
2009 Forest Service Alaska Region Sensitive Species List

Assessment and Proposed Revisions to the 2002 List

Prepared by:

Michael I. Goldstein, Regional Wildlife and Terrestrial Ecology Program Leader
Donald Martin, Regional Fisheries and Aquatic Ecology Program Leader
Mary C. Stensvold, Regional Botanist

Contents

	<u>Page</u>
<u>Introduction</u>	<u>2</u>
<u>Current (2002) Alaska Region Sensitive Species List</u>	<u>3</u>
<u>Methods Leading to Recommended Changes</u>	<u>4</u>
<u>Plants Recommended for Removal from the List</u>	<u>6</u>
<u>Animals Recommended for Removal from the List</u>	<u>9</u>
<u>Plants Recommended for Retention on the List</u>	<u>13</u>
<u>Animals Recommended for Retention on the List</u>	<u>17</u>
<u>Plants Recommended for Addition to the List</u>	<u>18</u>
<u>Animals Recommended for Addition to the List</u>	<u>26</u>
<u>Other Plants Considered but not Recommended for Listing</u>	<u>27</u>
<u>Other Animals Considered but not Recommended for Listing</u>	<u>32</u>
<u>Using and Updating the List</u>	<u>40</u>
<u>Exemptions</u>	<u>40</u>
<u>How to Suggest Changes to the List</u>	<u>40</u>
Table of Proposed Changes to the Current (2002) Alaska Region Sensitive	
<u>Species List</u>	<u>41</u>
<u>References</u>	<u>42</u>

2009 Forest Service Alaska Region Sensitive Species List

Assessment and Proposed Revisions to the 2002 List

Prepared by:

Michael I. Goldstein, Regional Wildlife and Terrestrial Ecology Program Leader
Donald Martin, Regional Fisheries and Aquatic Ecology Program Leader
Mary C. Stensvold, Regional Botanist

Introduction

Forest Service sensitive species are defined as: “Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by:

1. Significant current or predicted downward trends in population numbers or density.
2. Significant current or predicted downward trends in habitat capability that would reduce a species existing distribution” (Forest Service Manual [FSM] 2670.5.19).

Per USDA Forest Service Manual (2672.11) effective 31 May 1991, the following sources are to be examined for candidates for listing as sensitive species:

- State lists of endangered, threatened, rare, endemic, unique, or vanishing species, especially those listed as threatened under State law.
- Other sources as appropriate in order to focus conservation management strategies and to avert the need for Federal or State listing as a result of National Forest management activities.

In addition, per R-10 USDA Forest Service manual supplement (2670-2672.11) effective 21 September 2005, the identification of sensitive species is based on the following:

- The species identified as Candidates by the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) will be automatically designated as sensitive species in the Alaska Region.
- The species (or subspecies, variety, or stock) must be recognized by taxonomic experts and must be known or likely to occur on National Forest System lands within the Alaska Region. Sensitive species status applies throughout the range of the species on National Forest System (NFS) lands within the Alaska Region.
- The species warrants sensitive status (FSM 2670.5) based on 8 evaluation factors in the Forest Service manual supplement (see below).

The current sensitive species list contains 12 animals and 19 plants (Table 1). As stated in FSM 2672.11, the list of sensitive species will be reviewed and updated periodically. The list was updated for wildlife and fish species in June 1994. The list was revised for plant species in May 1999 and in June 2002. The 2009 Forest Service Alaska Region Sensitive Species List will supersede previous lists.

Table 1. Current (2002) Alaska Region Sensitive Species List. Y indicates known occurrence and S indicates suspected occurrence on the Chugach National Forest (CNF) and Tongass National Forest (TNF).

