposure
2341	1525-1980 m, Eolian Sand, Upper Bajada, NE exposure
2342	1525-1980 m, Eolian Sand, Upper Bajada, SW exposure
2350	1525-1980 m, Eolian Sand, Lower Bajada, Dry
2351	1525-1980 m, Eolian Sand, Lower Bajada, Int. Flow
2360	1525-1980 m, Eolian Sand, Flat, Dry

Appendix 9. Ecological Land Units of the Great Basin

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
2361	1525-1980 m, Eolian Sand, Flat, Int. Flow
2362	1525-1980 m, Eolian Sand, Flat, Int. Wet
2371	1525-1980 m, Eolian Sand, Canyon, NE exposure
2380	1525-1980 m, Eolian Sand, Toe Slope, Dry
2410	1525-1980 m, Granitic-Silicic, Ridgetop
2421	1525-1980 m, Granitic-Silicic, Cliff, NE exposure
1010	321-1524 m, Water, Ridgetop
1031	321-1524 m, Water, Steep Slope, NE exposure
1032	321-1524 m, Water, Steep Slope, SW exposure
1041	321-1524 m, Water, Upper Bajada, NE exposure
1042	321-1524 m, Water, Upper Bajada, SW exposure
1050	321-1524 m, Water, Lower Bajada, Dry
1051	321-1524 m, Water, Lower Bajada, Int. Flow
1052	321-1524 m, Water, Lower Bajada, Int. Wet
1060	321-1524 m, Water, Flat, Dry
1061	321-1524 m, Water, Flat, Int. Flow
1062	321-1524 m, Water, Flat, Int. Wet
1080	321-1524 m, Water, Toe Slope, Dry
1090	321-1524 m, Water, Water
1110	321-1524 m, Old Alluvium, Ridgetop
1121	321-1524 m, Old Alluvium, Cliff, NE exposure
1122	321-1524 m, Old Alluvium, Cliff, SW exposure
1131	321-1524 m, Old Alluvium, Steep Slope, NE exposure
1132	321-1524 m, Old Alluvium, Steep Slope, SW exposure
1141	321-1524 m, Old Alluvium, Upper Bajada, NE exposure
1142	321-1524 m, Old Alluvium, Upper Bajada, SW exposure
1150	321-1524 m, Old Alluvium, Lower Bajada, Dry
1151	321-1524 m, Old Alluvium, Lower Bajada, Int. Flow
1152	321-1524 m, Old Alluvium, Lower Bajada, Int. Wet
1160	321-1524 m, Old Alluvium, Flat, Dry
1161	321-1524 m, Old Alluvium, Flat, Int. Flow
1162	321-1524 m, Old Alluvium, Flat, Int. Wet
1171	321-1524 m, Old Alluvium, Canyon, NE exposure
1172	321-1524 m, Old Alluvium, Canyon, SW exposure
1180	321-1524 m, Old Alluvium, Toe Slope, Dry
1181	321-1524 m, Old Alluvium, Toe Slope, Int. Flow
1190	321-1524 m, Old Alluvium, Water
1210	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Ridgetop
1221	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, NE exposure
1222	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, SW exposure
1231	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, NE exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
1232	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, SW exposure
1241	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, NE exposure
1242	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, SW exposure
1250	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Dry
1251	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Flow
1252	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Wet
1260	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Dry
1261	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Int. Flow
1262	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Int. Wet
1271	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, NE exposure
1272	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, SW exposure
1280	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Dry
1281	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Flow
1282	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Wet
1290	321-1524 m, Young Alluvium-Colluvium-Glacial Deposit, Water
1310	321-1524 m, Eolian Sand, Ridgetop
1321	321-1524 m, Eolian Sand, Cliff, NE exposure
1331	321-1524 m, Eolian Sand, Steep Slope, NE exposure
1332	321-1524 m, Eolian Sand, Steep Slope, SW exposure
1341	321-1524 m, Eolian Sand, Upper Bajada, NE exposure
1342	321-1524 m, Eolian Sand, Upper Bajada, SW exposure
1350	321-1524 m, Eolian Sand, Lower Bajada, Dry
1351	321-1524 m, Eolian Sand, Lower Bajada, Int. Flow
1352	321-1524 m, Eolian Sand, Lower Bajada, Int. Wet
1360	321-1524 m, Eolian Sand, Flat, Dry
1361	321-1524 m, Eolian Sand, Flat, Int. Flow
1362	321-1524 m, Eolian Sand, Flat, Int. Wet
1371	321-1524 m, Eolian Sand, Canyon, NE exposure
1380	321-1524 m, Eolian Sand, Toe Slope, Dry
1390	321-1524 m, Eolian Sand, Water
1410	321-1524 m, Granitic-Silicic, Ridgetop
1421	321-1524 m, Granitic-Silicic, Cliff, NE exposure
1422	321-1524 m, Granitic-Silicic, Cliff, SW exposure
1431	321-1524 m, Granitic-Silicic, Steep Slope, NE exposure
1432	321-1524 m, Granitic-Silicic, Steep Slope, SW exposure
1441	321-1524 m, Granitic-Silicic, Upper Bajada, NE exposure
1442	321-1524 m, Granitic-Silicic, Upper Bajada, SW exposure
1450	321-1524 m, Granitic-Silicic, Lower Bajada, Dry
1451	321-1524 m, Granitic-Silicic, Lower Bajada, Int. Flow
1452	321-1524 m, Granitic-Silicic, Lower Bajada, Int. Wet
1460	321-1524 m, Granitic-Silicic, Flat, Dry

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
1461	321-1524 m, Granitic-Silicic, Flat, Int. Flow
1462	321-1524 m, Granitic-Silicic, Flat, Int. Wet
1471	321-1524 m, Granitic-Silicic, Canyon, NE exposure
1472	321-1524 m, Granitic-Silicic, Canyon, SW exposure
1480	321-1524 m, Granitic-Silicic, Toe Slope, Dry
1481	321-1524 m, Granitic-Silicic, Toe Slope, Int. Flow
1482	321-1524 m, Granitic-Silicic, Toe Slope, Int. Wet
1490	321-1524 m, Granitic-Silicic, Water
1510	321-1524 m, Sandstone, Ridgetop
1521	321-1524 m, Sandstone, Cliff, NE exposure
1522	321-1524 m, Sandstone, Cliff, SW exposure
1531	321-1524 m, Sandstone, Steep Slope, NE exposure
1532	321-1524 m, Sandstone, Steep Slope, SW exposure
1541	321-1524 m, Sandstone, Upper Bajada, NE exposure
1542	321-1524 m, Sandstone, Upper Bajada, SW exposure
1550	321-1524 m, Sandstone, Lower Bajada, Dry
1551	321-1524 m, Sandstone, Lower Bajada, Int. Flow
2422	1525-1980 m, Granitic-Silicic, Cliff, SW exposure
2431	1525-1980 m, Granitic-Silicic, Steep Slope, NE exposure
2432	1525-1980 m, Granitic-Silicic, Steep Slope, SW exposure
2441	1525-1980 m, Granitic-Silicic, Upper Bajada, NE exposure
2442	1525-1980 m, Granitic-Silicic, Upper Bajada, SW exposure
2450	1525-1980 m, Granitic-Silicic, Lower Bajada, Dry
2451	1525-1980 m, Granitic-Silicic, Lower Bajada, Int. Flow
2452	1525-1980 m, Granitic-Silicic, Lower Bajada, Int. Wet
2460	1525-1980 m, Granitic-Silicic, Flat, Dry
2461	1525-1980 m, Granitic-Silicic, Flat, Int. Flow
2462	1525-1980 m, Granitic-Silicic, Flat, Int. Wet
2471	1525-1980 m, Granitic-Silicic, Canyon, NE exposure
2472	1525-1980 m, Granitic-Silicic, Canyon, SW exposure
2480	1525-1980 m, Granitic-Silicic, Toe Slope, Dry
2481	1525-1980 m, Granitic-Silicic, Toe Slope, Int. Flow
2482	1525-1980 m, Granitic-Silicic, Toe Slope, Int. Wet
2490	1525-1980 m, Granitic-Silicic, Water
2510	1525-1980 m, Sandstone, Ridgetop
2521	1525-1980 m, Sandstone, Cliff, NE exposure
2522	1525-1980 m, Sandstone, Cliff, SW exposure
2531	1525-1980 m, Sandstone, Steep Slope, NE exposure
2532	1525-1980 m, Sandstone, Steep Slope, SW exposure
2541	1525-1980 m, Sandstone, Upper Bajada, NE exposure
2542	1525-1980 m, Sandstone, Upper Bajada, SW exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
2550	1525-1980 m, Sandstone, Lower Bajada, Dry
2551	1525-1980 m, Sandstone, Lower Bajada, Int. Flow
2552	1525-1980 m, Sandstone, Lower Bajada, Int. Wet
2560	1525-1980 m, Sandstone, Flat, Dry
2561	1525-1980 m, Sandstone, Flat, Int. Flow
2562	1525-1980 m, Sandstone, Flat, Int. Wet
2571	1525-1980 m, Sandstone, Canyon, NE exposure
2572	1525-1980 m, Sandstone, Canyon, SW exposure
2580	1525-1980 m, Sandstone, Toe Slope, Dry
2581	1525-1980 m, Sandstone, Toe Slope, Int. Flow
2582	1525-1980 m, Sandstone, Toe Slope, Int. Wet
2590	1525-1980 m, Sandstone, Water
2610	1525-1980 m, Basaltic-Mafic, Ridgetop
2621	1525-1980 m, Basaltic-Mafic, Cliff, NE exposure
2622	1525-1980 m, Basaltic-Mafic, Cliff, SW exposure
2631	1525-1980 m, Basaltic-Mafic, Steep Slope, NE exposure
2632	1525-1980 m, Basaltic-Mafic, Steep Slope, SW exposure
2641	1525-1980 m, Basaltic-Mafic, Upper Bajada, NE exposure
2642	1525-1980 m, Basaltic-Mafic, Upper Bajada, SW exposure
2650	1525-1980 m, Basaltic-Mafic, Lower Bajada, Dry
2651	1525-1980 m, Basaltic-Mafic, Lower Bajada, Int. Flow
2652	1525-1980 m, Basaltic-Mafic, Lower Bajada, Int. Wet
2660	1525-1980 m, Basaltic-Mafic, Flat, Dry
2661	1525-1980 m, Basaltic-Mafic, Flat, Int. Flow
2662	1525-1980 m, Basaltic-Mafic, Flat, Int. Wet
2671	1525-1980 m, Basaltic-Mafic, Canyon, NE exposure
2672	1525-1980 m, Basaltic-Mafic, Canyon, SW exposure
2680	1525-1980 m, Basaltic-Mafic, Toe Slope, Dry
2681	1525-1980 m, Basaltic-Mafic, Toe Slope, Int. Flow
2682	1525-1980 m, Basaltic-Mafic, Toe Slope, Int. Wet
2690	1525-1980 m, Basaltic-Mafic, Water
2710	1525-1980 m, Ultramafic, Ridgetop
2731	1525-1980 m, Ultramafic, Steep Slope, NE exposure
2741	1525-1980 m, Ultramafic, Upper Bajada, NE exposure
2742	1525-1980 m, Ultramafic, Upper Bajada, SW exposure
2750	1525-1980 m, Ultramafic, Lower Bajada, Dry
2760	1525-1980 m, Ultramafic, Flat, Dry
2810	1525-1980 m, Carbonate-Limestone, Ridgetop
2821	1525-1980 m, Carbonate-Limestone, Cliff, NE exposure
2822	1525-1980 m, Carbonate-Limestone, Cliff, SW exposure
2831	1525-1980 m, Carbonate-Limestone, Steep Slope, NE exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
2832	1525-1980 m, Carbonate-Limestone, Steep Slope, SW exposure
2841	1525-1980 m, Carbonate-Limestone, Upper Bajada, NE exposure
2842	1525-1980 m, Carbonate-Limestone, Upper Bajada, SW exposure
2850	1525-1980 m, Carbonate-Limestone, Lower Bajada, Dry
2851	1525-1980 m, Carbonate-Limestone, Lower Bajada, Int. Flow
2852	1525-1980 m, Carbonate-Limestone, Lower Bajada, Int. Wet
2860	1525-1980 m, Carbonate-Limestone, Flat, Dry
2861	1525-1980 m, Carbonate-Limestone, Flat, Int. Flow
2862	1525-1980 m, Carbonate-Limestone, Flat, Int. Wet
2871	1525-1980 m, Carbonate-Limestone, Canyon, NE exposure
2872	1525-1980 m, Carbonate-Limestone, Canyon, SW exposure
2880	1525-1980 m, Carbonate-Limestone, Toe Slope, Dry
2881	1525-1980 m, Carbonate-Limestone, Toe Slope, Int. Flow
2882	1525-1980 m, Carbonate-Limestone, Toe Slope, Int. Wet
2910	1525-1980 m, Shale, Ridgetop
2921	1525-1980 m, Shale, Cliff, NE exposure
2922	1525-1980 m, Shale, Cliff, SW exposure
2931	1525-1980 m, Shale, Steep Slope, NE exposure
2932	1525-1980 m, Shale, Steep Slope, SW exposure
2941	1525-1980 m, Shale, Upper Bajada, NE exposure
2942	1525-1980 m, Shale, Upper Bajada, SW exposure
2950	1525-1980 m, Shale, Lower Bajada, Dry
2951	1525-1980 m, Shale, Lower Bajada, Int. Flow
2952	1525-1980 m, Shale, Lower Bajada, Int. Wet
2960	1525-1980 m, Shale, Flat, Dry
2961	1525-1980 m, Shale, Flat, Int. Flow
2962	1525-1980 m, Shale, Flat, Int. Wet
2971	1525-1980 m, Shale, Canyon, NE exposure
2972	1525-1980 m, Shale, Canyon, SW exposure
2980	1525-1980 m, Shale, Toe Slope, Dry
2981	1525-1980 m, Shale, Toe Slope, Int. Flow
2982	1525-1980 m, Shale, Toe Slope, Int. Wet
2990	1525-1980 m, Shale, Water
3032	1981-2290 m, Water, Steep Slope, SW exposure
3041	1981-2290 m, Water, Upper Bajada, NE exposure
3042	1981-2290 m, Water, Upper Bajada, SW exposure
3050	1981-2290 m, Water, Lower Bajada, Dry
3060	1981-2290 m, Water, Flat, Dry
3061	1981-2290 m, Water, Flat, Int. Flow
3062	1981-2290 m, Water, Flat, Int. Wet
3071	1981-2290 m, Water, Canyon, NE exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
3072	1981-2290 m, Water, Canyon, SW exposure
3080	1981-2290 m, Water, Toe Slope, Dry
3090	1981-2290 m, Water, Water
3110	1981-2290 m, Old Alluvium, Ridgetop
3121	1981-2290 m, Old Alluvium, Cliff, NE exposure
3122	1981-2290 m, Old Alluvium, Cliff, SW exposure
3131	1981-2290 m, Old Alluvium, Steep Slope, NE exposure
3132	1981-2290 m, Old Alluvium, Steep Slope, SW exposure
3141	1981-2290 m, Old Alluvium, Upper Bajada, NE exposure
3142	1981-2290 m, Old Alluvium, Upper Bajada, SW exposure
3150	1981-2290 m, Old Alluvium, Lower Bajada, Dry
3151	1981-2290 m, Old Alluvium, Lower Bajada, Int. Flow
3152	1981-2290 m, Old Alluvium, Lower Bajada, Int. Wet
3160	1981-2290 m, Old Alluvium, Flat, Dry
3161	1981-2290 m, Old Alluvium, Flat, Int. Flow
3162	1981-2290 m, Old Alluvium, Flat, Int. Wet
3171	1981-2290 m, Old Alluvium, Canyon, NE exposure
3172	1981-2290 m, Old Alluvium, Canyon, SW exposure
3180	1981-2290 m, Old Alluvium, Toe Slope, Dry
3182	1981-2290 m, Old Alluvium, Toe Slope, Int. Wet
3210	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Ridgetop
3221	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, NE exposure
3222	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, SW exposure
3231	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, NE exposure
3232	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, SW exposure
3241	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, NE exposure
3242	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, SW exposure
3250	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Dry
3251	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Flow
3252	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Wet
3260	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Dry
3261	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Int. Flow
3262	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Int. Wet
3271	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, NE exposure
3272	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, SW exposure
3280	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Dry
3281	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Flow
3282	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Wet
3290	1981-2290 m, Young Alluvium-Colluvium-Glacial Deposit, Water
3410	1981-2290 m, Granitic-Silicic, Ridgetop
3421	1981-2290 m, Granitic-Silicic, Cliff, NE exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
3422	1981-2290 m, Granitic-Silicic, Cliff, SW exposure
3431	1981-2290 m, Granitic-Silicic, Steep Slope, NE exposure
3432	1981-2290 m, Granitic-Silicic, Steep Slope, SW exposure
3441	1981-2290 m, Granitic-Silicic, Upper Bajada, NE exposure
3442	1981-2290 m, Granitic-Silicic, Upper Bajada, SW exposure
3450	1981-2290 m, Granitic-Silicic, Lower Bajada, Dry
3451	1981-2290 m, Granitic-Silicic, Lower Bajada, Int. Flow
3452	1981-2290 m, Granitic-Silicic, Lower Bajada, Int. Wet
3460	1981-2290 m, Granitic-Silicic, Flat, Dry
3461	1981-2290 m, Granitic-Silicic, Flat, Int. Flow
3462	1981-2290 m, Granitic-Silicic, Flat, Int. Wet
3471	1981-2290 m, Granitic-Silicic, Canyon, NE exposure
3472	1981-2290 m, Granitic-Silicic, Canyon, SW exposure
3480	1981-2290 m, Granitic-Silicic, Toe Slope, Dry
3481	1981-2290 m, Granitic-Silicic, Toe Slope, Int. Flow
3482	1981-2290 m, Granitic-Silicic, Toe Slope, Int. Wet
3490	1981-2290 m, Granitic-Silicic, Water
3510	1981-2290 m, Sandstone, Ridgetop
3521	1981-2290 m, Sandstone, Cliff, NE exposure
3522	1981-2290 m, Sandstone, Cliff, SW exposure
3531	1981-2290 m, Sandstone, Steep Slope, NE exposure
3532	1981-2290 m, Sandstone, Steep Slope, SW exposure
3541	1981-2290 m, Sandstone, Upper Bajada, NE exposure
3542	1981-2290 m, Sandstone, Upper Bajada, SW exposure
3550	1981-2290 m, Sandstone, Lower Bajada, Dry
3551	1981-2290 m, Sandstone, Lower Bajada, Int. Flow
3552	1981-2290 m, Sandstone, Lower Bajada, Int. Wet
3560	1981-2290 m, Sandstone, Flat, Dry
3561	1981-2290 m, Sandstone, Flat, Int. Flow
3562	1981-2290 m, Sandstone, Flat, Int. Wet
3571	1981-2290 m, Sandstone, Canyon, NE exposure
3572	1981-2290 m, Sandstone, Canyon, SW exposure
3580	1981-2290 m, Sandstone, Toe Slope, Dry
3581	1981-2290 m, Sandstone, Toe Slope, Int. Flow
3582	1981-2290 m, Sandstone, Toe Slope, Int. Wet
3590	1981-2290 m, Sandstone, Water
3610	1981-2290 m, Basaltic-Mafic, Ridgetop
3621	1981-2290 m, Basaltic-Mafic, Cliff, NE exposure
3622	1981-2290 m, Basaltic-Mafic, Cliff, SW exposure
3631	1981-2290 m, Basaltic-Mafic, Steep Slope, NE exposure
3632	1981-2290 m, Basaltic-Mafic, Steep Slope, SW exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
3641	1981-2290 m, Basaltic-Mafic, Upper Bajada, NE exposure
3642	1981-2290 m, Basaltic-Mafic, Upper Bajada, SW exposure
3650	1981-2290 m, Basaltic-Mafic, Lower Bajada, Dry
3651	1981-2290 m, Basaltic-Mafic, Lower Bajada, Int. Flow
3652	1981-2290 m, Basaltic-Mafic, Lower Bajada, Int. Wet
3660	1981-2290 m, Basaltic-Mafic, Flat, Dry
3661	1981-2290 m, Basaltic-Mafic, Flat, Int. Flow
3662	1981-2290 m, Basaltic-Mafic, Flat, Int. Wet
3671	1981-2290 m, Basaltic-Mafic, Canyon, NE exposure
3672	1981-2290 m, Basaltic-Mafic, Canyon, SW exposure
3680	1981-2290 m, Basaltic-Mafic, Toe Slope, Dry
3681	1981-2290 m, Basaltic-Mafic, Toe Slope, Int. Flow
3682	1981-2290 m, Basaltic-Mafic, Toe Slope, Int. Wet
3690	1981-2290 m, Basaltic-Mafic, Water
3741	1981-2290 m, Ultramafic, Upper Bajada, NE exposure
3742	1981-2290 m, Ultramafic, Upper Bajada, SW exposure
3750	1981-2290 m, Ultramafic, Lower Bajada, Dry
3751	1981-2290 m, Ultramafic, Lower Bajada, Int. Flow
3752	1981-2290 m, Ultramafic, Lower Bajada, Int. Wet
3760	1981-2290 m, Ultramafic, Flat, Dry
3761	1981-2290 m, Ultramafic, Flat, Int. Flow
3762	1981-2290 m, Ultramafic, Flat, Int. Wet
3771	1981-2290 m, Ultramafic, Canyon, NE exposure
3780	1981-2290 m, Ultramafic, Toe Slope, Dry
3810	1981-2290 m, Carbonate-Limestone, Ridgetop
3821	1981-2290 m, Carbonate-Limestone, Cliff, NE exposure
3822	1981-2290 m, Carbonate-Limestone, Cliff, SW exposure
3831	1981-2290 m, Carbonate-Limestone, Steep Slope, NE exposure
3832	1981-2290 m, Carbonate-Limestone, Steep Slope, SW exposure
3841	1981-2290 m, Carbonate-Limestone, Upper Bajada, NE exposure
3842	1981-2290 m, Carbonate-Limestone, Upper Bajada, SW exposure
3850	1981-2290 m, Carbonate-Limestone, Lower Bajada, Dry
3851	1981-2290 m, Carbonate-Limestone, Lower Bajada, Int. Flow
3852	1981-2290 m, Carbonate-Limestone, Lower Bajada, Int. Wet
3860	1981-2290 m, Carbonate-Limestone, Flat, Dry
3861	1981-2290 m, Carbonate-Limestone, Flat, Int. Flow
3862	1981-2290 m, Carbonate-Limestone, Flat, Int. Wet
3871	1981-2290 m, Carbonate-Limestone, Canyon, NE exposure
3872	1981-2290 m, Carbonate-Limestone, Canyon, SW exposure
3880	1981-2290 m, Carbonate-Limestone, Toe Slope, Dry
3881	1981-2290 m, Carbonate-Limestone, Toe Slope, Int. Flow

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
3882	1981-2290 m, Carbonate-Limestone, Toe Slope, Int. Wet
3890	1981-2290 m, Carbonate-Limestone, Water
3910	1981-2290 m, Shale, Ridgetop
3921	1981-2290 m, Shale, Cliff, NE exposure
3922	1981-2290 m, Shale, Cliff, SW exposure
3931	1981-2290 m, Shale, Steep Slope, NE exposure
3932	1981-2290 m, Shale, Steep Slope, SW exposure
3941	1981-2290 m, Shale, Upper Bajada, NE exposure
3942	1981-2290 m, Shale, Upper Bajada, SW exposure
3950	1981-2290 m, Shale, Lower Bajada, Dry
3951	1981-2290 m, Shale, Lower Bajada, Int. Flow
3952	1981-2290 m, Shale, Lower Bajada, Int. Wet
3960	1981-2290 m, Shale, Flat, Dry
3961	1981-2290 m, Shale, Flat, Int. Flow
3962	1981-2290 m, Shale, Flat, Int. Wet
3971	1981-2290 m, Shale, Canyon, NE exposure
3972	1981-2290 m, Shale, Canyon, SW exposure
3980	1981-2290 m, Shale, Toe Slope, Dry
3981	1981-2290 m, Shale, Toe Slope, Int. Flow
3982	1981-2290 m, Shale, Toe Slope, Int. Wet
3990	1981-2290 m, Shale, Water
4110	2291-2900 m, Old Alluvium, Ridgetop
4121	2291-2900 m, Old Alluvium, Cliff, NE exposure
4122	2291-2900 m, Old Alluvium, Cliff, SW exposure
4131	2291-2900 m, Old Alluvium, Steep Slope, NE exposure
4132	2291-2900 m, Old Alluvium, Steep Slope, SW exposure
4141	2291-2900 m, Old Alluvium, Upper Bajada, NE exposure
4142	2291-2900 m, Old Alluvium, Upper Bajada, SW exposure
4150	2291-2900 m, Old Alluvium, Lower Bajada, Dry
4151	2291-2900 m, Old Alluvium, Lower Bajada, Int. Flow
4152	2291-2900 m, Old Alluvium, Lower Bajada, Int. Wet
4160	2291-2900 m, Old Alluvium, Flat, Dry
4162	2291-2900 m, Old Alluvium, Flat, Int. Wet
4171	2291-2900 m, Old Alluvium, Canyon, NE exposure
4172	2291-2900 m, Old Alluvium, Canyon, SW exposure
4180	2291-2900 m, Old Alluvium, Toe Slope, Dry
4181	2291-2900 m, Old Alluvium, Toe Slope, Int. Flow
4210	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Ridgetop
4221	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, NE exposure
4222	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, SW exposure
4231	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, NE exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
4232	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, SW exposure
4241	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, NE exposure
4242	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, SW exposure
4250	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Dry
4251	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Flow
4252	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Wet
4260	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Dry
4261	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Int. Flow
4262	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Int. Wet
4271	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, NE exposure
4272	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, SW exposure
4280	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Dry
4281	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Flow
4282	2291-2900 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Wet
4410	2291-2900 m, Granitic-Silicic, Ridgetop
4421	2291-2900 m, Granitic-Silicic, Cliff, NE exposure
4422	2291-2900 m, Granitic-Silicic, Cliff, SW exposure
4431	2291-2900 m, Granitic-Silicic, Steep Slope, NE exposure
4432	2291-2900 m, Granitic-Silicic, Steep Slope, SW exposure
4441	2291-2900 m, Granitic-Silicic, Upper Bajada, NE exposure
4442	2291-2900 m, Granitic-Silicic, Upper Bajada, SW exposure
4450	2291-2900 m, Granitic-Silicic, Lower Bajada, Dry
4451	2291-2900 m, Granitic-Silicic, Lower Bajada, Int. Flow
4452	2291-2900 m, Granitic-Silicic, Lower Bajada, Int. Wet
4460	2291-2900 m, Granitic-Silicic, Flat, Dry
4461	2291-2900 m, Granitic-Silicic, Flat, Int. Flow
4462	2291-2900 m, Granitic-Silicic, Flat, Int. Wet
4471	2291-2900 m, Granitic-Silicic, Canyon, NE exposure
4472	2291-2900 m, Granitic-Silicic, Canyon, SW exposure
4480	2291-2900 m, Granitic-Silicic, Toe Slope, Dry
4481	2291-2900 m, Granitic-Silicic, Toe Slope, Int. Flow
4482	2291-2900 m, Granitic-Silicic, Toe Slope, Int. Wet
4490	2291-2900 m, Granitic-Silicic, Water
4510	2291-2900 m, Sandstone, Ridgetop
4521	2291-2900 m, Sandstone, Cliff, NE exposure
4522	2291-2900 m, Sandstone, Cliff, SW exposure
4531	2291-2900 m, Sandstone, Steep Slope, NE exposure
4532	2291-2900 m, Sandstone, Steep Slope, SW exposure
4541	2291-2900 m, Sandstone, Upper Bajada, NE exposure
4542	2291-2900 m, Sandstone, Upper Bajada, SW exposure
4550	2291-2900 m, Sandstone, Lower Bajada, Dry

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
4551	2291-2900 m, Sandstone, Lower Bajada, Int. Flow
4552	2291-2900 m, Sandstone, Lower Bajada, Int. Wet
4560	2291-2900 m, Sandstone, Flat, Dry
4571	2291-2900 m, Sandstone, Canyon, NE exposure
4572	2291-2900 m, Sandstone, Canyon, SW exposure
4580	2291-2900 m, Sandstone, Toe Slope, Dry
4582	2291-2900 m, Sandstone, Toe Slope, Int. Wet
4610	2291-2900 m, Basaltic-Mafic, Ridgetop
4621	2291-2900 m, Basaltic-Mafic, Cliff, NE exposure
4622	2291-2900 m, Basaltic-Mafic, Cliff, SW exposure
4631	2291-2900 m, Basaltic-Mafic, Steep Slope, NE exposure
4632	2291-2900 m, Basaltic-Mafic, Steep Slope, SW exposure
4641	2291-2900 m, Basaltic-Mafic, Upper Bajada, NE exposure
4642	2291-2900 m, Basaltic-Mafic, Upper Bajada, SW exposure
4650	2291-2900 m, Basaltic-Mafic, Lower Bajada, Dry
4651	2291-2900 m, Basaltic-Mafic, Lower Bajada, Int. Flow
4652	2291-2900 m, Basaltic-Mafic, Lower Bajada, Int. Wet
4660	2291-2900 m, Basaltic-Mafic, Flat, Dry
4661	2291-2900 m, Basaltic-Mafic, Flat, Int. Flow
4662	2291-2900 m, Basaltic-Mafic, Flat, Int. Wet
4671	2291-2900 m, Basaltic-Mafic, Canyon, NE exposure
4672	2291-2900 m, Basaltic-Mafic, Canyon, SW exposure
4680	2291-2900 m, Basaltic-Mafic, Toe Slope, Dry
4681	2291-2900 m, Basaltic-Mafic, Toe Slope, Int. Flow
4682	2291-2900 m, Basaltic-Mafic, Toe Slope, Int. Wet
4690	2291-2900 m, Basaltic-Mafic, Water
4710	2291-2900 m, Ultramafic, Ridgetop
4722	2291-2900 m, Ultramafic, Cliff, SW exposure
4731	2291-2900 m, Ultramafic, Steep Slope, NE exposure
4732	2291-2900 m, Ultramafic, Steep Slope, SW exposure
4741	2291-2900 m, Ultramafic, Upper Bajada, NE exposure
4742	2291-2900 m, Ultramafic, Upper Bajada, SW exposure
4750	2291-2900 m, Ultramafic, Lower Bajada, Dry
4771	2291-2900 m, Ultramafic, Canyon, NE exposure
4772	2291-2900 m, Ultramafic, Canyon, SW exposure
4780	2291-2900 m, Ultramafic, Toe Slope, Dry
4810	2291-2900 m, Carbonate-Limestone, Ridgetop
4821	2291-2900 m, Carbonate-Limestone, Cliff, NE exposure
4822	2291-2900 m, Carbonate-Limestone, Cliff, SW exposure
4831	2291-2900 m, Carbonate-Limestone, Steep Slope, NE exposure
4832	2291-2900 m, Carbonate-Limestone, Steep Slope, SW exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
4841	2291-2900 m, Carbonate-Limestone, Upper Bajada, NE exposure
4842	2291-2900 m, Carbonate-Limestone, Upper Bajada, SW exposure
4850	2291-2900 m, Carbonate-Limestone, Lower Bajada, Dry
4851	2291-2900 m, Carbonate-Limestone, Lower Bajada, Int. Flow
4852	2291-2900 m, Carbonate-Limestone, Lower Bajada, Int. Wet
4860	2291-2900 m, Carbonate-Limestone, Flat, Dry
4861	2291-2900 m, Carbonate-Limestone, Flat, Int. Flow
4862	2291-2900 m, Carbonate-Limestone, Flat, Int. Wet
4871	2291-2900 m, Carbonate-Limestone, Canyon, NE exposure
4872	2291-2900 m, Carbonate-Limestone, Canyon, SW exposure
4880	2291-2900 m, Carbonate-Limestone, Toe Slope, Dry
4881	2291-2900 m, Carbonate-Limestone, Toe Slope, Int. Flow
4882	2291-2900 m, Carbonate-Limestone, Toe Slope, Int. Wet
4910	2291-2900 m, Shale, Ridgetop
4921	2291-2900 m, Shale, Cliff, NE exposure
4922	2291-2900 m, Shale, Cliff, SW exposure
4931	2291-2900 m, Shale, Steep Slope, NE exposure
4932	2291-2900 m, Shale, Steep Slope, SW exposure
4941	2291-2900 m, Shale, Upper Bajada, NE exposure
4942	2291-2900 m, Shale, Upper Bajada, SW exposure
4950	2291-2900 m, Shale, Lower Bajada, Dry
4951	2291-2900 m, Shale, Lower Bajada, Int. Flow
4952	2291-2900 m, Shale, Lower Bajada, Int. Wet
4960	2291-2900 m, Shale, Flat, Dry
4962	2291-2900 m, Shale, Flat, Int. Wet
4971	2291-2900 m, Shale, Canyon, NE exposure
4972	2291-2900 m, Shale, Canyon, SW exposure
4980	2291-2900 m, Shale, Toe Slope, Dry
4981	2291-2900 m, Shale, Toe Slope, Int. Flow
4982	2291-2900 m, Shale, Toe Slope, Int. Wet
5142	2901-4406 m, Old Alluvium, Upper Bajada, SW exposure
5210	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Ridgetop
5221	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, NE exposure
5222	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Cliff, SW exposure
5231	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, NE exposure
5232	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Steep Slope, SW exposure
5241	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, NE exposure
5242	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Upper Bajada, SW exposure
5250	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Dry
5251	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Lower Bajada, Int. Flow
5260	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Flat, Dry

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
5271	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, NE exposure
5272	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Canyon, SW exposure
5280	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Dry
5281	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Flow
5282	2901-4406 m, Young Alluvium-Colluvium-Glacial Deposit, Toe Slope, Int. Wet
5410	2901-4406 m, Granitic-Silicic, Ridgetop
5421	2901-4406 m, Granitic-Silicic, Cliff, NE exposure
5422	2901-4406 m, Granitic-Silicic, Cliff, SW exposure
5431	2901-4406 m, Granitic-Silicic, Steep Slope, NE exposure
5432	2901-4406 m, Granitic-Silicic, Steep Slope, SW exposure
5441	2901-4406 m, Granitic-Silicic, Upper Bajada, NE exposure
5442	2901-4406 m, Granitic-Silicic, Upper Bajada, SW exposure
5450	2901-4406 m, Granitic-Silicic, Lower Bajada, Dry
5451	2901-4406 m, Granitic-Silicic, Lower Bajada, Int. Flow
5452	2901-4406 m, Granitic-Silicic, Lower Bajada, Int. Wet
5460	2901-4406 m, Granitic-Silicic, Flat, Dry
5462	2901-4406 m, Granitic-Silicic, Flat, Int. Wet
5471	2901-4406 m, Granitic-Silicic, Canyon, NE exposure
5472	2901-4406 m, Granitic-Silicic, Canyon, SW exposure
5480	2901-4406 m, Granitic-Silicic, Toe Slope, Dry
5481	2901-4406 m, Granitic-Silicic, Toe Slope, Int. Flow
5482	2901-4406 m, Granitic-Silicic, Toe Slope, Int. Wet
5490	2901-4406 m, Granitic-Silicic, Water
5510	2901-4406 m, Sandstone, Ridgetop
5521	2901-4406 m, Sandstone, Cliff, NE exposure
5522	2901-4406 m, Sandstone, Cliff, SW exposure
5531	2901-4406 m, Sandstone, Steep Slope, NE exposure
5532	2901-4406 m, Sandstone, Steep Slope, SW exposure
5541	2901-4406 m, Sandstone, Upper Bajada, NE exposure
5542	2901-4406 m, Sandstone, Upper Bajada, SW exposure
5550	2901-4406 m, Sandstone, Lower Bajada, Dry
5571	2901-4406 m, Sandstone, Canyon, NE exposure
5572	2901-4406 m, Sandstone, Canyon, SW exposure
5580	2901-4406 m, Sandstone, Toe Slope, Dry
5610	2901-4406 m, Basaltic-Mafic, Ridgetop
5621	2901-4406 m, Basaltic-Mafic, Cliff, NE exposure
5622	2901-4406 m, Basaltic-Mafic, Cliff, SW exposure
5631	2901-4406 m, Basaltic-Mafic, Steep Slope, NE exposure
5632	2901-4406 m, Basaltic-Mafic, Steep Slope, SW exposure
5641	2901-4406 m, Basaltic-Mafic, Upper Bajada, NE exposure
5642	2901-4406 m, Basaltic-Mafic, Upper Bajada, SW exposure

Code	ELU Description *Elevation zone, Substrate type, Landform type, and Flow/aspect qualified*
5650	2901-4406 m, Basaltic-Mafic, Lower Bajada, Dry
5651	2901-4406 m, Basaltic-Mafic, Lower Bajada, Int. Flow
5660	2901-4406 m, Basaltic-Mafic, Flat, Dry
5671	2901-4406 m, Basaltic-Mafic, Canyon, NE exposure
5672	2901-4406 m, Basaltic-Mafic, Canyon, SW exposure
5680	2901-4406 m, Basaltic-Mafic, Toe Slope, Dry
5681	2901-4406 m, Basaltic-Mafic, Toe Slope, Int. Flow
5710	2901-4406 m, Ultramafic, Ridgetop
5810	2901-4406 m, Carbonate-Limestone, Ridgetop
5821	2901-4406 m, Carbonate-Limestone, Cliff, NE exposure
5822	2901-4406 m, Carbonate-Limestone, Cliff, SW exposure
5831	2901-4406 m, Carbonate-Limestone, Steep Slope, NE exposure
5832	2901-4406 m, Carbonate-Limestone, Steep Slope, SW exposure
5841	2901-4406 m, Carbonate-Limestone, Upper Bajada, NE exposure
5842	2901-4406 m, Carbonate-Limestone, Upper Bajada, SW exposure
5850	2901-4406 m, Carbonate-Limestone, Lower Bajada, Dry
5851	2901-4406 m, Carbonate-Limestone, Lower Bajada, Int. Flow
5860	2901-4406 m, Carbonate-Limestone, Flat, Dry
5871	2901-4406 m, Carbonate-Limestone, Canyon, NE exposure
5872	2901-4406 m, Carbonate-Limestone, Canyon, SW exposure
5880	2901-4406 m, Carbonate-Limestone, Toe Slope, Dry
5881	2901-4406 m, Carbonate-Limestone, Toe Slope, Int. Flow
5882	2901-4406 m, Carbonate-Limestone, Toe Slope, Int. Wet
5910	2901-4406 m, Shale, Ridgetop
5921	2901-4406 m, Shale, Cliff, NE exposure
5922	2901-4406 m, Shale, Cliff, SW exposure
5931	2901-4406 m, Shale, Steep Slope, NE exposure
5932	2901-4406 m, Shale, Steep Slope, SW exposure
5941	2901-4406 m, Shale, Upper Bajada, NE exposure
5942	2901-4406 m, Shale, Upper Bajada, SW exposure
5950	2901-4406 m, Shale, Lower Bajada, Dry
5960	2901-4406 m, Shale, Flat, Dry
5971	2901-4406 m, Shale, Canyon, NE exposure
5972	2901-4406 m, Shale, Canyon, SW exposure
5980	2901-4406 m, Shale, Toe Slope, Dry

Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A001	**AMERICAN FORK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,774.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	9,327.0 % Private: 99.8%	RW A	**County:**	Utah
TERR SYSTEMS	Desert riparian shrubland and woodland			
PLANTS	Spiranthes diluvialis	Ute ladies' tresses	G2	Disjunct, declining
MOLLUSKS	Fluminicola sp 21	Bonneville Basin pebblesnail	G2	Limited?
	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
BIRDS	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
A002	**ANCHORITE HILLS**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	13,684.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	33,815.0 % Private: 0.0%	BD SS LM MA	**County:**	Mineral
TERR SYSTEMS	Greasewood shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
PLANTS	Polyctenium williamsiae	Williams combleaf	G2	Limited
INVERTEBRATES	Hesperia uncas giulianii	Giuliani's unca skipper	G4G5T1	Unknown
A003	**ANDERSON HILL**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	2,064.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	5,101.1 % Private: 99.8%	BD SS SD RW	**County:**	Box Elder
TERR SYSTEMS	Desert riparian shrubland and woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	Semi-desert shrub steppe			
PLANTS	Allium passeyi	Passey's onion	G1	Endemic
A004	**ANTELOPE SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,717.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,243.3 % Private: 0.0%	SS LM	**County:**	Beaver
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Astragalus pinonis	Pinyon milkvetch	G2G3	Endemic
A005	**ANTELOPE VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	18,434.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	45,551.7 % Private: 1.3%	BD SS LM MA SD RW A	**County:**	Elko
TERR SYSTEMS	Greasewood shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Sagebrush semidesert			
	Salt desert scrub			
MOLLUSKS	Pyrgulopsis cruciglans	Transverse gland springsnail	G1	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
A006	**ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	North Central
Size Ha:	176,322.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	435,693.9 % Private: 57.2%	BD SS LM MA SD RW A	**County:**	Lander, Eureka, Elko
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Montane meadow			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Medium-size runoff-fed stream			
	Permanent flowing waters			
	River and major tributary			
	Small-size spring and outflow springbrook			
	Small-size spring and outflow stream, thermal spring and springbrook			
G1G2 ASSOCATIONS	Salix laevigata - Fraxinus velutina woodland		G1G2	Limited
PLANTS	Astragalus pterocarpus	Winged milkvetch	G3	Limited
INVERTEBRATES	Andrena raveni	(Bee)	G2	Limited
	Dufourea orovada		G1	Limited
	Limenitis archippus lahontani	Nevada viceroy	G5T2	Endemic
	Phyciodes pulchella shoshone	Humboldt River crescentspot	G5T2	Endemic
	Satyrium sylvinus megapallidum	Pallid sylvinus hairstreak	G5T2T3	Endemic
MOLLUSKS	Anodonta californiensis	California floater	G3G4	Widespread, declining
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Ixobrychus exilis	Least Bittern	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
	Spizella breweri	Brewer's Sparrow	G5	Widespread

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Lutra canadensis nexa	Humboldt River otter	?	Limited
	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited
A007	**ARTESIA LAKE-EAST PINE NUT MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	50,741.9 % Class 1 or 2: 1.5%	System Groups (2)	**State:**	NV
Acres:	125,383.2 % Private: 20.7%	BD SS LM MA SD RW A	**County:**	Lyon, Douglas
TERR SYSTEMS	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Ephemeral standing waters			
	Small-size spring and outflow springbrook			
PLANTS	Astragalus convallarius var. margaretiae	Margaret rushy milkvetch	G5T2	Endemic
	Camissonia nevadensis	Nevada suncup	G3	Endemic
	Eriogonum sp.	Churchill Narrows buckwheat	G1G2	Endemic
	Stroganowia tiehmii	Tiehm stroganowia	G2	Endemic
BIRDS	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Larus californicus	California Gull	G5	Disjunct, colonial
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Ursus americanus	Black bear	G5	Peripheral
A008	**AUGUSTA MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	6,236.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	15,409.7 % Private: 4.3%	BD SS LM MA RW A	**County:**	Pershing, Churchill, Lander
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis augustae	Elongate Cain Spring springsnail	G1	Endemic

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
MOLLUSKS	Pyrgulopsis dixiensis	Dixie Valley springsnail	G1	Endemic
	Pyrgulopsis pictilis	Ovate Cain Spring springsnail	G1	Endemic
A009	**BALD MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	2,024.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	5,001.4 % Private: 5.6%	LM MA	**County:**	Juab
TERR SYSTEMS	Montane forest and woodland			
	Pinyon-juniper woodland			
PLANTS	Aster kingii var. barnebyana		G3T1	Limited
A010	**BALD MOUNTAIN**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	20,252.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	50,042.9 % Private: 6.5%	BD SS LM MA SD	**County:**	Lyon
TERR SYSTEMS	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
PLANTS	Astragalus oophorus var. lavinii	Lavin eggvetch	G4T2	Endemic
	Camissonia nevadensis	Nevada suncup	G3	Endemic
	Cusickiella quadricostata	Bodie Hills cusickiella, Bodie Hills draba	G3	Endemic
	Phacelia monoensis	Mono County phacelia	G3,G3Q	Limited
	Polyctenium williamsiae	Williams combleaf	G2	Limited
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Sorex tenellus	Inyo shrew	G3G4	Limited
A011	**BARRETT CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	3,505.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	8,661.4 % Private: 0.0%	SS LM MA RW	**County:**	Nye
TERR SYSTEMS	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
PLANTS	Eriogonum esmeraldense var. toiyabense	Toiyabe buckwheat	G4T2	Endemic
	Smelowskia holmgrenii	Holmgren smelowskia	G2	Endemic
A012	**BATTLE MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	24,529.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	60,612.2 % Private: 46.1%	BD SS LM MA SD RW A	**County:**	Lander, Humboldt
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
	Semi-desert shrub steppe			

