



United States
Department of
Agriculture



Forest Service
State and Private
Forestry
Forest Health
Protection
Intermountain Region



State of Nevada
Department of
Conservation and
Natural Resources
Division of Forestry,
Western Region

2001 FOREST INSECT AND DISEASE CONDITIONS IN NEVADA



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**FOREST INSECT AND DISEASE
CONDITIONS
IN NEVADA**

2001

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December 2002

Table of Contents

Forest Health Conditions Summary	1
Table 1. 2001 Insect and Disease activity by county	2
STATUS OF INSECTS	3
Insects: Native	3
Defoliators.....	3
Douglas-fir tussock moth.....	3
Bark beetles.....	3
Douglas-fir beetle.....	3
Fir engraver beetle.....	4
Jeffrey pine beetle	4
Mountain pine beetle.....	5
Pinyon Engraver Beetle	6
Spruce beetle	6
Insects: Non-native	7
European gypsy moth.....	7
STATUS OF DISEASES	8
Diseases: Native	8
Stem and Branch Diseases	8
Dwarf mistletoes	8
Root Diseases.....	8
Annosum root disease	8
Armillaria root disease.....	9
Black stain root disease.....	9
Leaf and Needle Diseases	9
Aspen leaf discoloration.....	9
DECLINES / COMPLEXES	10
Subalpine fir mortality complex	10
ABIOTIC DAMAGE	10
Frost damage	10
Blowdown	10
NOXIOUS WEEDS	11
Noxious weed websites	11
Table 2. Nevada noxious weeds by county	13
APPENDIX A	
Table 3. Acres affected by insect or disease damage on all ownerships.....	14
Table 4. Acres surveyed by county	15

Forest Health Conditions Summary

Forest health is a complicated topic. To keep things simple, this report focuses only on the effects of insects, diseases, and weather on trees. Within that realm, precipitation is crucial for trees to remain vigorous which increases the trees resistance to insects and pathogens. With adequate rainfall or snowmelt, the trees can maintain their defenses: flushing attacking bark beetles with pitch or growing more foliage to replace those eaten by defoliating insects. Without adequate precipitation, tree resistance is significantly reduced. The western states, including Nevada, have been experiencing drought since 2000. The effect of drought and increased insect activity is becoming noticeable throughout the Intermountain Region.

In 2001, high levels of **Douglas-fir tussock moth** defoliation were detected in two Nevada counties affecting approximately 4,059- acres. Douglas-fir tussock moth defoliation had not been reported in Nevada in over 20 years. Most of this defoliation occurred in Elko County in the Jarbidge Wilderness on the Humboldt-Toiyabe National Forest. Coincidentally, it was in this part of Nevada where Douglas-fir tussock moth was first reported to have occurred in the United States in 1927.

Mountain pine beetle, along with white pine blister rust and fire exclusion, has contributed significantly to the decline of whitebark and limber pine. Whitebark and limber pine are important in watershed protection because they help to stabilize soil and rock on harsh sites and retain snowpack for extending ephemeral stream flow. Additionally, they are a critical food source for certain wildlife species. In Nevada, mountain pine beetle killed approximately 3,400 whitebark and limber pine trees on approximately 1,500 acres.

Four Nevada counties had **fir engraver beetle**–caused tree mortality on 5,274-acres. White Pine and Nye counties accounted for the majority of the mortality where the infestation began in 1999. Engraver beetles pose a threat to remaining host types as populations continue to build in these two counties. The infestation on the Carson Ranger District in Washoe, Douglas and Carson City counties was first recorded in 1991 and caused a fair amount of mortality through 1997. This infestation has since decreased to endemic levels.

The **western balsam bark beetle** is the most significant mortality agent in a complex of forest insects and disease causing subalpine fir mortality. In Nevada, a total of 925-acres of subalpine fir mortality was observed. Elko County sustained the majority of the mortality.