Common Name	Scientific Name	Occurrence		Designation
		CNF	TNF	
Plants				
Eschsoltz's little nightmare	<i>Aphragmus eschsoltzianus</i>	Y	S	FS Sensitive
Norberg's arnica	<i>Arnica lessingii</i> subsp. <i>norbergii</i>	Y	Y	FS Sensitive
Moosewort fern	<i>Botrychium tunux</i>	S	Y	FS Sensitive
Moonwort fern, no common name	<i>Botrychium yaaxudakeit</i>	S	Y	FS Sensitive
Goose-grass sedge	<i>Carex lenticularis</i> var. <i>dolia</i>	Y	Y	FS Sensitive
Edible thistle	<i>Cirsium edule</i>		Y	FS Sensitive
Tundra whitlow-grass	<i>Draba kananaskis</i>	Y		FS Sensitive
Davy mannagrass	<i>Glyceria leptostachya</i>		Y	FS Sensitive
Wright's filmy fern	<i>Hymenophyllum wrightii</i>	S	Y	FS Sensitive
Truncate quillwort	<i>Isoetes xtruncata</i>	Y	Y	FS Sensitive
Calder's lovage	<i>Ligusticum calderi</i>	S	Y	FS Sensitive
Pale poppy	<i>Papaver alboroseum</i>	Y	S	FS Sensitive
Bog orchid	<i>Platanthera gracilis</i>		Y	FS Sensitive
Loose-flowered bluegrass	<i>Poa laxiflora</i>	Y	Y	FS Sensitive
Smooth alkali grass	<i>Puccinellia glabra</i>	Y		FS Sensitive
Kamchatka alkali grass	<i>Puccinellia kamtschatica</i>	S	Y	FS Sensitive
Unalaska mist-maid	<i>Romanzoffia unalascensis</i>	Y	Y	FS Sensitive
Queen Charlotte butterweed	<i>Senecio moresbiensis</i>		Y	FS Sensitive
Circumpolar starwort	<i>Stellaria ruscifolia</i> subsp. <i>aleutica</i>	S	Y	FS Sensitive
Animals				
Kittlitz's Murrelet	<i>Brachyramphus brevirostris</i>	Y	Y	FS Sensitive*
Cook Inlet beluga whale	<i>Delphinapterus leucas</i>	Y		FS Sensitive*
Montague Island tundra vole	<i>Microtus oeconomus</i>	Y		FS Sensitive

	<i>elymocetes</i>			
Trumpeter swan	<i>Cygnus buccinator</i>	Y	Y	FS Sensitive
Dusky Canada goose	<i>Branta canadensis occidentalis</i>	Y		FS Sensitive
American osprey	<i>Pandion haliaetus carolinensis</i>	Y	Y	FS Sensitive
Queen Charlotte goshawk	<i>Accipiter gentilis laingi</i>		Y	FS Sensitive
Peale's peregrine falcon	<i>Falco peregrinus pealei</i>	Y	Y	FS Sensitive
Northern Pike (Pike Lakes)	<i>Esox lucius</i>		Y	FS Sensitive
Chum Salmon (Fish Creek)	<i>Onchorhynchus keta</i>		Y	FS Sensitive
King Salmon (King Salmon River)	<i>Onchorhynchus tshawytscha</i>		Y	FS Sensitive
King Salmon (Wheeler Creek)	<i>Onchorhynchus tshawytscha</i>		Y	FS Sensitive

* Based on our Alaska Region and National Forest System policy, USFWS and NMFS Candidate species are considered and treated as FS Sensitive Species.

Methods Leading to Recommended Changes

To revise the R10 sensitive species list, we used the existing body of knowledge about viability risk, the sensitive species process described in the Forest Service Manual, and knowledge of approaches used by other Forest Service Regions. We evaluated all vascular plants, lichens and animals known or suspected to occur on National Forest lands in the Alaska Region for which concern has been identified by credible scientific agencies and organizations. We consulted other lists that had already screened hundreds of species, which considerably reduced duplication and redundancy of efforts. We considered species for subsequent evaluation from the following lists:

- Species removed from federal listing under the Endangered Species Act (ESA) within the past 5 years
- US Fish and Wildlife Service Candidate species for federal listing under ESA
- US Fish and Wildlife Service Focal Species
- Alaska Natural Heritage Program (ANHP) Ranks G1-G3, T1-T3, and S1-S3
- IUCN critically endangered, endangered, or vulnerable designations
- Bureau of Land Management sensitive species
- Audubon Alaska Watchlist Species
- State of Alaska Threatened, Endangered, Concern, or Sensitive species
- National Park Service Species of Management Concern
- Species suggested by stakeholders for review within our program areas

We removed species not likely to occur on NFS lands in the Alaska Region. We removed species that have harvest limits set by the State of Alaska, as those are species formally recognized by the State agency as not having viability concerns. We also assessed taxonomic status using corporate databases, peer-reviewed published literature, and ITIS (Integrated Taxonomic Information System; <http://www.itis.gov/>). We removed taxa that are not currently recognized by taxonomic authorities. Some taxa were suggested as needing conservation

measures because of their status as island endemics. However, most of these have not been formally recognized as species or sub-species by the scientific community, including hunted or trapped animals that do not have separate harvest limits set by the State of Alaska.