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
AQ SYSTEMS	Permanent flowing waters			
MOLLUSKS	Pyrgulopsis sadai	Sada's springsnail	G1G2	Endemic
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
A013	**BEAVER DAM WASH-BULL VALLEY MOUNTAINS**		**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	49,221.5 % Class 1 or 2: 27.2%	System Groups (2)	**State:**	NV
Acres:	121,626.3 % Private: 3.5%	BD SS LM SD RW A	**County:**	Washington, Lincoln
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Desert riparian shrubland and woodland			
	Low montane shrublands			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush steppe			
PLANTS	Epilobium nevadense	Nevada willowherb	G2	Limited
FISHES	Catostomus clarki	Desert sucker	G3G4	Widespread
	Lepidomeda mollispinis	Virgin spinedace	G1	Limited
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo	G5T2T3	Peripheral
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
A014	**BEAVER LAKE MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	2,399.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	5,927.9 % Private: 2.4%	SS LM SD	**County:**	Beaver
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
PLANTS	Trifolium friscanum	Frisco clover	G1	Endemic
A015	**BEAVER RIDGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	2,633.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	6,508.2 % Private: 85.7%	BD SD RW	**County:**	Millard
TERR SYSTEMS	Desert riparian shrubland and woodland			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
INVERTEBRATES	Anthophora affabilis	(Bee)	?	Limited

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
A016	**BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	337,833.8 % Class 1 or 2: 39.4%	System Groups (2)	**State:**	NV
Acres:	834,787.3 % Private: 0.0%	BD SS LM MA SD RW A	**County:**	Nye, Lincoln
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Joshua tree-mixed mojave scrub			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Permanent flowing waters			
	Spring pool			
PLANTS	Arabis dispar	Pinyon rock cress	G3	Limited
	Astragalus beatleyae	Beatley milkvetch	G3	Endemic
	Astragalus funereus	Black milk-vetch, black woollypod	G2	Peripheral
	Astragalus oophorus var. clokeyanus	Clokey eggvetch	G4T2	Peripheral
	Camissonia megalantha	Cane Spring suncup	G3	Limited
	Castilleja martinii var. clokeyi	Clokey paintbrush	G3QT3	Peripheral
	Eriogonum concinnum	Darin buckwheat	G2	Limited
	Frasera pahutensis	Pahute green gentian	G3Q	Endemic
	Galium hilendiae ssp. kingstonense	Kingston Mountains bedstraw	G4QT2?	Limited
	Gilia heterostyla	Cochrane gilia	?	Endemic
	Ivesia arizonica var. saxosa	Rock purpusia	G4T1	Limited
	Penstemon pahutensis	Pahute Mesa beardtongue	G3	Limited
	Perityle intricata		G3	Peripheral or Limited
	Phacelia beatleyae	Beatley scorpion plant	G3	Peripheral
	Phacelia mustelina	Death Valley round-leaved phacelia, weasel phacelia	G2,G2G3	Limited
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Euderma maculatum	Spotted bat	G4	Unknown
	Myotis thysanodes	Fringed myotis	G5	Widespread, declining
	Sorex tenellus	Inyo shrew	G3G4	Limited
A017	**BLACK HILLS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	5,610.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	13,864.4 % Private: 0.0%	BD SS A	**County:**	Millard
TERR SYSTEMS	+ Salt desert scrub			
AQ SYSTEMS	Lakes			
PLANTS	Astragalus uncialis	Currant milkvetch	G2	Endemic

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A018	**BLACK MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	5,590.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	13,814.0 % Private: 4.6%	BD SS LM MA RW	**County:**	Iron
TERR SYSTEMS	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A019	**BLACK ROCK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	4,130.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	10,206.7 % Private: 0.0%	BD SS	**County:**	Humboldt
TERR SYSTEMS	+ Salt desert scrub			
PLANTS	Astragalus pterocarpus	Winged milkvetch	G3	Limited
	Caulanthus barnebyi	Barneby stemflower	G2	Limited
A020	**BLACK ROCK DESERT-SMOKE CREEK DESERT**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	265,947.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	657,156.8 % Private: 1.4%	BD SS LM MA SD RW A	**County:**	Humboldt, Washoe, Pershing
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Greasewood shrubland			
	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Ephemeral alkaline playa lake, chloride waters			
	Ephemeral standing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
PLANTS	Astragalus pterocarpus	Winged milkvetch	G3	Limited
	Penstemon floribundus	Cordelia beardtongue	G1	Endemic
	Smelowskia holmgrenii	Holmgren smelowskia	G2	Endemic
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
MAMMALS	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
A021	**BLOWSAND MOUNTAINS-BARNETT HILLS**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	27,957.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	69,084.0 % Private: 0.0%	BD SS SD	**County:**	Churchill, Mineral
TERR SYSTEMS	Greasewood shrubland			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic
	Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited
	Psorothamnus kingii	Lahontan indigobush	G3	Endemic

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
INVERTEBRATES	Aegialia hardyi	Hardy's aegialian scarab	G1	Endemic
	Aegialia spinosa	(Scarab beetle)	?	Limited
	Andrena chrylismiae	(Bee)	G1	Endemic
	Andrena sp. nov.	(Bee)	G1	Endemic
	Andrena taeniata	(Bee)	G2	Disjunct
	Anthidium rodecki	(Bee)	?	Limited
	Anthophora sp. nov.	(Bee)	G1	Endemic
	Atoposmia rufifemur	Red-legged beardtongue bee	?	Limited
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Coenonycha pygmaea	Sand Mountain pygmy scarab	G1	Endemic
	Colletes sp. nov. 1	(Bee)	G1	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Hesperapis kayella	(Bee)	G1	Limited
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Myrmecocystus arenarius	Dune honey ant	G2?	Endemic?
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Perdita hirticeps apicata	(Bee)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Rhadine myrmecodes	(Sand obligate beetle)	?	Limited
	Serica psammobunus	Sand Mountain serican scarab	G1	Endemic
	Stenopelmatus ssp. nov	(Sand obligate cricket)	?	Endemic
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited

A022 BLUE LAKES-BADLANDS

Site Type: LANDSCAPE SITE
Section: North Central
State: NV, UT
County: Elko, White Pine, Tooele

Size Ha: 141,257.7 % Class 1 or 2: 0.5%
Acres: 349,047.7 % Private: 3.1%

System Groups (2)

BD	SS	LM	MA	SD	RW	A

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
MOLLUSKS	Pyrgulopsis cruciglans	Transverse gland springsnail	G1	Endemic
	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
MOLLUSKS	Tryonia protea	Desert tryonia	G3G4	Widespread, specialist
FISHES	Oncorhynchus clarki utah	Bonneville cutthroat trout	G4T2	Endemic?
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited
	Tadarida brasiliensis	Brazilian free-tailed bat	G5	Unknown

A023 BODIE HILLS — **Site Type:** LANDSCAPE SITE; **Section:** California; **State:** CA, NV; **County:** Mono, Mineral

Size Ha: 86,690.6 % Class 1 or 2: 1.6% — Acres: 214,212.5 % Private: 16.1%

System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Fen			
	Freshwater marsh			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Ephemeral desert scrub pool			
	Ephemeral standing waters			
	Lakes			
	Medium-size runoff-fed stream			
	Medium-size spring and outflow stream, hot spring & springbrook			
	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
G1G2 ASSOCATIONS	Purshia tridentata - Artemisia tridentata ssp. tridentata shrubland		G1?	Limited
PLANTS	Arabis bodiensis	Bodie Hills rock cress	G1,G2	Limited
	Astragalus johannis-howellii	Long Valley milk-vetch	G2	Endemic
	Astragalus oophorus var. lavinii	Lavin eggvetch	G4T2	Endemic
	Crepis runcinata ssp. hallii	Hall's meadow hawksbeard	G5T3?	Endemic
	Cusickiella quadricostata	Bodie Hills cusickiella, Bodie Hills draba	G3	Endemic
	Phacelia monoensis	Mono County phacelia	G3,G3Q	Limited
	Polyctenium williamsiae	Williams combleaf	G2	Limited
	Streptanthus oliganthus	Masonic Mountain jewel-flower	G3	Limited
INVERTEBRATES	Calliopsis filiorum	(Bee)	G1	Endemic

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
INVERTEBRATES	Hygrotus fontinalis	Travertine band-thigh diving beetle	G1	Endemic
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
MAMMALS	Brachylagus idahoensis	Pygmy rabbit	G5	Limited
	Lepus townsendii	White-tailed jack rabbit	?	Widespread
	Ochotona princeps sspp.	Pika	G5T?	Limited?
	Ursus americanus	Black bear	G5	Peripheral
A024	**BOLIVIA**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	8,013.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	19,800.7 % Private: 3.7%	BD SS LM MA RW	**County:**	Churchill, Pershing
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	+ Salt desert scrub			
PLANTS	Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic
	Penstemon palmeri var. macranthus		G5T2?	Endemic
A025	**BOONE SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	1,780.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,399.1 % Private: 10.8%	SS LM A	**County:**	Elko
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
MOLLUSKS	Pyrgulopsis cruciglans	Transverse gland springsnail	G1	Endemic
A026	**BROKEN HILLS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	12,519.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	30,936.6 % Private: 0.0%	BD	**County:**	Churchill
TERR SYSTEMS	Salt desert scrub			
A027	**BUCKSKIN HILL**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,304.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	25,462.4 % Private: 0.0%	BD SS LM MA	**County:**	Millard
TERR SYSTEMS	Mountain sagebrush			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Astragalus callithrix	Callaway milkvetch	G3	Endemic
	Eriogonum batemanii var. eremicum	Desert wild buckwheat	G4?T2T3	Endemic
	Eriogonum nummulare var. ammophilum	Ibex buckwheat	G4T1	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A028	**BUFFALO SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	4,208.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	10,399.0 % Private: 7.7%	BD SS RW A	**County:**	Pershing, Churchill, Lander
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Sagebrush steppe			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis sadai	Sada's springsnail	G1G2	Endemic
A029	**BUFFALO VALLEY-TOBIN RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	11,815.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	29,196.8 % Private: 0.9%	BD SS LM MA RW	**County:**	Pershing, Humboldt
TERR SYSTEMS	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
A030	**BUTLER BASIN**		**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	19,308.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	47,710.1 % Private: 0.5%	BD SS LM MA RW A	**County:**	Nye, Eureka
TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Wet meadow			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
REPTILES	Phrynosoma hernandesi	Mountain short-horned lizard	G3	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
A031	**BUTTE MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	6,045.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	14,938.2 % Private: 0.0%	SS LM	**County:**	White Pine
TERR SYSTEMS	Pinyon-juniper woodland			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	+ Sagebrush semidesert			
	Sagebrush steppe			
INVERTEBRATES	Perdita exigua	(Bee)	G1	Endemic
BIRDS	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining

A032 CACTUS FLAT — **Site Type:** FUNCTIONAL SITE; **Section:** Tonopah; **State:** NV; **County:** Nye

Size Ha: 43,492.5 % Class 1 or 2: 0.0% — System Groups (2): BD SS

Acres: 107,469.9 % Private: 0.1%

TERR SYSTEMS	Greasewood shrubland		
	Sagebrush semidesert		
	Salt desert scrub		

A033 CACTUS RANGE — **Site Type:** FUNCTIONAL SITE; **Section:** Tonopah; **State:** NV; **County:** Nye

Size Ha: 33,176.3 % Class 1 or 2: 0.0% — System Groups (2): BD SS LM

Acres: 81,978.8 % Private: 0.0%

TERR SYSTEMS	Greasewood shrubland		
	Sagebrush semidesert		
	Salt desert scrub		
G1G2 ASSOCATIONS	Artemisia tridentata - Yucca brevifolia - Juniperus osteosperma shrubland		G2G3 Limited
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q Endemic
	Astragalus beatleyae	Beatley milkvetch	G3 Endemic

A034 CALICO HILLS — **Site Type:** FUNCTIONAL SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Humboldt

Size Ha: 6,465.1 % Class 1 or 2: 0.0% — System Groups (2): BD A

Acres: 15,975.2 % Private: 7.8%

TERR SYSTEMS	Greasewood shrubland		
	+ Salt desert scrub		
	Salt desert scrub		
MOLLUSKS	Pyrgulopsis longiglans	Western Lahontan springsnail	G2G3 Endemic

A035 CAMP VALLEY — UNIQUE SITE (1) — **Site Type:** FUNCTIONAL SITE; **Section:** Central Mountains; **State:** NV; **County:** Lincoln

Size Ha: 1,850.3 % Class 1 or 2: 0.0% — System Groups (2): LM RW A

Acres: 4,572.1 % Private: 9.3%

TERR SYSTEMS	Montane riparian shrubland		
	+ Pinyon-juniper woodland		
MOLLUSKS	Pyrgulopsis montana	Camp Valley springsnail	G1 Endemic

A036 CANE SPRING — **Site Type:** FUNCTIONAL SITE; **Section:** Tonopah; **State:** NV; **County:** Nye

Size Ha: 1,836.7 % Class 1 or 2: 0.0% — System Groups (2): BD SS

Acres: 4,538.5 % Private: 12.1%

TERR SYSTEMS	+ Greasewood shrubland		
	+ Sagebrush semidesert		
	+ Salt desert scrub		
PLANTS	Sclerocactus blainei	Blaine pincushion	G1Q Endemic

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A037	**CANYON MOUNTAINS-DELTA**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	58,667.3 % Class 1 or 2: 0.8%	System Groups (2)	**State:**	UT
Acres:	144,967.0 % Private: 12.3%	BD SS LM MA SD RW A	**County:**	Millar, Juab
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Ponderosa pine woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Sand dunes			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
PLANTS	Aster kingii var. barnebyana		G3T1	Limited
	Atriplex canescens var. gigantea	Giant four-wing saltbush	G5T1	Endemic
	Cymopterus acaulis var. parvus		G5T2T3	Endemic
	Epilobium nevadense	Nevada willowherb	G2	Limited
	Gutierrezia petradona	Goldenrod snakeweed	G3	Limited
	Lepidium integrifolium var. heterophyllum		G2T1?	Limited
	Penstemon angustifolius var. dulcis		G5T2	Endemic
INVERTEBRATES	Anthidium rodecki	(Bee)	?	Limited
	Anthophora affabilis	(Bee)	?	Limited
	Colletes ciliatoides	(Bee)	?	Limited
	Hesperapis oliviae	(Bee)	?	Limited
	Perdita aridella	(Bee)	?	Limited
MOLLUSKS	Pyrgulopsis peculiaris	Bifid duct springsnail	G?,G2?	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
A038	**CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY** UNIQUE SITE (1)		**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	47,609.3 % Class 1 or 2: 3.7%	System Groups (2)	**State:**	NV, CA
Acres:	117,642.5 % Private: 64.2%	BD SS LM MA SD RW A	**County:**	Washoe, Lassen, Sierra
TERR SYSTEMS	Altered andesite soils			
	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Medium-size runoff-fed stream			
	Small-size spring and outflow stream, cold spring and springbrook			
PLANTS	Eriogonum robustum	Altered andesite buckwheat	G2G3Q	Limited
	Ivesia aperta var. aperta	Sierra Valley ivesia	G2T2	Peripheral or Limited
	Ivesia webberi	Webber ivesia	G2	Limited
	Plagiobothrys glomeratus	Altered andesite popcorn-flower	G2G3	Limited
	Silene nuda var. nuda	Naked catchfly	G3T1T2Q	Endemic
INVERTEBRATES	Capnura wanica	(Stonefly)	G?	Disjunct
	Euphilotes enoptes aridorum	Peavine blue	G5T1	Endemic
	Perdita exigua	(Bee)	G1	Endemic
	Speyeria nokomis carsonensis	Carson Valley silverspot	G4T2	Limited
MOLLUSKS	Pyrgulopsis longae		G1	Endemic
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining

A039 CARSON RIVER UNIQUE SITE (1)

Site Type: LANDSCAPE SITE
Section: California
State: NV, CA
County: Douglas, Carson, Alpine, Lyon

Size Ha: 104,031.6 % Class 1 or 2: 0.0%
Acres: 257,062.0 % Private: 54.9%

System Groups (2)
BD SS LM MA SD RW A

TERR SYSTEMS	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
PLANTS	Astragalus oophorus var. lavinii	Lavin eggvetch	G4T2	Endemic
	Ivesia webberi	Webber ivesia	G2	Limited
	Lupinus malacophyllus	Soft lupine	G3?	Limited
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
	Penstemon rubicundus	Wassuk Beardtongue	G2G3	Endemic
	Polyctenium williamsiae	Williams combleaf	G2	Limited
INVERTEBRATES	Cercyonis pegala carsonensis	Carson Valley wood nymph	G5T2	Endemic
	Polites sabuleti genoa	Carson Valley sandhill skipper	G5T2	Endemic
	Pseudocopaeodes eunus obscurus	Carson alkali skipperling	G3T1	Endemic
	Speyeria nokomis carsonensis	Carson Valley silverspot	G4T2	Limited
MOLLUSKS	Anodonta californiensis	California floater	G3G4	Widespread, declining

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
MOLLUSKS	Pyrgulopsis longiglans	Western Lahontan springsnail	G2G3	Endemic
	Pyrgulopsis wongi	Wong's springsnail	G1G2	Endemic or Limited
REPTILES	Clemmys marmorata marmorata	Northwestern pond turtle	G3T3	Disjunct
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo	G5T2T3	Peripheral
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Larus californicus	California Gull	G5	Disjunct, colonial
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
	Spizella breweri	Brewer's Sparrow	G5	Widespread
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining
	Ursus americanus	Black bear	G5	Peripheral

A040 CARSON SINK — UNIQUE SITE (1)

Site Type: LANDSCAPE SITE
Section: Lahontan Basin
State: NV
County: Churchill, Pershing

Size				
Ha:	379,147.0	% Class 1 or 2:	15.3%	
Acres:	936,872.2	% Private:	27.6%	

System Groups (2)

BD	SS	LM	MA	SD	RW	A

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Sand dunes			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Ephemeral alkaline playa lake, carbonate waters			
	Ephemeral standing waters			
	Highly alkaline playa lake, carbonate waters			
	Lakes			
PLANTS	Astragalus lentiginosus var kennedyi		G5T3T4	Endemic
	Eriogonum rubricaule	Lahontan Basin buckwheat	G3	Endemic
	Helianthus deserticola	Desert sunflower	G2Q	Limited
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited
	Penstemon arenarius	Nevada dune beardtongue	G2G3	Endemic
	Penstemon palmeri var. macranthus		G5T2?	Endemic
	Phacelia glaberrima	Reese River phacelia	G3?	Endemic

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
INVERTEBRATES	Aegialia spinosa	(Scarab beetle)	?	Limited
	Aphodius parapyriformis ssp. nov.	(Bee)	?	Limited
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Colletes sp. nov. 1	(Bee)	G1	Limited
	Colletes tectiventris	(Bee)	?	Disjunct
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Novelsis sabulorum	(Sand obligate beetle)	?	Endemic
	Perdita haigi	(Bee)	G1	Endemic
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Pseudocopaeodes eunus flavus	Nevada alkali skipperling	G3T2	Endemic
	Rhadine myrmecodes	(Sand obligate beetle)	?	Limited
	Stenopelmatus ssp. nov	(Sand obligate cricket)	?	Endemic
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited
FISHES	Gila bicolor ssp. 9	Dixie Valley tui chub	G4T1	Endemic?
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo	G5T2T3	Peripheral
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Ixobrychus exilis	Least Bittern	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Larus californicus	California Gull	G5	Disjunct, colonial
	Larus pipixcan	Franklin's Gull	G4G5	Disjunct
	Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
	Stellula calliope	Calliope Hummingbird	G5	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Brachylagus idahoensis	Pygmy rabbit	G5	Limited
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Dipodomys deserti	Desert kangaroo rat	G5	Limited
	Dipodomys microps	Chisel-toothed kangaroo rat	G5	Limited
	Lagurus curtatus	Sagebrush vole	G5	Endemic or Limited
	Microdipodops megalocephalus	Dark kanagaroo mouse	?	Unknown
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
MAMMALS	Tadarida brasiliensis	Brazilian free-tailed bat	G5	Unknown
A041	**CATHEDRAL CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	2,551.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	6,305.4 % Private: 1.0%	SS LM RW	**County:**	White Pine
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush steppe			
A042	**CAVE VALLEY-UPPER WHITE RIVER VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	163,531.4 % Class 1 or 2: 2.0%	System Groups (2)	**State:**	NV
Acres:	404,086.1 % Private: 4.2%	BD SS LM MA SD RW A	**County:**	Lincoln, Nye, White Pine
TERR SYSTEMS	Alpine herbaceous			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
	Astragalus calycosus var. monophyllidius	One-leaflet torrey milkvetch	G5T2	Endemic
	Cryptantha welshii	White River catseye	G3	Endemic
	Frasera gypsicola	Sunnyside green gentian	G1	Endemic
	Penstemon barnebyi	Barneby's beardtongue	G3	Endemic
	Phacelia parishii	Parish phacelia	G2G3	Limited
	Townsendia jonesii var. tumulosa	Charleston grounddaisy	G3T3	Peripheral
INVERTEBRATES	Cercyonis pegala pluvialis	White River wood nymph	G5T2	Endemic
	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
MOLLUSKS	Pyrgulopsis breviloba	Flag springsnail	G1	Endemic
	Pyrgulopsis lata	Butterfield springsnail	G1	Endemic
	Pyrgulopsis marcida	Hardy springsnail	G2	Endemic
	Pyrgulopsis merriami	Pahranagat pebblesnail	G1	Endemic
	Pyrgulopsis sathos	White River Valley springsnail	G1G2	Endemic
	Pyrgulopsis sublata	Lake Valley springsnail	G1	Endemic
	Tryonia clathrata	Grated tyronia	G2	Peripheral or Limited
FISHES	Catostomus clarki intermedius	White River Desert sucker	G3G4T1T2Q	Endemic
	Cottus sp. 3 (bairdi)	White River Mottled sculpin	G1	Endemic
	Crenichthys baileyi thermophilus	Moorman White River springfish	G2T1	Endemic
	Lepidomeda albivallis	White River spinedace	G1	Endemic
	Rhinichthys osculus ssp. 7	White River speckled dace	G5T2T3	Endemic
BIRDS	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Ixobrychus exilis	Least Bittern	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining
	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
A043	**CEDAR CITY JUNCTION**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,849.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,570.8 % Private: 67.9%	BD SS LM RW	**County:**	Iron
TERR SYSTEMS	Montane riparian shrubland			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A044	**CEDAR PASS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	4,041.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,987.4 % Private: 0.0%	SS LM MA	**County:**	Nye
TERR SYSTEMS	Mountain mahogany woodlands			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Astragalus oophorus var. clokeyanus	Clokey eggvetch	G4T2	Peripheral
A045	**CLAYTON VALLEY SAND DUNES**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	7,964.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	19,679.5 % Private: 0.0%	BD SD	**County:**	Esmeralda
TERR SYSTEMS	+ Salt desert scrub			
INVERTEBRATES	Aegialia spinosa	(Scarab beetle)	?	Limited
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Lariversius tibalis	(Sand obligate beetle)	?	Limited

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Rhadine myrmecodes	(Sand obligate beetle)	?	Limited
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited
A046 CLEAR LAKE			**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha: 30,785.4	% Class 1 or 2: 5.3%	System Groups (2)	**State:**	UT
Acres: 76,070.8	% Private: 1.5%	BD SS LM SD RW A	**County:**	Millard
TERR SYSTEMS	Freshwater marsh			
	Greasewood shrubland			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
PLANTS	Cymopterus acaulis var. parvus		G5T2T3	Endemic
	Penstemon angustifolius var. dulcis		G5T2	Endemic
BIRDS	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
A047 CLOVER CREEK			**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha: 3,974.9	% Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres: 9,821.9	% Private: 0.0%	SS LM A	**County:**	Lincoln
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush steppe			
FISHES	Catostomus clarki ssp. 2	Meadow Valley Wash Desert sucker	G3G4T2	Endemic
	Rhinichthys osculus ssp. 2 mv	Meadow Valley speckled dace	G5T2	Limited
A048 COMINS MEADOW			**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha: 4,033.6	% Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres: 9,967.0	% Private: 8.0%	BD SS RW	**County:**	White Pine
TERR SYSTEMS	+ Sagebrush semidesert			
	Sagebrush steppe			
	Semi-desert shrub steppe			
INVERTEBRATES	Cercyonis pegala pluvialis	White River wood nymph	G5T2	Endemic
A049 CONFUSION RANGE			**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha: 3,825.4	% Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres: 9,452.7	% Private: 0.0%	BD SS LM MA	**County:**	Millard
TERR SYSTEMS	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Semi-desert shrub steppe			
PLANTS	Eriogonum nummulare var. ammophilum	Ibex buckwheat	G4T1	Endemic

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A050	**CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE**		**Site Type:**	LANDSCAPE SITE
			Section:	North Central
Size Ha:	222,673.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	550,225.3 % Private: 8.2%	BD SS LM MA RW A	**County:**	Eureka, Elko
TERR SYSTEMS	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Low montane shrublands			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
AQ SYSTEMS	Ephemeral standing waters			
	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
PLANTS	Lesquerella goodrichii	Goodrich bladderpod	G2G4	Endemic
	Phacelia minutissima	Least phacelia	G2	Peripheral
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
A051	**COVE CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	23,449.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	57,943.5 % Private: 7.9%	BD SS LM RW	**County:**	Millard, Beaver
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
A052	**COWCAMP**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	3,868.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,559.2 % Private: 0.5%	BD SS LM	**County:**	Esmeralda
TERR SYSTEMS	Pinyon-juniper woodland			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Penstemon barnebyi	Barneby's beardtongue	G3	Endemic
A053	**CRESCENT DUNES**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	12,033.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	29,734.8 % Private: 0.0%	BD SS SD	**County:**	Nye
TERR SYSTEMS	Sagebrush semidesert			
	Salt desert scrub			
	Sand dunes			
PLANTS	Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic
INVERTEBRATES	Aegialia crescenta	Crescent Dunes aegialian scarab	G1	Endemic
	Cardiophorus spp.	(Click beetle)	?	Limited
	Cardiophorus ssp. nov.	(Click beetle)	?	Endemic
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Serica ammomenisco	Crescent Dunes serican scarab	G1	Endemic
	Serica psammobunus	Sand Mountain serican scarab	G1	Endemic
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited
A054	**CRICKET MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	28,913.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	71,445.6 % Private: 2.5%	BD SS LM SD A	**County:**	Millard
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
AQ SYSTEMS	Lakes			
PLANTS	Eriogonum spathulatum var. natum	Son's wild buckwheat	G3T2	Endemic
A055	**CURRANT MOUNTAIN**		**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	68,944.1 % Class 1 or 2: 21.9%	System Groups (2)	**State:**	NV
Acres:	170,360.8 % Private: 3.0%	BD SS LM MA SD RW A	**County:**	Nye, White Pine
TERR SYSTEMS	Alpine herbaceous			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
AQ SYSTEMS	Permanent flowing waters			
G1G2 ASSOCATIONS	Purshia tridentata - Artemisia tridentata ssp. tridentata shrubland		G1?	Limited
PLANTS	Agastache cusickii	Cusick hyssop	G3	Peripheral
	Astragalus callithrix	Callaway milkvetch	G3	Endemic
	Astragalus calycosus var. monophyllidius	One-leaflet torrey milkvetch	G5T2	Endemic
	Astragalus uncialis	Currant milkvetch	G2	Endemic
	Draba cusickii var. pedicellata	Stalked cusick whitlowgrass	G4T3?	Endemic
	Gilia heterostyla	Cochrane gilia	?	Endemic
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
	Penstemon moriahensis	Mount Moriah beardtongue	G1G2	Endemic
	Sclerocactus blainei	Blaine pincushion	G1Q	Endemic
	Silene nachlingerae	Nachlinger catchfly	G2	Endemic
	Sphaeralcea caespitosa	Jones globe-mallow	G3	Endemic
	Viola lithion	Rock violet	G1	Endemic
INVERTEBRATES	Polites sabuleti basinensis	Pallid skipper	G5T2	Unknown
FISHES	Gila bicolor nevadae	Duckwater Creek tui chub/ Hot Creek tui chub/ Railroad Valley tui chub)	G4T1	Endemic?
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining
	Ochotona princeps sspp.	Pika	G5T?	Limited?
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
A056	**CURRANT SUMMIT**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,585.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	3,918.0 % Private: 0.0%	SS LM SD	**County:**	White Pine, Nye
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Trifolium andinum var. podocephalum	Currant Summit clover	G3T1	Endemic
A057	**CURRIE GARDENS-TAYLOR CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	8,003.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	19,777.0 % Private: 4.1%	SS LM MA RW A	**County:**	Elko
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
INVERTEBRATES	Oreohelix hemphilii	White Pine mountainsnail	?	Endemic
MOLLUSKS	Pyrgulopsis serrata	Northern Steptoe springsnail	G1	Endemic

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
A058	**DAISY CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	1,951.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,822.0 % Private: 18.8%	BD SS LM MA A	**County:**	Lander
TERR SYSTEMS	Mountain sagebrush			
	+ Pinyon-juniper woodland			
	+ Sagebrush steppe			
	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis sadai	Sada's springsnail	G1G2	Endemic
A059	**DEEP CREEK RANGE**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	171,555.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	423,913.4 % Private: 4.6%	BD SS LM MA SD RW A	**County:**	Tooele, Juab
TERR SYSTEMS	Alpine herbaceous			
	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Permanent flowing waters			
G1G2 ASSOCATIONS	Populus angustifolia - Rhus trilobata forest		G2G3	Widespread
PLANTS	Draba kassii	Kass rockcress	G1	Endemic
	Hackelia ibapensis	Deep Creek stickseed	G1	Endemic
	Jamesia americana var. macrocalyx	Wasatch jamesia	G5T2	Limited
	Penstemon nanus	Low beardtongue	G3	Endemic
	Penstemon patricus	Dad's penstemon	G2Q	Endemic
	Potentilla cottamii	Cottam's cinquefoil	G1	Limited
	Potentilla pensylvanica var. paucijuga		G5T1T2Q	Limited
INVERTEBRATES	Oreohelix eurekensis	Eureka mountainsnail	G1	Unknown
	Pteronarcys priinceps		?	Peripheral
	Pteronarcys princeps	Giant stonefly	G4	Peripheral, specialist
MOLLUSKS	Anodonta californiensis	California floater	G3G4	Widespread, declining
	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
FISHES	Iotichthys phlegethontis	Least chub	G1	Limited
	Oncorhynchus clarki utah	Bonneville cutthroat trout	G4T2	Endemic?
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Otus flammeolus	Flammulated Owl	G4	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited

A060 DESATOYA MOUNTAINS — **Site Type:** LANDSCAPE SITE; **Section:** Central Mountains; **State:** NV; **County:** Lander, Churchill

Size Ha: 66,722.3 % Class 1 or 2: 0.0% — Acres: 164,870.9 % Private: 1.9%

System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
INVERTEBRATES	Melecta alexanderi	Parasitic bee	G1	Limited
	Osmia tanneri	(Bee)	G1	Limited
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
MAMMALS	Ochotona princeps sspp.	Pika	G5T?	Limited?

A061 DIAMOND PEAK — **Site Type:** FUNCTIONAL SITE; **Section:** Central Mountains; **State:** NV; **County:** White Pine, Eureka

Size Ha: 10,820.0 % Class 1 or 2: 0.0% — Acres: 26,736.3 % Private: 10.2%

System Groups (2): BD SS LM MA RW A

TERR SYSTEMS	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Wet meadow			
INVERTEBRATES	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
FISHES	Gila bicolor newarkensis	Newark Valley tui chub/Fish Creek Springs tui chub	G4T1	Endemic

A062 DIAMOND SPRINGS — **Site Type:** FUNCTIONAL SITE; **Section:** Central Mountains; **State:** NV; **County:** White Pine, Eureka

Size Ha: 10,117.8 % Class 1 or 2: 0.0% — Acres: 25,001.0 % Private: 0.0%

System Groups (2): BD SS LM MA

TERR SYSTEMS	Low montane shrublands
	Mountain mahogany woodlands
	Mountain sagebrush
	Pinyon-juniper woodland
	Sagebrush semidesert
	Sagebrush steppe
	Semi-desert shrub steppe

A063 DIAMOND VALLEY ALKALI FLAT — **Site Type:** FUNCTIONAL SITE; **Section:** Central Mountains; **State:** NV; **County:** Eureka

Size Ha: 7,128.2 % Class 1 or 2: 0.0% — Acres: 17,613.9 % Private: 0.9%

System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Greasewood shrubland			
	Low montane shrublands			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
AQ SYSTEMS	Ephemeral standing waters			
PLANTS	Epilobium nevadense	Nevada willowherb	G2	Limited
BIRDS	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist

A064 DIXIE CREEK — **Site Type:** FUNCTIONAL SITE; **Section:** North Central; **State:** NV; **County:** Elko

Size Ha: 23,829.5 % Class 1 or 2: 0.0% — Acres: 58,882.7 % Private: 28.7%

System Groups (2): BD SS LM MA RW A

TERR SYSTEMS	Low montane shrublands
	Montane riparian shrubland
	Mountain sagebrush
	Pinyon-juniper woodland
	Sagebrush semidesert
	Sagebrush steppe
	Salt desert scrub
	Semi-desert shrub steppe

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited

A065 DIXIE VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** Central Mountains; **State:** NV; **County:** Churchill

Size Ha: 16,365.8 % Class 1 or 2: 0.0% — Acres: 40,440.0 % Private: 0.8% — System Groups (2): BD SS LM RW

TERR SYSTEMS	Desert riparian shrubland and woodland		
	Greasewood shrubland		
	Pinyon-juniper woodland		
	Sagebrush semidesert		
	Salt desert scrub		
MAMMALS	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited

A066 DOVE CREEK HILLS — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Box Elder

Size Ha: 31,364.0 % Class 1 or 2: 0.0% — Acres: 77,500.3 % Private: 49.2% — System Groups (2): BD SS LM MA RW

TERR SYSTEMS	Desert riparian shrubland and woodland		
	Montane riparian shrubland		
	Mountain sagebrush		
	Pinyon-juniper woodland		
	Sagebrush semidesert		
	Sagebrush steppe		
	Salt desert scrub		
	Semi-desert shrub steppe		

A067 DRY LAKE VALLEY — **Site Type:** LANDSCAPE SITE; **Section:** Tonopah; **State:** NV; **County:** Lincoln

Size Ha: 38,716.4 % Class 1 or 2: 0.0% — Acres: 95,668.3 % Private: 0.1% — System Groups (2): BD SS LM SD

TERR SYSTEMS	Blackbrush-hopsage desert shrubland		
	Pinyon-juniper woodland		
	Sagebrush semidesert		
	Salt desert scrub		
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
MAMMALS	Microdipodops megacephalus albiventer	Desert Valley kangaroo mouse	G5T1	Endemic

A068 DUCK CREEK RANGE-STEPTOE VALLEY — **Site Type:** LANDSCAPE SITE; **Section:** Central Mountains; **State:** NV; **County:** White Pine

Size Ha: 42,275.0 % Class 1 or 2: 0.0% — Acres: 104,461.5 % Private: 31.6% — System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Desert riparian shrubland and woodland		
	Freshwater marsh		
	Greasewood shrubland		
	Montane forest and woodland		
	Montane riparian shrubland		

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Draba pennellii	Pennell draba	G2	Endemic
	Silene nachlingerae	Nachlinger catchfly	G2	Endemic
INVERTEBRATES	Andrena raveni	(Bee)	G2	Limited
	Cercyonis pegala pluvialis	White River wood nymph	G5T2	Endemic
	Phyciodes batesii arenacolor	Steptoe Valley crescentspot	G5T1	Endemic
	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
MOLLUSKS	Pyrgulopsis landyei	Landyes springsnail	G1	Endemic
	Pyrgulopsis neritella	Neritiform Steptoe Ranch springsnail	G1	Endemic
	Pyrgulopsis orbiculata	Sub-globose Steptoe Ranch springsnail	G1	Endemic
	Pyrgulopsis planulata	Flat-topped Steptoe springsnail	G1	Endemic
	Pyrgulopsis sulcata	Southern Steptoe springsnail	G1	Endemic
FISHES	Relictus solitarius	Relict dace	G2G3	Endemic
BIRDS	Leucosticte atrata	Black Rosy-Finch	G4	Limited

A069 DUCKWATER VALLEY — UNIQUE SITE (1) — **Site Type:** LANDSCAPE SITE

Section: Tonopah

Size Ha: 32,081.0 % Class 1 or 2: 0.0% — System Groups (2): BD SS LM A — **State:** NV

Acres: 79,272.1 % Private: 4.0% — **County:** Nye, White Pine

TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Small-size spring and outflow stream, thermal spring and springbrook			
PLANTS	Astragalus eurylobus	Needle Mountains milkvetch	G2	Limited
INVERTEBRATES	Hesperia uncas fulvapalla	Railroad Valley skipper	G4G5T1	Endemic
	Polites sabuleti basinensis	Pallid skipper	G5T2	Unknown
MOLLUSKS	Pyrgulopsis aloba	Duckwater springsnail	G1	Endemic
	Pyrgulopsis anatina	Southern Duckwater springsnail	G1	Endemic
	Pyrgulopsis papillata	Big Warm Spring springsnail	G1	Endemic
	Pyrgulopsis villacampae	Duckwater Warm Springs springsnail	G1	Endemic
FISHES	Crenichthys nevadae	Railroad Valley springfish	G2	Endemic
	Gila bicolor nevadae	Duckwater Creek tui chub/ Hot Creek tui chub/ Railroad Valley tui chub)	G4T1	Endemic?

A070 DUGWAY RANGE — **Site Type:** FUNCTIONAL SITE

Section: Bonneville Basin

Size Ha: 13,322.4 % Class 1 or 2: 0.0% — System Groups (2): BD SS LM — **State:** UT

Acres: 32,919.6 % Private: 1.7% — **County:** Tooele, Juab

TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Semi-desert shrub steppe			
A071	**EAST CRICKET MOUNTAINS FOOTHILLS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	4,153.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	10,264.2 % Private: 0.0%	BD SS SD	**County:**	Millard
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Eriogonum spathulatum var. natum	Son's wild buckwheat	G3T2	Endemic
A072	**EAST DUGWAY DUNES**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,656.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	26,333.3 % Private: 0.0%	BD SS SD	**County:**	Tooele
TERR SYSTEMS	Greasewood shrubland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Cymopterus acaulis var. parvus		G5T2T3	Endemic
INVERTEBRATES	Andrena sp. nov.	(Bee)	G1	Endemic
	Melecta alexanderi	Parasitic bee	G1	Limited
A073	**EAST GABBS VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	16,948.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	41,879.1 % Private: 6.4%	BD SS SD	**County:**	Nye
TERR SYSTEMS	Greasewood shrubland			
	Salt desert scrub			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
	Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic
A074	**EAST HUMBOLDT RANGE**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	North Central
Size Ha:	72,243.3 % Class 1 or 2: 21.5%	System Groups (2)	**State:**	NV
Acres:	178,513.1 % Private: 57.4%	BD SS LM MA SD RW A	**County:**	Elko
TERR SYSTEMS	Alpine herbaceous			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Wet meadow			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
	Subalpine or alpine lake			
PLANTS	Astragalus robbinsii var. occidentalis	Lamoille canyon milkvetch	G5T2T3	Endemic
	Penstemon procerus var. modestus		G5T2T3	Endemic
INVERTEBRATES	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
	Utaperla sopladora		G?	Disjunct
MOLLUSKS	Pyrgulopsis leporina	Elko springsnail	G1	Endemic or Limited
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
	Rhinichthys osculus oligoporus	Clover Valley speckled dace	G5T1	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Euderma maculatum	Spotted bat	G4	Unknown
	Lasiurus cinereus	Hoary bat	G5	Widespread, declining
	Lepus townsendii	White-tailed jack rabbit	?	Widespread
	Ochotona princeps sspp.	Pika	G5T?	Limited?