The **pinyon engraver** is an increasing problem in pinyon-juniper ecosystems often affecting valuable home landscape trees. Continued drought conditions have increased tree stress, predisposing trees to pinyon engraver attack. Pinyon pine mortality in 2001 totaled 1,785-acres. White Pine County experienced the greatest mortality followed by Elko and Nye Counties. Because aerial observers did not fly the entire pinyon-juniper forest cover type in 2001, the extent of pinyon pine mortality is assumed larger than the recorded coverage.

Table 1. 2001 Insect and Disease activity detected during aerial survey by county.

County	Mountain Pine Beetle		Douglas-fir Beetle		Spruce Beetle		Fir Engraver Beetle		Subalpine fir Mortality Complex		Jeffrey Pine Beetle		Douglas-Fir Tussock Moth
	Trees	Acres	Trees	Acres	Trees	Acres	Trees	Acres	Trees	Acres	Trees	Acres	Acres
Carson City	-	-	-	-	-	-	-	-	-	-	-	-	-
Churchill	-	-	-	-	-	-	-	-	-	-	-	-	-
Clark	-	-	-	-	-	-	-	-	-	-	-	-	-
Douglas	-	-	-	-	-	-	700	82	-	-	-	-	-
Elko	3,400	1,367	-	-	60	30	-	-	4,600	885	-	-	3,988
Esmeralda	-	-	-	-	-	-	-	-	-	-	-	-	-
Eureka	-	-	-	-	-	-	-	-	-	-	-	-	-
Humboldt	-	-	-	-	-	-	-	-	-	-	-	-	-
Lander	-	-	-	-	-	-	-	-	-	-	-	-	-
Lincoln	-	-	-	-	-	-	-	-	-	-	-	-	-
Lyon	-	-	-	-	-	-	-	-	-	-	-	-	-
Mineral	-	-	-	-	-	-	-	-	-	-	-	-	-
Nye	-	-	-	-	-	-	2,100	857	-	-	-	-	-
Pershing	-	-	-	-	-	-	-	-	-	-	-	-	-
Storey	-	-	-	-	-	-	-	-	-	-	-	-	-
Washoe	-	-	-	-	-	-	150	53	-	-	14	7	-
White Pine	622	278	60	30	210	72	13,424	4,282	80	40	-	-	71
Total	4,022	1,645	60	30	270	102	16,374	5,274	4,680	925	14	7	4,059

*Churchill, Esmeralda, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, and Storey counties were not surveyed in 2001.

STATUS OF INSECTS

Insects: Native

Defoliators

Douglas-fir tussock moth

Orgyia pseudotsugata

Nevada Hosts: Douglas-fir, true firs, Engelmann and Colorado blue spruce



Adult DFTM larvae

The Douglas-fir tussock moth (DFTM) is an important native insect causing significant defoliation. Severe episodes of defoliation can result in reduced growth, stress, and tree mortality. Defoliation occurs quickly with treetops sometimes killed after only a single season of severe injury. Outbreaks are cyclic, usually appearing abruptly, and then typically subsiding after 1 to 4 years.

In 2001, high levels of DFTM defoliation were detected in Nevada on 4,059-acres. DFTM defoliation had not been reported in Nevada in over 20 years. Most of this defoliation occurred in Elko County on the Humboldt-Toiyabe National Forest (H-T NF) on the Jarbidge Ranger District and within the Jarbidge Wilderness. In these areas, 3,988-acres of subalpine fir were affected. Coincidentally, it was in this part of Nevada where DFTM was first reported in the United States in 1927. White Pine County experienced heavy defoliation on 71 acres, which were detected on the north end of the Currant Mountain Wilderness, Ely Ranger District, H-T NF.

Bark beetles

Douglas-fir beetle

Dendroctonus pseudotsugae

Nevada Host: Douglas-fir

Although only ¼ inch long, the Douglas-fir beetle is the most destructive bark beetle of Douglas-fir in western North American forests. Endemic populations typically infest down host material, but may also attack individual trees of low vigor and poor health. Where there is an abundance of stressed trees, insect populations can build rapidly and spread to adjacent, green standing trees.