The pre-screened species were then evaluated using the following 8 factors:

1. Geographic distribution within the Alaska Region
2. Geographic distribution outside the Alaska Region
3. Capability of the species to disperse
4. Abundance in Alaska Region
5. Population trend in Alaska Region
6. Habitat trend in Alaska Region
7. Vulnerability of habitats in the Alaska Region (recent and potential effects of habitat modification based on the historical range of variation [HRV])
8. Life history and demographic characteristics

Species were scored for each criterion, and the scores across multiple factors were considered in determining whether each species merited a sensitive species designation. A combination of Forest Service professionals and non-Forest Service experts performed these evaluations.

Results of the evaluations were reviewed by a group of Forest Service biologists, botanists, and ecologists who drafted recommendations for the status of each species. This process took supporting information for each species into account as well as the scores for the 8 evaluation factors. This ensured that all information was used to formulate the recommendation for sensitive status. Although it is possible that any one factor could justify sensitive status, the information must provide a compelling argument that population viability is of concern as evidenced by known or predicted downward trends, and that the conservation strategy within the land management plan may not provide for species viability at an appropriate level of detail. A species merits inclusion on the Regional list if it is at risk in the Alaska Region over a substantial part of its range. Species with insufficient information available to make a recommendation at this time should be considered at a future date when that information becomes available.

The draft list was distributed for review to specialists in the Chugach and Tongass National Forests, the Washington Office, Forest Service Research, and partner agencies including the U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, Alaska Department of Fish and Game, and the Alaska Natural Heritage Program. The Regional Program Leaders for Wildlife, Fish, and Botany considered the review comments, made changes as needed, and a final review was completed by the Tongass and Chugach National Forests before the final list was submitted for the Regional Forester's approval and issuance to the field. The Regional Office will periodically evaluate and update the list to keep it current. Forest Supervisors may submit proposals for changes to the Alaska Region WFEWS Director. The petition must specify reasons for change that address the 8 evaluation factors, and include supporting documentation.

Plants Recommended for Removal from the List

Norberg's arnica (*Arnica lessingii* (Torrey & A. Gray) Greene subsp. *norbergii* Hulten & Maguire)

In his Flora of North America treatment of *Arnica*, Wolf (2006) subsumed this taxon into *Arnica lessingii*, an *Arnica* with a distribution ranging from the Russian Far East and south to the mountains of central British Columbia and western Northwest Territories. Isozyme analysis of the two subspecies (subsp. *lessingii* & subsp. *norbergii*) from Portage, Yakutat and Sitka showed genetic similarities above 99%, indicating that they did not warrant subspecific or varietal status, and are populations of the same taxon. Subspecies *norbergii* was known only from the Portage, Cordova, Yakutat and Juneau areas. The taller, leafier subsp. *norbergii* tends to grow in shaded lowland areas, and the shorter, less leafy subsp. *lessingii* grows in open exposed alpine areas; these growth forms are phenotypic responses to ecological variation. Because this taxon is no longer recognized by taxonomic experts, it is recommended for removal from the Sensitive Species list.

Goose-grass sedge (*Carex lenticularis* Michx. var. *dolia* (M.E. Jones) L.A. Standl.)

Taxonomic experts (Standley *et al.*, 2002) now consider *Carex lenticularis* Michx. var. *dolia* to include the more common *Carex enanderi* T. Holm. Therefore the taxon is more broadly distributed and abundant than before *C. enanderi* was subsumed by *C. lenticularis* var. *dolia*. Because this taxon is now more widespread and abundant, it is recommended for removal from the Sensitive Species list.

Tundra whitlow-grass (*Draba kananaskis* G. A. Mulligan)

Although *Draba kananaskis* has been treated as a distinct species, authorities (including Mulligan, the author) now see no basis for maintaining the taxon as a distinct species and consider it to be a minor variant of *Draba juvenilis* (Al-Shehbaz *et al.*, in press). Because this taxon is no longer recognized by taxonomic experts, it is recommended for removal from the Sensitive Species list.