A075 EAST TINTIC MOUNTAINS-TINTIC VALLEY UNIQUE SITE (1) **Site Type:** LANDSCAPE SITE

Section: Bonneville Basin

Size Ha: 57,422.7 % Class 1 or 2: 0.0% System Groups (2) **State:** UT

Acres: 141,891.5 % Private: 39.3% BD SS LM MA SD RW A **County:** Juab

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
INVERTEBRATES	Perdita crotonis juabensis	(Bee)	G1	Endemic
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
BIRDS	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A076	**EASTGATE-ROCK CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	7,880.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	19,472.3 % Private: 1.2%	BD SS	**County:**	Churchill
TERR SYSTEMS	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
PLANTS	Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic
A077	**EIGHTEEN MILE MARSH**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	4,135.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	10,217.6 % Private: 25.6%	SS RW A	**County:**	Elko
TERR SYSTEMS	Freshwater marsh			
	+ Sagebrush semidesert			
	Sagebrush steppe			
MOLLUSKS	Pyrgulopsis millenaria	Twentyone Mile springsnail	G1	Endemic
BIRDS	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
A078	**ELKO**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	1,626.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,018.3 % Private: 80.8%	SS SD	**County:**	Elko
TERR SYSTEMS	+ Sagebrush steppe			
MAMMALS	Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining
A079	**ELLISON CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,633.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,035.2 % Private: 0.0%	LM A	**County:**	White Pine
TERR SYSTEMS	+ Pinyon-juniper woodland			
FISHES	Rhinichthys osculus ssp. 7	White River speckled dace	G5T2T3	Endemic
A080	**EMIGRANT PASS**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	4,047.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	10,000.3 % Private: 53.9%	SS	**County:**	Eureka
TERR SYSTEMS	+ Sagebrush semidesert			
	Sagebrush steppe			
INVERTEBRATES	Andrena raveni	(Bee)	G2	Limited
A081	**ESCALANTE DESERT**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,918.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	26,980.7 % Private: 82.9%	BD SS LM RW	**County:**	Iron
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Sagebrush semidesert			
	Salt desert scrub			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Semi-desert shrub steppe			
PLANTS	Sclerocactus spinosior	Desert Valley fishhook-cactus	G2G3	Endemic

A082 ESCALANTE VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Iron

Size Ha: 10,465.7 % Class 1 or 2: 0.0% — Acres: 25,860.8 % Private: 8.7% — System Groups (2): BD SS LM

TERR SYSTEMS	Pinyon-juniper woodland Sagebrush semidesert Semi-desert shrub steppe			
PLANTS	Astragalus oophorus var. lonchocalyx	Pink egg milkvetch, long-calyx eggvetch	G4T2	Endemic

A083 EUGENE MOUNTAINS — **Site Type:** FUNCTIONAL SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Humboldt, Pershing

Size Ha: 8,025.9 % Class 1 or 2: 0.0% — Acres: 19,831.9 % Private: 49.5% — System Groups (2): BD SS LM MA

TERR SYSTEMS	Mountain sagebrush Pinyon-juniper woodland Sagebrush steppe + Salt desert scrub			
PLANTS	Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic

A084 EUREKA — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Utah, Juab

Size Ha: 4,033.6 % Class 1 or 2: 0.0% — Acres: 9,967.1 % Private: 95.3% — System Groups (2): LM MA

TERR SYSTEMS	Mountain sagebrush Pinyon-juniper woodland			
INVERTEBRATES	Oreohelix eurekensis	Eureka mountainsnail	G1	Unknown

A085 FAIRVIEW PEAK — **Site Type:** FUNCTIONAL SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Churchill

Size Ha: 3,769.1 % Class 1 or 2: 0.0% — Acres: 9,313.5 % Private: 4.2% — System Groups (2): BD SS LM SD

TERR SYSTEMS	Pinyon-juniper woodland Sagebrush steppe + Salt desert scrub			
PLANTS	Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic

A086 FAIRVIEW VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Churchill, Mineral

Size Ha: 10,860.1 % Class 1 or 2: 0.0% — Acres: 26,835.3 % Private: 0.0% — System Groups (2): BD SS

TERR SYSTEMS	Sagebrush steppe Salt desert scrub			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A087	**FANDANGO**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	2,800.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	6,920.2 % Private: 0.0%	SS LM MA SD RW A	**County:**	Nye
TERR SYSTEMS	Clifflands			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
AQ SYSTEMS	Permanent flowing waters			
	Small-size spring and outflow springbrook			
A088	**FENCEMAKER**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	8,307.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	20,527.6 % Private: 0.3%	BD SS LM SD	**County:**	Pershing
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush steppe			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Phacelia glaberrima	Reese River phacelia	G3?	Endemic
A089	**FERGUSON DESERT-TULE VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	46,874.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	115,825.7 % Private: 0.1%	BD SS LM SD A	**County:**	Millard
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Lakes			
PLANTS	Astragalus uncialis	Currant milkvetch	G2	Endemic
	Cryptantha compacta	Mound cryptanth	G1	Endemic
	Cymopterus acaulis var. parvus		G5T2T3	Endemic
	Cymopterus basalticus	Dolomite spring-parsley, intermountain wavewing	G2,G2G3	Endemic
	Cymopterus coulteri	Coulter biscuitroot	G3	Limited
	Eriogonum batemanii var. eremicum	Desert wild buckwheat	G4?T2T3	Endemic
	Eriogonum nummulare var. ammophilum	Ibex buckwheat	G4T1	Endemic
	Sclerocactus spinosior	Desert Valley fishhook-cactus	G2G3	Endemic
A090	**FINGER ROCK WASH**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	42,917.0 % Class 1 or 2: 15.1%	System Groups (2)	**State:**	NV
Acres:	106,048.0 % Private: 0.4%	BD SS LM SD	**County:**	Mineral, Nye
TERR SYSTEMS	Greasewood shrubland			
	Sagebrush semidesert			
	Salt desert scrub			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Semi-desert shrub steppe			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
	Astragalus callithrix	Callaway milkvetch	G3	Endemic
	Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic
	Eriogonum beatleyae	Beatley buckwheat	G2Q	Endemic
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
A091	**FISH CREEK SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	5,044.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	12,465.4 % Private: 19.1%	BD SS RW A	**County:**	Eureka
TERR SYSTEMS	Montane riparian shrubland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
FISHES	Gila bicolor newarkensis	Newark Valley tui chub/Fish Creek Springs tui chub	G4T1	Endemic
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
A092	**FISH SPRINGS**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	31,537.3 % Class 1 or 2: 19.2%	System Groups (2)	**State:**	UT
Acres:	77,928.8 % Private: 0.5%	BD SS LM SD RW A	**County:**	Tooele, Juab
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Freshwater marsh			
	Greasewood shrubland			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
	Permanent standing waters			
	Small-size spring and outflow springbrook			
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
	Tryonia protea	Desert tryonia	G3G4	Widespread, specialist
FISHES	Iotichthys phlegethontis	Least chub	G1	Limited
BIRDS	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
MAMMALS	Myotis thysanodes	Fringed myotis	G5	Widespread, declining

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A093	**FLAT SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,753.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,331.6 % Private: 0.0%	SS LM A	**County:**	White Pine
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
MOLLUSKS	Pyrgulopsis cruciglans	Transverse gland springsnail	G1	Endemic
A094	**FLY RANCH GEYSER-GRANITE RANGE**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	48,680.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	120,289.6 % Private: 15.6%	BD SS LM SD RW A	**County:**	Washoe
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Small-size spring and outflow stream, thermal spring and springbrook			
MOLLUSKS	Pyrgulopsis bruesi	Brue's springsnail	G1	Endemic
	Tryonia protea	Desert tryonia	G3G4	Widespread, specialist
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
MAMMALS	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
A095	**FOURMILE BASIN**		**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	24,706.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	61,049.2 % Private: 0.5%	BD SS LM SD RW A	**County:**	Nye
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Permanent flowing waters			
PLANTS	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
	Astragalus toquimanus	Toquima milkvetch	G2	Endemic
	Gilia heterostyla	Cochrane gilia	?	Endemic
MOLLUSKS	Pyrgulopsis sterilis	Sterile Basin springsnail	G1	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
A096	**FOURMILE WASH**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,660.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,101.8 % Private: 9.9%	BD SS	**County:**	Iron
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A097	**FROST CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,842.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,553.5 % Private: 15.0%	BD SS LM	**County:**	Elko
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
	+ Salt desert scrub			
PLANTS	Penstemon barnebyi	Barneby's beardtongue	G3	Endemic
A098	**GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH** UNIQUE SITE (1)		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	81,179.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	200,594.6 % Private: 3.6%	BD SS LM MA SD RW A	**County:**	Mineral
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Ephemeral standing waters			
	Permanent flowing waters			
PLANTS	Astragalus lentiginosus var. sesquimetralis	Sodaville milk-vetch	G5T1	Limited
	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited
	Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited
	Penstemon arenarius	Nevada dune beardtongue	G2G3	Endemic
INVERTEBRATES	Aegialia spinosa	(Scarab beetle)	?	Limited
	Cardiophorus ssp. nov.	(Click beetle)	?	Endemic
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus hirsutus	(Sand obligate beetle)	?	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Rhadine myrmecodes	(Sand obligate beetle)	?	Limited
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited
FISHES	Crenichthys nevadae	Railroad Valley springfish	G2	Endemic
BIRDS	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
A099	**GARFIELD HILLS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	1,868.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,616.9 % Private: 0.4%	BD SS LM SD	**County:**	Mineral
TERR SYSTEMS	Clifflands			
	+ Salt desert scrub			
PLANTS	Penstemon barnebyi	Barneby's beardtongue	G3	Endemic
A100	**GIOCOECHEA WARM SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,611.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	3,982.6 % Private: 35.5%	BD SS RW A	**County:**	White Pine
TERR SYSTEMS	+ Greasewood shrubland			
	Montane riparian shrubland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
FISHES	Gila bicolor newarkensis	Newark Valley tui chub/Fish Creek Springs tui chub	G4T1	Endemic
A101	**GOSHEN-WARM SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	2,350.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	5,809.2 % Private: 93.0%	BD SS LM RW A	**County:**	Utah
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
AQ SYSTEMS	Ephemeral alkaline playa lake, sulfide waters			
	Small-size spring and outflow stream, cold spring and springbrook			
	Small-size spring and outflow stream, thermal spring and springbrook			
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A102	**GOSHUTE MOUNTAINS**		**Site Type:**	LANDSCAPE SITE
			Section:	North Central
Size Ha:	44,372.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	109,644.9 % Private: 0.0%	BD SS LM MA SD RW A	**County:**	Elko
TERR SYSTEMS	Freshwater marsh			
	Greasewood shrubland			
	Montane forest and woodland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Subalpine forest and woodland			
AQ SYSTEMS	Permanent flowing waters			
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
A103	**GOSS SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,752.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,331.4 % Private: 16.3%	BD A	**County:**	Nye
TERR SYSTEMS	+ Joshua tree-mixed mojave scrub			
	+ Salt desert scrub			
MOLLUSKS	Pyrgulopsis micrococcus		G3?	Limited
A104	**GOVERNMENT PEAK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,710.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT, NV
Acres:	4,227.1 % Private: 6.1%	SS LM MA RW	**County:**	Iron, Lincoln
TERR SYSTEMS	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	+ Pinyon-juniper woodland			
PLANTS	Astragalus oophorus var. lonchocalyx	Pink egg milkvetch, long-calyx eggvetch	G4T2	Endemic
A105	**GRANITE PEAK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	16,784.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	41,474.5 % Private: 2.7%	BD SS LM	**County:**	Tooele
TERR SYSTEMS	Greasewood shrubland			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A106	**GREAT SALT LAKE**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	1,011,283.5 % Class 1 or 2: 5.4%	System Groups (2)	**State:**	UT
Acres:	2,498,881.6 % Private: 38.1%	BD SS LM MA SD RW A	**County:**	Box Elder, Tooele, Davis
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Highly alkaline playa lake, chloride waters			
	Lakes			
	River and major tributary			
PLANTS	Allium passeyi	Passey's onion	G1	Endemic
	Penstemon platyphyllus	Broadleaf penstemon	G2G3	Peripheral
MOLLUSKS	Physella utahensis	Utah physa	G1	Limited
	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
	Stagnicola bonnevillensis	Fat-whorled pondsnail	G1	Endemic
	Tryonia protea	Desert tryonia	G3G4	Widespread, specialist
FISHES	Iotichthys phlegethontis	Least chub	G1	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo	G5T2T3	Peripheral
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Larus californicus	California Gull	G5	Disjunct, colonial
	Larus pipixcan	Franklin's Gull	G4G5	Disjunct
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
BIRDS	Spizella breweri	Brewer's Sparrow	G5	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Sorex preblei	Preble's shrew	G4	Unknown

A107 GREAT SALT LAKE DESERT MUD FLAT — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin

Size Ha: 25,633.5 % Class 1 or 2: 0.0% — System Groups (2): BD — **State:** UT

Acres: 63,340.3 % Private: 1.0% — **County:** Tooele

TERR SYSTEMS	Greasewood shrubland
	Pickleweed flats
	Salt desert scrub
	Semi-desert shrub steppe

A108 GROUSE CREEK MOUNTAINS-RAFT RIVER MOUNTAINS — UNIQUE SITE (1) — **Site Type:** LANDSCAPE SITE; **Section:** Bonneville Basin

Size Ha: 545,563.9 % Class 1 or 2: 0.0% — System Groups (2): BD SS LM MA SD RW A — **State:** UT

Acres: 1,348,088.3 % Private: 49.4% — **County:** Box Elder

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Permanent flowing waters			
	Small-size spring and outflow springbrook			
PLANTS	Allium passeyi	Passey's onion	G1	Endemic
	Potentilla cottamii	Cottam's cinquefoil	G1	Limited
INVERTEBRATES	Colletes sp. nov. 1	(Bee)	G1	Limited
	Perdita vesca	(Bee)	?	Limited
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
	Pyrgulopsis lentiglans	Crittenden springsnail	G1	Endemic
	Pyrgulopsis variegata	Northwest Bonneville springsnail	G2	Limited
FISHES	Chasmistes liorus	June sucker	G1	Endemic
	Iotichthys phlegethontis	Least chub	G1	Limited
	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Falco mexicanus	Prairie Falcon	G5	Widespread

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Spizella breweri	Brewer's Sparrow	G5	Widespread
A109	**HANDY SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	3,749.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,264.0 % Private: 1.2%	BD SS LM MA A	**County:**	White Pine, Eureka
TERR SYSTEMS	Low montane shrublands			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
INVERTEBRATES	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
FISHES	Gila bicolor newarkensis	Newark Valley tui chub/Fish Creek Springs tui chub	G4T1	Endemic
A110	**HEART HILLS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,716.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,241.6 % Private: 0.0%	BD SS LM	**County:**	Nye
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
A111	**HERD PASS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	17,574.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	43,425.8 % Private: 6.0%	SS LM MA SD	**County:**	Iron
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
PLANTS	Ivesia shockleyi var. ostleri	Ostler's ivesia	G3G4T1	Endemic
	Penstemon concinnus	Tunnel spring beardtongue	G3	Endemic
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread
A112	**HIGHLAND RANGE**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	4,300.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	10,626.0 % Private: 3.9%	LM MA	**County:**	Lincoln
TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Mountain mahogany woodlands			
	Pinyon-juniper woodland			
	Subalpine forest and woodland			
PLANTS	Jamesia tetrapetala	Basin jamesia, waxflower	G2	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Hypaurotis crysalus intermedia	Intermediate Colorado hairstreak	G5T1	Endemic
	Satyrium saepium latilinea	Broadlined saepium hairstreak	G5T1	Limited
A113	**HIKO SPRING**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,933.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,777.9 % Private: 12.9%	BD A	**County:**	Lincoln
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	+ Salt desert scrub			
MOLLUSKS	Pyrgulopsis hubbsi	Hubbs springsnail	G1	Endemic
	Pyrgulopsis merriami	Pahranagat pebblesnail	G1	Endemic
FISHES	Crenichthys baileyi grandis	Hiko White River springfish	G2T1	Limited
A114	**HOLBROOK JUNCTION**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	1,826.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,514.1 % Private: 93.3%	BD SS RW	**County:**	Douglas
TERR SYSTEMS	Desert riparian shrubland and woodland			
	+ Sagebrush semidesert			
PLANTS	Cymopterus globosus	Wall Spring parsley	G3G4	Endemic
A115	**HOLDEN SAND DUNES**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,254.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	8,042.6 % Private: 96.8%	BD SS SD RW	**County:**	Millard
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
INVERTEBRATES	Anthidium rodecki	(Bee)	?	Limited
	Calliopsis barri	(Bee)	?	Limited
A116	**HOME STATION WASH**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	17,847.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	44,100.6 % Private: 0.8%	BD SS LM MA SD	**County:**	Lander, Pershing
TERR SYSTEMS	Greasewood shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Penstemon palmeri var. macranthus		G5T2?	Endemic
	Phacelia glaberrima	Reese River phacelia	G3?	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A117	**HORSESHOE BASIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	12,301.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	30,397.3 % Private: 0.0%	BD SS LM MA RW	**County:**	Lander
TERR SYSTEMS	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
PLANTS	Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic
A118	**HORSESHOE SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,721.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,253.9 % Private: 48.9%	BD SS LM RW A	**County:**	Tooele
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	+ Greasewood shrubland			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
	Tryonia protea	Desert tryonia	G3G4	Widespread, specialist
MAMMALS	Sorex preblei	Preble's shrew	G4	Unknown
A119	**HOT CREEK VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	3,667.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,061.9 % Private: 0.2%	BD SS LM A	**County:**	Nye
TERR SYSTEMS	Greasewood shrubland			
	+ Salt desert scrub			
PLANTS	Astragalus callithrix	Callaway milkvetch	G3	Endemic
	Gilia heterostyla	Cochrane gilia	?	Endemic
FISHES	Crenichthys nevadae	Railroad Valley springfish	G2	Endemic
A120	**HOT CREEK-PALISADE MESA**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	7,807.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	19,292.5 % Private: 0.0%	BD SS	**County:**	Nye
TERR SYSTEMS	Greasewood shrubland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
	Phacelia sp. 1	Undescribed phacelia 1	G2	Peripheral

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A121	**HOT SPRINGS CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	5,924.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	14,638.7 % Private: 34.8%	SS MA A	**County:**	Elko
TERR SYSTEMS	Mountain sagebrush			
	+ Sagebrush semidesert			
	Sagebrush steppe			
MOLLUSKS	Pyrgulopsis humboldtensis	Humboldt springsnail	G1	Limited
A122	**HOT SPRINGS HILL**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,638.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,047.6 % Private: 0.0%	BD SS LM SD A	**County:**	Eureka
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Salt desert scrub			
AQ SYSTEMS	Small-size spring and outflow stream, hot spring and springbrook			
PLANTS	Astragalus calycosus var. monophyllidius	One-leaflet torrey milkvetch	G5T2	Endemic
	Castilleja salsuginosa	Monte Neva paintbrush	G1Q	Endemic
	Lepidium nanum	Dwarf peppergrass	G3	Endemic
A123	**HOUSE RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	26,154.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	64,627.8 % Private: 0.0%	BD SS LM MA	**County:**	Millard
TERR SYSTEMS	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Jamesia tetrapetala	Basin jamesia, waxflower	G2	Endemic
	Primula domensis	House Range primrose	G1	Endemic
INVERTEBRATES	Oreohelix eurekensis	Eureka mountainsnail	G1	Unknown
A124	**HOYE CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	2,159.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	5,335.9 % Private: 38.9%	SS LM MA RW	**County:**	Douglas, Lyon
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
PLANTS	Astragalus oophorus var. clokeyanus	Clokey eggvetch	G4T2	Peripheral
BIRDS	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
MAMMALS	Ursus americanus	Black bear	G5	Peripheral

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A125	**HUMBOLDT RANGE**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	28,815.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	71,202.4 % Private: 35.8%	BD SS LM MA SD RW	**County:**	Pershing
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Low montane shrublands			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
	Cymopterus goodrichii	Goodrich biscuitroot	G1	Endemic
	Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic
	Leptodactylon glabrum	Bruneau river prickly phlox	G2	Limited
	Penstemon palmeri var. macranthus		G5T2?	Endemic
	Phacelia inconspicua	Obscure scorpion plant	G2	Limited
	Smelowskia holmgrenii	Holmgren smelowskia	G2	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
	Stellula calliope	Calliope Hummingbird	G5	Widespread
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
A126	**HUMBOLDT RIVER GOLCONDA**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	42,427.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	104,837.2 % Private: 81.7%	BD SS MA RW	**County:**	Humboldt
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Montane meadow			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
INVERTEBRATES	Ochlodes yuma lutea	Great Basin yuma skipper	G3T2T3	Limited
	Osmia nigropilosa	(Bee)	G1	Endemic
BIRDS	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
A127	**HUMBOLDT RIVER IMLAY**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	5,311.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	13,124.8 % Private: 70.6%	BD SS RW A	**County:**	Pershing
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Sagebrush steppe			
	+ Salt desert scrub			
	Wet meadow			
BIRDS	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
MAMMALS	Lutra canadensis nexa	Humboldt River otter	?	Limited
A128	**HUNTOON SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	1,838.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,543.1 % Private: 2.6%	BD SS LM A	**County:**	Mineral
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
MOLLUSKS	Pyrgulopsis wongi	Wong's springsnail	G1G2	Endemic or Limited
A129	**INDIAN PEAK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	16,703.3 % Class 1 or 2: 24.9%	System Groups (2)	**State:**	UT
Acres:	41,273.8 % Private: 3.5%	LM MA RW	**County:**	Beaver
TERR SYSTEMS	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
PLANTS	Ivesia shockleyi var. ostleri	Ostler's ivesia	G3G4T1	Endemic
A130	**INYO MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	248,912.1 % Class 1 or 2: 13.2%	System Groups (2)	**State:**	CA
Acres:	615,061.9 % Private: 1.1%	BD SS LM MA SD RW A	**County:**	Inyo
TERR SYSTEMS	Bitterbrush shrubland			
	Blackbrush-hopsage desert shrubland			
	Cliffflands			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Joshua tree-mixed mojave scrub			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Permanent flowing waters			
	Small-size spring and outflow springbrook			
	Spring pool			
G1G2 ASSOCATIONS	Artemisia nova - Purshia glandulosa rock dwarf-shrubland		G2?	Limited
	Leymus cinereus herbaceous vegetation [provisional]		G2G3Q	Widespread
	Purshia tridentata - Artemisia tridentata ssp. tridentata shrubland		G1?	Limited
PLANTS	Arabis dispar	Pinyon rock cress	G3	Limited
	Astragalus kentrophyta var. elatus	Spiny-leaved milk-vetch	G5T4	Endemic
	Caulostramina jaegeri	Jaeger's caulostramina	G1	Endemic
	Crepis runcinata ssp. hallii	Hall's meadow hawksbeard	G5T3?	Endemic
	Cryptantha roosiorum	Bristlecone cryptantha	G1	Endemic
	Dedeckera eurekensis	July gold	G2	Peripheral
	Ericameria gilmanii	Gilman's goldenbush	G1	Limited
	Eriogonum eremicola	Wildrose canyon buckwheat	G1	Limited
	Eriogonum microthecum var. panamintense	Panamint Mountains buckwheat	G5T2	Limited
	Gilia ripleyi	Ripley's gilia	G2G3	Peripheral
	Jamesia americana var. macrocalyx	Wasatch jamesia	G5T2	Limited
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited
	Perityle inyoensis	Inyo rock daisy	G1	Limited
	Phacelia amabilis	Saline Valley phacelia	G1Q	Limited
	Phacelia mustelina	Death Valley round-leaved phacelia, weasel phacelia	G2,G2G3	Limited
INVERTEBRATES	Ashmeadiella rhodognatha	(Bee)	?	Disjunct
	Atoposmia sp. nov. 3	(Bee)	G1	Limited
	Bembix frommeri	(Wasp)	G1	Endemic
	Calliopsis sp. nov	(Bee)	?	Limited
	Cardiophorus spp.	(Click beetle)	?	Limited
	Hoplitis bidenticauda		G2	Limited
	Megachile astragali		?	Peripheral
	Osmia sp. nov.	(Bee)	G1	Endemic
	Perdita cowaniae	(Bee)	?	Limited
	Perdita xerophila fuscicornis	(Bee)	G1	Limited
MOLLUSKS	Fontelicella sp	Deep Springs fontelicella	G1	Endemic
	Pyrgulopsis owensensis	Owens Valley springsnail	G1G2,G1	Endemic
	Pyrgulopsis wongi	Wong's springsnail	G1G2	Endemic or Limited
FISHES	Gila bicolor snyderi	Owens tui chub	G4T1	Limited

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
AMPHIBIANS	Batrachoseps campi	Inyo Mountains slender salamander	G2	Endemic?
	Bufo exsul	Black toad	G1	Endemic
REPTILES	Elgaria panamintina	Panamint alligator lizard	G1G2	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Dipodomys microps	Chisel-toothed kangaroo rat	G5	Limited
	Euderma maculatum	Spotted bat	G4	Unknown
	Microdipodops pallidus	Pale kangaroo mouse	G5	Endemic
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
	Tadarida brasiliensis	Brazilian free-tailed bat	G5	Unknown
A131	**IONE VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	34,234.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	84,592.3 % Private: 0.0%	BD SS LM SD	**County:**	Nye
TERR SYSTEMS	Greasewood shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread
A132	**JACKSON MOUNTAINS**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	14,314.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	35,371.2 % Private: 4.1%	BD SS LM MA RW A	**County:**	Humboldt
TERR SYSTEMS	Low montane shrublands			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
	Salt desert scrub			
PLANTS	Caulanthus barnebyi	Barneby stemflower	G2	Limited
	Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic
	Penstemon floribundus	Cordelia beardtongue	G1	Endemic
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
A133	**JACKSON SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,822.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,504.3 % Private: 0.0%	BD LM RW	**County:**	Washington
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Desert riparian shrubland and woodland			
	Low montane shrublands			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	+ Pinyon-juniper woodland			
	Semi-desert shrub steppe			
A134	**JACKSON WASH**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,832.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,529.1 % Private: 0.3%	BD SS LM MA	**County:**	Iron, Beaver
TERR SYSTEMS	Mountain sagebrush			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
	Semi-desert shrub steppe			
PLANTS	Cymopterus purpureus var. jonesii		G5T2T3	Limited
A135	**JAKES VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	20,908.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	51,665.6 % Private: 0.0%	BD SS LM	**County:**	White Pine
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
BIRDS	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
A136	**JERSEY SUMMIT**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	3,734.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,227.5 % Private: 0.0%	BD SS MA	**County:**	Pershing
TERR SYSTEMS	Sagebrush steppe			
	+ Salt desert scrub			
PLANTS	Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic
A137	**JUAB VALLEY**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	20,963.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	51,801.7 % Private: 69.6%	BD SS LM RW A	**County:**	Juab
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Lakes			
	Permanent standing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
PLANTS	Penstemon tidestromii	Tidestrom beardtongue	G2G3	Peripheral
MOLLUSKS	Anodonta californiensis	California floater	G3G4	Widespread, declining

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
FISHES	Gila copei	Leatherside chub	G3G4	Limited?
	Iotichthys phlegethontis	Least chub	G1	Limited
	Oncorhynchus clarki utah	Bonneville cutthroat trout	G4T2	Endemic?
A138 KANARRA			**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha: 1,840.8	% Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres: 4,548.7	% Private: 64.8%	BD SS LM RW	**County:**	Iron, Washington
TERR SYSTEMS	Desert riparian shrubland and woodland			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A139 KANOSH			**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha: 2,179.7	% Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres: 5,386.0	% Private: 100.0%	SS SD RW	**County:**	Millard
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Sagebrush steppe			
INVERTEBRATES	Anthophora affabilis	(Bee)	?	Limited
A140 KAWICH RANGE		UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha: 8,517.7	% Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres: 21,047.1	% Private: 2.8%	SS LM MA A	**County:**	Nye
TERR SYSTEMS	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
AQ SYSTEMS	Ephemeral desert scrub pool			
PLANTS	Penstemon pudicus	Bashful beardtongue	G1	Endemic
	Polyctenium williamsiae	Williams combleaf	G2	Limited
A141 KERN MOUNTAINS			**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha: 6,452.1	% Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres: 15,943.1	% Private: 6.5%	SS LM MA	**County:**	White Pine
TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
PLANTS	Penstemon moriahensis	Mount Moriah beardtongue	G1G2	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A142	**KING LEAR PEAK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	7,996.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	19,759.3 % Private: 0.6%	BD SS LM MA	**County:**	Humboldt
TERR SYSTEMS	Greasewood shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Salt desert scrub			
	+ Salt desert scrub			
PLANTS	Agastache cusickii	Cusick hyssop	G3	Peripheral
	Astragalus pterocarpus	Winged milkvetch	G3	Limited
	Caulanthus barnebyi	Barneby stemflower	G2	Limited
	Penstemon floribundus	Cordelia beardtongue	G1	Endemic
A143	**KINGS CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	2,473.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	6,111.5 % Private: 0.0%	BD SS LM MA	**County:**	Millard
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
INVERTEBRATES	Oreohelix eurekensis	Eureka mountainsnail	G1	Unknown
A144	**KNOLL SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,764.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,360.6 % Private: 0.0%	BD A	**County:**	Millard
TERR SYSTEMS	+ Salt desert scrub			
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
FISHES	Iotichthys phlegethontis	Least chub	G1	Limited
A145	**KOBEH VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	30,829.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	76,179.0 % Private: 3.2%	BD SS LM MA RW	**County:**	Eureka
TERR SYSTEMS	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Semi-desert shrub steppe			
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
A146	**KUMIVA VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	11,139.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	27,526.5 % Private: 0.0%	BD SS	**County:**	Pershing
TERR SYSTEMS	Greasewood shrubland			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Sagebrush steppe			
	Salt desert scrub			
A147	**LAKE VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	2,000.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,942.0 % Private: 0.0%	SS LM	**County:**	Lincoln
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
PLANTS	Lesquerella pendula	Hanging bladderpod	G2?	Endemic
A148	**LAVA BEDS CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	17,928.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	44,301.6 % Private: 0.0%	BD SS	**County:**	Pershing
TERR SYSTEMS	Greasewood shrubland			
	Sagebrush steppe			
	Salt desert scrub			
A149	**LITTLE SAHARA SAND DUNES**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	51,643.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	127,611.9 % Private: 7.8%	BD SS LM SD RW A	**County:**	Juab, Millard
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Sand dunes			
	Semi-desert shrub steppe			
PLANTS	Atriplex canescens var. gigantea	Giant four-wing saltbush	G5T1	Endemic
	Penstemon angustifolius var. dulcis		G5T2	Endemic
INVERTEBRATES	Calliopsis hesperia equina	(Bee)	?	Disjunct
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Hesperapis oliviae	(Bee)	?	Limited
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trimeritropis barnami	(Sand dune obligate)	G1?	Limited
	Trogloderus costatus		?	Limited
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A150	**LONE MOUNTAIN-MONTE CRISTO RANGE**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	135,560.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	334,970.0 % Private: 0.2%	BD SS LM MA SD RW A	**County:**	Esmeralda
TERR SYSTEMS	Greasewood shrubland			
	Joshua tree-mixed mojave scrub			
	Low montane shrublands			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
AQ SYSTEMS	Permanent flowing waters			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
	Haplopappus crispus	Pine Valley goldenbush	G2	Endemic
	Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic
	Tonestus graniticus	Lone Mountain tonestus	G1	Endemic
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
A151	**LONE TREE-CEDAR VALLEY**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	24,392.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	60,273.8 % Private: 55.0%	BD SS LM RW	**County:**	Iron
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Penstemon franklinii	Ben's beardtongue	G1	Endemic
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A152	**LONG VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	160,476.8 % Class 1 or 2: 0.8%	System Groups (2)	**State:**	CA
Acres:	396,538.2 % Private: 4.3%	BD SS LM MA SD RW A	**County:**	Mono
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Joshua tree-mixed mojave scrub			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Pinyon-juniper woodland			
	Ponderosa pine woodland			
	Sagebrush semidesert			
	Sagebrush steppe			

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Desert scrub pool			
	Ephemeral alkaline playa lake, carbonate waters			
	Ephemeral alkaline playa lake, chloride waters			
	Ephemeral standing waters			
	Lakes			
	Medium-size spring and outflow stream			
	Medium-size spring and outflow stream, hot spring & springbrook			
	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
	Small-size spring and outflow stream, hot spring and springbrook			
	Small-size spring and outflow stream, thermal spring and springbrook			
	Spring pool			
	Spring pool, thermal spring			
	Spring-fed desert lake			
PLANTS	Astragalus johannis-howellii	Long Valley milk-vetch	G2	Endemic
	Astragalus monoensis var. monoensis	Mono milk-vetch	G2T2	Peripheral or Limited
	Astragalus monoensis var. ravenii	Raven's milk-vetch	G2T1Q	Peripheral or Limited
	Calochortus excavatus	Inyo County star-tulip	G3	Limited
	Crepis runcinata ssp. hallii	Hall's meadow hawksbeard	G5T3?	Endemic
	Ivesia kingii var. kingii	Alkali ivesia	G3T2	Limited
	Lupinus duranii	Mono Lake lupine	G2	Limited
	Plagiobothrys glomeratus	Altered andesite popcorn-flower	G2G3	Limited
INVERTEBRATES	Branchinecta gigas	Giant fairy shrimp	?	Widespread, specialist
	Hydroscapha natans		?	Limited
	Hygrotus fontinalis	Travertine band-thigh diving beetle	G1	Endemic
	Potamocypris ssp. nov		?	Endemic?
MOLLUSKS	Pyrgulopsis wongi	Wong's springsnail	G1G2	Endemic or Limited
	Tryonia protea	Desert tryonia	G3G4	Widespread, specialist
FISHES	Catostomus fumeiventris	Owens sucker	G3	Endemic
	Cyprinodon radiosus	Owens pupfish	G1	Limited
	Gila bicolor snyderi	Owens tui chub	G4T1	Limited
	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
	Rhinichthys osculus ssp.	Long Valley speckled dace	G5T1	Endemic
	Rhinichthys osculus ssp. 2 ow	Owen's speckled dace	G5T1T2	Limited
AMPHIBIANS	Rana muscosa	Mountain yellow-legged frog	G3	Peripheral
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Leucosticte atrata	Black Rosy-Finch	G4	Limited
	Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining
	Otus flammeolus	Flammulated Owl	G4	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
MAMMALS	Lepus townsendii	White-tailed jack rabbit	?	Widespread
	Ursus americanus	Black bear	G5	Peripheral
A153	**LOOKOUT SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,929.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,766.9 % Private: 0.9%	SS LM A	**County:**	White Pine, Elko
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush steppe			
FISHES	Relictus solitarius	Relict dace	G2G3	Endemic
A154	**LOVELOCK VALLEY**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	33,084.7 % Class 1 or 2: 0.5%	System Groups (2)	**State:**	NV
Acres:	81,752.4 % Private: 86.9%	BD SS SD RW	**County:**	Pershing
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Salt desert scrub			
PLANTS	Camissonia nevadensis	Nevada suncup	G3	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
A155	**LUCKY BOY PASS**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	6,868.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	16,971.8 % Private: 10.8%	BD SS LM MA	**County:**	Mineral
TERR SYSTEMS	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
MAMMALS	Microdipodops megacephalus nasutus	Fletcher dark kangaroo mouse	G5T1	Endemic
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A156	**LUND FLATS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,987.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,910.4 % Private: 17.1%	BD SS	**County:**	Iron
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Salt desert scrub			
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A157	**LYNNDYL SAND DUNES**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,874.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	9,574.5 % Private: 85.9%	BD SS LM SD RW	**County:**	Millard
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
INVERTEBRATES	Anthidium rodecki	(Bee)	?	Limited
A158	**MAGGIE CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	5,211.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	12,878.0 % Private: 69.0%	SS A	**County:**	Elko, Eureka
TERR SYSTEMS	+ Sagebrush semidesert			
	Sagebrush steppe			
AQ SYSTEMS	Medium-size runoff-fed stream			
INVERTEBRATES	Capnura intermontana	Common winter stonefly	G?	Limited
MAMMALS	Brachylagus idahoensis	Pygmy rabbit	G5	Limited
A159	**MASON VALLEY**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	17,261.6 % Class 1 or 2: 20.8%	System Groups (2)	**State:**	NV
Acres:	42,653.3 % Private: 33.6%	BD SS RW A	**County:**	Lyon
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Ephemeral standing waters			
INVERTEBRATES	Pseudocopaeodes eunus flavus	Nevada alkali skipperling	G3T2	Endemic
BIRDS	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
A160	**MCKINNEY MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size	Ha: 3,675.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
	Acres: 9,080.8 % Private: 2.0%	LM RW	**County:**	Nye
TERR SYSTEMS	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Wet meadow			
PLANTS	Astragalus toquimanus	Toquima milkvetch	G2	Endemic
A161	**MEADOW VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size	Ha: 43,682.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
	Acres: 107,939.8 % Private: 10.5%	BD SS LM SD RW A	**County:**	Lincoln
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
PLANTS	Astragalus eurylobus	Needle Mountains milkvetch	G2	Limited
	Cryptantha welshii	White River catseye	G3	Endemic
	Sclerocactus schlesseri	Schlesser pincushion	G1Q	Endemic
	Spiranthes diluvialis	Ute ladies' tresses	G2	Disjunct, declining
FISHES	Catostomus clarki ssp. 2	Meadow Valley Wash Desert sucker	G3G4T2	Endemic
	Lepidomeda mollispinis pratensis	Big Spring spinedace	G1T1	Endemic
	Rhinichthys osculus ssp. 2 mv	Meadow Valley speckled dace	G5T2	Limited
BIRDS	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
A162	**MELOY SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size	Ha: 1,844.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
	Acres: 4,557.1 % Private: 0.9%	SS LM A	**County:**	Lincoln
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
MOLLUSKS	Pyrgulopsis breviloba	Flag springsnail	G1	Endemic
A163	**MILLS VALLEY-SEVIER CANYON-WEST HILLS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size	Ha: 25,808.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
	Acres: 63,773.1 % Private: 48.5%	BD SS LM SD RW A	**County:**	Juab
TERR SYSTEMS	Desert riparian shrubland and woodland			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Small-size spring and outflow springbrook			
PLANTS	Penstemon angustifolius var. dulcis		G5T2	Endemic
FISHES	Iotichthys phlegethontis	Least chub	G1	Limited

A164 MINERAL VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** California

Size Ha: 2,081.9 % Class 1 or 2: 0.0% — System Groups (2): SS LM MA RW

Acres: 5,144.4 % Private: 77.3% — **State:** NV; **County:** Douglas

TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
INVERTEBRATES	Speyeria nokomis carsonensis	Carson Valley silverspot	G4T2	Limited
MAMMALS	Ursus americanus	Black bear	G5	Peripheral

A165 MONO LAKE — UNIQUE SITE (1) — **Site Type:** LANDSCAPE SITE; **Section:** California

Size Ha: 90,257.1 % Class 1 or 2: 0.0% — System Groups (2): BD SS LM MA SD RW A

Acres: 223,025.4 % Private: 9.4% — **State:** CA, NV; **County:** Mono, Mineral

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Highly alkaline terminal lake			
	Lakes			
	Permanent flowing waters			
PLANTS	Arabis bodiensis	Bodie Hills rock cress	G1,G2	Limited
	Astragalus johannis-howellii	Long Valley milk-vetch	G2	Endemic
	Astragalus kentrophyta var. elatus	Spiny-leaved milk-vetch	G5T4	Endemic
	Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic
	Cusickiella quadricostata	Bodie Hills cusickiella, Bodie Hills draba	G3	Endemic
	Eriogonum ampullaceum	Mono buckwheat	G3	Limited
	Eriogonum beatleyae	Beatley buckwheat	G2Q	Endemic
	Lupinus duranii	Mono Lake lupine	G2	Limited
	Polyctenium williamsiae	Williams combleaf	G2	Limited
	Streptanthus oliganthus	Masonic Mountain jewel-flower	G3	Limited
	Tetradymia tetrameres		?	Endemic
INVERTEBRATES	Aegialia spinosa	(Scarab beetle)	?	Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Artemia monica	Mono brine shrimp	G1	Endemic
	Calliopsis filiorum	(Bee)	G1	Endemic
	Cardiophorus ssp. nov.	(Click beetle)	?	Endemic
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Pseudocopaeodes eunus ssp. nov	Mono Lake wandering skipper	G3T1	Endemic
	Rhadine myrmecodes	(Sand obligate beetle)	?	Limited
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited
MOLLUSKS	Pyrgulopsis wongi	Wong's springsnail	G1G2	Endemic or Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Empidonax traillii extimus	Southwestern Willow Flycatcher	G5T2	Peripheral
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Larus californicus	California Gull	G5	Disjunct, colonial
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
MAMMALS	Dipodomys microps	Chisel-toothed kangaroo rat	G5	Limited
	Microdipodops megalocephalus	Dark kanagaroo mouse	?	Unknown
	Ursus americanus	Black bear	G5	Peripheral
A166	**MONTANA MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	99,903.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	246,861.8 % Private: 0.6%	BD SS LM A	**County:**	Humboldt
TERR SYSTEMS	Greasewood shrubland			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Small-size runoff-fed stream			
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
MAMMALS	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited
A167	**MONTE CRISTO MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	5,931.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	14,657.8 % Private: 1.1%	BD SD	**County:**	Nye, Mineral
TERR SYSTEMS	Greasewood shrubland			
	+ Salt desert scrub			

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
PLANTS	Astragalus lentiginosus var. sesquimetralis	Sodaville milk-vetch	G5T1	Limited
A168	**MOOR SUMMIT**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	6,568.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	16,231.2 % Private: 53.8%	SS LM MA SD	**County:**	Elko, Eureka
TERR SYSTEMS	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
INVERTEBRATES	Anthidium rodecki	(Bee)	?	Limited
	Hoplitis shoshone		?	Endemic
A169	**MOUNT LEWIS**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	11,557.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	28,558.8 % Private: 48.6%	SS LM MA A	**County:**	Lander
TERR SYSTEMS	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
AQ SYSTEMS	Permanent flowing waters			
PLANTS	Penstemon tiehmii	Tiehm beardtongue	G1	Endemic
A170	**MOUNT TIMPANOGOS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,793.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,432.1 % Private: 30.5%	LM MA	**County:**	Utah
TERR SYSTEMS	+ Pinyon-juniper woodland			
PLANTS	Jamesia americana var. macrocalyx	Wasatch jamesia	G5T2	Limited
A171	**MOUNTAIN HOME RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	7,713.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	19,061.2 % Private: 0.0%	BD SS LM	**County:**	Millard, Beaver
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	Semi-desert shrub steppe			
PLANTS	Eriogonum batemanii var. eremicum	Desert wild buckwheat	G4?T2T3	Endemic
	Sclerocactus spinosior	Desert Valley fishhook-cactus	G2G3	Endemic
A172	**MUDHOLE SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,442.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	3,565.4 % Private: 0.0%	SS LM MA RW	**County:**	Nye
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
PLANTS	Eriogonum esmeraldense var. toiyabense	Toiyabe buckwheat	G4T2	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
A173	**NELSON SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,773.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,381.7 % Private: 0.0%	SS LM	**County:**	Lincoln
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
PLANTS	Astragalus convallarius var. finitimus	Lesser rushy milkvetch	G5T3	Endemic
A174	**NEW PASS**		**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	19,707.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	48,697.0 % Private: 2.5%	BD SS LM MA RW A	**County:**	Churchill
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
PLANTS	Eriogonum beatleyae	Beatley buckwheat	G2Q	Endemic
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
A175	**NEWARK LAKE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	3,635.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	8,984.1 % Private: 5.1%	BD SS RW	**County:**	White Pine
TERR SYSTEMS	Greasewood shrubland			
	Montane riparian shrubland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
BIRDS	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
A176	**NEWFOUNDLAND MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	54,069.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	133,604.6 % Private: 15.2%	BD SS LM RW A	**County:**	Box Elder
TERR SYSTEMS	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
AQ SYSTEMS	Lakes			
MAMMALS	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A177	**NIGHTINGALE FLAT**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	8,605.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	21,265.1 % Private: 47.9%	BD SS LM SD	**County:**	Churchill
TERR SYSTEMS	Greasewood shrubland			
	+ Salt desert scrub			
MAMMALS	Dipodomys deserti	Desert kangaroo rat	G5	Limited
	Dipodomys microps	Chisel-toothed kangaroo rat	G5	Limited
	Microdipodops megalocephalus	Dark kanagaroo mouse	?	Unknown
	Microdipodops pallidus	Pale kangaroo mouse	G5	Endemic
A178	**NIGHTINGALE MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	3,763.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,299.6 % Private: 12.3%	BD	**County:**	Pershing, Washoe
TERR SYSTEMS	+ Salt desert scrub			
A179	**NORTH PAROWAN VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,775.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,387.8 % Private: 19.6%	BD LM RW	**County:**	Iron
TERR SYSTEMS	Montane riparian shrubland			
	+ Pinyon-juniper woodland			
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A180	**NORTH PYRAMID LAKE**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	25,226.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	62,333.9 % Private: 0.9%	BD SS LM SD RW A	**County:**	Washoe
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Pinyon-juniper woodland			
	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Lakes			
	Small-size spring and outflow springbrook			
MOLLUSKS	Fluminicola dalli	Dall pebblesnail	G1	Endemic
BIRDS	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
A181	**NORTH RALSTON VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	7,338.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	18,133.5 % Private: 4.4%	BD SS	**County:**	Nye
TERR SYSTEMS	Greasewood shrubland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A182	**NORTH SEVIER LAKE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,815.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,486.3 % Private: 0.0%	BD SS	**County:**	Millard
TERR SYSTEMS	+ Salt desert scrub			
PLANTS	Astragalus uncialis	Currant milkvetch	G2	Endemic
A183	**NORTH WAH WAH MOUNTAINS**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	15,887.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	39,258.7 % Private: 0.0%	BD SS LM MA SD	**County:**	Beaver, Millard
TERR SYSTEMS	Greasewood shrubland			
	Montane forest and woodland			
	Pinyon-juniper woodland			
	Ponderosa pine woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
PLANTS	Ericameria cervina	Antelope goldenbush	G3?	Limited
	Eriogonum batemanii var. eremicum	Desert wild buckwheat	G4?T2T3	Endemic
	Eriogonum soredium	Frisco buckwheat	G1	Endemic
	Machaeranthera grindelioides var. depressa		G5T3T4	Limited
	Penstemon concinnus	Tunnel spring beardtongue	G3	Endemic
	Penstemon nanus	Low beardtongue	G3	Endemic
	Sclerocactus spinosior	Desert Valley fishhook-cactus	G2G3	Endemic
	Sphaeralcea caespitosa	Jones globe-mallow	G3	Endemic
A184	**NORTH WASSUK RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	6,407.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	15,832.8 % Private: 0.0%	BD SS LM MA SD	**County:**	Mineral
TERR SYSTEMS	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
PLANTS	Astragalus cimae var. cimae	Cima milkvetch	G2T2	Peripheral
	Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited
	Penstemon rubicundus	Wassuk Beardtongue	G2G3	Endemic
A185	**NORTH WIG SAND DUNES**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,527.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	26,013.7 % Private: 0.0%	BD SD	**County:**	Tooele
TERR SYSTEMS	Greasewood shrubland			
	Pickleweed flats			
	Salt desert scrub			