Adult Douglas-fir beetle

Thirty acres of Douglas-fir beetle-caused tree mortality were detected in the northeast corner of Great Basin National Park in White Pine County in 2001. Tree mortality attributed to the Douglas-fir beetle was also reported in the same general area in 1999; although, none in 2000.

Fir engraver beetle

Scolytus ventralis

Nevada Hosts: red fir, subalpine fir, white fir



Fir engraver is a major pest of true firs in western forests. It attacks trees ranging from pole to mature size. Tree stress due to drought, disease, and defoliation may incite outbreaks causing severe tree mortality. It is often associated with other forest pests such as Douglas-fir tussock moth, spruce budworm, annosum root disease, bark beetles, and woodborers.

Four Nevada counties had fir engraver beetle-caused tree mortality on 5,274-acres. White Pine County accounted for 4,282-acres of mortality, which was particularly heavy in the Schell Creek Mountain Range on the Ely Ranger District, H-T NF, and in Great Basin National Park. Significant amounts of mortality were also detected along the Eagan Range on Forest Service, Bureau of Land Management, and private lands south of Ely. Nye County sustained 857-acres of mortality in the Quinn Canyon Wilderness and the south end of the Currant Mountain Wilderness, Ely Ranger District, H-T NF. The infestation in these two counties began in 1999.

Douglas and Washoe counties had 82- and 53-acres of mortality, respectively, on Forest Service, State, and private lands in the Carson Range. This infestation was first recorded in 1991 primarily in Carson County on the Carson Ranger District, H-T NF. Through 1997 fir engraver beetles caused a fair amount of mortality in these three counties. Since 1997, however, populations have decreased.

Jeffrey pine beetle

Dendroctonus jeffreyi

Nevada Host: Jeffrey pine

Seven acres of Jeffrey pine beetle-caused tree mortality were detected on State land and the Carson Ranger District, H-T NF. The most recent Jeffrey pine beetle infestation in this area began in the 1980's. The infestation peaked around 1990 and steadily decreased to endemic levels.

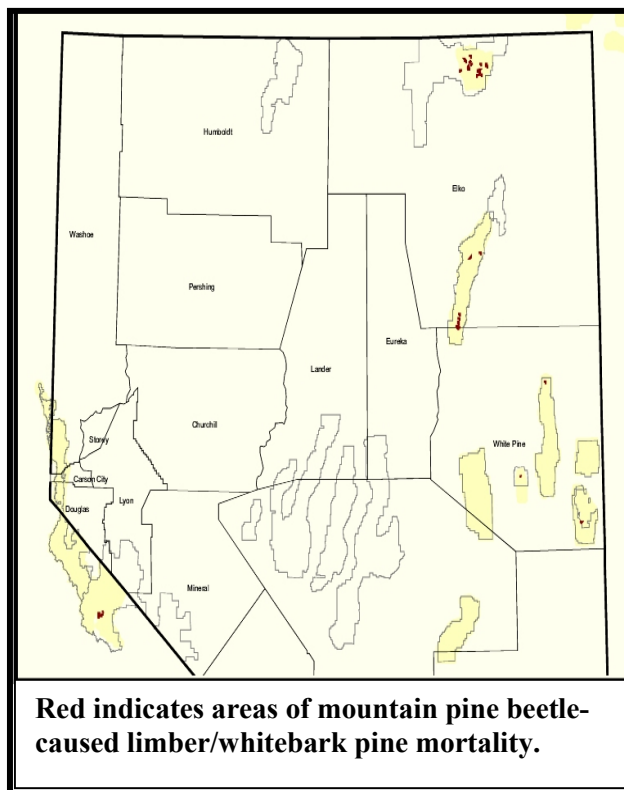
Mountain pine beetle

Dendroctonus ponderosae

Nevada Host: whitebark, limber lodgepole, sugar, and ponderosa pine

A destructive forest insect, the mountain pine beetle (MPB) can kill thousands of trees a year during outbreak conditions and millions of trees during extended epidemics in western forests. At endemic levels, MPB favors weakened, less vigorous trees with adequate phloem thickness to complete its life cycle. During epidemics, beetles may attack trees down to 4 inches in diameter measured at breast height. Extensive mortality may alter large forest landscapes by converting pine forest ecosystem to grass and shrub landscapes for a period of 10-20 years. This conversion affects wildlife species, water yields and fuel loading.