Davy mannagrass (*Glyceria leptostachya* Buckley)

This grass is known from the southern half of the Alaska panhandle, occurs disjunctly south to the Queen Charlotte Islands, southern Vancouver Island, western Washington, western Oregon, and disjunct to the San Francisco area of California (Barkworth & Anderson, 2007). Its habitat is often associated with standing or slow moving water and includes swamps, pond and lake margins, ditches and disturbed areas. Rare plant surveys in recent years reveal this plant to be much more abundant than previously thought. The first Alaska collection of *Glyceria leptostachya* was made in 1939 by J. P. Anderson in the Wrangell vicinity. In 1994, four populations were found on Wrangell Island in and around the city of Wrangell. Since then, many more populations have been documented or reported from Wrangell, Sitka, Petersburg and other locations between Sitka and southern Revilla Island (26 locations are documented in the Tongass Forest rare plant database). Many of these populations were found in recently disturbed areas, suggesting a continued upward population trend for this species. On account of *Glyceria leptostachya*'s apparently broadening distribution and upward population trend, this species is recommended for removal from the Sensitive Species list.

Wright's filmy fern (*Hymenophyllum wrightii* Bosch)

The Alaska Natural Heritage Program ranks this plant as a G4?S23 (apparently secure globally, but cause for long-term concern, and imperiled to rare/uncommon within Alaska). It is known from Japan and Korea and is disjunct to North America where it is a narrow endemic with a distribution extending from southeastern Alaska south to the Olympic Peninsula of Washington State (where it was first discovered in August of 2008). Wright's filmy fern grows in dark moist areas under fallen trees, in dark crevices in living trees or in protected crevices in rock cliffs. It grows in the darkest areas, where competition with bryophytes is low.

It is important to note that this fern has two free-living, photosynthetic generations in its lifecycle, the minute (generally overlooked) gametophyte and the spore producing sporophyte (the generation we generally recognize as a fern). Sporophytes are known from a site on the Queen Charlotte Islands of British Columbia (separated by open ocean from the Tongass National Forest); all other North American occurrences are gametophytes. The minute ribbon-like, much-branched gametophytes are a single cell thick and visible with magnification. They are long lived and reproduce asexually through the dispersal of gemmae (Farrar, 1993). Gemmae are larger and heavier than spores and therefore are not good agents of long distance dispersal (Farrar, 1998). As of summer 2008, Wright's filmy fern gametophytes were known from at least 60 locations on the Tongass National Forest (Sitka, Wrangell, Petersburg and Thorne Bay Ranger Districts). The gametophyte is very likely to occur throughout the wetter parts of the Tongass National Forest. Based on the relatively large number of gametophytes found on the Forest and variety of habitats in which they occur, the gametophytes appear have stable populations.

Surveys have been conducted for sporophytes, with none yet found. Sporophytes are most likely to be found on Prince of Wales Island and other locations in the southern Tongass, including areas where habitat may be affected by past or planned timber harvest. We recommend that the search for sporophytes continued and, if found on National Forest System lands, we recommend further investigation of population status and habitat relationships. In the meantime, on account of the large abundance and wide distribution of gametophytes and their stable populations, and the lack of evidence that sporophytes occur on the Tongass National Forest, Wright's filmy fern is recommended for removal from the Sensitive Species list.

Truncate quillwort (*Isoetes xtruncata* (A.A. Eat.) Clute)

This sterile hybrid is the result of hybridization between *Isoetes occidentalis* and *Isoetes maritima*. It is recognized as a hybrid entity in the *Flora of North America* (Taylor *et al.*, 1993). Specimens from Kodiak Island and National Forest System lands in Alaska identified as *I. xtruncata* in the past have been re-evaluated and are now called *I. occidentalis*. For this reason the truncate quillwort is recommended for removal from the Sensitive Species list.

Queen Charlotte butterweed (*Packera subnuda* (deCandolle) Trock & T. M. Barkley var. *moresbiensis* (Calder & Taylor) Trock)

The Alaska Natural Heritage Program ranks the Queen Charlotte butterweed as G3S2S3 (Rare or uncommon globally, and imperiled to rare or uncommon in Alaska). This plant was previously listed on the Regional Forester's Sensitive Species list as *Senecio moresbiensis* (Calder & Roy L.