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Semi-desert shrub steppe			
INVERTEBRATES	Melecta alexanderi	Parasitic bee	G1	Limited
A186	**NORTHWEST SEVIER LAKE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	5,829.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	14,404.2 % Private: 0.0%	BD SS SD A	**County:**	Millard
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Salt desert scrub			
AQ SYSTEMS	Lakes			
PLANTS	Astragalus uncialis	Currant milkvetch	G2	Endemic
	Eriogonum spathulatum var. natum	Son's wild buckwheat	G3T2	Endemic
A187	**OAK WELL CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,843.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,555.6 % Private: 0.0%	SS LM	**County:**	Lincoln
TERR SYSTEMS	+ Pinyon-juniper woodland			
PLANTS	Astragalus calycosus var. monophyllidius	One-leaflet torrey milkvetch	G5T2	Endemic
A188	**OASIS VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,722.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,256.6 % Private: 14.2%	BD A	**County:**	Nye
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	+ Joshua tree-mixed mojave scrub			
	+ Salt desert scrub			
MOLLUSKS	Pyrgulopsis micrococcus		G3?	Limited
A189	**OGDEN CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,780.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	9,341.8 % Private: 37.5%	LM SD RW A	**County:**	Weber
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Pinyon-juniper woodland			
PLANTS	Penstemon platyphyllus	Broadleaf penstemon	G2G3	Peripheral
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
A190	**OLD RIVER BED**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,745.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,312.2 % Private: 6.0%	BD SD	**County:**	Millard
TERR SYSTEMS	+ Salt desert scrub			
PLANTS	Cymopterus acaulis var. parvus		G5T2T3	Endemic
A191	**ONAQUI MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,136.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	25,046.3 % Private: 10.0%	BD SS LM MA SD	**County:**	Tooele
TERR SYSTEMS	Bitterbrush shrubland			

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Semi-desert shrub steppe			
PLANTS	Potentilla cottamii	Cottam's cinquefoil	G1	Limited
INVERTEBRATES	Perdita mormonica	(Bee)	?	Limited

A192 OQUIRRH MOUNTAINS — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Tooele, Salt Lake, Utah

Size Ha: 19,583.6 % Class 1 or 2: 0.0% — Acres: 48,391.1 % Private: 81.0%

System Groups (2): BD SS LM MA SD RW

TERR SYSTEMS	Desert riparian shrubland and woodland		
	Low montane shrublands		
	Montane forest and woodland		
	Montane meadow		
	Montane riparian shrubland		
	Mountain sagebrush		
	Pinyon-juniper woodland		
	Sagebrush semidesert		
	Sagebrush steppe		
	Semi-desert shrub steppe		
	Subalpine forest and woodland		
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration

A193 OWENS LAKE — **Site Type:** FUNCTIONAL SITE; **Section:** California; **State:** CA; **County:** Inyo

Size Ha: 22,140.5 % Class 1 or 2: 0.0% — Acres: 54,709.1 % Private: 0.0%

System Groups (2): RW A

AQ SYSTEMS	Ephemeral alkaline playa lake, chloride waters			
	Ephemeral standing waters			
BIRDS	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Ixobrychus exilis	Least Bittern	G5	Peripheral

A194 OWENS RIVER GORGE — **Site Type:** FUNCTIONAL SITE; **Section:** California; **State:** CA; **County:** Mono, Mineral

Size Ha: 1,619.6 % Class 1 or 2: 0.0% — Acres: 4,002.2 % Private: 0.0%

System Groups (2): MA SD A

TERR SYSTEMS	Montane forest and woodland			
FISHES	Gila bicolor snyderi	Owens tui chub	G4T1	Limited
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A195	**OWENS VALLEY-BENTON VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	136,064.5 % Class 1 or 2: 10.8%	System Groups (2)	**State:**	CA
Acres:	336,215.4 % Private: 4.9%	BD SS LM MA SD RW A	**County:**	Inyo, Mono
TERR SYSTEMS	Alpine herbaceous			
	Blackbrush-hopsage desert shrubland			
	Clifflands			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Joshua tree-mixed mojave scrub			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Ephemeral alkaline playa lake, chloride waters			
	Ephemeral standing waters			
	Lakes			
	Medium-size runoff-fed stream			
	Permanent flowing waters			
	River and major tributary			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
	Small-size spring and outflow stream, cold spring and springbrook			
	Spring pool			
PLANTS	Agastache cusickii	Cusick hyssop	G3	Peripheral
	Arabis dispar	Pinyon rock cress	G3	Limited
	Astragalus lentiginosus var kennedyi		G5T3T4	Endemic
	Astragalus lentiginosus var. piscinensis	Fish Slough milk-vetch	G5T1	Endemic
	Astragalus monoensis var. monoensis	Mono milk-vetch	G2T2	Peripheral or Limited
	Calochortus excavatus	Inyo County star-tulip	G3	Limited
	Crepis runcinata ssp. hallii	Hall's meadow hawksbeard	G5T3?	Endemic
	Dedeckera eurekensis	July gold	G2	Peripheral
	Fimbristylis thermalis	Hot springs fimbristylis	G4?	Limited
	Ivesia kingii var. kingii	Alkali ivesia	G3T2	Limited
	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited
	Sidalcea covillei	Owens Valley checkerbloom	G2	Limited
INVERTEBRATES	Dianthidium marshi		G1	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Stygobromus sp. nov. (Owens Valley)	(aquatic amphipod)	?	Endemic
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
MOLLUSKS	Pyrgulopsis aardahli	Benton Valley springsnail/ Aahrdahl's springsnail	G1	Endemic
	Pyrgulopsis owensensis	Owens Valley springsnail	G1G2,G1	Endemic
	Pyrgulopsis perturbata	Fish Slough springsnail	G1G2	Endemic
	Pyrgulopsis wongi	Wong's springsnail	G1G2	Endemic or Limited
FISHES	Catostomus fumeiventris	Owens sucker	G3	Endemic
	Cyprinodon radiosus	Owens pupfish	G1	Limited
	Gila bicolor snyderi	Owens tui chub	G4T1	Limited
	Rhinichthys osculus sp. bv	Benton Valley speckled dace	G5T1	Endemic
	Rhinichthys osculus ssp. 2 ow	Owen's speckled dace	G5T1T2	Limited
AMPHIBIANS	Hydromantes sp.1	Owens Valley web-toed salamander	G1?	Limited
REPTILES	Elgaria panamintina	Panamint alligator lizard	G1G2	Limited
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo	G5T2T3	Peripheral
	Empidonax traillii extimus	Southwestern Willow Flycatcher	G5T2	Peripheral
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Ixobrychus exilis	Least Bittern	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
	Spizella breweri	Brewer's Sparrow	G5	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Euderma maculatum	Spotted bat	G4	Unknown
	Microtus californicus vallicola	Owens valley vole	G5T1	Peripheral or Limited
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
	Tadarida brasiliensis	Brazilian free-tailed bat	G5	Unknown
	Ursus americanus	Black bear	G5	Peripheral

A196 PAH RAH RANGE

Site Type: FUNCTIONAL SITE
Section: Lahontan Basin
State: NV
County: Washoe

Size Ha: 10,069.3 % Class 1 or 2: 0.0%
Acres: 24,881.1 % Private: 76.9%

System Groups (2)
BD SS LM SD RW

TERR SYSTEMS	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
BIRDS	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.
(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A197	**PAHROC SUMMIT PASS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,887.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,664.4 % Private: 0.0%	BD SS SD	**County:**	Lincoln
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Ivesia arizonica var. saxosa	Rock purpusia	G4T1	Limited
A198	**PALMETTO MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	3,901.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,640.3 % Private: 0.0%	BD SS	**County:**	Esmeralda
TERR SYSTEMS	+ Joshua tree-mixed mojave scrub			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic
A199	**PANCAKE SUMMIT**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	2,318.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	5,728.0 % Private: 0.0%	BD SS LM	**County:**	White Pine
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
INVERTEBRATES	Andrena nevadae	(Bee)	G1	Endemic
A200	**PARADISE VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	1,713.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,233.4 % Private: 3.6%	BD A	**County:**	Humboldt
TERR SYSTEMS	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis sadai	Sada's springsnail	G1G2	Endemic
A201	**PARK RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,589.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	3,928.3 % Private: 0.0%	SS LM MA RW	**County:**	Nye
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
A202	**PAROWAN VALLEY**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	22,684.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	56,052.2 % Private: 76.2%	BD SS LM RW A	**County:**	Iron
TERR SYSTEMS	Montane riparian shrubland			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Lakes			
FISHES	Iotichthys phlegethontis	Least chub	G1	Limited
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited

A203 PATTERSON WASH — **Site Type:** FUNCTIONAL SITE; **Section:** Central Mountains; **State:** NV; **County:** Lincoln

Size Ha: 1,985.3 % Class 1 or 2: 0.0% — Acres: 4,905.6 % Private: 0.0%

System Groups (2): SS SD

TERR SYSTEMS	+	Sagebrush semidesert			
PLANTS		Cryptantha welshii	White River catseye	G3	Endemic

A204 PEQUOP MOUNTAINS-TOANO DRAW — **Site Type:** LANDSCAPE SITE; **Section:** North Central; **State:** NV; **County:** Elko

Size Ha: 68,669.7 % Class 1 or 2: 0.0% — Acres: 169,682.8 % Private: 52.4%

System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Clifflands			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Permanent flowing waters			
PLANTS	Collomia renacta	Barren Valley collomia	G1Q	Limited
	Eriogonum microthecum var. panamintense	Panamint Mountains buckwheat	G5T2	Limited
INVERTEBRATES	Euphilotes pallescens mattoni	Mattoni's blue	G4T1	Limited
	Perdita exigua	(Bee)	G1	Endemic
FISHES	Relictus solitarius	Relict dace	G2G3	Endemic
BIRDS	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread

A205 PILOT CREEK VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** North Central; **State:** NV; **County:** Elko

Size Ha: 1,859.9 % Class 1 or 2: 0.0% — Acres: 4,595.9 % Private: 48.3%

System Groups (2): BD SS

TERR SYSTEMS	+	Salt desert scrub			
INVERTEBRATES		Euphilotes pallescens mattoni	Mattoni's blue	G4T1	Limited

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A206	**PILOT MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	11,234.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	27,760.4 % Private: 0.7%	SS LM MA SD A	**County:**	Mineral
TERR SYSTEMS	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
INVERTEBRATES	Icaricia icarioides albihalos	White Mountains icarioides blue	G5T1T2	Endemic
FISHES	Crenichthys baileyi grandis	Hiko White River springfish	G2T1	Limited
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Euderma maculatum	Spotted bat	G4	Unknown
A207	**PILOT RANGE**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	46,710.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT, NV
Acres:	115,422.0 % Private: 32.5%	BD SS LM MA SD RW A	**County:**	Box Elder, Elko, Tooele
TERR SYSTEMS	Alpine herbaceous			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
AQ SYSTEMS	Lakes			
	Permanent flowing waters			
PLANTS	Potentilla cottamii	Cottam's cinquefoil	G1	Limited
	Viola lithion	Rock violet	G1	Endemic
INVERTEBRATES	Oreohelix haydeni	Lyrate mountainsnail	G2G3	Peripheral or Limited
	Oreohelix hemphilii	White Pine mountainsnail	?	Endemic
MOLLUSKS	Pyrgulopsis variegata	Northwest Bonneville springsnail	G2	Limited
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
A208	**PINE FOREST RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	2,074.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	5,125.8 % Private: 8.3%	BD SS	**County:**	Humboldt
TERR SYSTEMS	Sagebrush steppe			
	+ Salt desert scrub			
PLANTS	Caulanthus barnebyi	Barneby stemflower	G2	Limited

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A209	**PINE RIDGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	2,796.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	6,909.4 % Private: 40.7%	SS LM MA	**County:**	Elko
TERR SYSTEMS	Low montane shrublands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
BIRDS	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
A210	**PINE VALLEY MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	181,132.6 % Class 1 or 2: 11.9%	System Groups (2)	**State:**	UT
Acres:	447,578.6 % Private: 12.0%	BD SS LM MA SD RW A	**County:**	Washington, Iron
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Desert riparian shrubland and woodland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Ponderosa pine woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Intermittent scrub stream			
	Lakes			
	Permanent flowing waters			
	Small-size runoff-fed stream			
G1G2 ASSOCATIONS	Amelanchier utahensis - Cercocarpus montanus shrubland		G2	Widespread
	Betula occidentalis - Cornus sericea shrubland		G2G3	Widespread
PLANTS	Astragalus straturensis	Silver reef milkvetch	G2G3	Peripheral or Limited
	Astragalus zionis var. vigulus		G4?T1	Limited
	Camissonia gouldii		G1	Limited
	Cymopterus purpureus var. jonesii		G5T2T3	Limited
	Haplopappus crispus	Pine Valley goldenbush	G2	Endemic
	Lomatium scabrum var. tripinnatum		G3G4T2T3	Peripheral
	Pediomelum mephiticum		G3?	Peripheral or Limited
	Penstemon pinorum	Pinyon penstemon	G1	Endemic
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
FISHES	Catostomus clarki	Desert sucker	G3G4	Widespread
	Lepidomeda mollispinis	Virgin spinedace	G1	Limited
REPTILES	Lampropeltis pyromelana infralabialis	Utah mountain kingsnake	G5T3	Unknown

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining
	Otus flammeolus	Flammulated Owl	G4	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
	Stellula calliope	Calliope Hummingbird	G5	Widespread
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Myotis thysanodes	Fringed myotis	G5	Widespread, declining

A211 PLEASANT VALLEY — UNIQUE SITE (1) — **Site Type:** FUNCTIONAL SITE

Size Ha: 6,172.9 % Class 1 or 2: 0.0% — System Groups (2): BD SS A — **Section:** Lahontan Basin

Acres: 15,253.4 % Private: 5.5% — **State:** NV — **County:** Pershing

TERR SYSTEMS	Sagebrush steppe			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis aurata	Pleasant Valley springsnail	G1	Endemic

A212 POGONIP RIDGE — **Site Type:** FUNCTIONAL SITE — **Section:** Central Mountains

Size Ha: 1,856.8 % Class 1 or 2: 0.0% — System Groups (2): LM MA SD RW — **State:** NV

Acres: 4,588.1 % Private: 12.0% — **County:** White Pine

TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	+ Pinyon-juniper woodland			
	Subalpine forest and woodland			
INVERTEBRATES	Oreohelix hemphilii	White Pine mountainsnail	?	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Otus flammeolus	Flammulated Owl	G4	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining

A213 PRATHER SPRINGS — **Site Type:** FUNCTIONAL SITE — **Section:** North Central

Size Ha: 6,029.8 % Class 1 or 2: 0.0% — System Groups (2): SS RW A — **State:** NV

Acres: 14,899.7 % Private: 51.3% — **County:** Elko

TERR SYSTEMS	Montane riparian shrubland			
	Sagebrush steppe			
MOLLUSKS	Anodonta californiensis	California floater	G3G4	Widespread, declining
	Pyrgulopsis hovinghi	Upper Thousand Spring springsnail	G1	Endemic

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A214	**PYRAMID LAKE-LOWER TRUCKEE RIVER**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	208,539.9 % Class 1 or 2: 2.1%	System Groups (2)	**State:**	NV
Acres:	515,302.0 % Private: 28.2%	BD SS LM MA SD RW A	**County:**	Washoe, Churchill, Lyon
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
	Permanent flowing waters			
	River and major tributary			
	Slightly alkaline terminal lake			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
	Small-size spring and outflow stream, cold spring and springbrook			
PLANTS	Astragalus convallarius var. margaretiae	Margaret rushy milkvetch	G5T2	Endemic
	Astragalus lentiginosus var kennedyi		G5T3T4	Endemic
	Astragalus pterocarpus	Winged milkvetch	G3	Limited
	Camissonia nevadensis	Nevada suncup	G3	Endemic
	Eriogonum lemmonii	Lemmon buckwheat	G3?	Endemic
	Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited
	Penstemon arenarius	Nevada dune beardtongue	G2G3	Endemic
	Psorothamnus kingii	Lahontan indigobush	G3	Endemic
	Stroganowia tiehmii	Tiehm stroganowia	G2	Endemic
INVERTEBRATES	Anthidium rodecki	(Bee)	?	Limited
	Ashmeadiella rhodognatha	(Bee)	?	Disjunct
	Calliopsis hesperia equina	(Bee)	?	Disjunct
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Colletes sp. nov. 1	(Bee)	G1	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Hesperapis kayella	(Bee)	G1	Limited
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Myrmecocystus arenarius	Dune honey ant	G2?	Endemic?
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Perdita arenaria	(Bee)	?	Disjunct
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Rhadine myrmecodes	(Sand obligate beetle)	?	Limited

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited
MOLLUSKS	Fluminicola virginius	Virginia Mountains pebblesnail	G1	Endemic
	Pyrgulopsis longiglans	Western Lahontan springsnail	G2G3	Endemic
FISHES	Chasmistes cujus	Cui-ui	G1	Endemic
	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Larus californicus	California Gull	G5	Disjunct, colonial
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Stellula calliope	Calliope Hummingbird	G5	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Dipodomys deserti	Desert kangaroo rat	G5	Limited
	Dipodomys microps	Chisel-toothed kangaroo rat	G5	Limited
	Microdipodops megacephalus albiventer	Desert Valley kangaroo mouse	G5T1	Endemic
	Microdipodops megalocephalus	Dark kanagaroo mouse	?	Unknown
	Microdipodops pallidus	Pale kangaroo mouse	G5	Endemic
	Tadarida brasiliensis	Brazilian free-tailed bat	G5	Unknown
A215	**QUICHAPA LAKE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,688.2	% Class 1 or 2: 0.0%	System Groups (2)	**State:** UT
Acres:	9,113.6	% Private: 86.3%	BD SS LM RW	**County:** Iron
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A216	**QUILICI SPRING-BUTTE VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	31,984.5	% Class 1 or 2: 0.0%	System Groups (2)	**State:** NV
Acres:	79,033.6	% Private: 1.6%	BD SS LM MA RW A	**County:** Elko
TERR SYSTEMS	Greasewood shrubland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
MOLLUSKS	Pyrgulopsis serrata	Northern Steptoe springsnail	G1	Endemic
FISHES	Relictus solitarius	Relict dace	G2G3	Endemic

A217 QUINN CANYON RANGE-GRANT RANGE — **Site Type:** LANDSCAPE SITE; **Section:** Tonopah; **State:** NV; **County:** Nye, Lincoln

Size Ha: 182,940.0 % Class 1 or 2: 18.0% — Acres: 452,044.6 % Private: 0.6%

System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Alpine herbaceous			
	Bitterbrush shrubland			
	Blackbrush-hopsage desert shrubland			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Subalpine forest and woodland			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
PLANTS	Astragalus uncialis	Currant milkvetch	G2	Endemic
	Castilleja martinii var. clokeyi	Clokey paintbrush	G3QT3	Peripheral
	Cryptantha welshii	White River catseye	G3	Endemic
	Draba cusickii var. pedicellata	Stalked cusick whitlowgrass	G4T3?	Endemic
	Jamesia tetrapetala	Basin jamesia, waxflower	G2	Endemic
	Lesquerella hitchcockii	Hitchcock bladderpod	G3	Peripheral or Limited
	Lesquerella pendula	Hanging bladderpod	G2?	Endemic
	Lewisia maguirei	Maguire bitterroot	G1	Endemic
	Primula nevadensis	Nevada primrose	G1	Endemic
	Silene nachlingerae	Nachlinger catchfly	G2	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Otus flammeolus	Flammulated Owl	G4	Widespread
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Brachylagus idahoensis	Pygmy rabbit	G5	Limited
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A218	**QUINN RIVER**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	47,414.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	117,160.3 % Private: 12.8%	BD SS LM RW	**County:**	Humboldt
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
PLANTS	Caulanthus barnebyi	Barneby stemflower	G2	Limited
BIRDS	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
MAMMALS	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited
A219	**RABBIT CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	10,893.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	26,917.0 % Private: 84.2%	BD SS MA RW A	**County:**	Elko
TERR SYSTEMS	Montane meadow			
	Montane riparian shrubland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis leporina	Elko springsnail	G1	Endemic or Limited
A220	**RAILROAD GRADE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	2,103.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	5,198.4 % Private: 0.0%	SS MA SD	**County:**	Lander
TERR SYSTEMS	+ Sagebrush semidesert			
PLANTS	Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic
	Phacelia glaberrima	Reese River phacelia	G3?	Endemic
A221	**RAILROAD PASS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,977.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,887.4 % Private: 29.2%	BD SS	**County:**	Lander
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Sagebrush steppe			
	+ Salt desert scrub			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Andrena raveni	(Bee)	G2	Limited
A222	**RAILROAD VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	50,694.6 % Class 1 or 2: 8.9%	System Groups (2)	**State:**	NV
Acres:	125,266.3 % Private: 1.8%	BD SS SD RW A	**County:**	Nye
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Montane riparian shrubland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
	Astragalus calycosus var. monophyllidius	One-leaflet torrey milkvetch	G5T2	Endemic
	Astragalus uncialis	Currant milkvetch	G2	Endemic
	Sphaeralcea caespitosa	Jones globe-mallow	G3	Endemic
INVERTEBRATES	Hesperia uncas fulvapalla	Railroad Valley skipper	G4G5T1	Endemic
	Polites sabuleti basinensis	Pallid skipper	G5T2	Unknown
MOLLUSKS	Pyrgulopsis lockensis	Lockes springsnail	G1	Endemic
FISHES	Crenichthys nevadae	Railroad Valley springfish	G2	Endemic
	Gila bicolor nevadae	Duckwater Creek tui chub/ Hot Creek tui chub/ Railroad Valley tui chub)	G4T1	Endemic?
BIRDS	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Larus californicus	California Gull	G5	Disjunct, colonial
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
A223	**RAINBOW CANYON**		**Site Type:**	LANDSCAPE SITE
			Section:	Tonopah
Size Ha:	24,737.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	61,126.5 % Private: 5.4%	BD SS LM SD RW A	**County:**	Lincoln
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Low montane shrublands			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
PLANTS	Astragalus convallarius var. finitimus	Lesser rushy milkvetch	G5T3	Endemic
	Astragalus oophorus var. lonchocalyx	Pink egg milkvetch, long-calyx eggvetch	G4T2	Endemic
	Epilobium nevadense	Nevada willowherb	G2	Limited
	Ivesia arizonica var. saxosa	Rock purpusia	G4T1	Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
FISHES	Catostomus clarki ssp. 2	Meadow Valley Wash Desert sucker	G3G4T2	Endemic
	Rhinichthys osculus ssp. 2 mv	Meadow Valley speckled dace	G5T2	Limited
BIRDS	Empidonax traillii extimus	Southwestern Willow Flycatcher	G5T2	Peripheral
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
A224	**RED HILL**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,738.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,296.7 % Private: 0.0%	BD SS	**County:**	Nye
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
A225	**RED PEAK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	3,440.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	8,500.8 % Private: 1.8%	BD SS LM	**County:**	Nye
TERR SYSTEMS	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
PLANTS	Astragalus cimae var. cimae	Cima milkvetch	G2T2	Peripheral
	Eriogonum beatleyae	Beatley buckwheat	G2Q	Endemic
A226	**RED POINT**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	1,937.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,788.3 % Private: 20.4%	SS RW	**County:**	Elko
TERR SYSTEMS	Montane riparian shrubland			
	+ Sagebrush steppe			
PLANTS	Arabis falcifructa	Elko rockcress	G1G2	Peripheral
A227	**REESE RIVER**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	45,308.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	111,957.6 % Private: 10.9%	BD SS LM MA SD RW A	**County:**	Lander
TERR SYSTEMS	Greasewood shrubland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Ephemeral standing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow stream, hot spring and springbrook			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
	Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic
	Phacelia glaberrima	Reese River phacelia	G3?	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Cercyonis oetus pallescens	Pallid wood nymph	G5T1	Endemic
	Hesperia uncas reesorum	Reese River unca skipper	G4G5T1	Endemic
	Polites sabuleti basinensis	Pallid skipper	G5T2	Unknown
	Pseudocopaeodes eunus flavus	Nevada alkali skipperling	G3T2	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
A228	**REESE RIVER VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	3,596.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	8,887.5 % Private: 0.0%	BD SS SD	**County:**	Lander
TERR SYSTEMS	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
INVERTEBRATES	Andrena chrylismiae	(Bee)	G1	Endemic
	Andrena raveni	(Bee)	G2	Limited
	Anthophora affabilis	(Bee)	?	Limited
A229	**REVEILLE VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	13,499.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	33,355.9 % Private: 0.0%	BD SS LM	**County:**	Nye
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
PLANTS	Sclerocactus nyensis	Tonopah fishhook cactus	G1Q	Endemic
A230	**RICKEY PEAK**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	10,183.3 % Class 1 or 2: 11.0%	System Groups (2)	**State:**	CA
Acres:	25,163.0 % Private: 2.4%	SS LM MA RW A	**County:**	Mono, Tuolumne
TERR SYSTEMS	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Subalpine forest and woodland			
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
MAMMALS	Ursus americanus	Black bear	G5	Peripheral
A231	**ROCK SPRINGS CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,729.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,272.5 % Private: 0.0%	SS LM	**County:**	Lincoln
TERR SYSTEMS	+ Pinyon-juniper woodland			
PLANTS	Astragalus oophorus var. lonchocalyx	Pink egg milkvetch, long-calyx eggvetch	G4T2	Endemic

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A232	**RUBY MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	139,915.7 % Class 1 or 2: 27.7%	System Groups (2)	**State:**	NV
Acres:	345,731.6 % Private: 19.3%	BD SS LM MA SD RW A	**County:**	Elko
TERR SYSTEMS	Alpine herbaceous			
	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
	Subalpine or alpine lake			
PLANTS	Arabis falcatoria	Grouse Creek rockcress	G1	Peripheral or Limited
	Astragalus robbinsii var. occidentalis	Lamoille canyon milkvetch	G5T2T3	Endemic
	Draba sphaeroides	Mountain draba	G2?	Limited
	Eriogonum kingii	King buckwheat	G3?	Endemic
	Lesquerella goodrichii	Goodrich bladderpod	G2G4	Endemic
	Primula capillaris	Ruby Mountain primrose	G1	Endemic
	Silene nachlingerae	Nachlinger catchfly	G2	Endemic
INVERTEBRATES	Osmia tanneri	(Bee)	G1	Limited
	Speyeria hesperis greyi	Grey's silverspot	G5T1	Endemic
	Utacapnia lemoniana	Winter stonefly	G?	Disjunct, specialist
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Leucosticte atrata	Black Rosy-Finch	G4	Limited
	Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining
	Otus flammeolus	Flammulated Owl	G4	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Spizella breweri	Brewer's Sparrow	G5	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
MAMMALS	Euderma maculatum	Spotted bat	G4	Unknown
	Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining
	Lasiurus cinereus	Hoary bat	G5	Widespread, declining
	Ochotona princeps sspp.	Pika	G5T?	Limited?
A233	**RUBY VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	North Central
Size Ha:	104,262.8 % Class 1 or 2: 2.8%	System Groups (2)	**State:**	NV
Acres:	257,633.3 % Private: 31.3%	BD SS LM MA SD RW A	**County:**	Elko, White Pine
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
AQ SYSTEMS	Permanent flowing waters			
	Small-size spring and outflow springbrook			
	Spring-fed desert lake			
PLANTS	Eriogonum argophyllum	Sulphur Springs buckwheat	G1	Endemic
INVERTEBRATES	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
	Stygobromus sp. nov. (Ruby Marsh)	(aquatic amphipod)	?	Endemic
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
FISHES	Relictus solitarius	Relict dace	G2G3	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Coccyzus americanus occidentalis	Western Yellow-Billed Cuckoo	G5T2T3	Peripheral
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Ixobrychus exilis	Least Bittern	G5	Peripheral
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Larus pipixcan	Franklin's Gull	G4G5	Disjunct
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
MAMMALS	Brachylagus idahoensis	Pygmy rabbit	G5	Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A234	**RUSH VALLEY**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	120,330.6 % Class 1 or 2: 0.2%	System Groups (2)	**State:**	UT
Acres:	297,336.9 % Private: 31.8%	BD SS LM MA SD RW A	**County:**	Tooele
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
PLANTS	Astragalus lentiginosus var kennedyi		G5T3T4	Endemic
	Astragalus lentiginosus var. pohlii	Pohl milkvetch	G5T1	Endemic
	Cymopterus coulteri	Coulter biscuitroot	G3	Limited
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
	Pyrgulopsis transversa	Southern Bonneville springsnail	G?	Endemic or Limited
BIRDS	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
A235	**RUTH**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,753.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,332.7 % Private: 8.6%	SS LM	**County:**	White Pine
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
PLANTS	Lepidium nanum	Dwarf peppergrass	G3	Endemic
	Lesquerella pendula	Hanging bladderpod	G2?	Endemic
A236	**RYE PATCH**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	7,993.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	19,752.6 % Private: 15.0%	BD SD RW	**County:**	Pershing
TERR SYSTEMS	Desert riparian shrubland and woodland			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Freshwater marsh			
	Greasewood shrubland			
	+ Salt desert scrub			
PLANTS	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited

A237 SAGE HEN VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Churchill

Size Ha: 1,736.0 % Class 1 or 2: 0.0% — Acres: 4,289.7 % Private: 46.1%

System Groups (2): BD SS LM SD

TERR SYSTEMS	+ Sagebrush steppe			
	+ Salt desert scrub			
MAMMALS	Dipodomys microps	Chisel-toothed kangaroo rat	G5	Limited
	Microdipodops megacephalus albiventer	Desert Valley kangaroo mouse	G5T1	Endemic

A238 SAHWAVE MOUNTAINS-LAKE RANGE — **Site Type:** FUNCTIONAL SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Pershing, Washoe

Size Ha: 20,217.9 % Class 1 or 2: 0.0% — Acres: 49,958.4 % Private: 31.1%

System Groups (2): BD SS A

TERR SYSTEMS	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis longiglans	Western Lahontan springsnail	G2G3	Endemic

A239 SAN ANTONIO DUNES — **Site Type:** FUNCTIONAL SITE; **Section:** Tonopah; **State:** NV; **County:** Nye

Size Ha: 10,462.5 % Class 1 or 2: 0.0% — Acres: 25,852.8 % Private: 0.9%

System Groups (2): BD SS SD

TERR SYSTEMS	Greasewood shrubland			
	Sagebrush semidesert			
	Salt desert scrub			
	Sand dunes			
PLANTS	Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic
INVERTEBRATES	Aegialia crescenta	Crescent Dunes aegialian scarab	G1	Endemic
	Cardiophorus spp.	(Click beetle)	?	Limited
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Serica psammobunus	Sand Mountain serican scarab	G1	Endemic
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited

A240 SAN FRANCISCO MOUNTAINS — UNIQUE SITE (1) — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Beaver

Size Ha: 11,028.6 % Class 1 or 2: 0.0% — Acres: 27,251.8 % Private: 21.8%

System Groups (2): BD SS LM MA SD

TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Mountain mahogany woodlands			
	Pinyon-juniper woodland			
	Ponderosa pine woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
PLANTS	Eriogonum soredium	Frisco buckwheat	G1	Endemic
	Lepidium ostleri	Ostler peppergrass	G1	Endemic
	Machaeranthera grindelioides var. depressa		G5T3T4	Limited
	Trifolium friscanum	Frisco clover	G1	Endemic

A241 SAN PITCH MOUNTAINS — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Juab, Sanpete

Size Ha: 3,903.3 % Class 1 or 2: 0.0% — Acres: 9,645.1 % Private: 58.8%

System Groups (2): BD SS LM RW A

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
AQ SYSTEMS	Lakes			
PLANTS	Penstemon tidestromii	Tidestrom beardtongue	G2G3	Peripheral

A242 SAND MOUNTAIN — UNIQUE SITE (1) — **Site Type:** LANDSCAPE SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Churchill

Size Ha: 23,720.6 % Class 1 or 2: 0.0% — Acres: 58,613.6 % Private: 0.6%

System Groups (2): BD SS SD

TERR SYSTEMS	Greasewood shrubland			
	Sagebrush steppe			
	Salt desert scrub			
	Sand dunes			
	Semi-desert shrub steppe			
PLANTS	Astragalus lentiginosus var kennedyi		G5T3T4	Endemic
	Helianthus deserticola	Desert sunflower	G2Q	Limited
INVERTEBRATES	Aegialia hardyi	Hardy's aegialian scarab	G1	Endemic
	Anthidium rodecki	(Bee)	?	Limited
	Anthophora affabilis	(Bee)	?	Limited
	Anthophora sp. nov.	(Bee)	G1	Endemic
	Calliopsis phaceliae	(Bee)	?	Limited
	Calliopsis sp. nov	(Bee)	?	Limited
	Cardiophorus ssp. nov.	(Click beetle)	?	Endemic
	Coenonycha pygmaea	Sand Mountain pygmy scarab	G1	Endemic
	Colletes sp. nov. 1	(Bee)	G1	Limited
	Colletes stepheni	(Bee)	?	Disjunct
	Colletes tectiventris	(Bee)	?	Disjunct
	Euphilotes pallescens arenamontana	Sand Mountain blue	G4T1	Endemic
	Hesperapis sp. nov.2	(Bee)	G1	Endemic
	Myrmecocystus arenarius	Dune honey ant	G2?	Endemic?

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Perdita aridella	(Bee)	?	Limited
	Perdita chloris	(Bee)	?	Limited
	Perdita cleomellae	(Bee)	?	Disjunct
	Perdita eucnides eucnides	(Bee)	G2	Disjunct
	Perdita haigi	(Bee)	G1	Endemic
	Perdita hirticeps apicata	(Bee)	?	Limited
	Perdita sp. nov. 3	(Bee)	G1	Endemic
	Perdita vesca	(Bee)	?	Limited
	Serica psammobunus	Sand Mountain serican scarab	G1	Endemic
A243	**SAWTOOTH MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,182.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	25,159.7 % Private: 0.0%	BD SS LM MA SD A	**County:**	Millard
TERR SYSTEMS	Greasewood shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
	Subalpine forest and woodland			
PLANTS	Cryptantha compacta	Mound cryptanth	G1	Endemic
	Jamesia tetrapetala	Basin jamesia, waxflower	G2	Endemic
	Primula domensis	House Range primrose	G1	Endemic
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
A244	**SCHELL CREEK RANGE**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	86,036.1 % Class 1 or 2: 1.9%	System Groups (2)	**State:**	NV
Acres:	212,595.1 % Private: 3.0%	BD SS LM MA SD RW A	**County:**	White Pine
TERR SYSTEMS	Alpine herbaceous			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Ponderosa pine woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Subalpine forest and woodland			
AQ SYSTEMS	Ephemeral spring pool and seep			
	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
PLANTS	Astragalus lentiginosus var. latus	Broad-pod freckled milkvetch	G5T1	Endemic
	Draba cusickii var. pedicellata	Stalked cusick whitlowgrass	G4T3?	Endemic
	Draba pennellii	Pennell draba	G2	Endemic
	Lesquerella hitchcockii	Hitchcock bladderpod	G3	Peripheral or Limited

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
PLANTS	Penstemon rhizomatosus	Rhizome beardtongue	G1	Endemic
	Poa abbreviata ssp. marshii	Marsh's blue grass	G5T2	Limited
	Silene nachlingerae	Nachlinger catchfly	G2	Endemic
INVERTEBRATES	Euphydryas editha koreti	Koret's checkerspot	G5T1Q	Endemic
	Oreohelix hemphilii	White Pine mountainsnail	?	Endemic
	Oreohelix nevadensis	Schell Creek mountainsnail	G1	Endemic
	Osmia tanneri	(Bee)	G1	Limited
FISHES	Relictus solitarius	Relict dace	G2G3	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Otus flammeolus	Flammulated Owl	G4	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
A245	**SCHELLBOURNE PASS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	3,737.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,236.0 % Private: 5.6%	SS LM MA RW	**County:**	White Pine
TERR SYSTEMS	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Astragalus lentiginosus var. latus	Broad-pod freckled milkvetch	G5T1	Endemic
INVERTEBRATES	Cercyonis pegala pluvialis	White River wood nymph	G5T2	Endemic
A246	**SCHURZ**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	11,439.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	28,265.8 % Private: 5.5%	BD SS LM SD RW	**County:**	Mineral
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
PLANTS	Helianthus deserticola	Desert sunflower	G2Q	Limited
A247	**SEVENMILE SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	3,784.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,350.5 % Private: 14.2%	BD A	**County:**	Washoe
TERR SYSTEMS	+ Salt desert scrub			
MOLLUSKS	Pyrgulopsis longiglans	Western Lahontan springsnail	G2G3	Endemic
A248	**SEVIER BRIDGE RESERVOIR**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,883.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,654.7 % Private: 59.0%	BD SS A	**County:**	Juab
TERR SYSTEMS	+ Sagebrush semidesert			
	Semi-desert shrub steppe			
AQ SYSTEMS	Lakes			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
PLANTS	Cymopterus coulteri	Coulter biscuitroot	G3	Limited
A249	**SEVIER DESERT**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	11,595.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	28,652.1 % Private: 0.0%	BD SS LM SD	**County:**	Millard
TERR SYSTEMS	Sagebrush semidesert			
	Salt desert scrub			
PLANTS	Astragalus uncialis	Currant milkvetch	G2	Endemic
	Eriogonum spathulatum var. natum	Son's wild buckwheat	G3T2	Endemic
	Penstemon nanus	Low beardtongue	G3	Endemic
A250	**SHEPHERD CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	1,785.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	CA
Acres:	4,410.8 % Private: 0.0%	BD SS RW	**County:**	Inyo
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Montane riparian shrubland			
	+ Sagebrush steppe			
A251	**SHERMAN CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	5,948.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	14,699.7 % Private: 46.2%	SS RW A	**County:**	Elko
TERR SYSTEMS	Montane riparian shrubland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
A252	**SHERMAN MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,717.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,244.1 % Private: 0.0%	LM MA RW	**County:**	White Pine
TERR SYSTEMS	Low montane shrublands			
	Montane riparian shrubland			
	Mountain sagebrush			
	+ Pinyon-juniper woodland			
PLANTS	Smelowskia holmgrenii	Holmgren smelowskia	G2	Endemic
A253	**SHOAL CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	3,883.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	9,596.4 % Private: 36.5%	SS LM RW	**County:**	Washington, Iron
TERR SYSTEMS	Montane riparian shrubland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Astragalus oophorus var. lonchocalyx	Pink egg milkvetch, long-calyx eggvetch	G4T2	Endemic

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A254	**SHOSHONE RANGE-CARICO LAKE VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	21,295.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	52,621.2 % Private: 5.6%	BD SS LM MA RW A	**County:**	Lander
TERR SYSTEMS	Greasewood shrubland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Ephemeral alkaline playa lake, chloride waters			
	Ephemeral standing waters			
	Permanent flowing waters			
	Small-size spring and outflow springbrook			
MOLLUSKS	Pyrgulopsis basiglans	Large gland Carico springsnail	G1	Endemic
	Pyrgulopsis bifurcata	Small gland Carico springsnail	G1	Endemic
	Pyrgulopsis sadai	Sada's springsnail	G1G2	Endemic
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
A255	**SHOSHONE-BEOWAWE**		**Site Type:**	LANDSCAPE SITE
			Section:	North Central
Size Ha:	50,485.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	124,750.3 % Private: 58.7%	BD SS LM MA RW A	**County:**	Eureka
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Montane meadow			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	River and major tributary			
	Small-size spring and outflow springbrook			
INVERTEBRATES	Baetisca lacustris	(Mayfly)	G?	Disjunct
BIRDS	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
MAMMALS	Lutra canadensis nexa	Humboldt River otter	?	Limited
A256	**SILVER ISLAND MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	42,383.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	104,729.3 % Private: 1.9%	BD SS LM RW	**County:**	Tooele, Box Elder
TERR SYSTEMS	Greasewood shrubland			
	Pickleweed flats			
	Pinyon-juniper woodland			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Sagebrush semidesert			
	Salt desert scrub			
	Wet meadow			
PLANTS	Eriogonum nummulare var. ammophilum	Ibex buckwheat	G4T1	Endemic
A257	**SILVER PEAK RANGE**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	5,688.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	14,057.4 % Private: 0.0%	BD SS LM SD	**County:**	Esmeralda
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Eriogonum tiehmii	Tiehm buckwheat	G1	Endemic
	Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
A258	**SILVER STATE SAND DUNES**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	121,896.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	301,207.3 % Private: 46.9%	BD SS LM MA SD RW A	**County:**	Humboldt
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Montane meadow			
	Mountain sagebrush			
	Sagebrush steppe			
	Salt desert scrub			
	Sand dunes			
	Semi-desert shrub steppe			
AQ SYSTEMS	Desert scrub pool			
PLANTS	Eriogonum nummulare var. ammophilum	Ibex buckwheat	G4T1	Endemic
	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited
	Psorothamnus kingii	Lahontan indigobush	G3	Endemic
INVERTEBRATES	Aegialia spinosa	(Scarab beetle)	?	Limited
	Andrena thorpi	(Bee)	G1	Endemic
	Anthidium rodecki	(Bee)	?	Limited
	Anthophora affabilis	(Bee)	?	Limited
	Calliopsis barri	(Bee)	?	Limited
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Euphilotes pallescens ricei	Rice's blue	G4T1	Endemic
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Rhadine myrmecodes	(Sand obligate beetle)	?	Limited
	Serica humboldti	Humboldt serican scarab	G1	Endemic
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A259	**SIMPSON BUTTES**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	4,103.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	10,140.0 % Private: 0.0%	BD A	**County:**	Tooele
TERR SYSTEMS	+ Salt desert scrub			
	Semi-desert shrub steppe			
FISHES	Iotichthys phlegethontis	Least chub	G1	Limited
A260	**SIMPSON MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,014.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	24,746.8 % Private: 6.0%	SS LM MA RW A	**County:**	Tooele
TERR SYSTEMS	Bitterbrush shrubland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
AQ SYSTEMS	Permanent flowing waters			
MOLLUSKS	Pyrgulopsis transversa	Southern Bonneville springsnail	G?	Endemic or Limited
A261	**SIMPSON PARK MOUNTAINS-NORTH TOIYABE RANGE**		**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	269,858.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	666,820.6 % Private: 4.5%	BD SS LM MA RW A	**County:**	Lander, Eureka
TERR SYSTEMS	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
INVERTEBRATES	Andrena raveni	(Bee)	G2	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A262	**SIXMILE FLAT**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	21,767.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	53,787.8 % Private: 1.2%	BD SS SD	**County:**	Lincoln
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Ivesia arizonica var. saxosa	Rock purpusia	G4T1	Limited
A263	**SKULL VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	4,274.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	10,562.8 % Private: 32.5%	BD SS	**County:**	Tooele
TERR SYSTEMS	Greasewood shrubland			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Astragalus lentiginosus var. pohlii	Pohl milkvetch	G5T1	Endemic
A264	**SLINKARD VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	California
Size Ha:	18,608.7 % Class 1 or 2: 36.1%	System Groups (2)	**State:**	CA
Acres:	45,982.1 % Private: 41.2%	SS LM MA SD RW A	**County:**	Mono, Alpine
TERR SYSTEMS	Clifflands			
	Desert riparian shrubland and woodland			
	Montane forest and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
	Permanent flowing waters			
	Small-size spring and outflow springbrook			
PLANTS	Silene nuda var. nuda	Naked catchfly	G3T1T2Q	Endemic
INVERTEBRATES	Capnia mono	Mono winter stonefly	G2	Limited
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
MAMMALS	Ursus americanus	Black bear	G5	Peripheral
A265	**SLOW ELK HILLS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	5,985.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	14,790.1 % Private: 7.5%	BD SS LM A	**County:**	Tooele, Juab
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
MOLLUSKS	Pyrgulopsis transversa	Southern Bonneville springsnail	G?	Endemic or Limited

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A266	**SMOKE CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	6,607.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV, CA
Acres:	16,327.5 % Private: 33.2%	BD RW A	**County:**	Washoe, Lassen
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Montane riparian shrubland			
	+ Salt desert scrub			
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow stream, cold spring and springbrook			
MOLLUSKS	Fluminicola turbiniformis	(Pebblesnail)	?	Limited
	Pyrgulopsis eremica		?	Limited
FISHES	Rhinchthys osculus robustus	Lahontan speckled dace	?	Endemic
A267	**SNAKE RANGE**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	225,821.8 % Class 1 or 2: 26.9%	System Groups (2)	**State:**	NV, UT
Acres:	558,005.8 % Private: 3.4%	BD SS LM MA SD RW A	**County:**	White Pine, Millard
TERR SYSTEMS	Alpine herbaceous			
	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
	Permanent flowing waters			
	Small-size runoff-fed stream			
	Subalpine or alpine lake			
G1G2 ASSOCATIONS	Cercocarpus ledifolius- Symphoricarpos oreophilus woodland		G2	Limited
PLANTS	Arenaria congesta var. wheelerensis	Wheeler peak sandwort	G5T1?	Endemic
	Astragalus diversifolius	Mesic milkvetch, meadow milkvetch	G3	Limited
	Astragalus kentrophyta var. elatus	Spiny-leaved milk-vetch	G5T4	Endemic
	Astragalus lentiginosus var. latus	Broad-pod freckled milkvetch	G5T1	Endemic
	Cryptantha welshii	White River catseye	G3	Endemic
	Cymopterus basalticus	Dolomite spring-parsley, intermountain wavewing	G2,G2G3	Endemic
	Draba cusickii var. pedicellata	Stalked cusick whitlowgrass	G4T3?	Endemic
	Draba oreibata var. serpentina	Snake Range whitlowgrass	G4T1	Endemic