Whitebark/limber pine: Limber and whitebark pine have been identified as important elements of high-elevation ecosystems in western North American forests. Generally, whitebark establish in the subalpine regions above 9,000 ft. elevation and limber pine are an alpine species. They are able to establish on cold, dry, and windy sites. Their presence may produce changes in microclimates of alpine ecotone communities to allow other trees, such as subalpine fir, to establish. These attributes are important in watershed protection, because they help to stabilize soil and rock on harsh sites, and retain snowpack for extending ephemeral stream flow. Limber and whitebark pine seeds are also an important source of food for many animal species. Currently, whitebark/limber pine is rapidly declining in pine communities in the western U.S. and Canada. Mountain pine beetle has contributed significantly to this decline, along with white pine blister rust and fire exclusion.



In Nevada, MPB accounted for 1,505-acres of limber/ whitebark pine mortality in 2001. Mortality was detected on 1,237-acres in Elko County, on lands within the Jarbidge Wilderness, Jarbidge Ranger District, and the Ruby Mountain Range, all located within the Humboldt Toiyabe National Forest. The MPB infestation in this area began in 1998 and has been slowly building.

Mountain pine beetle accounted for 268-acres of limber pine mortality in White Pine County. The MPB infestation began in 1999 as 3 small mortality centers encompassing 23 acres of whitebark pine. Populations have slowly expanded from these centers with 13 pockets currently affecting 268 acres on Forest Service, Bureau of Land Management, and National Park lands.

Lodgepole pine: In 2001, mortality from Mountain pine beetle was observed for the third consecutive year in north Elko County affecting 130-acres. This mortality predominantly occurred in the Jarbidge Wilderness, Jarbidge Ranger District, H-T NF.

Ponderosa pine: Mountain pine beetle-caused tree mortality was recorded for 10-acres in southeastern White Pine County within the Great Basin National Park.

Pinyon Engraver Beetle

Ips confusus

Nevada Hosts: Single leaf pinyon and pinyon pine

The pinyon engraver is an increasing problem in pinyon-juniper ecosystems often affecting valuable home landscape trees. Continued drought conditions have increased tree stress, predisposing trees to *Ips* attack. The rapid spread rate of an infestation can be attributed to the insect's ability to produce 2-4 generations per year.

Single leaf pinyon mortality in 2001 totaled 1,785-acres. White Pine County experienced the greatest mortality with 1,032-acres of infested trees on the Ely and Ruby Mountain Ranger Districts of the H-T NF, the Bureau of Land Management, and Great Basin National Park lands. The south end of the Ruby Mountains in Elko County sustained 414-acres of tree mortality, Ruby Mountain Ranger District, H-T NF. Nye County accounted for 339-acres of tree mortality, with beetles infesting trees in the Grant Range Wilderness and neighboring forests on the Ely Ranger District, H-T NF. Because aerial observers did not fly the entire pinyon-juniper forest cover type in 2001, the extent of pinyon pine mortality is assumed larger than the recorded coverage.

Spruce beetle

Dendroctonus rufipennis

Nevada Hosts: Engelmann spruce, Colorado blue spruce



The spruce beetle is the most significant natural mortality agent of mature spruce. Endemic populations usually inhabit windthrown trees, logging slash, and fresh stumps, but may also attack weakened trees. Outbreaks typically occur when beetle populations build to high levels in concentrations of downed host material. Dispersing adults may infest standing live trees in susceptible stands with initial attacks on large diameter trees.

In Nevada, spruce beetle mortality occurred on 102-acres during 2001. White Pine County had 72-acres of spruce beetle-killed trees within the Mount Moriah Wilderness, H-T NF, and Great Basin National Park. Thirty acres were detected in Elko County, on the north edge of the Jarbidge Wilderness, H-T NF.