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
PLANTS	Draba pennellii	Pennell draba	G2	Endemic
	Draba sphaeroides	Mountain draba	G2?	Limited
	Eriogonum darrovii	Darrow buckwheat	G2G3	Limited
	Eriogonum holmgrenii	Holmgren buckwheat	G1	Endemic
	Eriogonum nummulare var. ammophilum	Ibex buckwheat	G4T1	Endemic
	Jamesia tetrapetala	Basin jamesia, waxflower	G2	Endemic
	Lesquerella pendula	Hanging bladderpod	G2?	Endemic
	Penstemon concinnus	Tunnel spring beardtongue	G3	Endemic
	Penstemon leiophyllus var. francisci-pennellii	Pennell beardtongue	G3T2	Endemic
	Penstemon moriahensis	Mount Moriah beardtongue	G1G2	Endemic
	Phacelia parishii	Parish phacelia	G2G3	Limited
	Primula nevadensis	Nevada primrose	G1	Endemic
	Silene nachlingerae	Nachlinger catchfly	G2	Endemic
INVERTEBRATES	Euphilotes bernardino minuta	Baking Powder Flat Blue	G5T1	Endemic
	Euphydryas editha koreti	Koret's checkerspot	G5T1Q	Endemic
	Oreohelix eurekensis	Eureka mountainsnail	G1	Unknown
	Oreohelix hemphilii	White Pine mountainsnail	?	Endemic
	Osmia alpestris	(Bee)	?	Limited
	Osmia tanneri	(Bee)	G1	Limited
	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
MOLLUSKS	Pyrgulopsis anguina	Longitudinal gland springsnail	G1	Endemic
	Pyrgulopsis peculiaris	Bifid duct springsnail	G?,G2?	Endemic
	Pyrgulopsis saxatilis	Sub-globose Snake springsnail	G1	Endemic
FISHES	Empetrichthys latos latos	Pahrump poolfish	G1T1	Introduced
	Iotichthys phlegethontis	Least chub	G1	Limited
	Oncorhynchus clarki utah	Bonneville cutthroat trout	G4T2	Endemic?
	Relictus solitarius	Relict dace	G2G3	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Otus flammeolus	Flammulated Owl	G4	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining
	Lasiurus cinereus	Hoary bat	G5	Widespread, declining
	Myotis thysanodes	Fringed myotis	G5	Widespread, declining
	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited
	Tadarida brasiliensis	Brazilian free-tailed bat	G5	Unknown

A268 SNAKE VALLEY

Site Type: LANDSCAPE SITE
Section: Bonneville Basin
State: UT
County: Millard, Juab

Size Ha: 55,720.5 % Class 1 or 2: 0.0%
Acres: 137,685.5 % Private: 2.8%

System Groups (2)
BD SS MA SD RW A

TERR SYSTEMS
Desert riparian shrubland and woodland
Freshwater marsh
Greasewood shrubland
Montane riparian shrubland
Mountain sagebrush

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Pickleweed flats			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
	Small-size spring and outflow springbrook			
PLANTS	Cryptantha compacta	Mound cryptanth	G1	Endemic
MOLLUSKS	Physa megalochlamys		G3	Unknown
	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
FISHES	Iotichthys phlegethontis	Least chub	G1	Limited
BIRDS	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread

A269 SOAP HOLLOW — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Millard

Size Ha: 11,464.3 % Class 1 or 2: 0.0%
Acres: 28,328.2 % Private: 0.0%
System Groups (2): BD SS

TERR SYSTEMS	Sagebrush semidesert	
	Salt desert scrub	
	Semi-desert shrub steppe	
PLANTS	Astragalus uncialis	Currant milkvetch

A270 SOLDIER MEADOWS — UNIQUE SITE (1) — **Site Type:** LANDSCAPE SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Humboldt

Size Ha: 33,875.0 % Class 1 or 2: 0.0%
Acres: 83,705.1 % Private: 9.4%
System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Greasewood shrubland			
	Montane meadow			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Lakes			
	Small-size spring and outflow stream, cold spring and springbrook			
	Small-size spring and outflow stream, hot spring and springbrook			
PLANTS	Caulanthus barnebyi	Barneby stemflower	G2	Limited
	Mentzelia mollis	Smooth stickleaf	G2	Peripheral
	Potentilla basaltica	Soldier Meadow cinquefoil	G1	Limited
MOLLUSKS	Pyrgulopsis limaria	Squat Mud Meadows springsnail	G1	Endemic
	Pyrgulopsis longiglans	Western Lahontan springsnail	G2G3	Endemic
	Pyrgulopsis militaris	Northern Soldier Meadow springsnail	G1	Limited
	Pyrgulopsis notidicola	Elongate Mud Meadows springsnail	G1	Endemic
	Pyrgulopsis umbilicata	Southern Soldier Meadow springsnail	G1	Endemic
FISHES	Eremichthys acros	Desert dace	G1	Endemic
BIRDS	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
MAMMALS	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited
A271	**SONOMA RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	12,421.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	30,694.3 % Private: 29.5%	SS LM MA RW	**County:**	Humboldt, Pershing
TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
PLANTS	Eriogonum anemophilum	Windloving buckwheat	G2G3	Endemic
A272	**SOUTH GROOM RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,536.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	3,797.4 % Private: 0.0%	SS LM MA	**County:**	Lincoln
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Erigeron ovinus	Sheep fleabane	G2	Limited
A273	**SOUTH JUAB VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,855.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	9,526.2 % Private: 57.2%	BD SS LM RW	**County:**	Juab
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Astragalus diversifolius	Mesic milkvetch, meadow milkvetch	G3	Limited
	Penstemon tidestromii	Tidestrom beardtongue	G2G3	Peripheral
A274	**SOUTH MILFORD**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,883.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	9,595.8 % Private: 68.6%	BD SS LM RW	**County:**	Beaver
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Sclerocactus spinosior	Desert Valley fishhook-cactus	G2G3	Endemic
A275	**SOUTH PINE NUT MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	11,476.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	28,357.3 % Private: 33.5%	BD SS LM MA SD RW	**County:**	Douglas
TERR SYSTEMS	Altered andesite soils			
	Desert riparian shrubland and woodland			
	Low montane shrublands			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Montane meadow			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
PLANTS	Ivesia pityocharis	Pine Nut Mountains ivesia	G2	Endemic
INVERTEBRATES	Speyeria nokomis carsonensis	Carson Valley silverspot	G4T2	Limited
MAMMALS	Ursus americanus	Black bear	G5	Peripheral

A276 SOUTH RAILROAD VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** Tonopah; **State:** NV; **County:** Nye

Size Ha: 10,856.0 % Class 1 or 2: 0.0% Acres: 26,825.3 % Private: 0.0%

System Groups (2): BD

TERR SYSTEMS	Blackbrush-hopsage desert shrubland	
	Salt desert scrub	

A277 SOUTH RALSTON VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** Tonopah; **State:** NV; **County:** Nye

Size Ha: 3,762.4 % Class 1 or 2: 0.0% Acres: 9,296.9 % Private: 0.0%

System Groups (2): BD SD

TERR SYSTEMS	+ Salt desert scrub	
PLANTS	Astragalus pseudiodanthus	Tonopah milk-vetch

A278 SOUTH SEVIER LAKE — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Millard

Size Ha: 10,352.1 % Class 1 or 2: 0.0% Acres: 25,580.2 % Private: 2.5%

System Groups (2): BD SS SD

TERR SYSTEMS	Greasewood shrubland	
	Sagebrush semidesert	
	Salt desert scrub	
PLANTS	Cymopterus acaulis var. parvus	
	Eriogonum spathulatum var. natum	Son's wild buckwheat

A279 SOUTH WAH WAH MOUNTAINS — **Site Type:** LANDSCAPE SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Beaver

Size Ha: 51,836.1 % Class 1 or 2: 0.0% Acres: 128,087.1 % Private: 1.1%

System Groups (2): BD SS LM MA SD RW

TERR SYSTEMS	Montane riparian shrubland	
	Mountain sagebrush	
	Pinyon-juniper woodland	
	Sagebrush semidesert	
	Sagebrush steppe	
	Salt desert scrub	
	Semi-desert shrub steppe	
PLANTS	Ivesia shockleyi var. ostleri	Ostler's ivesia
	Penstemon concinnus	Tunnel spring beardtongue
	Sphaeralcea caespitosa	Jones globe-mallow
REPTILES	Lampropeltis pyromelana infralabialis	Utah mountain kingsnake
BIRDS	Amphispiza belli	Sage Sparrow

Global Rank	Ecoregional Distribution
G3G4T1	Endemic
G3	Endemic
G3	Endemic
G5T3	Unknown
G5	Widespread, declining

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
BIRDS	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Buteo swainsoni	Swainson's Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread

A280 SOUTH WASSUK RANGE

Site Type: LANDSCAPE SITE
Section: California
State: NV
County: Mineral

Size Ha: 49,189.4 % Class 1 or 2: 0.0%
Acres: 121,547.0 % Private: 14.0%

System Groups (2)
BD SS LM MA SD RW A

TERR SYSTEMS	Alpine herbaceous			
	Altered andesite soils			
	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Lakes			
	Permanent flowing waters			
PLANTS	Arabis bodiensis	Bodie Hills rock cress	G1,G2	Limited
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
	Penstemon rubicundus	Wassuk Beardtongue	G2G3	Endemic
INVERTEBRATES	Speyeria nokomis apacheana	Apache silverspot	G4T3	Endemic
	Thorybes mexicana blanca	White Mountains cloudy wing	G5T2	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
MAMMALS	Lepus townsendii	White-tailed jack rabbit	?	Widespread
	Ochotona princeps sspp.	Pika	G5T?	Limited?
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A281	**SPRING CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	6,214.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	15,355.0 % Private: 6.2%	BD SS A	**County:**	Pershing
TERR SYSTEMS	Sagebrush steppe			
	+ Salt desert scrub			
FISHES	Gila bicolor ssp. 9	Dixie Valley tui chub	G4T1	Endemic?
A282	**SPRING VALLEY CREEK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	4,034.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,970.1 % Private: 12.5%	SS LM A	**County:**	White Pine
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
FISHES	Relictus solitarius	Relict dace	G2G3	Endemic
A283	**SPRING VALLEY-HAMLIN VALLEY**		**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	47,966.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	118,526.0 % Private: 0.2%	BD SS LM	**County:**	Lincoln, White Pine
TERR SYSTEMS	Greasewood shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Lesquerella pendula	Hanging bladderpod	G2?	Endemic
	Penstemon concinnus	Tunnel spring beardtongue	G3	Endemic
REPTILES	Lampropeltis pyromelana infralabialis	Utah mountain kingsnake	G5T3	Unknown
BIRDS	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
A284	**SPRUCE MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	1,761.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,351.7 % Private: 19.6%	LM MA	**County:**	Elko
TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Mountain sagebrush			
	+ Pinyon-juniper woodland			
	Subalpine forest and woodland			
PLANTS	Draba cusickii var. pedicellata	Stalked cusick whitlowgrass	G4T3?	Endemic
A285	**SQUAW VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	10,390.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	25,675.3 % Private: 48.5%	BD SS SD RW A	**County:**	Elko
TERR SYSTEMS	Freshwater marsh			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Sagebrush steppe			
	Semi-desert shrub steppe			
AQ SYSTEMS	Medium-size runoff-fed stream			
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
MAMMALS	Lutra canadensis nexa	Humboldt River otter	?	Limited

A286 STANSBURY MOUNTAINS — **Site Type:** LANDSCAPE SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Tooele

Size Ha: 38,246.0 % Class 1 or 2: 26.8% Acres: 94,505.9 % Private: 7.3%

System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Permanent flowing waters			
G1G2 ASSOCATIONS	Amelanchier utahensis - Cercocarpus montanus shrubland		G2	Widespread
	Populus fremontii - Acer negundo forest		G2Q	Peripheral
PLANTS	Cymopterus acaulis var. parvus		G5T2T3	Endemic
	Potentilla cottamii	Cottam's cinquefoil	G1	Limited
INVERTEBRATES	Oreohelix eurekensis	Eureka mountainsnail	G1	Unknown
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Otus flammeolus	Flammulated Owl	G4	Widespread

A287 STEPTOE VALLEY — UNIQUE SITE (1) — **Site Type:** LANDSCAPE SITE; **Section:** North Central; **State:** NV; **County:** White Pine, Elko

Size Ha: 123,620.8 % Class 1 or 2: 0.0% Acres: 305,467.0 % Private: 11.6%

System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Permanent standing waters			
	Small-size runoff-fed stream			
	Small-size spring and outflow springbrook			
	Small-size spring and outflow stream, thermal spring and springbrook			
PLANTS	Castilleja salsuginosa	Monte Neva paintbrush	G1Q	Endemic
	Draba cusickii var. pedicellata	Stalked cusick whitlowgrass	G4T3?	Endemic
	Draba pennellii	Pennell draba	G2	Endemic
	Eriogonum kingii	King buckwheat	G3?	Endemic
	Silene nachlingerae	Nachlinger catchfly	G2	Endemic
INVERTEBRATES	Andrena raveni	(Bee)	G2	Limited
	Cercyonis pegala pluvialis	White River wood nymph	G5T2	Endemic
	Phyciodes batesii arenacolor	Steptoe Valley crescentspot	G5T1	Endemic
	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
MOLLUSKS	Eremopyrgus eganensis	Steptoe hydrobe	G1	Endemic
	Pyrgulopsis landyei	Landyes springsnail	G1	Endemic
	Pyrgulopsis neritella	Neritiform Steptoe Ranch springsnail	G1	Endemic
	Pyrgulopsis orbiculata	Sub-globose Steptoe Ranch springsnail	G1	Endemic
	Pyrgulopsis planulata	Flat-topped Steptoe springsnail	G1	Endemic
	Pyrgulopsis serrata	Northern Steptoe springsnail	G1	Endemic
	Pyrgulopsis sulcata	Southern Steptoe springsnail	G1	Endemic
FISHES	Oncorhynchus clarki utah	Bonneville cutthroat trout	G4T2	Endemic?
	Relictus solitarius	Relict dace	G2G3	Endemic
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Ixobrychus exilis	Least Bittern	G5	Peripheral
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
A288	**STILLWATER RANGE -DIXIE VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	17,441.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	43,097.1 % Private: 0.6%	BD LM MA RW	**County:**	Churchill
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Low montane shrublands			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Salt desert scrub			
	Wet meadow			
PLANTS	Penstemon palmeri var. macranthus		G5T2?	Endemic

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A289	**STONE CABIN VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,812.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,477.6 % Private: 0.0%	BD SD	**County:**	Nye
TERR SYSTEMS	+ Salt desert scrub			
PLANTS	Penstemon arenarius	Nevada dune beardtongue	G2G3	Endemic
A290	**STONEBERGER BASIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	13,204.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	32,629.3 % Private: 0.1%	SS LM MA RW A	**County:**	Nye, Lander
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Permanent flowing waters			
PLANTS	Eriogonum esmeraldense var. toiyabense	Toiyabe buckwheat	G4T2	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
MAMMALS	Lagurus curtatus	Sagebrush vole	G5	Endemic or Limited
A291	**STONEWALL MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	4,810.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	11,885.7 % Private: 0.7%	BD SS LM A	**County:**	Nye
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
AQ SYSTEMS	Small-size spring and outflow stream, cold spring and springbrook			
PLANTS	Penstemon pahutensis	Pahute Mesa beardtongue	G3	Limited
MAMMALS	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
A292	**SUGARLOAF KNOB**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	10,457.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	25,840.7 % Private: 0.2%	BD	**County:**	Humboldt
TERR SYSTEMS	Greasewood shrubland			
	Salt desert scrub			
A293	**SULLIVAN SPRING**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,796.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,439.7 % Private: 8.0%	SS LM MA RW A	**County:**	Eureka
TERR SYSTEMS	Montane riparian shrubland			

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Mountain sagebrush			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
MOLLUSKS	Pyrgulopsis pellita	Antelope Valley springsnail	G1	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining

A294 SULPHUR — **Site Type:** FUNCTIONAL SITE; **Section:** Lahontan Basin; **State:** NV; **County:** Pershing, Humboldt

Size Ha: 3,813.0 % Class 1 or 2: 0.0% — Acres: 9,421.8 % Private: 0.3% — System Groups (2): BD SS

TERR SYSTEMS	Greasewood shrubland	
	+ Salt desert scrub	
PLANTS	Caulanthus barnebyi	Barneby stemflower

A295 SULPHURDALE — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Beaver

Size Ha: 1,974.7 % Class 1 or 2: 0.0% — Acres: 4,879.5 % Private: 30.4% — System Groups (2): BD SS LM MA RW

TERR SYSTEMS	Montane riparian shrubland	
	Mountain sagebrush	
	+ Pinyon-juniper woodland	
	+ Sagebrush steppe	
	Semi-desert shrub steppe	
PLANTS	Cymopterus purpureus var. jonesii	

A296 SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER — **Site Type:** LANDSCAPE SITE; **Section:** North Central; **State:** NV; **County:** Elko

Size Ha: 23,715.9 % Class 1 or 2: 0.0% — Acres: 58,602.0 % Private: 39.5% — System Groups (2): BD SS SD RW A

TERR SYSTEMS	Desert riparian shrubland and woodland	
	Freshwater marsh	
	Sagebrush semidesert	
	Sagebrush steppe	
	Salt desert scrub	
	Semi-desert shrub steppe	
	Wet meadow	
AQ SYSTEMS	Lakes	
	Medium-size runoff-fed stream	
	Small-size spring and outflow stream, hot spring and springbrook	
INVERTEBRATES	Capnura intermontana	Common winter stonefly
BIRDS	Circus cyaneus	Northern Harrier
	Falco mexicanus	Prairie Falcon
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat

A297 SWAN LAKE SALT MARSH — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Millard

Size Ha: 3,831.5 % Class 1 or 2: 0.0% — Acres: 9,467.6 % Private: 0.9% — System Groups (2): BD RW

TERR SYSTEMS	Desert riparian shrubland and woodland	

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	+ Salt desert scrub			
BIRDS	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
A298	**SWASEY MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,713.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	9,175.3 % Private: 0.0%	LM MA A	**County:**	Millard
TERR SYSTEMS	Montane forest and woodland			
	Pinyon-juniper woodland			
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
	Pyrgulopsis peculiaris	Bifid duct springsnail	G?,G2?	Endemic
A299	**SWEETWATER MOUNTAINS**		**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	114,555.0 % Class 1 or 2: 1.3%	System Groups (2)	**State:**	CA, NV
Acres:	283,065.5 % Private: 9.5%	SS LM MA SD RW A	**County:**	Mono, Lyon, Douglas
TERR SYSTEMS	Alpine herbaceous			
	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Lakes			
	Permanent flowing waters			
	Small-size runoff-fed stream			
PLANTS	Arabis bodiensis	Bodie Hills rock cress	G1,G2	Limited
	Astragalus oophorus var. lavinii	Lavin eggvetch	G4T2	Endemic
	Cusickiella quadricostata	Bodie Hills cusickiella, Bodie Hills draba	G3	Endemic
	Plagiobothrys glomeratus	Altered andesite popcorn-flower	G2G3	Limited
	Polemonium chartaceum	Mason's sky pilot, White Mountain skypilot	G1	Endemic
	Polyctenium williamsiae	Williams combleaf	G2	Limited
	Streptanthus oliganthus	Masonic Mountain jewel-flower	G3	Limited
MOLLUSKS	Pyrgulopsis owensensis	Owens Valley springsnail	G1G2,G1	Endemic
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4 T3	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
MAMMALS	Ursus americanus	Black bear	G5	Peripheral

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A300	**TABLE GROUNDS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	3,844.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	9,500.7 % Private: 41.0%	SS LM MA RW	**County:**	Beaver
TERR SYSTEMS	Montane forest and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Cymopterus purpureus var. jonesii		G5T2T3	Limited
A301	**TELEGRAPH PEAK**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	3,955.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,772.7 % Private: 3.3%	LM MA RW	**County:**	White Pine
TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
PLANTS	Silene nachlingerae	Nachlinger catchfly	G2	Endemic
A302	**THE COVE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,890.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,670.8 % Private: 35.8%	BD SS LM	**County:**	Juab, Millard
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Semi-desert shrub steppe			
PLANTS	Cymopterus coulteri	Coulter biscuitroot	G3	Limited
A303	**THE NARROWS**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	1,746.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,315.5 % Private: 0.0%	SS LM A	**County:**	Elko
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
FISHES	Relictus solitarius	Relict dace	G2G3	Endemic
A304	**THE WALL**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	3,581.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	8,848.7 % Private: 0.0%	BD SS	**County:**	Nye
TERR SYSTEMS	Greasewood shrubland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
	+ Salt desert scrub			
PLANTS	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A305	**THERMAL HOT SPRINGS-ESCALANTE DESERT**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	24,271.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	59,975.7 % Private: 17.0%	BD SS LM RW A	**County:**	Beaver, Iron
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Small-size spring and outflow stream, hot spring and springbrook			
A306	**THORNE DUNE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	10,059.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	24,857.9 % Private: 0.2%	BD SS SD	**County:**	Mineral
TERR SYSTEMS	Greasewood shrubland			
	Sagebrush steppe			
	Salt desert scrub			
PLANTS	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited
INVERTEBRATES	Aegialia spinosa	(Scarab beetle)	?	Limited
	Chilometopon pallidium	(Sand obligate beetle)	?	Limited
	Edrotes ventricosus	(Sand obligate beetle)	?	Limited
	Eusattus muricatus	(Sand obligate beetle)	?	Widespread, specialist
	Lariversius tibalis	(Sand obligate beetle)	?	Limited
	Mecynotarsus delicatulus	(Sand obligate beetle)	?	Limited
	Niptus ventriculus	(Sand obligate beetle)	?	Limited
	Philothris ssp. nov.	(Predatory beetle)	?	Limited
	Rhadine myrmecodes	(Sand obligate beetle)	?	Limited
	Tetragonoderus pallidus	(Sand obligate beetle)	?	Limited
	Trogloderus costatus		?	Limited
A307	**THOUSAND SPRINGS CREEK HOT SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	4,158.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	10,276.4 % Private: 68.8%	BD SS	**County:**	Elko
TERR SYSTEMS	+ Sagebrush semidesert			
	Sagebrush steppe			
INVERTEBRATES	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
A308	**TINTIC MOUNTAINS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,063.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	24,866.9 % Private: 21.4%	SS LM MA RW A	**County:**	Utah, Tooele, Juab
TERR SYSTEMS	Bitterbrush shrubland			
	Montane forest and woodland			

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

+ Indicates that the terrestrial system present would need a greater extent beyond the site to be a viable patch size.

Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
AQ SYSTEMS	Montane lake			
	Small-size spring and outflow springbrook			

A309 TOD PARK — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Tooele

Size Ha: 1,798.9 % Class 1 or 2: 0.0% — Acres: 4,445.1 % Private: 56.7% — System Groups (2): BD SS LM RW

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
INVERTEBRATES	Andrena raveni	(Bee)	G2	Limited

A310 TOIYABE RANGE-BIG SMOKY VALLEY — UNIQUE SITE (1) — **Site Type:** LANDSCAPE SITE; **Section:** Central Mountains; **State:** NV; **County:** Nye, Lander

Size Ha: 205,734.1 % Class 1 or 2: 23.7% — Acres: 508,369.1 % Private: 3.2% — System Groups (2): BD SS LM MA SD RW A

TERR SYSTEMS	Alpine herbaceous			
	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Permanent flowing waters			
G1G2 ASSOCATIONS	Betula occidentalis - Cornus sericea shrubland		G2G3	Widespread
	Salix geyeriana - Mesic graminoids shrubland		G2G3	Widespread
PLANTS	Agastache cusickii	Cusick hyssop	G3	Peripheral
	Arabis ophira	Ophir rockcress	G1G2	Endemic
	Cymopterus goodrichii	Goodrich biscuitroot	G1	Endemic
	Draba arida	Desert whitlowgrass	G2	Endemic

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
PLANTS	Draba oreibata var. serpentina	Snake Range whitlowgrass	G4T1	Endemic
	Eriogonum esmeraldense var. toiyabense	Toiyabe buckwheat	G4T2	Endemic
	Eriogonum ovalifolium var. caelestinum	Heavenly buckwheat	G5T2T3	Endemic
	Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited
	Smelowskia holmgrenii	Holmgren smelowskia	G2	Endemic
	Tonestus alpinus	Alpine tonestus	G2	Endemic
	Trifolium rollinsii	Rollins clover	G2G3Q	Endemic
INVERTEBRATES	Cercyonis oetus alkalorum	Big Smoky wood nymph	G5T1	Endemic
	Euphydryas editha koreti	Koret's checkerspot	G5T1Q	Endemic
	Ochlodes yuma lutea	Great Basin yuma skipper	G3T2T3	Limited
	Oreohelix hemphilii	White Pine mountainsnail	?	Endemic
	Polites sabuleti basinensis	Pallid skipper	G5T2	Unknown
	Pseudocopaeodes eunus flavus	Nevada alkali skipperling	G3T2	Endemic
FISHES	Gila bicolor ssp. 10	Charnock springs tui chub	G4TH	Endemic
	Gila bicolor ssp. 8	Big Smoky Valley tui chub	G4T1	Endemic
	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
	Rhinchthys osculus robustus	Lahontan speckled dace	?	Endemic
	Rhinichthys osculus lariversi	Big Smoky Valley speckled dace	G5T1	Endemic
AMPHIBIANS	Rana luteiventris ssp.	Toiyabe spotted frog	G4T?	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
	Spizella breweri	Brewer's Sparrow	G5	Widespread
MAMMALS	Brachylagus idahoensis	Pygmy rabbit	G5	Limited
	Ochotona princeps sspp.	Pika	G5T?	Limited?
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited

A311 TONOPAH SUMMIT — **Site Type:** FUNCTIONAL SITE; **Section:** Tonopah; **State:** NV; **County:** Esmeralda

Size Ha: 1,838.6 % Class 1 or 2: 0.0% — Acres: 4,543.1 % Private: 13.3%

System Groups (2): BD SS

TERR SYSTEMS	+ Sagebrush semidesert		
	+ Salt desert scrub		
PLANTS	Sclerocactus nyensis	Tonopah fishhook cactus	G1Q	Endemic

A312 TOOELE VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Tooele

Size Ha: 3,979.6 % Class 1 or 2: 0.0% — Acres: 9,833.6 % Private: 60.5%

System Groups (2): BD SS LM MA RW

TERR SYSTEMS	Mountain sagebrush		
	Pinyon-juniper woodland		
	+ Sagebrush semidesert		
	Semi-desert shrub steppe		

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
A313	**TOPAZ MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	2,098.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	5,185.3 % Private: 0.0%	BD SS LM	**County:**	Juab
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Sclerocactus spinosior	Desert Valley fishhook-cactus	G2G3	Endemic
A314	**TOPIER CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,709.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,223.0 % Private: 1.2%	BD SS LM SD RW	**County:**	Nye
TERR SYSTEMS	Desert riparian shrubland and woodland			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Lasiurus cinereus	Hoary bat	G5	Widespread, declining
A315	**TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE** UNIQUE SITE (1)		**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	396,229.9 % Class 1 or 2: 14.2%	System Groups (2)	**State:**	NV
Acres:	979,084.1 % Private: 1.8%	BD SS LM MA SD RW A	**County:**	Nye, Lander, Eureka
TERR SYSTEMS	Alpine herbaceous			
	Blackbrush-hopsage desert shrubland			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Permanent flowing waters			
	Small-size spring and outflow springbrook			
	Small-size spring and outflow stream, hot spring and springbrook			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic

(1) Unique sites are irreplaceable. They harbor the one and only occurrence of at least one globally restricted conservation target.

(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
PLANTS	Astragalus calycosus var. monophyllidius	One-leaflet torrey milkvetch	G5T2	Endemic
	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
	Astragalus toquimanus	Toquima milkvetch	G2	Endemic
	Draba arida	Desert whitlowgrass	G2	Endemic
	Eriogonum esmeraldense var. toiyabense	Toiyabe buckwheat	G4T2	Endemic
	Eriogonum ovalifolium var. caelestinum	Heavenly buckwheat	G5T2T3	Endemic
	Ivesia kingii var. kingii	Alkali ivesia	G3T2	Limited
	Lepidium nanum	Dwarf peppergrass	G3	Endemic
	Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic
	Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited
	Penstemon barnebyi	Barneby's beardtongue	G3	Endemic
	Smelowskia holmgrenii	Holmgren smelowskia	G2	Endemic
	Tonestus alpinus	Alpine tonestus	G2	Endemic
INVERTEBRATES	Andrena chrylismiae	(Bee)	G1	Endemic
	Andrena nevadae	(Bee)	G1	Endemic
	Andrena raveni	(Bee)	G2	Limited
	Perdita bohartorum	(Bee)	?	Limited
	Perdita leucostoma	(Bee)	?	Limited
	Polites sabuleti basinensis	Pallid skipper	G5T2	Unknown
	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
MOLLUSKS	Pyrgulopsis sterilis	Sterile Basin springsnail	G1	Endemic
	Tryonia monitorae	Monitor Valley tryonia	G1	Endemic
FISHES	Crenichthys nevadae	Railroad Valley springfish	G2	Endemic
	Gila bicolor ssp. 6	Little Fish Lake Valley tui chub	G4T1	Endemic?
	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
	Rhinichthys osculus	Monitor Valley speckled dace	G5T1	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Buteo regalis	Ferruginous Hawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Lanius ludovicianus	Loggerhead Shrike	G5	Widespread, declining
	Larus californicus	California Gull	G5	Disjunct, colonial
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
	Recurvirostra americana	American Avocet	G5	Widespread, migratory concentration
	Spizella breweri	Brewer's Sparrow	G5	Widespread
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining
	Myotis thysanodes	Fringed myotis	G5	Widespread, declining
	Ochotona princeps sspp.	Pika	G5T?	Limited?

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
MAMMALS	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
A316	**TRAIL CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,743.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,308.1 % Private: 7.2%	BD SS RW A	**County:**	Nye
TERR SYSTEMS	Freshwater marsh			
	+ Greasewood shrubland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
	+ Salt desert scrub			
FISHES	Gila bicolor ssp. 8	Big Smoky Valley tui chub	G4T1	Endemic
A317	**TULE VALLEY**		**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	5,992.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	14,807.5 % Private: 0.0%	BD LM MA RW A	**County:**	Millard
TERR SYSTEMS	Freshwater marsh			
	Greasewood shrubland			
	+ Salt desert scrub			
	Wet meadow			
AQ SYSTEMS	Small-size spring and outflow springbrook			
PLANTS	Penstemon patricus	Dad's penstemon	G2Q	Endemic
INVERTEBRATES	Pteronarcys priinceps		?	Peripheral
FISHES	Oncorhynchus clarki utah	Bonneville cutthroat trout	G4T2	Endemic?
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Otus flammeolus	Flammulated Owl	G4	Widespread
A318	**TUNGSTONIA**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,924.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,756.3 % Private: 0.0%	BD SS LM MA	**County:**	White Pine
TERR SYSTEMS	Low montane shrublands			
	Montane forest and woodland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Cymopterus basalticus	Dolomite spring-parsley, intermountain wavewing	G2,G2G3	Endemic
A319	**TUNNEL SPRING MOUNTAINS-HALFWAY HILLS-PINE VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	64,307.6 % Class 1 or 2: 1.2%	System Groups (2)	**State:**	UT
Acres:	158,904.1 % Private: 2.0%	BD SS LM MA SD A	**County:**	Millard, Beaver, White Pine
TERR SYSTEMS	Greasewood shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Ephemeral standing waters			
PLANTS	Atriplex bonnevillensis		G2G3Q	Endemic
	Castilleja scabrida var. barnebyana	Barneby's paintbrush	G4T?	Endemic
	Cryptantha compacta	Mound cryptanth	G1	Endemic
	Cymopterus basalticus	Dolomite spring-parsley, intermountain wavewing	G2,G2G3	Endemic
	Ericameria cervina	Antelope goldenbush	G3?	Limited
	Eriogonum batemanii var. eremicum	Desert wild buckwheat	G4?T2T3	Endemic
	Ivesia shockleyi var. ostleri	Ostler's ivesia	G3G4T1	Endemic
	Lesquerella goodrichii	Goodrich bladderpod	G2G4	Endemic
	Machaeranthera grindelioides var. depressa		G5T3T4	Limited
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
	Penstemon concinnus	Tunnel spring beardtongue	G3	Endemic
	Penstemon humilis var. deserticus	Desert beardtongue	G5T2?	Endemic
	Penstemon nanus	Low beardtongue	G3	Endemic
	Sphaeralcea caespitosa	Jones globe-mallow	G3	Endemic
	Trifolium friscanum	Frisco clover	G1	Endemic
MOLLUSKS	Pyrgulopsis anguina	Longitudinal gland springsnail	G1	Endemic
	Pyrgulopsis peculiaris	Bifid duct springsnail	G?,G2?	Endemic
FISHES	Catostomus clarki	Desert sucker	G3G4	Widespread

A320 UPPER HUMBOLDT RIVER-LOWER MARYS RIVER

Site Type: LANDSCAPE SITE
Section: North Central
State: NV
County: Elko

Size Ha: 65,692.6 % Class 1 or 2: 0.0%
Acres: 162,326.4 % Private: 31.1%

System Groups (2)
BD SS LM MA RW A

TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Lakes			
	Permanent flowing waters			
G1G2 ASSOCATIONS	Leymus cinereus herbaceous vegetation [provisional]		G2G3Q	Widespread
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Phalaropus tricolor	Wilson's Phalarope	G5	Widespread, migratory concentration
MAMMALS	Lutra canadensis nexa	Humboldt River otter	?	Limited
	Sorex preblei	Preble's shrew	G4	Unknown

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A321	**UPPER ROCK CREEK**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	32,151.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	79,445.4 % Private: 52.8%	BD SS LM MA SD RW A	**County:**	Elko
TERR SYSTEMS	Montane riparian shrubland			
	Sagebrush steppe			
AQ SYSTEMS	Medium-size runoff-fed stream			
	Permanent flowing waters			
	Small-size runoff-fed stream			
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
MAMMALS	Ovis canadensis californiana	California bighorn sheep	G4T1	Limited
A322	**UPPER WHITE RIVER**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	11,748.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	29,030.6 % Private: 9.8%	SS LM MA RW A	**County:**	White pine
TERR SYSTEMS	Pinyon-juniper woodland			
	Sagebrush semidesert			
FISHES	Catostomus clarki intermedius	White River Desert sucker	G3G4T1T2Q	Endemic
	Rhinichthys osculus ssp. 7	White River speckled dace	G5T2T3	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
A323	**URSINE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	4,251.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	10,505.2 % Private: 4.3%	SS LM RW A	**County:**	Lincoln
TERR SYSTEMS	Montane riparian shrubland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
FISHES	Catostomus clarki ssp. 2	Meadow Valley Wash Desert sucker	G3G4T2	Endemic
	Rhinichthys osculus ssp. 2 mv	Meadow Valley speckled dace	G5T2	Limited
A324	**UTAH LAKE**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Bonneville Basin
Size Ha:	71,914.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	177,700.1 % Private: 40.9%	BD SS LM MA RW A	**County:**	Utah, Tooele, Juab
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			

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(2) System Designations: (BD) Basins and Desert Scrub; (SS) Sagebrush Semidesert; (LM) Lower Montane; (MA) Montane to Alpine; (SD) Sand Dunes and Badlands; (RW)Riparian and Wetlands; and (A) Aquatics.

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
TERR SYSTEMS	Salt desert scrub			
	Semi-desert shrub steppe			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Lakes			
	Medium-size runoff-fed stream			
	Slightly alkaline terminal lake			
PLANTS	Spiranthes diluvialis	Ute ladies' tresses	G2	Disjunct, declining
INVERTEBRATES	Hydroporus utahensis	Utah Hydroporus diving beetle	G1	Endemic
MOLLUSKS	Anodonta californiensis	California floater	G3G4	Widespread, declining
FISHES	Chasmistes liorus	June sucker	G1	Endemic
BIRDS	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration
	Ixobrychus exilis	Least Bittern	G5	Peripheral
	Numenius americanus	Long-Billed Curlew	G5	Widespread, declining
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
A325	**UVADA**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,746.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV, UT
Acres:	4,314.7 % Private: 15.1%	SS LM	**County:**	Lincoln, Iron
TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
PLANTS	Astragalus convallarius var. finitimus	Lesser rushy milkvetch	G5T3	Endemic
	Astragalus oophorus var. lonchocalyx	Pink egg milkvetch, long-calyx eggvetch	G4T2	Endemic
A326	**VALLEY MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	13,031.8 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	32,201.7 % Private: 1.8%	BD SS LM	**County:**	Elko
TERR SYSTEMS	Greasewood shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
A327	**VERNON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	17,327.2 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	42,815.5 % Private: 28.2%	BD SS LM MA SD RW A	**County:**	Tooele
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Semi-desert shrub steppe			

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
AQ SYSTEMS	Permanent flowing waters			
	Small-size runoff-fed stream			
PLANTS	Astragalus lentiginosus var. pohlii	Pohl milkvetch	G5T1	Endemic
INVERTEBRATES	Anthophora affabilis	(Bee)	?	Limited
A328	**VIRGINIA RANGE**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	42,457.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	104,912.1 % Private: 84.9%	BD SS LM MA SD RW	**County:**	Storey, Washoe
TERR SYSTEMS	Altered andesite soils			
	Bitterbrush shrubland			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
PLANTS	Astragalus convallarius var. margaretiae	Margaret rushy milkvetch	G5T2	Endemic
	Eriogonum ovalifolium var. williamsiae	Steamboat buckwheat	G5T1	Endemic
	Eriogonum robustum	Altered andesite buckwheat	G2G3Q	Limited
	Ivesia aperta var. aperta	Sierra Valley ivesia	G2T2	Peripheral or Limited
	Mimulus ovatus	Steamboat monkeyflower	G2G3Q	Endemic
	Plagiobothrys glomeratus	Altered andesite popcorn-flower	G2G3	Limited
	Polyctenium williamsiae	Williams combleaf	G2	Limited
INVERTEBRATES	Andrena chrylismiae	(Bee)	G1	Endemic
	Andrena raveni	(Bee)	G2	Limited
	Colletes xerophilus cismontanus	(Bee)	?	Disjunct
	Euphilotes enoptes aridorum	Peavine blue	G5T1	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Guiraca caerulea	Blue Grosbeak	G5	Peripheral
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Melanerpes lewis	Lewis's Woodpecker	G5	Widespread, declining
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Stellula calliope	Calliope Hummingbird	G5	Widespread
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
A329	**WAH WAH SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,677.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,143.9 % Private: 32.4%	BD SS LM RW	**County:**	Beaver
TERR SYSTEMS	Desert riparian shrubland and woodland			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Eriogonum batemanii var. eremicum	Desert wild buckwheat	G4?T2T3	Endemic

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A330	**WAH WAH WASH**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,767.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	4,367.1 % Private: 0.7%	BD SD	**County:**	Beaver
TERR SYSTEMS	+ Greasewood shrubland			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Eriogonum soredium	Frisco buckwheat	G1	Endemic
A331	**WALKER LAKE-WALKER RIVER**		**Site Type:**	LANDSCAPE SITE
			Section:	Lahontan Basin
Size Ha:	94,459.8 % Class 1 or 2: 2.9%	System Groups (2)	**State:**	NV, CA
Acres:	233,410.2 % Private: 29.7%	BD SS LM MA SD RW A	**County:**	Lyon, Mineral, Mono
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Low montane shrublands			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
AQ SYSTEMS	Lakes			
PLANTS	Oryctes nevadensis	Nevada oryctes	G2,G2G3	Limited
INVERTEBRATES	Calliopsis filiorum	(Bee)	G1	Endemic
FISHES	Oncorhynchus clarki henshawi	Lahontan cutthroat trout	G4T2,T3,G4T3	Limited
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Aythya americana	Redhead	G5	Widespread, migratory concentration
	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
	Plegadis chihi	White-Faced Ibis	G5	Widespread, migratory concentration
	Podiceps auritus	Eared Grebe	G5	Widespread, migratory concentration
MAMMALS	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
	Ursus americanus	Black bear	G5	Peripheral
A332	**WARD MOUNTAIN**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	12,808.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	31,650.7 % Private: 8.6%	SS LM MA RW	**County:**	White Pine
TERR SYSTEMS	Alpine herbaceous			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
	Subalpine forest and woodland			
PLANTS	Astragalus lentiginosus var. latus	Broad-pod freckled milkvetch	G5T1	Endemic

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
PLANTS	Lewisia maguirei	Maguire bitterroot	G1	Endemic
	Penstemon leiophyllus var. francisci-pennellii	Pennell beardtongue	G3T2	Endemic
REPTILES	Phrynosoma hernandesi	Mountain short-horned lizard	G3	Endemic
A333	**WARM SPRINGS**	UNIQUE SITE (1)	**Site Type:**	FUNCTIONAL SITE
			Section:	North Central
Size Ha:	1,736.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,290.6 % Private: 51.7%	SS LM RW A	**County:**	Elko
TERR SYSTEMS	Freshwater marsh			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
FISHES	Gila bicolor isolata	Independence Valley tui chub	G4T1	Endemic
	Rhinichthys osculus lethoporus	Independence Valley speckled dace	G5T1	Endemic
A334	**WARM SPRINGS VALLEY**		**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	25,542.4 % Class 1 or 2: 0.1%	System Groups (2)	**State:**	NV
Acres:	63,115.3 % Private: 17.6%	BD SS LM RW A	**County:**	Washoe
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Ephemeral standing waters			
G1G2 ASSOCATIONS	Purshia tridentata - Artemisia tridentata ssp. tridentata shrubland		G1?	Limited
PLANTS	Silene nuda var. nuda	Naked catchfly	G3T1T2Q	Endemic
INVERTEBRATES	Pseudocopaeodes eunus obscurus	Carson alkali skipperling	G3T1	Endemic
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
A335	**WASATCH FRONT DRAPER**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	7,813.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	19,307.1 % Private: 74.8%	BD LM MA SD RW A	**County:**	Salt Lake
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Pinyon-juniper woodland			
	+ Salt desert scrub			
PLANTS	Jamesia americana var. macrocalyx	Wasatch jamesia	G5T2	Limited
	Penstemon platyphyllus	Broadleaf penstemon	G2G3	Peripheral
MOLLUSKS	Fluminicola sp 21	Bonneville Basin pebblesnail	G2	Limited?
A336	**WASATCH FRONT PROVO-SPRINGVILLE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	9,890.7 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	24,440.0 % Private: 54.9%	LM MA SD RW A	**County:**	Utah, Tooele, Juab
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Pinyon-juniper woodland			
PLANTS	Jamesia americana var. macrocalyx	Wasatch jamesia	G5T2	Limited

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
FISHES	Chasmistes liorus	June sucker	G1	Endemic
	Iotichthys phlegethontis	Least chub	G1	Limited
BIRDS	Falco peregrinus	Peregrine Falcon	G4,G3	Widespread
	Pelecanus erythrorhynchos	American White Pelican	G3	Widespread, migratory concentration
MAMMALS	Euderma maculatum	Spotted bat	G4	Unknown
	Lasiurus blossevillii	Western red bat	G5	Unknown
A337	**WASATCH FRONT SALT LAKE CITY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	11,901.1 % Class 1 or 2: 10.9%	System Groups (2)	**State:**	UT
Acres:	29,407.6 % Private: 60.3%	LM SD RW A	**County:**	Salt Lake
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Pinyon-juniper woodland			
AQ SYSTEMS	Permanent flowing waters			
PLANTS	Cypripedium calceolus ssp. parviflorum	Small yellow lady's-slipper	G5T?	Widespread, declining
	Penstemon platyphyllus	Broadleaf penstemon	G2G3	Peripheral
MOLLUSKS	Pyrgulopsis kolobensis	Toquerville springsnail	G?	Limited
FISHES	Chasmistes liorus	June sucker	G1	Endemic
	Iotichthys phlegethontis	Least chub	G1	Limited
A338	**WELLINGTON HILLS**		**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	15,658.4 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	38,692.0 % Private: 7.9%	SS LM MA RW A	**County:**	Lyon, Douglas
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Montane forest and woodland			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
PLANTS	Astragalus oophorus var. lavinii	Lavin eggvetch	G4T2	Endemic
	Cusickiella quadricostata	Bodie Hills cusickiella, Bodie Hills draba	G3	Endemic
INVERTEBRATES	Speyeria nokomis carsonensis	Carson Valley silverspot	G4T2	Limited
MOLLUSKS	Pyrgulopsis owensensis	Owens Valley springsnail	G1G2,G1	Endemic
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Empidonax wrightii	Gray Flycatcher	G5	Widespread
	Gymnorhinus cyanocephalus	Pinyon Jay	G5	Widespread, specialist
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Oreoscoptes montanus	Sage Thrasher	G5	Widespread
	Spizella breweri	Brewer's Sparrow	G5	Widespread
MAMMALS	Ursus americanus	Black bear	G5	Peripheral

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A339	**WEST CEDAR CITY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	1,593.9 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	3,938.5 % Private: 95.7%	BD SS LM RW	**County:**	Iron
TERR SYSTEMS	Montane riparian shrubland			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Semi-desert shrub steppe			
MAMMALS	Cynomys parvidens	Utah prairie dog	G1	Limited
A340	**WEST DEVILS GATE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,758.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,344.1 % Private: 9.0%	BD SS LM RW	**County:**	Eureka
TERR SYSTEMS	Montane riparian shrubland			
	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Sagebrush steppe			
INVERTEBRATES	Polites sabuleti nigrescens	Dark sandhill skipper	G5T2	Endemic
A341	**WEST GABBS VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	21,053.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	52,021.9 % Private: 0.0%	BD SD	**County:**	Mineral
TERR SYSTEMS	Greasewood shrubland			
	Salt desert scrub			
PLANTS	Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited
A342	**WEST GROOM RANGE**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	3,861.5 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	9,541.8 % Private: 0.0%	BD SS LM	**County:**	Lincoln
TERR SYSTEMS	Blackbrush-hopsage desert shrubland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Astragalus gilmanii	Gilman milkvetch	G3?	Limited
	Polygala heterorhyncha	Notch-beak milkwort	G3Q	Limited
A343	**WEST NORTHUMBERLAND CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Central Mountains
Size Ha:	1,727.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	4,267.5 % Private: 0.0%	BD SS SD	**County:**	Nye
TERR SYSTEMS	+ Greasewood shrubland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A344	**WEST STONE CABIN VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	1,612.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	3,984.8 % Private: 0.0%	BD SS	**County:**	Nye
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Sagebrush steppe			
PLANTS	Mentzelia candelariae	Candelaria blazing-star	G3?Q	Endemic
A345	**WHIRLWIND VALLEY**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	5,698.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	14,079.8 % Private: 0.0%	BD SS LM	**County:**	Millard
TERR SYSTEMS	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Sclerocactus spinosior	Desert Valley fishhook-cactus	G2G3	Endemic
A346	**WHITE MOUNTAINS**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	California
Size Ha:	273,555.2 % Class 1 or 2: 20.6%	System Groups (2)	**State:**	CA, NV
Acres:	675,955.0 % Private: 2.8%	BD SS LM MA SD RW A	**County:**	Mono, Esmeralda, Inyo, Mineral
TERR SYSTEMS	Alpine herbaceous			
	Clifflands			
	Desert riparian shrubland and woodland			
	Freshwater marsh			
	Greasewood shrubland			
	Joshua tree-mixed mojave scrub			
	Low montane shrublands			
	Montane forest and woodland			
	Montane meadow			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pickleweed flats			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
	Wet meadow			
AQ SYSTEMS	Ephemeral standing waters			
	Medium-size runoff-fed stream			
	Permanent flowing waters			
	Small-size runoff-fed stream			
PLANTS	Arabis dispar	Pinyon rock cress	G3	Limited
	Arabis pinzliae	Pinzl's rock cress	G1,G2	Limited
	Astragalus kentrophyta var. elatus	Spiny-leaved milk-vetch	G5T4	Endemic
	Astragalus pseudiodanthus	Tonopah milk-vetch	G2	Endemic
	Calochortus excavatus	Inyo County star-tulip	G3	Limited

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PLANTS	Cordylanthus tecopensis	Tecopa birdsbeak	G2	Limited
	Dedeckera eurekensis	July gold	G2	Peripheral
	Draba californica	California draba	G2G3	Endemic
	Draba monoensis	White Mountains draba	G1	Endemic?
	Draba subumbellata	White Mountains cushion draba	G2	Limited
	Eriogonum ampullaceum	Mono buckwheat	G3	Limited
	Eriogonum beatleyae	Beatley buckwheat	G2Q	Endemic
	Fimbristylis thermalis	Hot springs fimbristylis	G4?	Limited
	Hackelia brevicula	Poison Canyon stickseed	G2	Endemic
	Horkelia hispidula	White Mountains horkelia	G2	Endemic
	Opuntia pulchella	Beautiful cholla, sand cholla	G4	Endemic, declining
	Penstemon barnebyi	Barneby's beardtongue	G3	Endemic
	Phacelia monoensis	Mono County phacelia	G3,G3Q	Limited
	Poa abbreviata ssp. marshii	Marsh's blue grass	G5T2	Limited
	Polemonium chartaceum	Mason's sky pilot, White Mountain skypilot	G1	Endemic
	Polyctenium williamsiae	Williams combleaf	G2	Limited
	Potentilla morefieldii	Morefield's cinquefoil	G1	Endemic
	Streptanthus oliganthus	Masonic Mountain jewel-flower	G3	Limited
	Trifolium macilentum var. dedeckerae	Dedecker's clover	G?T2	Peripheral
INVERTEBRATES	Ashmeadiella rhodognatha	(Bee)	?	Disjunct
	Atoposmia panamintensis	(Bee)	?	Limited
	Bembix frommeri	(Wasp)	G1	Endemic
	Capnia hornigi	(Stonefly)	G1	Endemic
	Cardiophorus spp.	(Click beetle)	?	Limited
	Hesperia miriamae longaevicola	White Mountains skipper	G3T1	Endemic
	Icaricia icarioides albihalos	White Mountains icarioides blue	G5T1T2	Endemic
	Lycaena rubidus incanus	White Mountains ruddy copper	G5T1T2	Endemic
	Perdita cowaniae	(Bee)	?	Limited
	Perdita leucostoma	(Bee)	?	Limited
	Perdita nasuta galacticoptera	(Bee)	G1	Limited
	Perdita xerophila fuscicornis	(Bee)	G1	Limited
	Polites sabuleti albamontana	White Mountains sandhill skipper	G5T1	Endemic
MOLLUSKS	Pyrgulopsis owensensis	Owens Valley springsnail	G1G2,G1	Endemic
	Pyrgulopsis wongi	Wong's springsnail	G1G2	Endemic or Limited
FISHES	Cyprinodon radiosus	Owens pupfish	G1	Limited
	Gila bicolor ssp. 4	Fish Lake Valley tui chub	G4T1	Endemic
	Oncorhynchus clarki seleniris	Paiute cutthroat trout	G4T1T2	Limited
AMPHIBIANS	Bufo exsul	Black toad	G1	Endemic
REPTILES	Elgaria panamintina	Panamint alligator lizard	G1G2	Limited
BIRDS	Accipiter cooperii	Cooper's Hawk	G4	Widespread, declining
	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Amphispiza belli	Sage Sparrow	G5	Widespread, declining
	Baeolophus griseus	Juniper Titmouse	G5	Widespread
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Circus cyaneus	Northern Harrier	G5	Widespread, declining
	Falco mexicanus	Prairie Falcon	G5	Widespread
	Icteria virens	Yellow-Breasted Chat	G5	Peripheral
	Vermivora virginiae	Virginia's Warbler	G5	Widespread
MAMMALS	Antrozous pallidus	Pallid bat	G5	Widespread, declining
	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
MAMMALS	Euderma maculatum	Spotted bat	G4	Unknown
	Lagurus curtatus	Sagebrush vole	G5	Endemic or Limited
	Lasionycteris noctivagans	Silver-haired bat	G5	Widespread, declining
	Lasiurus blossevillii	Western red bat	G5	Unknown
	Lasiurus cinereus	Hoary bat	G5	Widespread, declining
	Microtus californicus vallicola	Owens valley vole	G5T1	Peripheral or Limited
	Ochotona princeps sspp.	Pika	G5T?	Limited?
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
	Sorex tenellus	Inyo shrew	G3G4	Limited
	Tadarida brasiliensis	Brazilian free-tailed bat	G5	Unknown
	Ursus americanus	Black bear	G5	Peripheral
A347	**WHITE PINE RANGE**		**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	47,769.8 % Class 1 or 2: 0.2%	System Groups (2)	**State:**	NV
Acres:	118,039.2 % Private: 4.0%	BD SS LM MA SD RW A	**County:**	White Pine
TERR SYSTEMS	Alpine herbaceous			
	Bitterbrush shrubland			
	Low montane shrublands			
	Montane forest and woodland			
	Montane riparian shrubland			
	Mountain mahogany woodlands			
	Mountain sagebrush			
	Pinyon-juniper woodland			
	Sagebrush steppe			
	Semi-desert shrub steppe			
	Subalpine forest and woodland			
AQ SYSTEMS	Permanent flowing waters			
PLANTS	Castilleja dissitiflora		G4?	Endemic
	Draba cusickii var. pedicellata	Stalked cusick whitlowgrass	G4T3?	Endemic
	Lesquerella goodrichii	Goodrich bladderpod	G2G4	Endemic
BIRDS	Accipiter gentilis	Northern Goshawk	G4	Widespread, declining
	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining
	Ovis canadensis nelsoni	Desert bighorn sheep	G4T3	Limited
A348	**WHITE RIVER VALLEY**	UNIQUE SITE (1)	**Site Type:**	LANDSCAPE SITE
			Section:	Central Mountains
Size Ha:	34,909.0 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	86,260.1 % Private: 18.4%	BD SS LM MA SD RW A	**County:**	White Pine, Nye
TERR SYSTEMS	Montane riparian shrubland			
	Pinyon-juniper woodland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
AQ SYSTEMS	Ephemeral standing waters			
PLANTS	Cryptantha welshii	White River catseye	G3	Endemic
	Frasera gypsicola	Sunnyside green gentian	G1	Endemic
	Phacelia parishii	Parish phacelia	G2G3	Limited

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Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
INVERTEBRATES	Cercyonis pegala pluvialis	White River wood nymph	G5T2	Endemic
	Hesperia uncas grandiosa	White River Valley skipper	G4G5T1	Endemic
	Ochlodes yuma lutea	Great Basin yuma skipper	G3T2T3	Limited
MOLLUSKS	Pyrgulopsis gracilis	Emigrant springsnail	G1	Endemic
	Pyrgulopsis marcida	Hardy springsnail	G2	Endemic
	Pyrgulopsis merriami	Pahranagat pebblesnail	G1	Endemic
	Pyrgulopsis sathos	White River Valley springsnail	G1G2	Endemic
FISHES	Catostomus clarki intermedius	White River Desert sucker	G3G4T1T2Q	Endemic
	Crenichthys baileyi albivallis	Preston White River springfish	G2T1	Endemic
	Crenichthys baileyi thermophilus	Moorman White River springfish	G2T1	Endemic
	Lepidomeda albivallis	White River spinedace	G1	Endemic
	Rhinichthys osculus ssp. 7	White River speckled dace	G5T2T3	Endemic
AMPHIBIANS	Rana pipiens ssp.	Northern leopard frog	G5T?	Endemic
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining
	Grus canadensis	Greater Sandhill Crane	G5	Widespread, migratory concentration

A349 WHITE ROCK MOUNTAINS — UNIQUE SITE (1) — **Site Type:** FUNCTIONAL SITE; **Section:** Central Mountains; **State:** NV, UT; **County:** Lincoln, Beaver

Size Ha: 8,421.1 % Class 1 or 2: 0.0% — Acres: 20,808.6 % Private: 0.0% — System Groups (2): SS LM MA A

TERR SYSTEMS	Montane forest and woodland			
	Mountain mahogany woodlands			
	Pinyon-juniper woodland			
AQ SYSTEMS	Permanent flowing waters			
PLANTS	Astragalus oophorus var. lonchocalyx	Pink egg milkvetch, long-calyx eggvetch	G4T2	Endemic
	Eriogonum phoenicium	Scarlet buckwheat	G1	Endemic
MOLLUSKS	Pyrgulopsis hamlinensis	Hamlin Valley springsnail	G1	Endemic
REPTILES	Phrynosoma hernandesi	Mountain short-horned lizard	G3	Endemic
BIRDS	Centrocercus urophasianus	Sage Grouse	G5	Widespread, declining

A350 WHITE SAGE FLAT — **Site Type:** FUNCTIONAL SITE; **Section:** Central Mountains; **State:** NV; **County:** Lander

Size Ha: 2,045.9 % Class 1 or 2: 0.0% — Acres: 5,055.4 % Private: 0.0% — System Groups (2): BD SS LM

TERR SYSTEMS	Greasewood shrubland			
	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
PLANTS	Arabis falcifructa	Elko rockcress	G1G2	Peripheral

A351 WHITE SAGE VALLEY — **Site Type:** FUNCTIONAL SITE; **Section:** Bonneville Basin; **State:** UT; **County:** Millard

Size Ha: 1,861.3 % Class 1 or 2: 0.0% — Acres: 4,599.2 % Private: 0.0% — System Groups (2): BD SS LM

TERR SYSTEMS	+ Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	+ Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Cymopterus basalticus	Dolomite spring-parsley, intermountain wavewing	G2,G2G3	Endemic

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Appendix 10: Great Basin Portfolio Sites and their Attributes.

Type	Scientific Name	Common Name	Global Rank	Ecoregional Distribution
A352	**WILD ISLE-GREAT SALT LAKE DESERT SAND DUNES**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	41,012.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	101,342.2 % Private: 1.2%	BD LM	**County:**	Tooele
TERR SYSTEMS	Pickleweed flats			
	Pinyon-juniper woodland			
	Salt desert scrub			
	Semi-desert shrub steppe			
A353	**WILLOW PATCH SPRINGS**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	10,848.6 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	26,806.9 % Private: 25.7%	BD SS RW	**County:**	Tooele
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Greasewood shrubland			
	Sagebrush semidesert			
	Sagebrush steppe			
	Salt desert scrub			
	Semi-desert shrub steppe			
PLANTS	Astragalus lentiginosus var. pohlii	Pohl milkvetch	G5T1	Endemic
A354	**WILLOW SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Bonneville Basin
Size Ha:	4,096.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	UT
Acres:	10,121.6 % Private: 0.0%	SS LM MA SD	**County:**	Beaver
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
PLANTS	Astragalus pinonis	Pinyon milkvetch	G2G3	Endemic
	Ivesia shockleyi var. ostleri	Ostler's ivesia	G3G4T1	Endemic
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread
A355	**WILLOW SPRING**		**Site Type:**	FUNCTIONAL SITE
			Section:	Tonopah
Size Ha:	7,576.1 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	18,720.5 % Private: 0.2%	BD SS LM SD	**County:**	Nye
TERR SYSTEMS	Pinyon-juniper woodland			
	+ Sagebrush semidesert			
	Sagebrush steppe			
PLANTS	Asclepias eastwoodiana	Eastwood milkweed	G2Q	Endemic
	Astragalus serenoi var. sordescens	Squalid milkvetch	G4T2	Endemic
	Astragalus toquimanus	Toquima milkvetch	G2	Endemic
	Oxytheca watsonii	Watson's oxytheca	G2	Peripheral or Limited
A356	**WILSON CANYON**		**Site Type:**	FUNCTIONAL SITE
			Section:	Lahontan Basin
Size Ha:	6,094.3 % Class 1 or 2: 0.0%	System Groups (2)	**State:**	NV
Acres:	15,059.0 % Private: 29.0%	BD SS SD RW	**County:**	Lyon
TERR SYSTEMS	Desert riparian shrubland and woodland			
	Sagebrush steppe			

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Type	*Scientific Name*	*Common Name*	*Global Rank*	*Ecoregional Distribution*
TERR SYSTEMS	+ Salt desert scrub			
PLANTS	Eriogonum lemmonii	Lemmon buckwheat	G3?	Endemic
BIRDS	Falco mexicanus	Prairie Falcon	G5	Widespread
MAMMALS	Corynorhinus townsendii	Townsend's big-eared bat	G4	Widespread, declining

A357 WINNEMUCCA LAKE

Site Type: FUNCTIONAL SITE
Section: Lahontan Basin
State: NV
County: Pershing, Washoe

Size Ha: 10,151.6 % Class 1 or 2: 0.0%
Acres: 25,084.7 % Private: 71.8%

System Groups (2): BD SS A

TERR SYSTEMS	Greasewood shrubland
	Sagebrush steppe
	Salt desert scrub
AQ SYSTEMS	Ephemeral alkaline playa lake, chloride waters

A358 YELLAND DRY LAKE

Site Type: FUNCTIONAL SITE
Section: Central Mountains
State: NV
County: White Pine

Size Ha: 3,856.2 % Class 1 or 2: 0.0%
Acres: 9,528.7 % Private: 4.5%

System Groups (2): BD RW

TERR SYSTEMS	Greasewood shrubland			
	+ Salt desert scrub			
BIRDS	Charadrius alexandrinus nivosus	Western Snowy Plover	G4T2, G4T3,G4	Widespread, specialist

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Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
63	**MONTANA MOUNTAINS**		
	WBLM-09	Fire	Altered fire regime. Burns w/annual grass.
72	**BLACK ROCK DESERT-SMOKE CREEK DESERT**		
	WBLM-03	Military training/weapons testing	Unexplained ordinance on playa (bombing range in WWII).
		Recreation	Potential impacts (I.e., supersonic vehicles).
85	**MAGGIE CREEK**		
	BYUE-02	Grazing	Ranches.
95	**BATTLE MOUNTAIN**		
	BBLM-13	Grazing	Not in aspen, mostly in riparian. Meadows are heavily grazed, but are used by sage grouse.
		Mining	Bats are heavily impacted by mines and exploration. Pat Brown studying bats in abandoned mines.
		Non-native species - plants	White top in upper mining site drainages.
119	**ONAQUI MOUNTAINS**		
	SLBLM-07	Fire suppression	
125	**TINTIC MOUNTAINS**		
	SLBLM-13	Fire	Altered fire regime.
		Grazing	Sheep & cattle.
		Mining - historical	
		Non-native species - plants	Squarrose knapweed.
		Recreation - OHV use/dune buggy	ATV use.
130	**GOSHEN-WARM SPRINGS**		
	BYUE-04	Fishing	
		Mining - historical	Historical mining extraction operation. Reprocessed ore.
		Recreation	
135	**SAGE HEN VALLEY**		
	EBEE-14	Non-native species - plants	Cheatgrass, recent fire?
		Recreation - OHV use/dune buggy	Off-road vehicles.
138	**DUGWAY RANGE**		
	SLBLM-21	Fire	Some altered fire regime.
		Grazing	Winter sheep range.
		Non-native species - plants	At risk for cheatgrass invasion. Kingweed potential problem
		Recreation	Risk from rock hounding recreational use.
154	**HOT SPRINGS HILL**		
	JMJT-16	Geothermal development	Potential geothermal development.
		Grazing	
163	**HOUSE RANGE**		
	UBL-01	Mining - historical	
		Recreation	Rising. Hunters.
		Roads	
164	**FISH CREEK SPRINGS**		
	EBLM-05	Diversions	Dredged and dug historically & current.
		Grazing	Marsh is grazed.
		Ground water withdrawal	Water rights for 13 cfs, not exercised nut potential to dry creek and clean out springs.
170	**WHITE PINE RANGE**		
	EMP-03	Grazing	
		Non-native species - plants	
171	**KINGS CANYON**		
	UBL-02	Roads	Road access, but not much used.

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
175	**WHITE PINE RANGE**		
	EFS-02	Grazing	Grazing occurs lower down.
188	**FANDANGO**		
	TFS-11	Grazing - historical	Not currently grazed, healing.
217	**HERD PASS**		
	KO-08	Grazing	Sheepherding.
247	**WHITE PINE RANGE**		
	WMP-16	Military training/weapons testing	LOCALIZED EXPLOSIONS
		Mining - historical	
		Non-native species - mammals	WILD HORSE
255	**STONEWALL MOUNTAIN**		
	WMP-17	Grazing	AT SPRING
		Non-native species - mammals	WILD HORSE
279	**EIGHTEEN MILE MARSH**		
	PB-32	Diversions	Improving. Was a 404 Clean Water Act violation.
284	**SQUAW VALLEY**		
	KBLM-08	Grazing	LIVESTOCK GRAZING, IN BAD SHAPE ON PUBLIC LANDS
		Non-native species - fishes	CARP & SUCKERS INCREASING
291	**UPPER ROCK CREEK**		
	KBLM-07	Grazing	Planned grazing improvements to help aspen. Livestock grazing.
		Mining	Minor dewatering threat.
293	**NEWFOUNDLAND MOUNTAINS**		
	SLBLM-15	Grazing	Winter sheep grazing -- none for 9 years.
		Non-native species - plants	Areas of cheatgrass.
294	**GROUSE CREEK MOUNTAINS-RAFT RIVER MOUNTAINS**		
	UTDWR-14	Conversion of habitat	Agricultural conversion.
	SLBLM-10	Grazing	Winter sheep
	UTDWR-14	Grazing	Heavy
		Non-native species - plants	Natives lost. Exotic invasion. Cheeatgrass.
		Recreation	
299	**PEQUOP MOUNTAINS-TOANO DRAW**		
	PB-31	Grazing	Horses
300	**SOLDIER MEADOWS**		
	WBLM-02	Grazing	Horses watering at spring (more at the south end).
		Grazing	Trampling. But grazing impact not completely know (for example, potentilla doing well where there's grazing).
		Hydrologic Regime Alterations	Springs modified by diversion. Pools for bathing.
		Recreation	Water quality issues from recreational camping.
		Roads	Roads going through Potentilla basaltica habitat.
302	**SILVER STATE SAND DUNES**		
	WBLM-06	Fire	Vegetation altered by fire.
	RR-01	Grazing	Cattle grazing on dunes. But probably not a significant stress.
		Recreation - OHV use/dune buggy	Site near Hwy-95, some disturbance for ORV vehicles. Otherwise in good shape.
	WBLM-06	Roads	Roads among dunes.
310	**PILOT RANGE**		
	SLBLM-01	Grazing	Light livestock use.
313	**SHERMAN CREEK**		
	KBLM-23	Grazing	Trespass grazing.

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	From Expert Site	Threat Source	Comments
314	**SILVER ISLAND MOUNTAINS**		
	SLBLM-14	Fire	
		Grazing	Sheep camps.
		Non-native species - plants	Downy brome.
315	**FLY RANCH GEYSER-GRANITE RANGE**		
	MA-08	Agriculture - grazing	Active grazing, so remote wetlands are in better shape. Biggest threat is grazing.
	DWS-02	Diversions	Diversion - spring source altered. Also, dredged.
		Recreation	
316	**HUMBOLDT RIVER GOLCONDA**		
	LN-08	Conversion of habitat	Agricultural interests maintain meadows.
	GA-07	Development-unspecified	
	LN-08	Grazing	Winter
		Hydrologic Regime Alterations	Channel degradation. A lot of has happened already.
320	**NORTH GREAT SALT LAKE**		
	JLN-09	Grazing	Some grazing.
	NW-03	Ground water withdrawal	Potential.
		Recreation - OHV use/dune buggy	But not a lot of ORV activity.
321	**QUINN RIVER**		
	LN-12	Grazing	Can be heavy occasionally.
326	**SMOKE CREEK**		
	DWS-01	Fire	Fire risk.
		Grazing	Cattle grazing.
		Non-native species - fishes	Green sunfish and rainbow trout exotics. Low numbers of rainbow in upper basin.
336	**PINE RIDGE**		
	KBLM-38	Fire	Altered fire regime.
		Mining	Exploration.
338	**MOUNT LEWIS**		
	BBLM-14	Grazing	Cattle higher up.
344	**WINNEMUCCA LAKE**		
	WBLM-08	Grazing	Minimal.
349	**HUMBOLDT RIVER IMLAY**		
	LN-09	Grazing	
		Management	Floodplain management issues.
352	**OQUIRRH MOUNTAINS**		
	SLBLM-02	Fire	
		Grazing	Past
		Mining	Kennicot mining activity potential.
		Residential - secondary (rural)	Rural development & growth.
354	**SOUTH GREAT SALT LAKE**		
	UTDWR-04	Habitat fragmentation	Lack of connectivity for Ferruginous Hawks.
		Harvest of natural resources	Fairy shrimp harvesting.
		Hydrologic Regime Alterations	
		Military training/weapons testing	Nuclear railroad potential.
	MW-05	Non-native species - plants	Cheatgrass below.
	UTDWR-04	Urban expansion	Subdivision and highway building
355	**ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOU**		
	KBLM-04	Fire	Altered fire regime.
	BBLM-01	Fire	Threatened by fire/cheatgrass, but risk higher in NW area. Otherwise good now.

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
	KBLM-02	Grazing	Rest & grazing management.
	GA-09	Grazing	Some
	BBLM-02	Grazing	
	BBLM-01	Grazing	Operator is cooperative
	KBLM-04	Grazing	Periodically heavy.
	KBLM-02	Habitat fragmentation	
		Hydrologic Regime Alterations	Culvert barriers.
	BBLM-02	Hydrologic Regime Alterations	Ditched Humboldt, decreased water levels, straightened. Springs are stressed by cattle.
	KBLM-02	Mining	Dewatering potential from mining operation -- springs and ground water.
	BBLM-01	Mining	Exploration in NE area.
	BBLM-02	Non-native species - plants	Cockleburs invaded. Whitetop, tamarisk, thistles. Willows sprayed and removed.
	KBLM-04	Non-native species - plants	Cheatgrass.
356	**SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER**		
	KBLM-05	Grazing	
	KBLM-03	Hydrologic Regime Alterations	
	KBLM-05	Mining	Dewatering, loss of base flows.
	KBLM-03	Recreation	Creates ruts in meadows.
359	**SHOSHONE-BEOWAWE**		
	PB-05	Conversion of habitat	Past willow removal. Mature willow standes needed by egrets for nesting. There aren't enough older willows along Humboldt River.
		Grazing	
	KBLM-20	Hydrologic Regime Alterations	Spring development with collection box and pipe to trough.
360	**WILD ISLE-GREAT SALT LAKE DESERT SAND DUNES**		
	MW-01	Fire	Need to keep fire off it.
		Military training/weapons testing	AF considering for bombing target.
		Non-native species - plants	Heavy cheatgrass to E near road E of Wildcat mountains. Otherwise, relatively free of cheatgrass. Tamarisk present.
		Roads	1 road to it now.
363	**DIXIE CREEK**		
	KBLM-24	Fire	Fire burned fences.
		Grazing	
369	**STANSBURY MOUNTAINS**		
	SLBLM-05	Conversion of habitat	White fir encroachment.
		Fire	Altered fire regime.
		Grazing	Livestock. Moderate grazing. E side heavily grazed. Better to N and W.
	NW-17	Grazing	
	SLBLM-05	Herp Collectors	
		Management	Elk re-introduction.
	UBL-04	Recreation	Human impacts from rec use.
	NW-17	Recreation	
	SLBLM-05	Recreation - OHV use/dune buggy	Tremendous recreation impacts. Also from camping, hunting.
	UBL-04	Roads	Road present. Also possible road development.
371	**NORTH WIG SAND DUNES**		
	UBL-08	Military training/weapons testing	Potential for increased military activity.
375	**GOSHUTE MOUNTAINS**		
	KBLM-41	Fire suppression	Higher elevation needs fire. Important for non-game birds. BLM developing burn plan.
		Grazing	W side cattle grazing. Winter sheep use.
	GCTF-01	Grazing	Historic domestic sheep grazing lower in the winter.
377	**QUILICI SPRING-BUTTE VALLEY**		
	PB-23	Grazing	Horse & cattle.

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
382	**ANTELOPE VALLEY**		
	NW-09	Grazing	Livestock threat low.
387	**CURRIE GARDENS-TAYLOR CANYON**		
	MAP-09	Grazing	Sheep
	MAP-10	Management	Fenced from grazing.
393	**WASATCH FRONT SALT LAKE CITY**		
	NW-13	Non-native species - plants	Weed invasion.
		Pollution - industrial	Air pollution
		Recreation	Foot traffic.
403	**SIMPSON MOUNTAINS**		
	SLBLM-08	Fire	
		Grazing	
410	**SHOSHONE RANGE-CARICO LAKE VALLEY**		
	BBLM-05	Diversions	Some springs are diverted lower.
		Grazing	Limites potential, tramples springs. Some feral horses.
	BBLM-06	Grazing	Feral horses & cattle.
		Hydrologic Regime Alterations	Non functioning (BLM).
		Non-native species - plants	Musk, thistle? Bull?
417	**NORTH PYRAMID LAKE**		
	DWS-10	Grazing	Moderately impacted by cattle grazing.
420	**RUBY MOUNTAINS/EAST HUMBOLDT RANGE**		
	PB-30	Grazing	Minor grazing in most places. Heavy grazing at Secret Pass.
428	**GRANITE PEAK**		
	NW-06	Military training/weapons testing	Expanded military activity.
429	**FISH SPRINGS**		
	UTDWR-13	Dams	Dikes.
	WP-05	Grazing	Livestock.
	UTDWR-13	Management	Management practice geared for waterfowl (drained & burned).
	WP-05	Recreation	Light
437	**SIMPSON PARK MOUNTAINS-NORTH TOIYABE RANGE**		
	BBLM-07	Fire	
		Grazing	Heavy. Feral horses reach high numbers.
		Non-native species - plants	Grass Valley has major exotics problem (whitetop, thistle).
442	**NIGHTINGALE FLAT**		
	BL-02	Grazing	Well in area, but cows don't move. Most has been heavily grazed.
443	**STILLWATER RANGE -DIXIE VALLEY**		
	ES-06	Geothermal development	Hydrothermal development has destroyed habitat for toads.
445	**JUAB VALLEY**		
	TC-02	Agriculture - crop	
		Development-unspecified	
	UTDWR-06	Grazing	
		Ground water withdrawal	Water declining.
		Non-native species - fishes	
455	**UTAH LAKE**		
	UTDWR-05	Agriculture - crop	Irrigation diversions
		Agriculture - grazing	Grazed fields. Agricultural fields plowed (Powell Slough).
		Hydrologic Regime Alterations	Channelization.
		Non-native species - fishes	Non-native predation on sucker.
		Urban expansion	Golf course development.

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	From Expert Site	Threat Source	Comments
456	**EAST DUGWAY DUNES**		
	UBL-07	Military training/weapons testing	Older military activity.
		Roads	Sandy roads into it. Signs are there for protection.
483	**LITTLE SAHARA SAND DUNES**		
	RR-11	Fire	Current wildfire zone. Tumbleweed, cheatgrass carries fire and into Giant Fourwing.
		Recreation	3 campground areas. Atriplex gets used by campers as fire wood.
		Recreation - OHV use/dune buggy	Restricted ORV use. May have other areas of ORV use.
485	**KOBEH VALLEY**		
	PB-07	Loss of habitat elsewhere	Habitat fragmentation makes easier access for poaching hawks. Hawks are vulnerable to road density.
487	**STEPTOE VALLEY**		
	EBLM-03	Conversion of habitat	Cattails expanding (don't know why).
	KBLM-09	Fire	Altered fire regime.
	EBLM-03	Fishing	Minor.
	EBLM-13	Grazing	Current and historical.
	EBLM-03	Grazing	But mostly helps to limit tamarisk.
	KBLM-09	Grazing	Heavy grazing
	EBLM-03	Ground water withdrawal	Potential for water development.
	EBLM-13	Hydrologic Regime Alterations	Huge floos 83-84, downcut 30'.
	PB-26	Mining - historical	Have had to gate some caves against ongoing recreational use by cavers.
	KBLM-09	Non-native species - mammals	Wild horses.
	EBLM-03	Non-native species - plants	Tamarisk, but grazing helps to limit tamarisk.
	KBLM-09	Target related bio/ecological threats	Disease.
		Target related bio/ecological threats	Overstocked with trees. Imbalance of age structures.
488	**MILLS VALLEY-SEVIER CANYON-WEST HILLS**		
	UTDWR-07	Agriculture - crop	Some agricultural manipulation to N.
		Grazing	
		Harvest of natural resources	Potential peat mining.
		Hydrologic Regime Alterations	Water declining.
489	**CANYON MOUNTAINS-DELTA**		
	UTDWR-17	Recreation	
491	**CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALL**		
	DWS-09	Diversions	Diverted, ditched, and dredged.
	BYUE-03	Grazing	
	DWS-09	Residential - primary	Adjacent to a residence.
497	**REESE RIVER**		
	GA-05	Grazing	Possible.
	BBLM-08	Grazing	Grazed actively by horses and cows.
499	**VIRGINIA RANGE**		
	FWS-10	Conversion of habitat	White top coming in to drainage areas.
	LN-03	Diversions	Sewer plant diversion above.
	DC-22	Fire	Fire threat for pj woodlands.
	FWS-10	Geothermal development	Potential geothermal expansion. Current violation w/pipeline construction.
	LN-03	Pollution - industrial	Sewer plant diversion above. Probably mercury contamination.
	FWS-10	Roads	Highway right-of-way, bladed. I-580 expansion may change surface flows.
	LN-03	Urban expansion	POTENTIAL development. Currently for sale.
502	**TULE VALLEY**		
	UTDWR-12	Grazing	
		Grazing	Heavy in unfenced area.
		Non-native species - plants	Squarrose, knapweed in Tule Valley. Potential threat.

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	From Expert Site	Threat Source	Comments
	UTDWR-12	Target related bio/ecological threats	Springs are filling in (successional).
508	**CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRI**		
	EMP-05	Dams	Riparian in poor condition.
	BBLM-18	Fire	Table Mountain burns every year. Seeded last fall and planted bitterbrush, but cheatgrass coming in.
		Grazing	Heavy grazing.
	EMP-05	Grazing	Historically heavy livestock and horse use. Wild horses.
	BBLM-15	Grazing	Heavy. Sheep & cattle. Head of Pete Hansen is not grazed.
	SE-09	Grazing	Moderate.
	PB-08	Ground water withdrawal	Sometimes used as stockwater.
	BBLM-15	Mining	Limited mining now (major in part).
	EMP-05	Non-native species - plants	Cheatgrass.
	BBLM-18	Non-native species - plants	Cheatgrass problem.
	BBLM-15	Non-native species - plants	Musk thistle, possible longcree, Russian knapwood.
513	**RUTH**		
	JT-14	Mining	Potential
		Recreation - OHV use/dune buggy	
515	**POGONIP RIDGE**		
	EFS-08	Mining	New large open pit mine since owls last seen and doesn't know current situation. Additional exploration in the area. FS will reclaim old mining spot.
	MAP-06	Mining - historical	Probably good though for making talua.
540	**ARTESIA LAKE-EAST PINE NUT MOUNTAINS**		
	JM-10	Non-native species - plants	Exotics are moving in.
545	**SAWTOOTH MOUNTAIN**		
	NW-18	Mining	mining claims in the area.
		Roads	Can drive to patch.
546	**CLEAR LAKE**		
	NW-04	Grazing	Cattle grazing, but little impact because plants are resilient.
	UTTNC-01	Management	Habitat manipulation for waterfowl improvement.
	NW-04	Non-native species - plants	Cheatgrass.
		Recreation - OHV use/dune buggy	
550	**BUTLER BASIN**		
	TFS-01	Fire	Fires so rabbitbrush dominates in areas.
		Grazing	Livestock, wild horses. Overuse in sagebrish.
		Management	Electrical fence.
554	**STONEBERGER BASIN**		
	TBLM-09	Grazing	Problem for the vole especially.
		Grazing - historical	
		Management	Some exclosures for sage grouse, but needs better grazing management. Historically sprayed.
564	**UPPER WHITE RIVER**		
	FWS-02	Grazing	
		Hydrologic Regime Alterations	
568	**DESATOYA MOUNTAINS**		
	BBLM-12	Grazing	Limited grazing. Grazed in upper areas.
	CBLM-03	Grazing	Grazing in areas.
569	**SAND MOUNTAIN**		
	PFB-04	Recreation - OHV use/dune buggy	Not much activity though according to Pete Brussard, but Rust reports heavy rec use throughout.
570	**JAKES VALLEY**		
	EBLM-04	Grazing	Heavy grazing in areas near water. Cattle, sheep and feral horses.

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	From Expert Site	Threat Source	Comments
	EBLM-04	Non-native species - plants	Halogeton & atrip, annual sp., tansy mustard.
571	**DUCKWATER VALLEY**		
	FWS-14	Diversions	
	LVNDOW-11	Hydrologic Regime Alterations	Channelized, ditched.
		Non-native species - fishes	Catfish
	FWS-14	Recreation	Swimming.
	LVNDOW-11	Recreation	
572	**WHITE RIVER VALLEY**		
	PB-12	Agriculture - crop	Change from dairy (grain) to alfalfa production makes it less attractive to Greater Sandhill Cranes.
	LVNDOW-14	Diversions	
	PB-12	Diversions	
		Grazing	
	GA-03	Grazing	Heavy.
	LVNDOW-14	Grazing	
	EBLM-07	Grazing	Moderate grazing in site.
	PB-12	Hydrologic Regime Alterations	Channelizations
		Non-native species - fishes	Bass in big pond
	LVNDOW-15	Non-native species - fishes	Spring source in pond w/bass.
	PB-12	Non-native species - plants	Gambusia & other introductions
		Pollution - industrial	Copper sulfate
576	**WILSON CANYON**		
	JM-13	Fishing	
		Grazing	Probably grazed.
		Recreation	
		Recreation - OHV use/dune buggy	OHV use in riparian corridor.
580	**TUNNEL SPRING MOUNTAINS-HALFWAY HILLS-PINE VALLEY**		
	NW-07	Conversion of habitat	Halogeton threatening winterfat.
	LVNDOW-24	Diversions	Channelizations.
	LA-02	Grazing	Strict grazing regime w/enclosures. Sheep when there is snow.
	LVNDOW-24	Grazing	
		Non-native species - fishes	Carp introduced. Catfish.
	NW-08	Non-native species - mammals	Wild horses.
	KO-10	Roads	Roads nearby.
583	**WALKER LAKE-WALKER RIVER**		
	FWS-13	Diversions	Dredging irrigation structures.
		Hydrologic Regime Alterations	Lots of barriers on W fork.
	GCTF-06	Hydrologic Regime Alterations	Water quality issues (TDS, Mercury?)
		Non-native species	
	FWS-13	Non-native species - plants	Tamarisk
		Target related bio/ecological threats	No natural reproduction.
593	**WELLINGTON HILLS**		
	LN-06	Recreation	Use by campers.
595	**SPRING VALLEY-HAMLIN VALLEY**		
	PB-42	Loss of habitat elsewhere	Habitat fragmentation
597	**SOUTH WASSUK RANGE**		
	DC-01	Fire	Susceptible to burning (canopy closure). Needs thinning & grasses.
	CBLM-04	Fire	
	EBEE-11	Global climate change	POTENTIAL
	CBLM-04	Global climate change	
		Target related bio/ecological threats	Mountain lion threatens BHS.

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
600	**SAN FRANCISCO MOUNTAINS**		
	USL-04	Fire	Ponderosa pine threat.
	KO-07	Mining	Marble quarry disturbance.
		Mining - historical	
		Recreation	
	USL-04	Recreation	Possible. Rugged/remote w/4 WD road to top w/antennae.
602	**NORTH WAH WAH MOUNTAINS**		
	USL-01	Fire	Fire less frequent now.
		Grazing	Lower areas impacted by grazing.
	KO-09	Grazing	Winter grazing in the valleys.
615	**PILOT MOUNTAINS**		
	LVNDOW-07	Mining	
		Non-native species - mammals	Wild horse use.
618	**ANCHORITE HILLS**		
	GA-04	Pollution - industrial	Possible HAWD munitions disposal.
619	**LONE MOUNTAIN-MONTE CRISTO RANGE**		
	TBLM-07	Grazing	Heavy use by livestock.
	LVNDOW-06	Grazing	Wild horse use.
		Mining	Mining sites, old mining claims.
	TBLM-07	Non-native species - plants	Tamarisk in area, although have a removal program at springs and canyon.
620	**FOURMILE BASIN**		
	TFS-14	Non-native species - mammals	Wild horse use.
	TFS-13	Non-native species - mammals	Wild horse use.
		Target related bio/ecological threats	Repressed willows.
621	**WHITE ROCK MOUNTAINS**		
	LVNDOW-21	Grazing	
622	**THERMAL HOT SPRINGS-ESCALANTE DESERT**		
	BYUP-02	Grazing	Probably grazed for 100 years.
624	**INDIAN PEAK**		
	NW-11	Grazing	Grazed by livestock. Execessive elk.
		Non-native species - plants	Cheatgrass.
625	**SOUTH WAH WAH MOUNTAINS**		
	UTDWR-16	Conversion of habitat	Chaining
		Grazing	Lots of grazing.
	TCE-03	Herp Collectors	
	UTDWR-16	Mining - historical	
	TCE-03	Mining - historical	
626	**NORTH RALSTON VALLEY**		
	JM-08	Grazing	
629	**CRESCENT DUNES**		
	RR-04	Recreation	Local rec use. Fairly heavy. Tonopah BLM reports that use is restricted to bottom of dune, not top.
630	**QUINN CANYON RANGE-GRANT RANGE**		
	EMP-02	Conversion of habitat	Cheatgrass in Troy canyon has taken over since a fire destroyed what used to be great winter sheep range.
	EFS-14	Fire	In area recently.
	EMP-06	Fire	2 recent fires: 1998 (2k ac), 1999 (10k ac) burned from Rimrock Canyon to Murphy spring. 3rd burn at Horse Spring 15 years old w/excellent regeneration.
	EMP-02	Fire suppression	
	EFS-17	Grazing	Grazed lightly, concentrated at lower springs.
	DC-24	Grazing	Probably. Sheep above.