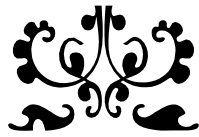
Insects: Non-native

European gypsy moth

Lymantria dispar

Nevada Host: Various deciduous species

No moths or egg masses were detected during the 2001 trapping survey. In 1999, egg masses were discovered in an RV park in Winnemucca. Surveys conducted by Nevada State Department of Agriculture and APHIS will continue in 2002.



STATUS OF DISEASES

Diseases: Native

Stem and Branch Diseases

Dwarf mistletoes

Arceuthobium spp.

Nevada Hosts: Douglas-fir, pines, true firs, single-leaf pinyon and spruce

Dwarf mistletoes are the single-most damaging agent of coniferous trees. These parasitic plants remain the most widespread and frequently observed disease within the state. Profusely branched, dense masses of host branches called “witches brooms” are typically observed. Heavy dwarf mistletoe infestation can predispose trees to insects and other diseases, reduce incremental growth, affect the forest canopy structure, lower resistance to drought, and affect recreation and aesthetics. Since dwarf mistletoe infests trees of all ages, infestation problems may exist in secondary growth and regeneration, as well as mature and overmature tree stands. The percentage of infection by major host species in Nevada is estimated as follows: lodgepole pine 17%, ponderosa pine 35%, Jeffrey pine 12.7%, true firs 4.1%, single-leaf pinyon 20%, and Douglas-fir 25%.

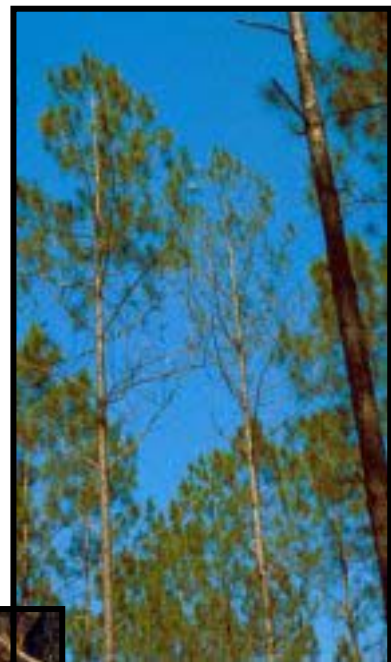
Root Diseases

Annosum root disease

Heterobasidion annosum

Nevada Hosts: Bitterbrush, chokecherry, Douglas-fir, lodgepole pine, ponderosa pine, spruce, true firs, and incense cedar

This disease can be found throughout the state, but mostly as a saprophyte on dead trees, stumps, roots, and cull logs or fallen stems. The fungus occasionally kills young ponderosa pine, especially in plantations on droughty soils. It is often associated with fir engraver beetle caused tree mortality. Symptoms include a thinning crown and fruiting bodies that develop at the base of the tree.



**Thinning crowns
and fruiting bodies
caused by Annosum
root disease**

Armillaria root disease

Armillaria spp.

Nevada Hosts: Douglas-fir, grand fir, pines, spruce, subalpine fir and incense cedar



Armillaria fruiting bodies

Evidence of Armillaria root disease can be found throughout the state but it functions primarily as a weak pathogen or saprophyte causing little direct mortality. Fruiting bodies of Armillaria growing in clusters can be found on tree roots or at the base of trees.

Black stain root disease

Ophiostoma wagneri

Nevada Hosts: single leaf pinyon, Jeffrey pine and ponderosa pine

Black stain root disease is considered an important pathogen of pinyon pine in Nevada. It usually kills infected trees within several years and can cause mortality centers several acres in size. Diseased trees may become focal points for pinyon engraver beetle infestations. The engraver beetles can then spread to nearby healthy trees.

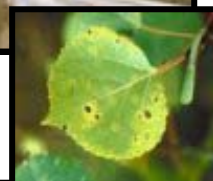
Small groups of pinyon pine killed by black stain root disease were observed in Lander County within the Bob Scott Campground, Austin Ranger District, H-T NF. There were also scattered groups of pinyon pine mortality located in Nye County on the west side of the Quinn Canyon Range, H-T NF.

Leaf and Needle Diseases

Aspen leaf discoloration

Nevada Host: Aspen

White Pine County was the only county in Nevada to have aspen leaf discoloration recorded by aerial survey in 2001. A total of 167-acres were affected. It was difficult to attribute this damage to one agent. Aspen leaf blight (*Marssonina populi*) or forest tent caterpillar (*Malacosoma disstria*) were suggested to have been the damaging agents. Defoliation and discoloration due to frost damage also contributed to this damage. Aspen leaf discoloration was also detected by field crews across areas of the Santa Rosa Range in Humboldt County, within the Humboldt Toiyabe National Forest.



Aspen leaf blight-caused leaf discoloration.

DECLINES / COMPLEXES

Subalpine fir mortality complex

Nevada Host: Subalpine fir

The western balsam bark beetle (WBBB) is the most significant mortality agent in a complex of forest insects and disease causing subalpine fir mortality. Endemic insect populations occur in storm-damaged trees, slash, or trees of poor vigor. Drought and environmental stress may cause subalpine fir stands to become susceptible to WBBB and other insect and disease agents. Western balsam bark beetle infestations may build to epidemic levels, where mortality can occur in groups of 100 to 10,000 trees.

In Nevada, a total of 925-acres of subalpine fir mortality was observed. Elko County sustained the majority of the mortality with 885 affected acres on the north edge of the Jarbidge Wilderness extending north onto Jarbidge Ranger District, H-T NF. White Pine County had 40-acres of tree mortality located in the northeast corner of Great Basin National Park.

ABIOTIC DAMAGE

Frost damage

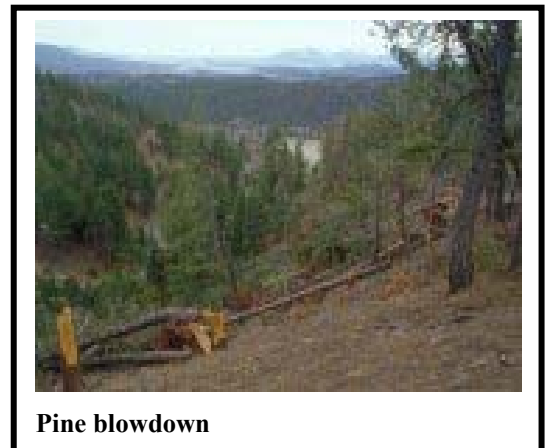
Nevada Hosts: maple, gambel oak, aspen

In Nevada, frost damage caused foliar browning on 90-acres of maple in Elko County, located on the southeastern edge of the Ruby Mountain Wilderness, H-T NF. Frost damage also contributed to aspen leaf discoloration.

Blowdown

Areas of concentrated, high velocity winds can cause trees to blow over. Blowdown occurs in groups or as scattered trees within the landscape. Depending on the tree species, patches of blowdown in coniferous forests can provide a food source for various bark beetles, enabling populations to build to epidemic levels. These epidemic populations may then attack and kill standing, live trees adjacent to the blowdown.

The 2001 aerial detection survey mapped a total of 77-acres of blowdown in mixed conifer in White Pine County within Great Basin National Park, southeast of Wheeler Peak, near the source of Snake Creek.



NOXIOUS WEEDS

Noxious weeds are a continuing problem for all western states. They have the ability to colonize disturbed habitats aggressively displacing native plant species and altering ecosystems. Several state and federal agencies have the responsibility for monitoring and controlling noxious weeds. Our intention by including this information is to increase awareness of these potential problems. Table 2 is the list of plants declared noxious weeds by the State of Nevada or specific counties.

The following noxious weed websites, while not inclusive, give additional information on the plants such as biology, history, and control.