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	From Expert Site	Threat Source	Comments
	EMP-06	Non-native species - plants	Exotic invasion. Cheatgrass.
	EMP-02	Recreation	Especially in abandoned mines where bats are roosting. Mines need gating.
635	**DRY LAKE VALLEY**		
	LVNDOW-26	Grazing	Wild horses.
636	**KAWICH RANGE**		
	TBLM-00	Grazing	Light.
637	**MEADOW VALLEY**		
	EBLM-11	Agriculture - crop	Hayed agricultural fields to S.
		Grazing	Grazed meadows.
		Grazing - historical	Sand dunes historically grazed.
		Non-native species - fishes	Crayfish & rainbow.
		Non-native species - plants	Tamarisk removal in progress.
646	**LONE TREE-CEDAR VALLEY**		
	UTDWR-10	Development-unspecified	Potential develoment on private land.
		Small population size	Utah prairie dog
647	**SILVER PEAK RANGE**		
	UTDWR-08	Harvest of natural resources	Historic wood cutting
		Recreation	
651	**PINE VALLEY MOUNTAINS**		
	WP-08	Development-unspecified	Development on private land next to FS.
	WP-07	Fire suppression	
		Grazing	Livestock
	JT-01	Non-native species - plants	In riparian, there are some exotics present.
	WP-08	Recreation	
	JT-01	Recreation	Camping.
		Roads	
652	**ESCALANTE VALLEY**		
	BYUP-01	Pollution - industrial	Huge tailings piles.
657	**SIXMILE FLAT**		
	DC-20	Grazing	Possibly heavily grazed.
		Hydrologic Regime Alterations	Possibly drought stressed.
659	**BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUN**		
	KO-01	Fire	Burns to south.
	KO-03	Ground water withdrawal	Old water line. Potential activity.
	WMP-14	Military training/weapons testing	ERRANT BOMBS
		Non-native species - mammals	WILD HORSES AROUND LOWER AREAS
	KO-03	Roads	Road through population.
	KO-01	Roads	Access somewhat easier now, but unlawful.
660	**RAINBOW CANYON**		
	EBLM-14	Diversions	Diverted for agriculture.
		Grazing	Moderate.
		Non-native species - plants	Tamarisk.
		Roads	Disturbance from roads/railroads.
662	**PALMETTO MOUNTAINS**		
	BBLM-23	Harvest of natural resources	
665	**BEAVER DAM WASH-BULL VALLEY MOUNTAINS**		
	UTDWR-09	Grazing	
		Non-native species	Non-native toad hybrid w/Bufo microscaphus.
		Non-native species - fishes	

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	From Expert Site	Threat Source	Comments
4201	**RUBY MOUNTAINS**		
	KFS-03	Conversion of habitat	Converted to crested wheatgrass in area.
	AR-01	Development-unspecified	? Water, mining.
	KFS-06	Development-unspecified	Development off and on
	KFS-09	Fire	Danger.
	KBLM-12	Grazing	Livestock
	KBLM-25	Grazing	
	KFS-10	Grazing	Cattle grazing. Lots of deer.
	KFS-09	Grazing	Light
	KFS-06	Grazing	Heavy
	FWS-21	Grazing	
	KFS-01	Grazing	POTENTIAL, allotment not closed.
	FWS-24	Grazing	
	FWS-20	Grazing	Cattle/sheep in Smith Creek. FS has problems w/grazing system.
	FWS-19	Grazing	Little grazing.
	KFS-03	Grazing	Heavy.
	FWS-17	Grazing	Cattle/sheep.
	KFS-07	Harvest of natural resources	Wood cutting.
	KFS-01	Hunting	Hunting outfitters.
	FWS-17	Hydrologic Regime Alterations	Channel management by the tribe.
	KBLM-25	Hydrologic Regime Alterations	Headcuts
	KFS-06	Hydrologic Regime Alterations	Non-functionoing spring.
	FWS-21	Hydrologic Regime Alterations	Private land water issues.
	FWS-24	Mining	Mining at headwaters contaminating system.
	FWS-17	Mining - historical	But POTENTIAL for re-use.
	FWS-20	Non-native species - fishes	Brook trout, may also be rainbow, brown.
	KBLM-25	Non-native species - fishes	Competition from brook trout.
	FWS-18	Non-native species - fishes	Brook trout competition.
	FWS-17	Non-native species - fishes	Competition with Brook, Rainbow, & hybrids w/Rainbow.
	FWS-19	Non-native species - fishes	Eradicated Brook trout 10 years ago but a few remain.
	FWS-16	Non-native species - fishes	Brook trout competition.
	FWS-15	Non-native species - fishes	Brook trout displacement from established populations.
	KFS-03	Non-native species - plants	Noxious weeds (medusa head, scotch musk, canadian hoary cress, spotted knapweed.
		Recreation	Heavy recreation.
	JLN-16	Recreation	
	AR-03	Recreation	Potential recreation lower down.
	KFS-07	Roads	Road access
	KFS-10	Target related bio/ecological threats	Not reproducing.
4202	**EAST HUMBOLDT RANGE**		
	FWS-03	Agriculture - crop Diversions	Irrigation.
	FWS-07	Grazing	Heavy.
	KFS-02	Grazing - historical	Past heavy sheep and cattle use.
	FWS-09	Non-native species - fishes	Brook trout competition.
	FWS-08	Non-native species - fishes	Brook trout competition.
	JLN-15	Recreation	
	KFS-11	Recreation	Recreation in riparian.
4203	**RUBY VALLEY**		
	GCTF-05	Grazing	Graxed & draglined springs without inverts. Inverts are only in good open springs.
	GCTF-04	Grazing	
	DC-21	Grazing	

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	From Expert Site	Threat Source	Comments
	GCTF-04	Hydrologic Regime Alterations	
		Residential - primary	
5091	**BLUE LAKES-BADLANDS**		
	SLBLM-17	Conversion of habitat	Hay meadows. Hummocky meadows.
		Diversions	Diversions in site.
	SLBLM-20	Grazing	Winter sheep.
	SLBLM-18	Grazing	Cattle/sheep winter grazing.
	SLBLM-17	Grazing	Heavily used riparian in central private area.
	SLBLM-19	Grazing	Some years varies. Winter cattle/sheep.
	PB-25	Non-native species - fishes	
5092	**DEEP CREEK RANGE**		
	JLN-19	Diversions	Water diversions are below on all streams.
	SLBLM-16	Fire	Risk.
	JLN-19	Fishing	
		Grazing	
	UTDWR-02	Grazing	Livestock grazing.
	SLBLM-16	Grazing	Grazing pressure in riparian.
	UTDWR-02	Military training/weapons testing	Military oversight -- flares lead to fires.
	JLN-19	Mining	Mineral exploration is potential threat.
	UTDWR-02	Mining - historical	Not in immediate area.
	JLN-19	Non-native species - fishes	Rainbow introduced and hybrids presnet in 1980s.
	SLBLM-16	Non-native species - plants	Some cheatgrass below.
	UTDWR-01	Recreation	Minor recreation pressure on creeks
	SLBLM-16	Recreation	Some visitor use at Hack site, but relatively no threats.
5371	**SCHELL CREEK RANGE**		
	DC-23	Fire	Fire threat up higher.
	DC-15	Fire	
	MAP-02	Grazing	Grazing off drainage.
	MAP-03	Grazing	Snails found in litter.
	MAP-01	Grazing	Susceptible to cattle/sheep grazing in litter.
	JLN-12	Grazing	Sheep grazing at W boundary.
	EFS-21	Grazing - historical	Rested from sheep grazing since 80's.
	EFS-20	Grazing - historical	Rested from sheep grazing since mid-80s.
	EFS-18	Grazing - historical	Rested from sheep grazing since mid-80s.
	EFS-19	Grazing - historical	Rested from sheep grazing since mid-80s.
	DC-23	Habitat fragmentation	Problem w/ continuity in lower conifers.
	JLN-12	Recreation	
	DC-15	Recreation	
	MAP-05	Target related bio/ecological threats	Drought sensitive.
	MAP-04	Target related bio/ecological threats	Drought
5661	**PYRAMID LAKE-LOWER TRUCKEE RIVER**		
	GCTF-07	Diversions	
	WBLM-07	Fire	Some burnds, but untouched E of I-80.
	CBLM-07	Fire	1 old burn in an area.
	RR-15	Grazing	
	CBLM-07	Grazing	
	DWS-11	Grazing	Moderately disturbed by cattle.
	LVNDOW-05	Grazing	moderate.
	BL-01	Grazing	Very lightly grazed
	GCTF-07	Grazing	
	LVNDOW-05	Hunting	Varmint hunting.

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	From Expert Site	Threat Source	Comments
	MR-10	Hydrologic Regime Alterations	Increasing lake levels would close entrance. MR had to swim into entrance. Entrance is now 2 ft. There may be another entrance higher.
	GCTF-07	Hydrologic Regime Alterations	Fish passage impediments
	CBLM-07	Military training/weapons testing	Bombing/burning by Navy
	LVNDOW-05	Military training/weapons testing	Navy overflights.
	BL-01	Non-native species - plants	Cheatgrass is increasing. Russian thistle, barbwire.
	MR-06	Non-native species - plants	Cheatgrass & burning.
	EBEE-17	Non-native species - plants	Cheatgrass invasion
	CBLM-07	Non-native species - plants	Cheatgrass invasions.
	MR-06	Recreation	
	LVNDOW-05	Recreation	Use by locals.
	CBLM-07	Recreation - OHV use/dune buggy	
	RR-15	Roads	Habitat fragmentation.
	EBEE-17	Urban expansion	Expanding development and associated recreational pursuits in Fernley (trash, vehicle tracks, etc.)
5662	**CARSON SINK**		
	LN-01	Diversions	Carson River diversions. Managed for irrigation (fluctuating water levels). Community support for restoring riparian area, but not at expense of agriculture.
	GCTF-03	Hydrologic Regime Alterations	Dewatering upstream, water quality concerns.
		Non-native species - plants	Tamarisk
	LN-01	Non-native species - plants	Tamarisk in floodzone.
	RR-03	Recreation	
5663	**WARM SPRINGS**		
	CBLM-10	Fire	Altered fire regime. Some burned in 1999.
	DC-06	Grazing	
	CBLM-10	Grazing	
	DC-06	Ground water withdrawal	POTENTIAL
		Non-native species - plants	Little cheatgrass, tumbleweed,
		Pollution - agricultural	Pesticide drift from alfalfa
		Recreation - OHV use/dune buggy	
		Residential - secondary (rural)	
		Urban expansion	Potential development activities.
5731	**SNAKE VALLEY**		
	NW-02	Agriculture - crop	Potential agriculture threat.
		Fire suppression	Fire is not part of system.
	UTDWR-11	Grazing	
		Ground water withdrawal	Potential development and withdrawal.
	NW-02	Ground water withdrawal	Drawdowns.
	UTDWR-11	Mining	Gas & oil exploration.
		Non-native species	Bullfrogs
		Non-native species - fishes	Carp, bass
		Non-native species - plants	Purple loosestrife to NW. Potential threat of that being introduced.
5732	**SNAKE RANGE**		
	EFS-06	Fire	
	DC-16	Fire	But rocks protect mostly against it.
	EFS-09	Fire suppression	Needs fire -- ponderosas.
	MAP-07	Grazing	Very light grazing, but potential grazing.
	EBLM-08	Harvest of natural resources	Some cutting.
	EBLM-02	Hydrologic Regime Alterations	3c put in wells.
	EFS-09	Logging	Ponderosa pine logged historicall.
	EFS-10	Logging	Historically logged ponderosa pine.
	EBLM-12	Management	Surrounding area management needed.
	MR-07	Management	Gate designs at cave entrance is inappropriate.

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
	EFS-10	Mining	POTENTIAL.
	EFS-09	Mining	Quarry in area.
	EFS-10	Mining - historical	Impacted sediment load.
	GA-11	Non-native species - mammals	Trampling by horses.
	RR-13	Recreation	Light, otherwise no threats.
	RR-12	Recreation	Light.
	EFS-07	Recreation	Cavers disturb bats.
	MR-07	Recreation	Recreation is biggest problem, but overall habitat is good.
	EFS-06	Recreation	Minimal.
	EBLM-09	Target related bio/ecological threats	Domestic sheep grazing.
	EBLM-12	Target related bio/ecological threats	Domestic sheep grazing.
5733	**CAVE VALLEY-UPPER WHITE RIVER VALLEY**		
	FWS-01	Agriculture - crop	Water manipulation for irrigation.
	LVNDOW-13	Diversions	Sculpin in diversion creek 120' long.
	LVNDOW-16	Grazing	Wild horses.
	LVNDOW-17	Non-native species - disease	To S, sheep allotment, so maybe introduced disease.
	LVNDOW-16	Non-native species - fishes	Bass & trout in ponds.
	FWS-01	Non-native species - plants	
		Pollution - agricultural	NDOT pond, water poor quality.
5751	**CARSON RIVER**		
	PFB-05	Agriculture - crop	Alfalfa
	GCTF-11	Diversions	upstream.
	PFB-05	Grazing	leased to USFS as horse pasture.
	GCTF-11	Grazing	Heavy
	NS-01	Grazing	Taken out some wet vegetation.
	GA-06	Ground water withdrawal	Actual.
	GCTF-11	Hydrologic Regime Alterations	
	PFB-05	Hydrologic Regime Alterations	POTENTIAL water development.
	GCTF-11	Non-native species	Riparian (from Dayton down) has exotics, but above is better,
	GA-06	Non-native species - plants	Cheatgrass.
	PFB-05	Residential - secondary (rural)	Development.
	GA-06	Urban expansion	Surrounding development.
	GCTF-16	Urban expansion	Development on W side very intense.
	GCTF-11	Urban expansion	Subdivision from Carson City to State Line.
5752	**SLINKARD VALLEY**		
	DC-09	Fire	Burned 2 years ago. 1/3 of pj gone (in SE quadran).
		Grazing	Cattle grazing.
	JT-12	Grazing	
5753	**SOUTH PINE NUT MOUNTAINS**		
	DC-08	Development-unspecified	Development to E.
		Fire	Fire hazard.
		Roads	Road in canyon.
5871	**TOIYABE RANGE-BIG SMOKY VALLEY**		
	LVNDOW-03	Agriculture - crop	growing alfalfa.
	HT-06	Dams	
	LVNDOW-02	Development-unspecified	Pond development
	MP-06	Diversions	Water diversion downstream causes loss of connectivity.
	LVNDOW-03	Diversions	Flood irrigation. Mostly manipulated.
		Diversions	Diverted, stock pond development.
	MP-04	Diversions	Causes loss of connectivity downstream
	MP-03	Diversions	Water diversion downstream causes loss of connectivity.
	HT-11	Grazing	Livestock use.

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
	RT-10	Grazing	Sections are overgrazed. Overall fair to good condition.
	HT-05	Grazing	Heavy livestock disturbance.
	LVNDOW-03	Grazing	
	HT-06	Grazing	Minor grazing, but impacts snails.
	LVNDOW-04	Grazing	Wild horses.
	AFS-01	Grazing	
	JC-15	Grazing	Below Groves Lake Dam, sheep grazing.
	AFS-03	Grazing	Sheep allotment
	LVNDOW-02	Grazing	
	AFS-01	Habitat fragmentation	
	AFS-03	Hunting	Deer hunting.
	JC-15	Hydrologic Regime Alterations	Stream incision.
	HT-10	Hydrologic Regime Alterations	Main stem is incised (below cabin). Otherwise natural.
	HT-06	Hydrologic Regime Alterations	Incised flood plain.
	ES-07	Loss of genetic exchange/inbreeding	Isolation & endemicism.
		Management	FS management calls for some fencing which has negative impact .
	AFS-03	Mining	S side has active mining.
	HT-06	Non-native species - fishes	Exotic fishes.
	MP-04	Non-native species - fishes	Brown trout.
	LVNDOW-02	Non-native species - fishes	Trout present
	AFS-01	Non-native species - plants	Little bit of whitetop, cheatgrass and exotics.
	RT-10	Recreation	Access at the trail head.
	LVNDOW-03	Recreation	public bathhouse.
	HT-06	Recreation	
	AFS-01	Recreation	
	HT-05	Recreation	Campground, so heavy recreation impacts.
	HT-11	Recreation	Heavy recreation
	AFS-01	Roads	
	HT-11	Roads	
	HT-06	Roads	Major road impact.
	ES-07	Target related bio/ecological threats	Toads need regular disturbance, beaver dams. LCT prey on tadpoles and eggs.
5872	**TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE**		
	TBLM-08	Grazing	W side improving. Rested. Winterfat excluded from grazing.
	HT-03	Grazing	Elk grazing increasing. Rested for last 8 years.
	HT-04	Grazing	Livestock is major impact.
	HT-02	Grazing	
	JMJT-15	Grazing	Heavy grazing by livestock. But can't easily access marshy area so okay.
	ES-04	Grazing	Feral horses. Grazing in ripariar, ponds, and diversions, Some one grazing at W end. E better spring sources at N end.
	LVNDOW-01	Grazing	Cattle
	HT-02	Hydrologic Regime Alterations	
	JMJT-15	Hydrologic Regime Alterations	Dredging to move water.
	HT-04	Hydrologic Regime Alterations	
	HT-03	Hydrologic Regime Alterations	Streams are incised, but through natural processes.
	ES-04	Non-native species	
	TBLM-10	Non-native species - mammals	Wild horses.
	TBLM-08	Non-native species - plants	Crested wheatgrass seeding.
	JMJT-15	Power development	Hydrothermal development
		Recreation	High recreation use, but gated.
	HT-04	Roads	Roads alter flow regime. Also makes site pretty accessible.
	HT-02	Roads	Road goes up to site, but not in good condition. Remotes, so low recreational impact. However, road does divert the stream.
	JT-23	Roads	Right next to Highway 50

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
5881	**RAILROAD VALLEY**		
	ES-05	Diversions	Water diversion downstream.
	FWS-12	Grazing	on N side of highway.
	LVNDOW-10	Grazing	Heavy grazing.
		Hydrologic Regime Alterations	Channelized habitat.
	FWS-12	Hydrologic Regime Alterations	Springs ditched (at N Spring and Big Spring).
	LVNDOW-10	Non-native species	Invasion of melanoides.
5882	**CURRANT MOUNTAIN**		
	LVNDOW-12	Diversions	
	EMP-01	Fire suppression	Lack of fire regime. Too closed forest and woodland.
	LVNDOW-12	Grazing	Cattle grazing.
	EMP-01	Grazing	No livestock grazing high up though.
	JC-19	Hydrologic Regime Alterations	Riparian corridor has a little incision after flood event.
	LVNDOW-12	Non-native species - fishes	Bass fishing in main pool.
		Recreation	Old RV park.
6071	**SWEETWATER MOUNTAINS**		
	HT-21	Dams	Dam upstream (blows out).
	DC-03	Grazing	Grazing in riparian.
	JB-05	Grazing	Some.
	HT-22	Grazing - historical	
		Recreation	Camping
	HT-21	Recreation	Use heavy along creek.
	DC-03	Roads	Roads in drainages. Access road w/erosion.
6072	**BODIE HILLS**		
	DC-04	Diversions	in springs. Erosion also in drainages.
	HT-24	Diversions	Diversion problems for uticulata. Drains meadow.
	HT-25	Diversions	Drainage ditch effects are evident.
	WMW-02	Fire	POTENTIAL
		Grazing	HEAVILY CONTROLLED SHEEP ALLOTMENT SO NOT AN ISSUE
	DC-04	Grazing	
	HT-27	Grazing	
	HT-26	Grazing	
	HT-25	Grazing - historical	
	WMA-08	Hydrologic Regime Alterations	
	DC-04	Mining	
	HT-27	Mining - historical	Not a lot of tailings though.
	DC-04	Mining - historical	CURRENT & POTENTIAL
	HT-24	Non-native species - plants	Small patch of perennial pepperweed.
	WMW-02	Recreation	SNOWMOBILES
	WMA-08	Recreation	RECREATION AND HOT TUB BATHERS
	DC-04	Recreation	In springs.
	HT-27	Recreation	
		Roads	
	HT-25	Roads	
6073	**MONO LAKE**		
	BL-03	Grazing	Cattle
	JM-05	Grazing	Wild horse use.
	JT-04	Grazing	Evidence of grazing.
	RR-14	Grazing	Off the dunes.
	GCTF-08	Hydrologic Regime Alterations	
	RR-14	Recreation - OHV use/dune buggy	Tracks seen. Parks status has decreased OHV use.

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	Threat Source	Comments
6074	**LONG VALLEY**		
	WMW-03	Fire management policies/attitudes	ALTERED FIRE REGIMES
	WMA-03	Fire suppression	ALTERED FIRE REGIME
	WMA-05	Geothermal development	
		Grazing	
	WMW-03	Grazing	MINOR CATTLE BUT EXTENSIVE SHEEP
	WMA-07	Grazing	EXCESSIVE LIVESTOCK GRAZING
	WMA-04	Grazing	Over grazing
	WMA-03	Grazing	CATTLE AND SOME SHEEP GRAZING (CYCLIC ABUSE)
	WMA-02	Grazing	HISTORIC IMPACTS
	WMP-11	Grazing	LOWER ELEVATIONS; PRVIATE SHEEP GRAZING
	WMA-04	Ground water withdrawal	Ground water pumping
	WMA-03	Ground water withdrawal	POTENTIAL GROUND WATER PUMPING OF DRY CREEK WHICH THREATENS BIG SPRING
	WMA-06	Ground water withdrawal	Ground water use.
	WMA-05	Ground water withdrawal	PRIVATE PUMPING
	WMA-07	Ground water withdrawal	POTENTIAL DEPLETION
	WMW-05	Hydrologic Regime Alterations	WATER DIVERSION
	WMP-11	Logging	POTENTIAL FOREST CUTTING
	WMW-03	Logging	HEAVILY LOGGED
	WMA-06	Non-native species	Exotics
	WMA-04	Non-native species	Potential invasion of non-natives.
	WMA-07	Non-native species	Invasion of exotics
	WMA-05	Non-native species - fishes	
	WMA-02	Non-native species - fishes	BROWN AND BROOK TROUT
		Non-native species - mammals	MOUNTAIN PASS WILDHORSE HERD IN WINTERS AT ANTELOPE SPRING - CONTROLLED BY MOUTION LION
	WMW-05	Poaching	
		Recreation	
	WMW-03	Recreation	SNOWMOBILES
	WMA-06	Recreation	Off-road vehicles
	WMA-02	Recreation - OHV use/dune buggy	
	WMW-05	Roads	
6341	**OWENS VALLEY-BENTON VALLEY**		
	DWS-06	Diversions	Diverted springs. Impounded in tub.
	WMP-08	Flash Floods	HISTORIC FLOOD EVENTS - SEEDLINGS
	WMW-13	Flash Floods	POTENTIAL
	WMP-05	Global climate change	NOT EASILY ACCESSED, BUT SOME OHV USE
	WMW-12	Grazing	
	WMP-06	Grazing	
	WMP-04	Grazing	HORSE
	WMP-02	Grazing	HORSE/LIVESTOCK
	DWS-12	Grazing	Heavy grazing by cattle.
	DWS-06	Grazing	Heavy gazing -- cattle, horses.
	DWS-05	Grazing	Light grazing. Dense vegetation keeps cattle out.
	WMW-12	Ground water withdrawal	
	WMP-04	Ground water withdrawal	
	WMP-06	Ground water withdrawal	POTENTIAL - NOT PUMPED PLOWED
	DWS-12	Hydrologic Regime Alterations	Dredged.
	WMP-02	Hydrologic Regime Alterations	INUNDATION/MANIPULATION OF HYDROLOGIC REGIME
	WMW-12	Hydrologic Regime Alterations	SPRING DISCHARGE POTENTIALLY COMPROMISED BY HAMMIL VALLEYY AGRICULTURE; CHANNEL ALTERED TO KEEP OUT BASS; CDFG DAMMED SPRING SOURCE
	DWS-05	Non-native species	Introduced centrachids present.

Appendix 11. Threats Information Available for a Subset of the Portfolio Sites.

	From Expert Site	*Threat Source*	*Comments*
	DWS-06	Non-native species - fishes	Stocked with catfish.
	DWS-12	Non-native species - fishes	Brown trout.
	WMP-07	Non-native species - plants	LEPIDIM
	WMP-06	Non-native species - plants	
	WMW-08	Recreation	CLIMBERS RECREATION USE VERY HEAVY
	WMW-07	Recreation	GENERAL USE; POTENTIAL ROCK CLIMBING
	WMW-16	Recreation	HUMAN VISITATION TO CAVES
	DWS-05	Roads	Adjacent road building.
	WMP-07	Urban expansion	DEVELOPED - RESIDENTIAL AND PASTURE
6342	**WHITE MOUNTAINS**		
	RT-23	Grazing	Very heavily grazed riparian meadows.
	WMW-10	Grazing	EAST SIDE
	JM-01	Grazing	Heavy. Sand spring is cattle-grazed.
	WMW-10	Grazing	In Pinchot Creek.
	KZ-31	Grazing	Grazed lightly. Ungrazed carex.
	TFS-15	Grazing	Not over grazed, but meadow is hammered.
	LVNDOW-08	Hydrologic Regime Alterations	Springbrook channelized, but source in good shape.
	WMW-10	Mining - historical	PRIVATE. HISTORIC CLOSINGS
	TBLM-17	Non-native species - mammals	Wild horse (small band) use.
	WMW-09	Non-native species - mammals	WILD HORESES FROM CALVIN CREEK
	WMW-10	Recreation	PRIVATE OBSERVATORY
6343	**INYO MOUNTAINS**		
	ES-02	Diversions	Potential water draw down.
	WMA-10	Flash Floods	Natural flash floods occur
	WMP-01	Grazing	PARTS HISTORIC GRAZED; FS GRAZED
	JM-06	Grazing	Light.
	ES-01	Ground water withdrawal	Water draw down from aquifer.
	WMA-10	Herp Collectors	
	JM-06	Non-native species - plants	exotics in Deep Springs Valley.
	WMP-01	Poaching	
		Recreation	OBSERVATORY

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Bureau of Land Management

Site HA	% BLM	SITE ID	SITE NAME
13,684.75	20.78%	A002	ANCHORITE HILLS
1,717.24	85.01%	A004	ANTELOPE SPRINGS
18,434.51	98.73%	A005	ANTELOPE VALLEY
176,322.89	36.36%	A006	ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
50,741.89	76.26%	A007	ARTESIA LAKE-EAST PINE NUT MOUNTAINS
6,236.22	95.72%	A008	AUGUSTA MOUNTAINS
2,024.04	82.93%	A009	BALD MOUNTAIN
20,252.07	20.97%	A010	BALD MOUNTAIN
24,529.40	53.92%	A012	BATTLE MOUNTAIN
49,221.49	78.54%	A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS
2,398.98	89.36%	A014	BEAVER LAKE MOUNTAINS
2,633.82	14.25%	A015	BEAVER RIDGE
337,833.81	2.06%	A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
5,610.84	88.39%	A017	BLACK HILLS
5,590.46	89.26%	A018	BLACK MOUNTAINS
4,130.61	100.00%	A019	BLACK ROCK
265,947.72	98.41%	A020	BLACK ROCK DESERT-SMOKE CREEK DESERT
27,957.90	44.64%	A021	BLOWSAND MOUNTAINS-BARNETT HILLS
141,257.66	75.18%	A022	BLUE LAKES-BADLANDS
86,690.61	46.83%	A023	BODIE HILLS
8,013.22	96.30%	A024	BOLIVIA
1,780.31	89.22%	A025	BOONE SPRING
12,519.89	100.00%	A026	BROKEN HILLS
10,304.50	84.45%	A027	BUCKSKIN HILL
4,208.40	92.29%	A028	BUFFALO SPRINGS
11,815.78	99.09%	A029	BUFFALO VALLEY-TOBIN RANGE
19,308.02	13.19%	A030	BUTLER BASIN
6,045.40	100.00%	A031	BUTTE MOUNTAINS
6,465.08	91.53%	A034	CALICO HILLS
1,850.31	90.75%	A035	CAMP VALLEY
1,836.69	87.93%	A036	CANE SPRING
58,667.33	40.96%	A037	CANYON MOUNTAINS-DELTA
47,609.25	8.03%	A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
104,031.56	26.09%	A039	CARSON RIVER
379,146.97	48.19%	A040	CARSON SINK
163,531.42	93.47%	A042	CAVE VALLEY-UPPER WHITE RIVER VALLEY
1,849.79	5.02%	A043	CEDAR CITY JUNCTION

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Bureau of Land Management

Site HA	% BLM	SITE ID	SITE NAME
7,964.20	100.00%	A045	CLAYTON VALLEY SAND DUNES
30,785.41	79.69%	A046	CLEAR LAKE
3,974.88	100.00%	A047	CLOVER CREEK
4,033.59	92.03%	A048	COMINS MEADOW
3,825.44	87.29%	A049	CONFUSION RANGE
222,673.11	91.78%	A050	CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE
23,449.42	83.33%	A051	COVE CREEK
3,868.56	99.47%	A052	COWCAMP
12,033.50	100.00%	A053	CRESCENT DUNES
28,913.63	84.61%	A054	CRICKET MOUNTAINS
68,944.08	48.92%	A055	CURRANT MOUNTAIN
1,585.57	13.35%	A056	CURRANT SUMMIT
8,003.65	95.94%	A057	CURRIE GARDENS-TAYLOR CANYON
1,951.44	81.18%	A058	DAISY CREEK
171,555.38	72.53%	A059	DEEP CREEK RANGE
66,722.33	98.07%	A060	DESATOYA MOUNTAINS
10,820.02	89.76%	A061	DIAMOND PEAK
10,117.75	100.00%	A062	DIAMOND SPRINGS
7,128.24	99.09%	A063	DIAMOND VALLEY ALKALI FLAT
23,829.51	71.32%	A064	DIXIE CREEK
16,365.83	99.20%	A065	DIXIE VALLEY
31,363.96	45.80%	A066	DOVE CREEK HILLS
38,716.43	99.91%	A067	DRY LAKE VALLEY
42,274.98	68.04%	A068	DUCK CREEK RANGE-STEPTOE VALLEY
32,080.99	91.05%	A069	DUCKWATER VALLEY
13,322.40	88.42%	A070	DUGWAY RANGE
4,153.86	87.68%	A071	EAST CRICKET MOUNTAINS FOOTHILLS
16,948.24	91.96%	A073	EAST GABBS VALLEY
72,243.27	8.02%	A074	EAST HUMBOLDT RANGE
57,422.71	46.43%	A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY
7,880.35	98.80%	A076	EASTGATE-ROCK CREEK
4,135.00	74.40%	A077	EIGHTEEN MILE MARSH
1,626.19	15.13%	A078	ELKO
1,633.04	32.59%	A079	ELLISON CREEK
4,047.06	46.07%	A080	EMIGRANT PASS
10,918.93	7.53%	A081	ESCALANTE DESERT
10,465.74	77.38%	A082	ESCALANTE VALLEY
8,025.87	50.48%	A083	EUGENE MOUNTAINS

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Bureau of Land Management

Site HA	% BLM	SITE ID	SITE NAME
4,033.61	1.76%	A084	EUREKA
3,769.12	95.83%	A085	FAIRVIEW PEAK
10,860.08	100.00%	A086	FAIRVIEW VALLEY
8,307.42	99.70%	A088	FENCEMAKER
46,874.03	89.16%	A089	FERGUSON DESERT-TULE VALLEY
42,917.02	99.58%	A090	FINGER ROCK WASH
5,044.69	80.86%	A091	FISH CREEK SPRINGS
31,537.35	18.34%	A092	FISH SPRINGS
1,752.99	100.00%	A093	FLAT SPRING
48,680.53	84.35%	A094	FLY RANCH GEYSER-GRANITE RANGE
24,706.26	13.61%	A095	FOURMILE BASIN
1,659.96	88.78%	A096	FOURMILE WASH
1,842.78	84.98%	A097	FROST CREEK
81,179.53	96.37%	A098	GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
1,868.43	99.57%	A099	GARFIELD HILLS
1,611.75	64.54%	A100	GIOCOECHEA WARM SPRINGS
2,350.94	1.46%	A101	GOSHEN-WARM SPRINGS
44,372.70	100.00%	A102	GOSHUTE MOUNTAINS
1,752.91	83.74%	A103	GOSS SPRINGS
1,710.70	76.01%	A104	GOVERNMENT PEAK
16,784.52	0.11%	A105	GRANITE PEAK
1,011,283.52	10.11%	A106	GREAT SALT LAKE
545,563.87	39.01%	A108	GROUSE CREEK MOUNTAINS-RAFT RIVER MOUNTAINS
3,749.09	98.82%	A109	HANDY SPRING
1,716.54	100.00%	A110	HEART HILLS
17,574.17	85.45%	A111	HERD PASS
4,300.28	96.08%	A112	HIGHLAND RANGE
1,933.59	87.05%	A113	HIKO SPRING
1,826.82	6.75%	A114	HOLBROOK JUNCTION
3,254.81	1.71%	A115	HOLDEN SAND DUNES
17,847.27	99.22%	A116	HOME STATION WASH
12,301.60	100.00%	A117	HORSESHOE BASIN
1,721.51	51.07%	A118	HORSESHOE SPRINGS
3,667.28	99.79%	A119	HOT CREEK VALLEY
7,807.55	100.00%	A120	HOT CREEK-PALISADE MESA
5,924.20	65.25%	A121	HOT SPRINGS CREEK
1,638.03	100.00%	A122	HOT SPRINGS HILL
26,154.53	88.17%	A123	HOUSE RANGE

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Bureau of Land Management

Site HA	% BLM	SITE ID	SITE NAME
2,159.39	1.19%	A124	HOYE CANYON
28,815.22	62.56%	A125	HUMBOLDT RANGE
42,427.02	18.29%	A126	HUMBOLDT RIVER GOLCONDA
5,311.55	29.44%	A127	HUMBOLDT RIVER IMLAY
16,703.28	68.10%	A129	INDIAN PEAK
248,912.12	61.04%	A130	INYO MOUNTAINS
34,234.04	89.96%	A131	IONE VALLEY
14,314.51	95.92%	A132	JACKSON MOUNTAINS
1,822.86	89.02%	A133	JACKSON SPRING
1,832.92	85.57%	A134	JACKSON WASH
20,908.78	100.00%	A135	JAKES VALLEY
3,734.32	100.00%	A136	JERSEY SUMMIT
20,963.85	4.48%	A137	JUAB VALLEY
1,840.83	4.82%	A138	KANARRA
8,517.66	97.25%	A140	KAWICH RANGE
6,452.09	93.47%	A141	KERN MOUNTAINS
7,996.49	99.36%	A142	KING LEAR PEAK
2,473.29	94.54%	A143	KINGS CANYON
1,764.73	92.15%	A144	KNOLL SPRINGS
30,829.24	96.78%	A145	KOBEH VALLEY
11,139.82	100.00%	A146	KUMIVA VALLEY
2,000.00	100.00%	A147	LAKE VALLEY
17,928.62	100.00%	A148	LAVA BEDS CREEK
51,643.81	81.05%	A149	LITTLE SAHARA SAND DUNES
135,560.49	99.77%	A150	LONE MOUNTAIN-MONTE CRISTO RANGE
24,392.48	40.03%	A151	LONE TREE-CEDAR VALLEY
160,476.80	22.34%	A152	LONG VALLEY
1,929.12	99.14%	A153	LOOKOUT SPRINGS
33,084.72	12.54%	A154	LOVELOCK VALLEY
6,868.39	26.87%	A155	LUCKY BOY PASS
1,987.20	58.71%	A156	LUND FLATS
3,874.76	10.41%	A157	LYNNDYL SAND DUNES
5,211.66	30.95%	A158	MAGGIE CREEK
17,261.56	37.59%	A159	MASON VALLEY
43,682.62	88.26%	A161	MEADOW VALLEY
1,844.24	99.14%	A162	MELOY SPRING
25,808.63	46.38%	A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
2,081.93	22.68%	A164	MINERAL VALLEY

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Bureau of Land Management

Site HA	% BLM	SITE ID	SITE NAME
90,257.12	37.28%	A165	MONO LAKE
99,903.60	35.33%	A166	MONTANA MOUNTAINS
5,931.94	98.88%	A167	MONTE CRISTO MOUNTAINS
6,568.69	46.24%	A168	MOOR SUMMIT
11,557.59	51.41%	A169	MOUNT LEWIS
1,793.66	30.03%	A170	MOUNT TIMPANOGOS
7,713.95	87.60%	A171	MOUNTAIN HOME RANGE
1,442.89	23.02%	A172	MUDHOLE SPRING
1,773.24	100.00%	A173	NELSON SPRING
19,707.42	97.47%	A174	NEW PASS
3,635.80	94.93%	A175	NEWARK LAKE
54,069.05	66.03%	A176	NEWFOUNDLAND MOUNTAINS
8,605.86	52.15%	A177	NIGHTINGALE FLAT
3,763.48	87.71%	A178	NIGHTINGALE MOUNTAINS
1,775.72	69.37%	A179	NORTH PAROWAN VALLEY
25,226.18	5.94%	A180	NORTH PYRAMID LAKE
7,338.54	95.63%	A181	NORTH RALSTON VALLEY
1,815.57	77.11%	A182	NORTH SEVIER LAKE
15,887.79	89.88%	A183	NORTH WAH WAH MOUNTAINS
6,407.46	99.70%	A184	NORTH WASSUK RANGE
10,527.60	28.88%	A185	NORTH WIG SAND DUNES
5,829.28	92.43%	A186	NORTHWEST SEVIER LAKE
1,843.61	100.00%	A187	OAK WELL CANYON
1,722.62	85.78%	A188	OASIS VALLEY
1,745.12	82.26%	A190	OLD RIVER BED
10,136.09	79.99%	A191	ONAQUI MOUNTAINS
19,583.59	16.11%	A192	OQUIRRH MOUNTAINS
136,064.49	40.72%	A195	OWENS VALLEY-BENTON VALLEY
10,069.25	23.13%	A196	PAH RAH RANGE
1,887.64	100.00%	A197	PAHROC SUMMIT PASS
3,901.39	100.00%	A198	PALMETTO MOUNTAINS
2,318.07	100.00%	A199	PANCAKE SUMMIT
1,713.23	84.57%	A200	PARADISE VALLEY
1,589.74	100.00%	A201	PARK RANGE
22,684.01	21.36%	A202	PAROWAN VALLEY
1,985.29	100.00%	A203	PATTERSON WASH
68,669.68	47.57%	A204	PEQUOP MOUNTAINS-TOANO DRAW
1,859.93	51.72%	A205	PILOT CREEK VALLEY

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Bureau of Land Management

Site HA	% BLM	SITE ID	SITE NAME
11,234.47	99.35%	A206	PILOT MOUNTAINS
46,710.66	63.70%	A207	PILOT RANGE
2,074.37	91.67%	A208	PINE FOREST RANGE
2,796.21	59.32%	A209	PINE RIDGE
181,132.58	34.18%	A210	PINE VALLEY MOUNTAINS
6,172.95	94.50%	A211	PLEASANT VALLEY
6,029.83	48.68%	A213	PRATHER SPRINGS
208,539.87	25.92%	A214	PYRAMID LAKE-LOWER TRUCKEE RIVER
3,688.24	12.77%	A215	QUICHAPA LAKE
31,984.46	98.41%	A216	QUILICI SPRING-BUTTE VALLEY
182,939.95	51.23%	A217	QUINN CANYON RANGE-GRANT RANGE
47,414.11	84.15%	A218	QUINN RIVER
10,893.17	15.78%	A219	RABBIT CREEK
2,103.75	100.00%	A220	RAILROAD GRADE
1,977.92	70.80%	A221	RAILROAD PASS
50,694.57	88.99%	A222	RAILROAD VALLEY
24,737.57	94.56%	A223	RAINBOW CANYON
1,738.84	100.00%	A224	RED HILL
3,440.22	1.65%	A225	RED PEAK
1,937.80	79.60%	A226	RED POINT
45,308.62	89.10%	A227	REESE RIVER
3,596.71	100.00%	A228	REESE RIVER VALLEY
13,498.96	100.00%	A229	REVEILLE VALLEY
1,729.05	100.00%	A231	ROCK SPRINGS CANYON
139,915.68	35.01%	A232	RUBY MOUNTAINS
104,262.77	58.56%	A233	RUBY VALLEY
120,330.61	47.97%	A234	RUSH VALLEY
1,753.41	91.44%	A235	RUTH
7,993.78	68.54%	A236	RYE PATCH
1,736.02	53.88%	A237	SAGE HEN VALLEY
20,217.89	58.04%	A238	SAHWAVE MOUNTAINS-LAKE RANGE
10,462.50	99.13%	A239	SAN ANTONIO DUNES
11,028.65	70.90%	A240	SAN FRANCISCO MOUNTAINS
3,903.31	33.78%	A241	SAN PITCH MOUNTAINS
23,720.58	90.07%	A242	SAND MOUNTAIN
10,181.97	90.65%	A243	SAWTOOTH MOUNTAIN
86,036.07	9.23%	A244	SCHELL CREEK RANGE
3,737.76	87.91%	A245	SCHELLBOURNE PASS

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Bureau of Land Management

Site HA	% BLM	SITE ID	SITE NAME
11,439.03	6.99%	A246	SCHURZ
1,883.73	25.02%	A248	SEVIER BRIDGE RESERVOIR
11,595.35	92.38%	A249	SEVIER DESERT
1,785.02	74.98%	A250	SHEPHERD CREEK
5,948.88	53.84%	A251	SHERMAN CREEK
1,717.56	100.00%	A252	SHERMAN MOUNTAIN
21,295.53	92.98%	A254	SHOSHONE RANGE-CARICO LAKE VALLEY
50,485.75	41.15%	A255	SHOSHONE-BEOWAWE
42,383.37	84.95%	A256	SILVER ISLAND MOUNTAINS
5,688.95	100.00%	A257	SILVER PEAK RANGE
121,896.93	53.15%	A258	SILVER STATE SAND DUNES
4,103.62	14.37%	A259	SIMPSON BUTTES
10,014.88	82.27%	A260	SIMPSON MOUNTAINS
269,858.61	91.25%	A261	SIMPSON PARK MOUNTAINS-NORTH TOIYABE RANGE
21,767.61	98.80%	A262	SIXMILE FLAT
4,274.70	59.01%	A263	SKULL VALLEY
18,608.69	37.82%	A264	SLINKARD VALLEY
5,985.46	83.48%	A265	SLOW ELK HILLS
6,607.63	58.14%	A266	SMOKE CREEK
225,821.84	50.96%	A267	SNAKE RANGE
55,720.54	87.18%	A268	SNAKE VALLEY
11,464.26	87.68%	A269	SOAP HOLLOW
33,874.99	89.53%	A270	SOLDIER MEADOWS
12,421.82	70.50%	A271	SONOMA RANGE
1,536.78	100.00%	A272	SOUTH GROOM RANGE
3,855.21	9.12%	A273	SOUTH JUAB VALLEY
3,883.38	27.20%	A274	SOUTH MILFORD
11,476.05	66.51%	A275	SOUTH PINE NUT MOUNTAINS
10,856.05	100.00%	A276	SOUTH RAILROAD VALLEY
3,762.39	77.52%	A277	SOUTH RALSTON VALLEY
10,352.15	84.47%	A278	SOUTH SEVIER LAKE
51,836.14	87.51%	A279	SOUTH WAH WAH MOUNTAINS
49,189.41	31.46%	A280	SOUTH WASSUK RANGE
6,214.07	93.85%	A281	SPRING CREEK
4,034.83	87.52%	A282	SPRING VALLEY CREEK
47,966.82	99.83%	A283	SPRING VALLEY-HAMLIN VALLEY
1,761.09	80.38%	A284	SPRUCE MOUNTAIN
10,390.64	51.51%	A285	SQUAW VALLEY

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Bureau of Land Management

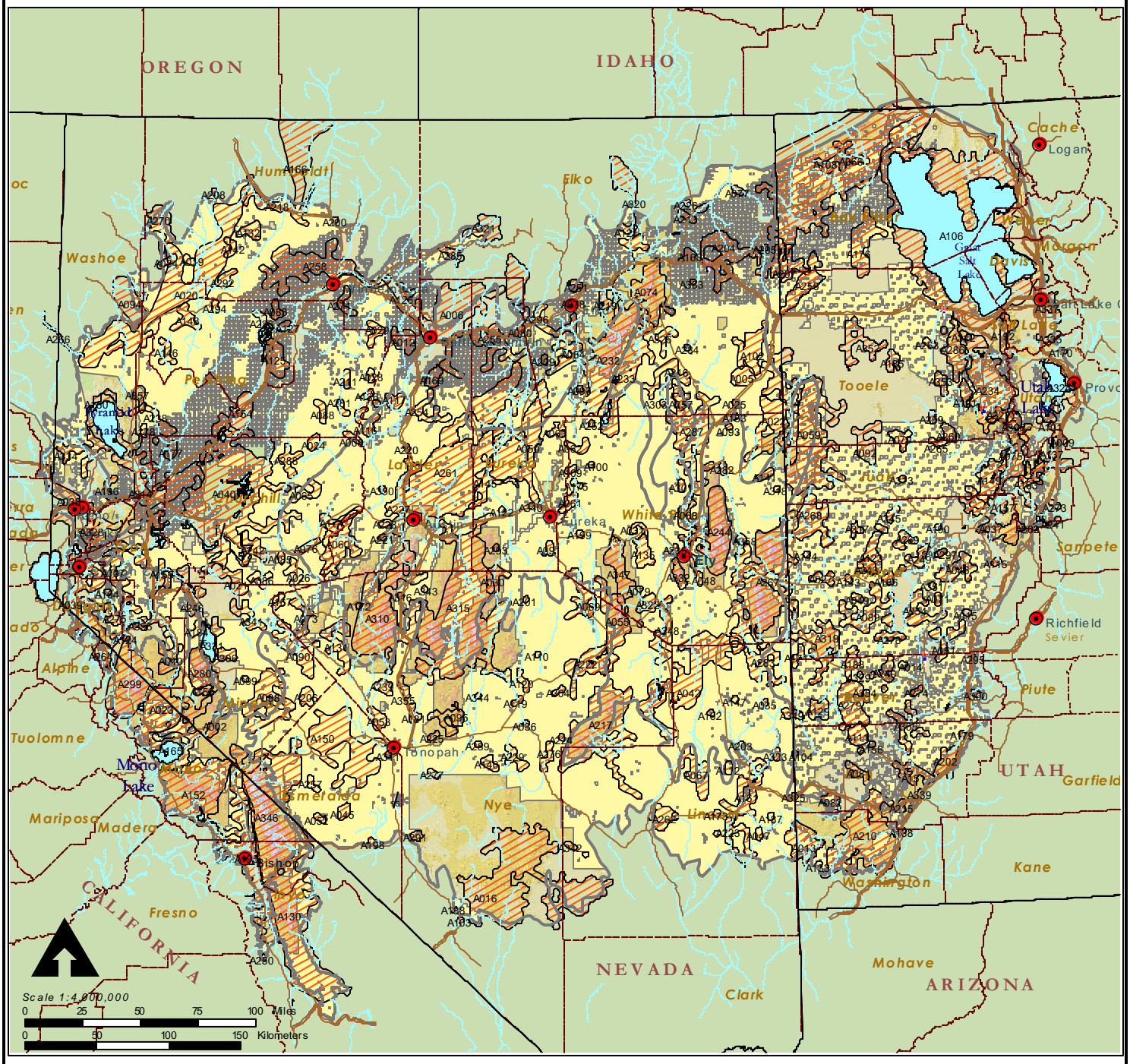
Site HA	% BLM	SITE ID	SITE NAME
38,246.00	45.88%	A286	STANSBURY MOUNTAINS
123,620.82	86.41%	A287	STEPTOE VALLEY
17,441.17	99.42%	A288	STILLWATER RANGE -DIXIE VALLEY
1,812.08	100.00%	A289	STONE CABIN VALLEY
4,810.08	43.76%	A291	STONEWALL MOUNTAIN
10,457.58	99.82%	A292	SUGARLOAF KNOB
1,796.71	9.45%	A293	SULLIVAN SPRING
3,812.95	99.67%	A294	SULPHUR
1,974.72	31.09%	A295	SULPHURDALE
23,715.90	60.46%	A296	SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER
3,831.48	59.68%	A297	SWAN LAKE SALT MARSH
3,713.20	85.86%	A298	SWASEY MOUNTAIN
114,555.02	1.01%	A299	SWEETWATER MOUNTAINS
3,844.90	41.78%	A300	TABLE GROUNDS
3,954.95	96.70%	A301	TELEGRAPH PEAK
1,890.24	52.62%	A302	THE COVE
1,746.46	100.00%	A303	THE NARROWS
3,581.02	100.00%	A304	THE WALL
24,271.85	70.97%	A305	THERMAL HOT SPRINGS-ESCALANTE DESERT
10,059.87	92.64%	A306	THORNE DUNE
4,158.78	31.22%	A307	THOUSAND SPRINGS CREEK HOT SPRINGS
10,063.49	72.49%	A308	TINTIC MOUNTAINS
1,798.90	0.01%	A309	TOD PARK
205,734.14	25.91%	A310	TOIYABE RANGE-BIG SMOKY VALLEY
1,838.58	86.73%	A311	TONOPAH SUMMIT
3,979.60	12.08%	A312	TOOELE VALLEY
2,098.45	87.59%	A313	TOPAZ MOUNTAIN
396,229.90	40.70%	A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
1,743.47	92.78%	A316	TRAIL CANYON
5,992.52	90.67%	A317	TULE VALLEY
1,924.84	100.00%	A318	TUNGSTONIA
64,307.59	60.05%	A319	TUNNEL SPRING MOUNTAINS-HALFWAY HILLS-PINE VALLEY
65,692.59	45.38%	A320	UPPER HUMBOLDT RIVER-LOWER MARYS RIVER
32,151.12	47.22%	A321	UPPER ROCK CREEK
11,748.51	79.49%	A322	UPPER WHITE RIVER
4,251.38	92.62%	A323	URSINE
71,914.23	5.43%	A324	UTAH LAKE
1,746.12	81.39%	A325	UVADA

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Bureau of Land Management

Site HA	% BLM	SITE ID	SITE NAME
13,031.84	98.20%	A326	VALLEY MOUNTAIN
17,327.21	27.99%	A327	VERNON
42,457.34	13.99%	A328	VIRGINIA RANGE
1,677.04	66.57%	A329	WAH WAH SPRINGS
1,767.34	85.59%	A330	WAH WAH WASH
94,459.81	24.98%	A331	WALKER LAKE-WALKER RIVER
12,808.88	27.26%	A332	WARD MOUNTAIN
1,736.37	38.61%	A333	WARM SPRINGS
25,542.43	82.35%	A334	WARM SPRINGS VALLEY
7,813.49	19.21%	A335	WASATCH FRONT DRAPER
11,901.08	23.92%	A337	WASATCH FRONT SALT LAKE CITY
15,658.42	0.47%	A338	WELLINGTON HILLS
1,593.87	1.88%	A339	WEST CEDAR CITY
1,758.04	90.98%	A340	WEST DEVILS GATE
21,052.97	73.20%	A341	WEST GABBS VALLEY
3,861.51	20.16%	A342	WEST GROOM RANGE
1,727.02	100.00%	A343	WEST NORTHUMBERLAND CANYON
1,612.64	100.00%	A344	WEST STONE CABIN VALLEY
5,698.03	90.01%	A345	WHIRLWIND VALLEY
273,555.25	32.90%	A346	WHITE MOUNTAINS
47,769.79	8.97%	A347	WHITE PINE RANGE
34,908.97	81.63%	A348	WHITE RIVER VALLEY
8,421.14	91.96%	A349	WHITE ROCK MOUNTAINS
2,045.90	100.00%	A350	WHITE SAGE FLAT
1,861.28	96.41%	A351	WHITE SAGE VALLEY
41,012.64	12.55%	A352	WILD ISLE-GREAT SALT LAKE DESERT SAND DUNES
10,848.62	61.08%	A353	WILLOW PATCH SPRINGS
4,096.14	86.51%	A354	WILLOW SPRING
7,576.08	68.05%	A355	WILLOW SPRING
6,094.31	44.29%	A356	WILSON CANYON
10,151.62	28.19%	A357	WINNEMUCCA LAKE
3,856.22	94.69%	A358	YELLAND DRY LAKE

Figure Appendix12a. Portfolio sites on BLM lands.



Action sites

BLM lands

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

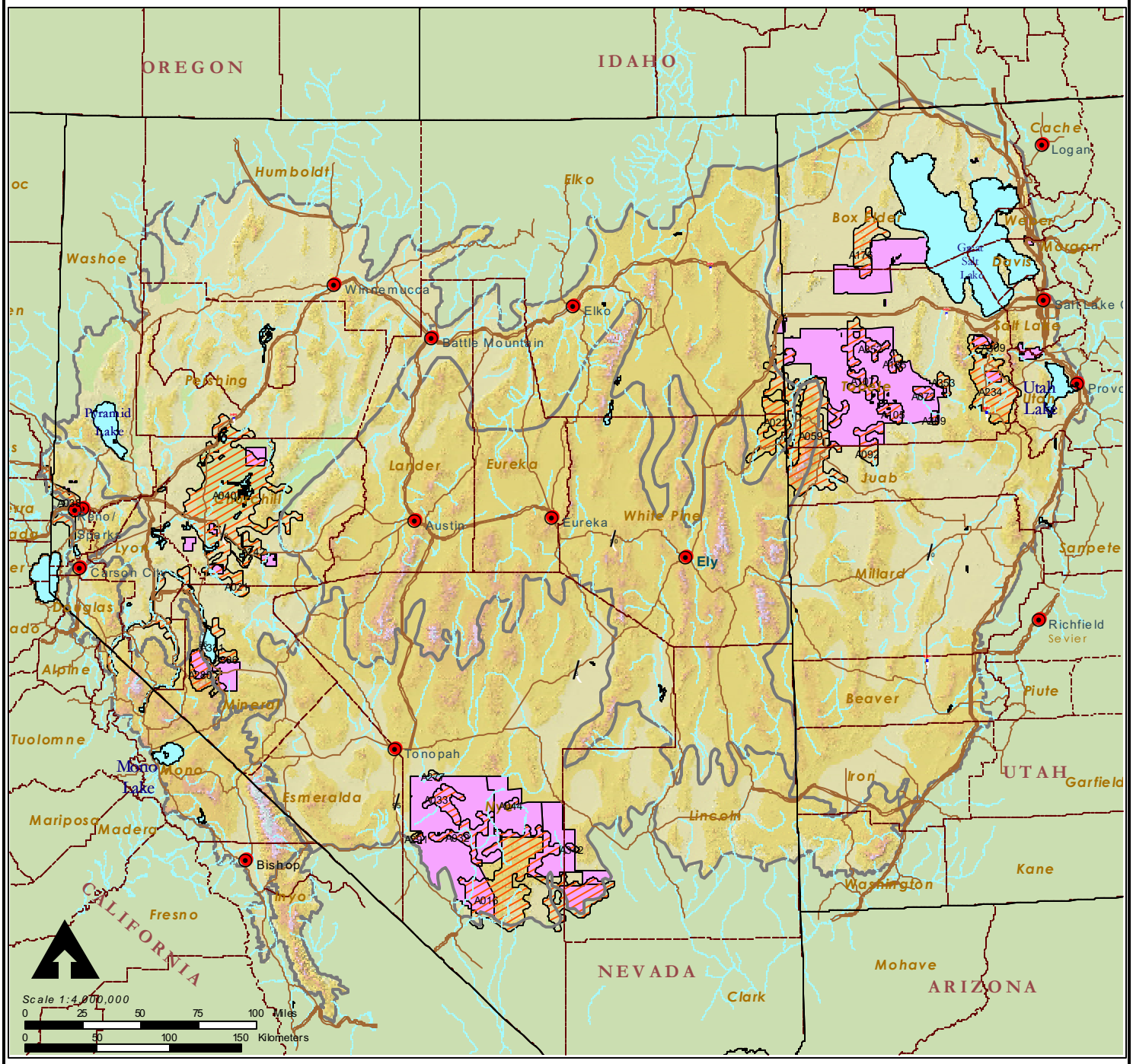
Modification and revision of portfolio site data and boundaries are ongoing.

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Department of Defense

Site HA	% DOD	SITE ID	SITE NAME
337,833.81	46.73%	A016	BELTED RANGE-KAWICH VALLEY-GOLD FLAT/TIMBER MOUNTAIN/EMIGRANT VALLEY-HALFPI
27,957.90	24.40%	A021	BLOWSAND MOUNTAINS-BARNETT HILLS
141,257.66	4.64%	A022	BLUE LAKES-BADLANDS
43,492.46	98.96%	A032	CACTUS FLAT
33,176.35	99.96%	A033	CACTUS RANGE
47,609.25	1.20%	A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
379,146.97	3.66%	A040	CARSON SINK
4,041.86	100.00%	A044	CEDAR PASS
171,555.38	8.81%	A059	DEEP CREEK RANGE
10,656.92	100.00%	A072	EAST DUGWAY DUNES
16,948.24	0.14%	A073	EAST GABBS VALLEY
31,537.35	56.49%	A092	FISH SPRINGS
16,784.52	97.21%	A105	GRANITE PEAK
1,011,283.52	0.17%	A106	GREAT SALT LAKE
25,633.48	99.05%	A107	GREAT SALT LAKE DESERT MUD FLAT
54,069.05	12.69%	A176	NEWFOUNDLAND MOUNTAINS
10,527.60	68.37%	A185	NORTH WIG SAND DUNES
120,330.61	12.67%	A234	RUSH VALLEY
23,720.58	9.37%	A242	SAND MOUNTAIN
4,103.62	85.63%	A259	SIMPSON BUTTES
3,762.39	22.48%	A277	SOUTH RALSTON VALLEY
49,189.41	46.42%	A280	SOUTH WASSUK RANGE
4,810.08	55.57%	A291	STONEWALL MOUNTAIN
10,059.87	7.16%	A306	THORNE DUNE
1,798.90	20.65%	A309	TOD PARK
94,459.81	0.79%	A331	WALKER LAKE-WALKER RIVER
3,861.51	79.84%	A342	WEST GROOM RANGE
41,012.64	83.92%	A352	WILD ISLE-GREAT SALT LAKE DESERT SAND DUNES
10,848.62	12.99%	A353	WILLOW PATCH SPRINGS

Figure Appendix12b. Portfolio sites on DOD lands.



Action sites

DOD lands

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

U.S. Forest Service

Site HA	%USFS	SITE ID	SITE NAME
3,774.58	0.25%	A001	AMERICAN FORK
13,684.75	79.22%	A002	ANCHORITE HILLS
2,024.04	6.47%	A009	BALD MOUNTAIN
20,252.07	72.55%	A010	BALD MOUNTAIN
3,505.20	100.00%	A011	BARRETT CANYON
49,221.49	13.76%	A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS
86,690.61	37.05%	A023	BODIE HILLS
19,308.02	86.35%	A030	BUTLER BASIN
58,667.33	35.78%	A037	CANYON MOUNTAINS-DELTA
47,609.25	25.99%	A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
104,031.56	11.71%	A039	CARSON RIVER
2,551.74	98.98%	A041	CATHEDRAL CANYON
68,944.08	48.10%	A055	CURRANT MOUNTAIN
1,585.57	86.65%	A056	CURRANT SUMMIT
42,274.98	0.15%	A068	DUCK CREEK RANGE-STEPTOE VALLEY
16,948.24	1.46%	A073	EAST GABBS VALLEY
72,243.27	32.92%	A074	EAST HUMBOLDT RANGE
1,633.04	67.41%	A079	ELLISON CREEK
2,800.56	100.00%	A087	FANDANGO
24,706.26	85.92%	A095	FOURMILE BASIN
1,011,283.52	0.00%	A106	GREAT SALT LAKE
545,563.87	4.30%	A108	GROUSE CREEK MOUNTAINS-RAFT RIVER MOUNTAINS
2,159.39	59.87%	A124	HOYE CANYON
1,838.57	97.42%	A128	HUNTOON SPRING
248,912.12	34.02%	A130	INYO MOUNTAINS
34,234.04	9.94%	A131	IONE VALLEY
20,963.85	10.83%	A137	JUAB VALLEY
160,476.80	66.75%	A152	LONG VALLEY
6,868.39	62.29%	A155	LUCKY BOY PASS
3,674.96	97.98%	A160	MCKINNEY MOUNTAINS
25,808.63	0.37%	A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
90,257.12	31.27%	A165	MONO LAKE
1,793.66	36.90%	A170	MOUNT TIMPANOGOS
1,442.89	76.98%	A172	MUDHOLE SPRING
3,780.56	62.46%	A189	OGDEN CANYON
1,619.65	68.50%	A194	OWENS RIVER GORGE
136,064.49	12.88%	A195	OWENS VALLEY-BENTON VALLEY
1,713.23	11.80%	A200	PARADISE VALLEY

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

U.S. Forest Service

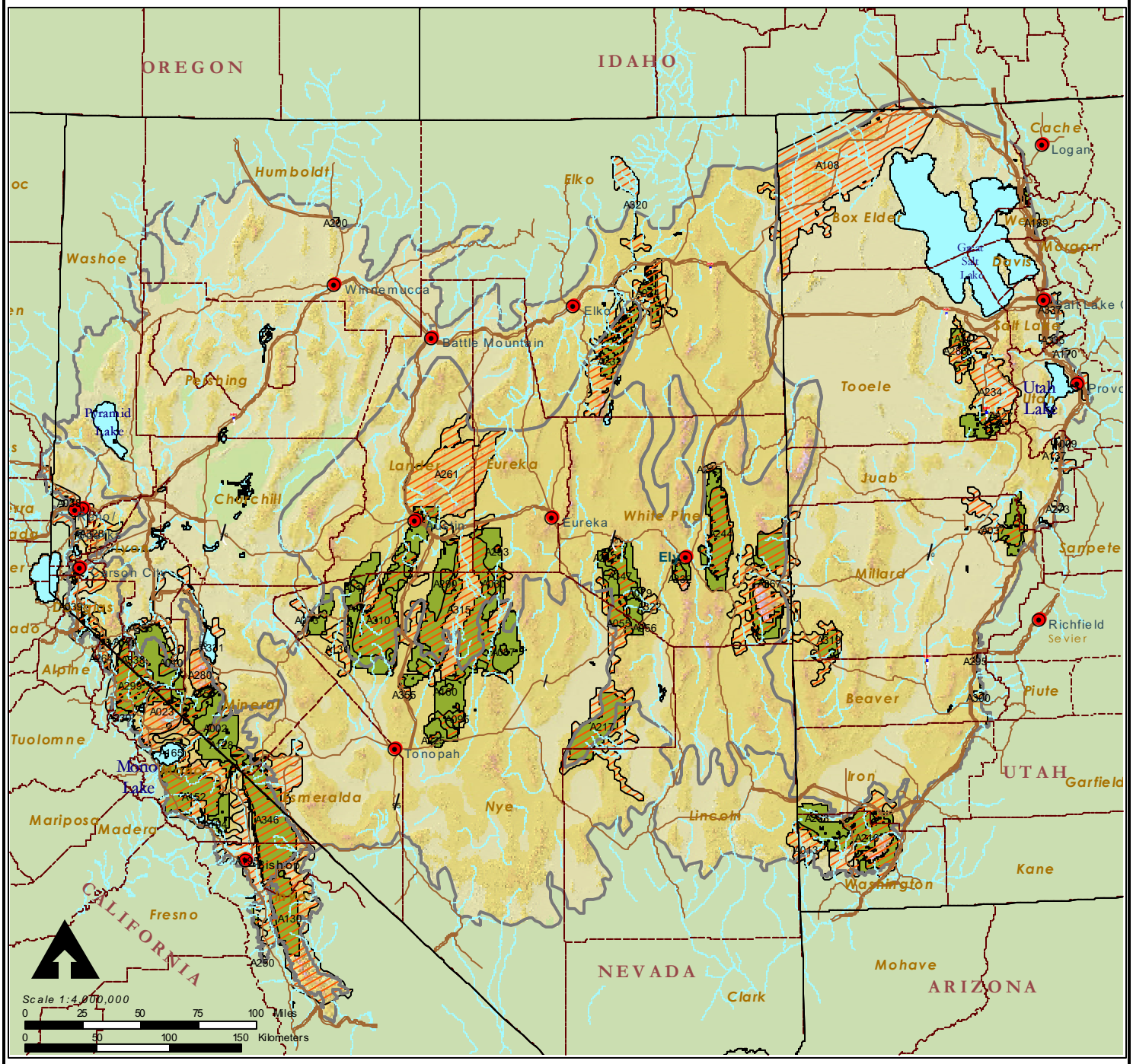
Site HA	%USFS	SITE ID	SITE NAME
22,684.01	0.01%	A202	PAROWAN VALLEY
181,132.58	50.88%	A210	PINE VALLEY MOUNTAINS
1,856.77	88.04%	A212	POGONIP RIDGE
182,939.95	48.13%	A217	QUINN CANYON RANGE-GRANT RANGE
3,440.22	96.59%	A225	RED PEAK
10,183.32	97.60%	A230	RICKEY PEAK
139,915.68	43.69%	A232	RUBY MOUNTAINS
104,262.77	0.03%	A233	RUBY VALLEY
120,330.61	2.91%	A234	RUSH VALLEY
86,036.07	87.60%	A244	SCHELL CREEK RANGE
3,737.76	6.44%	A245	SCHELLBOURNE PASS
1,785.02	24.33%	A250	SHEPHERD CREEK
3,883.62	62.67%	A253	SHOAL CREEK
269,858.61	4.21%	A261	SIMPSON PARK MOUNTAINS-NORTH TOIYABE RANGE
18,608.69	19.06%	A264	SLINKARD VALLEY
225,821.84	31.33%	A267	SNAKE RANGE
3,855.21	24.13%	A273	SOUTH JUAB VALLEY
49,189.41	3.98%	A280	SOUTH WASSUK RANGE
38,246.00	42.60%	A286	STANSBURY MOUNTAINS
123,620.82	0.46%	A287	STEPTOE VALLEY
13,204.88	99.93%	A290	STONEBERGER BASIN
1,796.71	82.55%	A293	SULLIVAN SPRING
1,974.72	38.54%	A295	SULPHURDALE
114,555.02	93.15%	A299	SWEETWATER MOUNTAINS
3,844.90	15.16%	A300	TABLE GROUNDS
205,734.14	70.16%	A310	TOIYABE RANGE-BIG SMOKY VALLEY
3,979.60	19.30%	A312	TOOELE VALLEY
1,709.03	98.77%	A314	TOPIER CANYON
396,229.90	57.46%	A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
64,307.59	32.33%	A319	TUNNEL SPRING MOUNTAINS-HALFWAY HILLS-PINE VALLEY
65,692.59	16.75%	A320	UPPER HUMBOLDT RIVER-LOWER MARYS RIVER
11,748.51	10.71%	A322	UPPER WHITE RIVER
71,914.23	0.03%	A324	UTAH LAKE
17,327.21	40.75%	A327	VERNON
42,457.34	0.61%	A328	VIRGINIA RANGE
94,459.81	7.48%	A331	WALKER LAKE-WALKER RIVER
12,808.88	64.13%	A332	WARD MOUNTAIN
7,813.49	5.94%	A335	WASATCH FRONT DRAPER

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

U.S. Forest Service

Site HA	%USFS	SITE ID	SITE NAME
9,890.74	45.05%	A336	WASATCH FRONT PROVO-SPRINGVILLE
11,901.08	14.80%	A337	WASATCH FRONT SALT LAKE CITY
15,658.42	91.66%	A338	WELLINGTON HILLS
273,555.25	64.25%	A346	WHITE MOUNTAINS
47,769.79	87.02%	A347	WHITE PINE RANGE
7,576.08	31.73%	A355	WILLOW SPRING
6,094.31	26.71%	A356	WILSON CANYON

Figure Appendix12c. Portfolio sites on USFS lands.



Action sites

USFS lands

Great Basin ecoregion boundary

County lines

Rivers and streams

Roads and highways

Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Private

Site HA	%PVT	SITE ID	SITE NAME
3,774.58	99.75%	A001	AMERICAN FORK
2,064.38	99.76%	A003	ANDERSON HILL
18,434.51	1.27%	A005	ANTELOPE VALLEY
176,322.89	57.18%	A006	ARGENTA MARSH-SHEEP CREEK RANGE-TUSCARORA MOUNTAINS
50,741.89	20.73%	A007	ARTESIA LAKE-EAST PINE NUT MOUNTAINS
6,236.22	4.28%	A008	AUGUSTA MOUNTAINS
2,024.04	5.63%	A009	BALD MOUNTAIN
20,252.07	6.49%	A010	BALD MOUNTAIN
24,529.40	46.08%	A012	BATTLE MOUNTAIN
49,221.49	3.53%	A013	BEAVER DAM WASH-BULL VALLEY MOUNTAINS
2,398.98	2.38%	A014	BEAVER LAKE MOUNTAINS
2,633.82	85.72%	A015	BEAVER RIDGE
5,590.46	4.62%	A018	BLACK MOUNTAINS
265,947.72	1.42%	A020	BLACK ROCK DESERT-SMOKE CREEK DESERT
141,257.66	3.11%	A022	BLUE LAKES-BADLANDS
86,690.61	16.05%	A023	BODIE HILLS
8,013.22	3.70%	A024	BOLIVIA
1,780.31	10.78%	A025	BOONE SPRING
4,208.40	7.71%	A028	BUFFALO SPRINGS
11,815.78	0.91%	A029	BUFFALO VALLEY-TOBIN RANGE
19,308.02	0.46%	A030	BUTLER BASIN
6,465.08	7.82%	A034	CALICO HILLS
1,850.31	9.25%	A035	CAMP VALLEY
1,836.69	12.07%	A036	CANE SPRING
58,667.33	12.28%	A037	CANYON MOUNTAINS-DELTA
47,609.25	64.16%	A038	CARSON RANGE FRONT-RENO NORTH VALLEYS-LONG VALLEY
104,031.56	54.91%	A039	CARSON RIVER
379,146.97	27.60%	A040	CARSON SINK
2,551.74	1.02%	A041	CATHEDRAL CANYON
163,531.42	4.18%	A042	CAVE VALLEY-UPPER WHITE RIVER VALLEY
1,849.79	67.95%	A043	CEDAR CITY JUNCTION
30,785.41	1.51%	A046	CLEAR LAKE
4,033.59	7.97%	A048	COMINS MEADOW
222,673.11	8.22%	A050	CORTEZ MOUNTAINS-ROBERTS MOUNTAINS-SULPHUR SPRING RANGE
23,449.42	7.88%	A051	COVE CREEK
3,868.56	0.53%	A052	COWCAMP
28,913.63	2.55%	A054	CRICKET MOUNTAINS
68,944.08	2.99%	A055	CURRANT MOUNTAIN

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Private

Site HA	%PVT	SITE ID	SITE NAME
8,003.65	4.06%	A057	CURRIE GARDENS-TAYLOR CANYON
1,951.44	18.82%	A058	DAISY CREEK
171,555.38	4.63%	A059	DEEP CREEK RANGE
66,722.33	1.93%	A060	DESATOYA MOUNTAINS
10,820.02	10.24%	A061	DIAMOND PEAK
7,128.24	0.91%	A063	DIAMOND VALLEY ALKALI FLAT
23,829.51	28.68%	A064	DIXIE CREEK
16,365.83	0.80%	A065	DIXIE VALLEY
31,363.96	49.22%	A066	DOVE CREEK HILLS
42,274.98	31.61%	A068	DUCK CREEK RANGE-STEPTOE VALLEY
32,080.99	3.97%	A069	DUCKWATER VALLEY
13,322.40	1.72%	A070	DUGWAY RANGE
16,948.24	6.44%	A073	EAST GABBS VALLEY
72,243.27	57.43%	A074	EAST HUMBOLDT RANGE
57,422.71	39.33%	A075	EAST TINTIC MOUNTAINS-TINTIC VALLEY
7,880.35	1.20%	A076	EASTGATE-ROCK CREEK
4,135.00	25.60%	A077	EIGHTEEN MILE MARSH
1,626.19	80.83%	A078	ELKO
4,047.06	53.93%	A080	EMIGRANT PASS
10,918.93	82.95%	A081	ESCALANTE DESERT
10,465.74	8.73%	A082	ESCALANTE VALLEY
8,025.87	49.52%	A083	EUGENE MOUNTAINS
4,033.61	95.34%	A084	EUREKA
3,769.12	4.17%	A085	FAIRVIEW PEAK
8,307.42	0.30%	A088	FENCEMAKER
46,874.03	0.15%	A089	FERGUSON DESERT-TULE VALLEY
42,917.02	0.42%	A090	FINGER ROCK WASH
5,044.69	19.14%	A091	FISH CREEK SPRINGS
31,537.35	0.53%	A092	FISH SPRINGS
48,680.53	15.55%	A094	FLY RANCH GEYSER-GRANITE RANGE
24,706.26	0.46%	A095	FOURMILE BASIN
1,659.96	9.95%	A096	FOURMILE WASH
1,842.78	15.02%	A097	FROST CREEK
81,179.53	3.63%	A098	GARFIELD FLAT-RHODES SALT MARSH-TEELS MARSH
1,868.43	0.43%	A099	GARFIELD HILLS
1,611.75	35.46%	A100	GIOCOECHEA WARM SPRINGS
2,350.94	92.95%	A101	GOSHEN-WARM SPRINGS
1,752.91	16.26%	A103	GOSS SPRINGS

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Private

Site HA	%PVT	SITE ID	SITE NAME
1,710.70	6.07%	A104	GOVERNMENT PEAK
16,784.52	2.68%	A105	GRANITE PEAK
1,011,283.52	38.08%	A106	GREAT SALT LAKE
25,633.48	0.95%	A107	GREAT SALT LAKE DESERT MUD FLAT
545,563.87	49.40%	A108	GROUSE CREEK MOUNTAINS-RAFT RIVER MOUNTAINS
3,749.09	1.18%	A109	HANDY SPRING
17,574.17	6.03%	A111	HERD PASS
4,300.28	3.92%	A112	HIGHLAND RANGE
1,933.59	12.95%	A113	HIKO SPRING
1,826.82	93.25%	A114	HOLBROOK JUNCTION
3,254.81	96.75%	A115	HOLDEN SAND DUNES
17,847.27	0.78%	A116	HOME STATION WASH
1,721.51	48.93%	A118	HORSESHOE SPRINGS
3,667.28	0.21%	A119	HOT CREEK VALLEY
5,924.20	34.75%	A121	HOT SPRINGS CREEK
2,159.39	38.94%	A124	HOYE CANYON
28,815.22	35.84%	A125	HUMBOLDT RANGE
42,427.02	81.71%	A126	HUMBOLDT RIVER GOLCONDA
5,311.55	70.56%	A127	HUMBOLDT RIVER IMLAY
1,838.57	2.58%	A128	HUNTOON SPRING
16,703.28	3.54%	A129	INDIAN PEAK
248,912.12	1.07%	A130	INYO MOUNTAINS
14,314.51	4.08%	A132	JACKSON MOUNTAINS
1,832.92	0.33%	A134	JACKSON WASH
20,963.85	69.64%	A137	JUAB VALLEY
1,840.83	64.78%	A138	KANARRA
2,179.69	100.00%	A139	KANOSH
8,517.66	2.75%	A140	KAWICH RANGE
6,452.09	6.53%	A141	KERN MOUNTAINS
7,996.49	0.64%	A142	KING LEAR PEAK
30,829.24	3.22%	A145	KOBEH VALLEY
51,643.81	7.81%	A149	LITTLE SAHARA SAND DUNES
135,560.49	0.18%	A150	LONE MOUNTAIN-MONTE CRISTO RANGE
24,392.48	55.05%	A151	LONE TREE-CEDAR VALLEY
160,476.80	4.27%	A152	LONG VALLEY
1,929.12	0.86%	A153	LOOKOUT SPRINGS
33,084.72	86.94%	A154	LOVELOCK VALLEY
6,868.39	10.84%	A155	LUCKY BOY PASS

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Private

Site HA	%PVT	SITE ID	SITE NAME
1,987.20	17.07%	A156	LUND FLATS
3,874.76	85.90%	A157	LYNNDYL SAND DUNES
5,211.66	69.05%	A158	MAGGIE CREEK
17,261.56	33.62%	A159	MASON VALLEY
3,674.96	2.02%	A160	MCKINNEY MOUNTAINS
43,682.62	10.46%	A161	MEADOW VALLEY
1,844.24	0.86%	A162	MELOY SPRING
25,808.63	48.55%	A163	MILLS VALLEY-SEVIER CANYON-WEST HILLS
2,081.93	77.32%	A164	MINERAL VALLEY
90,257.12	9.42%	A165	MONO LAKE
99,903.60	0.56%	A166	MONTANA MOUNTAINS
5,931.94	1.12%	A167	MONTE CRISTO MOUNTAINS
6,568.69	53.76%	A168	MOOR SUMMIT
11,557.59	48.59%	A169	MOUNT LEWIS
1,793.66	30.51%	A170	MOUNT TIMPANOGOS
19,707.42	2.53%	A174	NEW PASS
3,635.80	5.07%	A175	NEWARK LAKE
54,069.05	15.17%	A176	NEWFOUNDLAND MOUNTAINS
8,605.86	47.85%	A177	NIGHTINGALE FLAT
3,763.48	12.29%	A178	NIGHTINGALE MOUNTAINS
1,775.72	19.58%	A179	NORTH PAROWAN VALLEY
25,226.18	0.88%	A180	NORTH PYRAMID LAKE
7,338.54	4.37%	A181	NORTH RALSTON VALLEY
1,722.62	14.22%	A188	OASIS VALLEY
3,780.56	37.55%	A189	OGDEN CANYON
1,745.12	5.98%	A190	OLD RIVER BED
10,136.09	9.99%	A191	ONAQUI MOUNTAINS
19,583.59	81.03%	A192	OQUIRRH MOUNTAINS
136,064.49	4.91%	A195	OWENS VALLEY-BENTON VALLEY
10,069.25	76.87%	A196	PAH RAH RANGE
1,713.23	3.63%	A200	PARADISE VALLEY
22,684.01	76.18%	A202	PAROWAN VALLEY
68,669.68	52.40%	A204	PEQUOP MOUNTAINS-TOANO DRAW
1,859.93	48.28%	A205	PILOT CREEK VALLEY
11,234.47	0.65%	A206	PILOT MOUNTAINS
46,710.66	32.48%	A207	PILOT RANGE
2,074.37	8.33%	A208	PINE FOREST RANGE
2,796.21	40.68%	A209	PINE RIDGE

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Private

Site HA	%PVT	SITE ID	SITE NAME
181,132.58	11.96%	A210	PINE VALLEY MOUNTAINS
6,172.95	5.50%	A211	PLEASANT VALLEY
1,856.77	11.96%	A212	POGONIP RIDGE
6,029.83	51.32%	A213	PRATHER SPRINGS
208,539.87	28.18%	A214	PYRAMID LAKE-LOWER TRUCKEE RIVER
3,688.24	86.35%	A215	QUICHAPA LAKE
31,984.46	1.59%	A216	QUILICI SPRING-BUTTE VALLEY
182,939.95	0.64%	A217	QUINN CANYON RANGE-GRANT RANGE
47,414.11	12.76%	A218	QUINN RIVER
10,893.17	84.22%	A219	RABBIT CREEK
1,977.92	29.20%	A221	RAILROAD PASS
50,694.57	1.79%	A222	RAILROAD VALLEY
24,737.57	5.44%	A223	RAINBOW CANYON
3,440.22	1.76%	A225	RED PEAK
1,937.80	20.40%	A226	RED POINT
45,308.62	10.90%	A227	REESE RIVER
10,183.32	2.35%	A230	RICKEY PEAK
139,915.68	19.31%	A232	RUBY MOUNTAINS
104,262.77	31.32%	A233	RUBY VALLEY
120,330.61	31.82%	A234	RUSH VALLEY
1,753.41	8.56%	A235	RUTH
7,993.78	15.03%	A236	RYE PATCH
1,736.02	46.12%	A237	SAGE HEN VALLEY
20,217.89	31.11%	A238	SAHWAVE MOUNTAINS-LAKE RANGE
10,462.50	0.87%	A239	SAN ANTONIO DUNES
11,028.65	21.85%	A240	SAN FRANCISCO MOUNTAINS
3,903.31	58.80%	A241	SAN PITCH MOUNTAINS
23,720.58	0.56%	A242	SAND MOUNTAIN
86,036.07	2.98%	A244	SCHELL CREEK RANGE
3,737.76	5.65%	A245	SCHELLBOURNE PASS
11,439.03	5.45%	A246	SCHURZ
3,784.08	14.23%	A247	SEVENMILE SPRING
1,883.73	58.96%	A248	SEVIER BRIDGE RESERVOIR
5,948.88	46.16%	A251	SHERMAN CREEK
3,883.62	36.47%	A253	SHOAL CREEK
21,295.53	5.63%	A254	SHOSHONE RANGE-CARICO LAKE VALLEY
50,485.75	58.66%	A255	SHOSHONE-BEOWAWE
42,383.37	1.88%	A256	SILVER ISLAND MOUNTAINS

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Private

Site HA	%PVT	SITE ID	SITE NAME
121,896.93	46.85%	A258	SILVER STATE SAND DUNES
10,014.88	6.01%	A260	SIMPSON MOUNTAINS
269,858.61	4.54%	A261	SIMPSON PARK MOUNTAINS-NORTH TOIYABE RANGE
21,767.61	1.20%	A262	SIXMILE FLAT
4,274.70	32.46%	A263	SKULL VALLEY
18,608.69	41.23%	A264	SLINKARD VALLEY
5,985.46	7.45%	A265	SLOW ELK HILLS
6,607.63	33.17%	A266	SMOKE CREEK
225,821.84	3.37%	A267	SNAKE RANGE
55,720.54	2.77%	A268	SNAKE VALLEY
33,874.99	9.40%	A270	SOLDIER MEADOWS
12,421.82	29.50%	A271	SONOMA RANGE
3,855.21	57.18%	A273	SOUTH JUAB VALLEY
3,883.38	68.61%	A274	SOUTH MILFORD
11,476.05	33.49%	A275	SOUTH PINE NUT MOUNTAINS
10,352.15	2.52%	A278	SOUTH SEVIER LAKE
51,836.14	1.08%	A279	SOUTH WAH WAH MOUNTAINS
49,189.41	14.01%	A280	SOUTH WASSUK RANGE
6,214.07	6.15%	A281	SPRING CREEK
4,034.83	12.48%	A282	SPRING VALLEY CREEK
47,966.82	0.17%	A283	SPRING VALLEY-HAMLIN VALLEY
1,761.09	19.62%	A284	SPRUCE MOUNTAIN
10,390.64	48.49%	A285	SQUAW VALLEY
38,246.00	7.26%	A286	STANSBURY MOUNTAINS
123,620.82	11.57%	A287	STEPTOE VALLEY
17,441.17	0.58%	A288	STILLWATER RANGE -DIXIE VALLEY
4,810.08	0.66%	A291	STONEWALL MOUNTAIN
10,457.58	0.18%	A292	SUGARLOAF KNOB
1,796.71	8.01%	A293	SULLIVAN SPRING
3,812.95	0.33%	A294	SULPHUR
1,974.72	30.37%	A295	SULPHURDALE
23,715.90	39.54%	A296	SUSIE CREEK-SOUTH FORK HUMBOLDT RIVER
3,831.48	0.87%	A297	SWAN LAKE SALT MARSH
114,555.02	9.53%	A299	SWEETWATER MOUNTAINS
3,844.90	41.01%	A300	TABLE GROUNDS
3,954.95	3.30%	A301	TELEGRAPH PEAK
1,890.24	35.84%	A302	THE COVE
24,271.85	17.02%	A305	THERMAL HOT SPRINGS-ESCALANTE DESERT

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Private

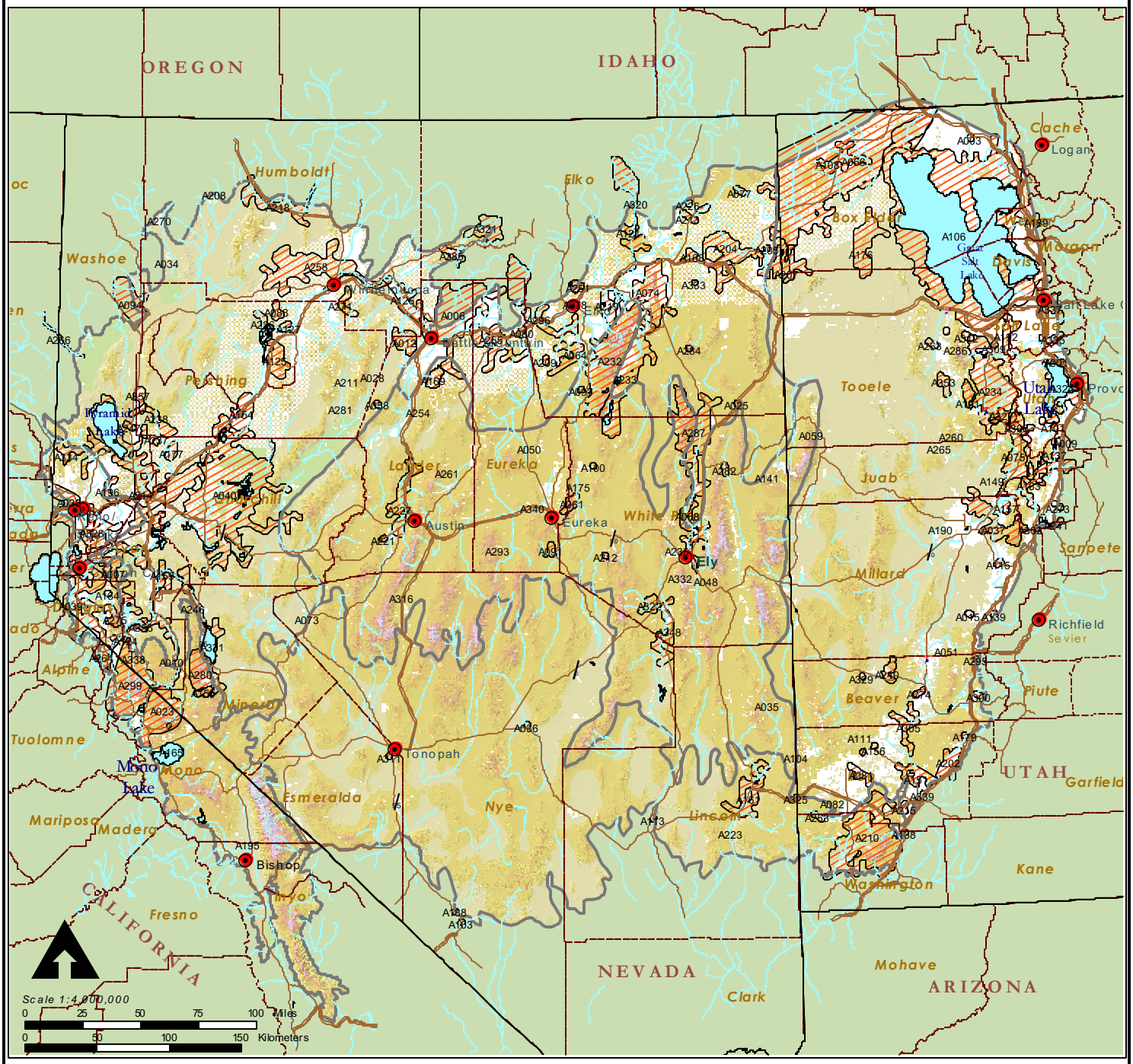
Site HA	%PVT	SITE ID	SITE NAME
10,059.87	0.20%	A306	THORNE DUNE
4,158.78	68.78%	A307	THOUSAND SPRINGS CREEK HOT SPRINGS
10,063.49	21.36%	A308	TINTIC MOUNTAINS
1,798.90	56.65%	A309	TOD PARK
205,734.14	3.21%	A310	TOIYABE RANGE-BIG SMOKY VALLEY
1,838.58	13.27%	A311	TONOPAH SUMMIT
3,979.60	60.52%	A312	TOOELE VALLEY
1,709.03	1.23%	A314	TOPIER CANYON
396,229.90	1.78%	A315	TOQUIMA RANGE-MONITOR VALLEY-MONITOR RANGE
1,743.47	7.22%	A316	TRAIL CANYON
64,307.59	2.04%	A319	TUNNEL SPRING MOUNTAINS-HALFWAY HILLS-PINE VALLEY
65,692.59	31.14%	A320	UPPER HUMBOLDT RIVER-LOWER MARYS RIVER
32,151.12	52.78%	A321	UPPER ROCK CREEK
11,748.51	9.80%	A322	UPPER WHITE RIVER
4,251.38	4.34%	A323	URSINE
71,914.23	40.86%	A324	UTAH LAKE
1,746.12	15.08%	A325	UVADA
13,031.84	1.80%	A326	VALLEY MOUNTAIN
17,327.21	28.17%	A327	VERNON
42,457.34	84.92%	A328	VIRGINIA RANGE
1,677.04	32.36%	A329	WAH WAH SPRINGS
1,767.34	0.69%	A330	WAH WAH WASH
94,459.81	29.66%	A331	WALKER LAKE-WALKER RIVER
12,808.88	8.61%	A332	WARD MOUNTAIN
1,736.37	51.65%	A333	WARM SPRINGS
25,542.43	17.56%	A334	WARM SPRINGS VALLEY
7,813.49	74.84%	A335	WASATCH FRONT DRAPER
9,890.74	54.87%	A336	WASATCH FRONT PROVO-SPRINGVILLE
11,901.08	60.34%	A337	WASATCH FRONT SALT LAKE CITY
15,658.42	7.90%	A338	WELLINGTON HILLS
1,593.87	95.69%	A339	WEST CEDAR CITY
1,758.04	9.02%	A340	WEST DEVILS GATE
273,555.25	2.78%	A346	WHITE MOUNTAINS
47,769.79	4.01%	A347	WHITE PINE RANGE
34,908.97	18.37%	A348	WHITE RIVER VALLEY
41,012.64	1.20%	A352	WILD ISLE-GREAT SALT LAKE DESERT SAND DUNES
10,848.62	25.72%	A353	WILLOW PATCH SPRINGS
7,576.08	0.22%	A355	WILLOW SPRING

Appendix 12: Lists and maps of conservation areas in the Great Basin ecoregion by major land management.

Private

Site HA	%PVT	SITE ID	SITE NAME
6,094.31	29.00%	A356	WILSON CANYON
10,151.62	71.81%	A357	WINNEMUCCA LAKE
3,856.22	4.50%	A358	YELLAND DRY LAKE

Figure Appendix12d. Portfolio sites on Private lands.



Action sites

Private lands

Great Basin ecoregion boundary

County lines

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Cities and towns

Water bodies

Map Created: May 30, 2001

Modification and revision of portfolio site data and boundaries are ongoing.