<http://pi.cdfa.ca.gov/weedinfo/NWCommonname.html>

California Department of Food and Agriculture has a very comprehensive webpage. The only weeds not mentioned are buffalobur, goatsrue, poison hemlock, houndstongue, blue-flowering lettuce, western whorled milkweed, Russian olive, and velvetleaf. Information includes description, distribution, habitat, and control methods. Pictures of the plants in various stages are just a click away.

http://www.wa.gov/agr/weedboard/weed_info/contents.html

State of Washington's noxious weed control board webpage has information on buffalobur, camelthorn, hoary cress, goatsrue, houndstongue, johnsongrass, diffuse, Russian and spotted knapweed, purple loosestrife, silverleaf nightshade, yellow nutsedge, perennial pepperweed, puncturevine, leafy spurge, St. Johnswort, yellow starthistle, Canada thistle, musk thistle, scotch thistle, Dalmation toadflax, velvetleaf, and dyer's woad. Topics include description, economic importance, geographic distribution, habitat, history, growth and development, reproduction, response to herbicides, response to cultural controls, and biocontrol potentials.

<http://www.ipm.ucdavis.edu/PMG/selectnewpest.home.html#weeds>

University of California pest management webpage has information on bermudagrass, field bindweed, yellow nutsedge, and yellow starthistle. Topics include identification and management through cultural and chemical control options.

<http://www.ext.colostate.edu/pubs/natres/pubnatr.html>

Colorado State University Cooperative Extension webpage has factsheets on musk thistle, leafy spurge, Canada thistle, toadflaxes, and diffuse, Russian, and spotted knapweeds. Information includes description, distribution, phenology, and management options such as cultural, chemical and biological.

<http://www.nps.gov/plants/alien/common.htm>

The National Park Service hosts the Plant Conservation Alliances weed webpage. Currently they have information on Canada thistle, leafy spurge, purple loosestrife, Russian olive, and musk thistle. Information includes native range, description, ecological threat, distribution, habitat, background, methods of reproduction and dispersal, and current management approaches.

<http://www.fs.fed.us/pnw/bmnri/weeds.htm>

The Blue Mountain Natural Research Institute for the USDA Forest Service website focuses on control and identification. Invasive plant species included are diffuse, Russian, and spotted knapweed, purple loosestrife, perennial pepperweed, puncturevine, medusahead, yellow starthistle, Canada thistle, musk thistle, scotch thistle, dalmation toadflax, St. Johnswort, leafy spurge, hoary cress and dyer's woad.

<http://www.adaweb.net/adaweb.nsf>

Idaho's Ada county webpage has good pictures and chemical control information on Canada thistle, hoary cress, puncturevine, purple loosestrife, and scotch thistle.

<http://weedcenter.org/info/weedlist.html>

An interagency website housed at the Montana State University. It has information on field bindweed, Canada thistle, Dalmatian toadflax, diffuse knapweed, leafy spurge, musk thistle, poison hemlock, puncturevine, purple loosestrife, Russian knapweed, spotted knapweed, squarrose knapweed, St. Johnswort, and yellow starthistle. Topics include biology, distribution, habitat, and history.

<http://www.dcr.state.va.us/dnh/invlist.htm>

The Virginia Department of Conservation and Recreation webpage has fact sheets on Russian olive, Canada thistle, Johnsongrass, purple loosestrife, and spotted knapweed. Information is in PDF format with line drawings of the plant with description, distribution, and control.

The following webpages have links to other sites with information on invasive and noxious weeds.

<http://invader.dbs.umt.edu>

The University of Montana's Invaders Database has a search engine that links the user to informational websites on most of the invasive weeds. The plants not covered are goatsrue, blue-flowering lettuce, western whorled milkweed, silverleaf nightshade, yellow nutsedge, and puncturevine.

<http://www.invasivespecies.gov/profiles/main.shtml#terplants>

National Biological Information Infrastructure website has links to other websites with information on leafy spurge, musk thistle, Russian olive, scotch thistle, spotted knapweed, and yellow star thistle.

Table 2. Nevada noxious weeds by county

Nevada Noxious Weeds by County																																						
County	State Declared Noxious Weeds															County Reported Noxious Weeds																						
	African Rue	Canada Thistle	Dalmatian Toadflax	Diffuse Knapweed	Dyer's Woad	Goat's Rue	Hoary Cress	Leafy Spurge	Mediterranean Sage	Musk Thistle	Perennial Pepperweed	Poison Hemlock	Puncturevine	Russian Knapweed	Scotch Thistle	Sowthistle	Spotted Knapweed	Water Hemlock	Yellow Starthistle	Black Henbane	Bull Thistle	Curly Dock	Halogeton	Hounds Tongue	Jointed Goatgrass	Malta Starthistle	Purple Loosestrife	Purple Starthistle	Salt Cedar	Skeletonweed	Squarrose Knapweed	Sulfur Cinquefoil	Water Hemlock	Yellow Toadflax				
Carson City		+				+	+			+			+	+				+																				
Churchill	+					+			+	+			+	+				+											+	+								
Clark						+				+			+	+			+	+								+			+									
Douglas		+	+			+			+	+			+	+			+	+																				
Elko		+	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+	+				+	+		+	+	+	+	+	+	+	+	+	+	+	
Esmeralda																																						
Eureka		+		+		+	+		+	+	+		+	+			+			+		+						+	+							+		
Humboldt		+				+	+		+	+			+	+					+		+																+	
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Mineral	+														+																							
Nye		+				+			+	+			+	+	+	+					+	+																
Pershing		+				+				+			+	+					+		+																	
Storey *										+																												
Washoe		+		+	+	+		+	+	+			+	+				+			+	+	+				+	+										

+ Located in the County according to the Nevada Noxious Weed GIS database, Natural Resources Conservation Service, 5/24/02.

* Storey County does not have an active noxious weed survey program at this time.

APPENDIX A

Table 3. Number of acres affected by insect or disease damage on all ownerships during 2001.

Bureau of Land Management		Humboldt-Toiyabe National Forest	
Douglas-fir tussock moth	3	Carson Ranger District	
Fir engraver beetle	230	Fir engraver beetle	85
Aspen discoloration	24	Jeffrey pine beetle	3
Pinyon Ips	128	Ely Ranger District	
Mountain pine beetle	15	Douglas-fir tussock moth	71
		Fir engraver	3,851
Great Basin National Park		Aspen discoloration	39
Blowdown	77	Pinyon Ips	935
Douglas-fir beetle	30	Mountain pine beetle	151
Fir engraver beetle	719	Spruce beetle	38
Aspen discoloration	81	Jarbridge Ranger District	
Pinyon Ips	78	Douglas-fir tussock moth	3,914
Mountain pine beetle	39	Mountain pine beetle	1,006
Spruce beetle	34	Spruce beetle	30
Subalpine fir complex	40	Subalpine fir complex	868
		Mountain City Ranger District	
Private land		Mountain pine beetle	14
Douglas-fir tussock moth	71	Ruby Mountain Ranger District	
Fir engraver beetle	339	Frost Damage	90
Aspen discoloration	23	Pinyon Ips	632
Pinyon Ips	12	Mountain pine beetle	405
Mountain pine beetle	15		
Subalpine fir complex	17		
State land			
Fir engraver	11		
Jeffrey pine beetle	4		
Lake Tahoe, Nevada State Park			
Fir engraver	39		

Table 4. Acres surveyed by county.

County	Acres in County	Acres Surveyed	% Acres Surveyed
Carson City	103,627	22,070	21%
Churchill	3,195,785	-	0%
Clark	5,176,843	195,609	4%
Douglas	478,562	49,702	10%
Elko	10,976,960	471,390	4%
Esmeralda	2,298,391	-	0%
Eureka	2,662,027	-	0%
Humboldt	6,216,605	-	0%
Lander	3,531,611	-	0%
Lincoln	6,783,631	28,741	0%
Lyon	1,310,421	-	0%
Mineral	2,462,011	-	0%
Nye	11,678,796	246,799	2%
Pershing	3,850,370	-	0%
Storey	167,832	-	0%
Washoe	4,235,444	122,537	3%
White Pine	5,677,536	958,939	17%
Total	70,806,452	2,095,787	3%