Taylor) G.W. Douglas & G. Ruyle-Douglas. Recent taxonomic work segregated *Packera* from *Senecio* and placed this taxon as a variety of *Packera subnuda*. The Queen Charlotte butterweed is a narrow endemic distributed from Coronation Island (northern known edge of the plant's range) in the southern Tongass National Forest, south to the Queen Charlotte Islands and northern Vancouver Island. In the *Flora of North America* Trock (2006) considers this plant to be of conservation concern. About 12 populations of the plant are known in Alaska. Habitats include open grass/sedge meadows, mossy slopes, bogs (Trock, 2006) and alpine slopes (Douglas *et al.*, 1998b). Based on herbarium records and observations, the plant is often associated with a calcareous substrate. Little is known about the plant's ability to disperse, the fruit is an achene with a small pappus of white bristles, so the fruit may be transported by animals or wind. However, Queen Charlotte butterweed's limited distribution indicates barriers to wide dispersal.

Although there appears to be stable amounts of suitable habitat, we can not make inferences about population trends since we know so little about the plant. Studies of known populations would help us learn about these trends. The plant grows in some alpine habitats that are relatively inaccessible, thus only a small amount of potential habitat may have been affected by human activities. These activities include communications sites, recreation and minerals activities. Many of the meadow situations are more accessible and are being affected by road construction, associated changes in hydrology and other human caused disturbances. Little is known about the plant's life history or demography; and further surveys are needed to learn more about its abundance and distribution. Because so little is known about the Queen Charlotte butterweed's population trends, abundance, distribution, life history, demography, and potential threats, we recommend study of the species to clarify its status in the Alaska Region. While it is rare, there is insufficient evidence to suggest that its population viability is at risk in the Alaska Region. We therefore recommend that the Queen Charlotte butterweed be removed from the Sensitive Species list.

Bog orchid (*Platanthera gracilis* Lindley)

Platanthera gracilis has been subsumed by the more abundant and widespread *Platanthera stricta* Lindley, and is no longer considered by authorities to be a distinct taxon. Sheviak in *Flora of North America* writes, "The plants described as *P. gracilis* Lindley are florally typical of the slender spurred extreme of *P. stricta*; they differ only in peculiarly reduced, slenderly oblong but nonetheless abruptly wide-spreading leaves." Since *P. stricta* is not uncommon and widely distributed along the coast and adjacent mountains from the Aleutians to Colorado and south to northern California, it is recommended for removal from the Sensitive Species list.

Loose-flowered bluegrass (*Poa laxiflora* Buckl.)

Endemic to the northwest coast, this grass is distributed from Prince William Sound south and east along the Pacific coast to northwestern Oregon. When Hulten's *Flora of Alaska* was published in 1968 the plant was known in Alaska only from Cape Fox Springs in the extreme southern part of the Tongass. Although the plant is not common, Forest Service rare plant surveys have shown it to be more abundant and widespread than previously thought. It is very likely that the plant has been overlooked; it is somewhat similar in appearance to the very common *Deschampsia caespitosa* and often grows in the same habitat. Because *Poa laxiflora* is

more broadly distributed and more abundant than previously thought, it is recommended for removal from the Sensitive Species list.

Smooth alkali grass (*Puccinellia glabra* Swallen)

Davis & Consaul (2007) in *Flora of North America* consider *Puccinellia glabra* to be a synonym of the geographically widespread *Puccinellia nutkaensis*. Because this taxon is no longer recognized by taxonomic experts, it is recommended for removal from the Sensitive Species list.

Kamchatka alkali grass (*Puccinellia kamtschatica* Holmb.)

Davis & Consaul (2007) in *Flora of North America* consider *Puccinellia kamtschatica* to be a synonym of the geographically widespread *Puccinellia nutkaensis*. Because this taxon is no longer recognized by taxonomic experts, it is recommended for removal from the Sensitive Species list.

Circumpolar starwort (*Stellaria ruscifolia* Pallas ex Schlecht. subsp. *aleutica* Hulten)

The Alaska Natural Heritage Program ranks this plant as G4T3S3 (The species is apparently secure globally, but cause for long-term concern, the subspecies is rare or uncommon globally, and the subspecies is rare or uncommon in Alaska). This subspecies was named by Hulten in 1943. Its range extends from the Aleutian Islands, east to Kodiak and disjunct to the Brooks Range and to the Yakutat area in southeastern Alaska, where the eastern edge of the plant's known range is in the Tongass National Forest. The plant is rare across its range, with 12 documented occurrences in North America (Morton, personal communication, 2006) all in Alaska. In the Alaska Region this plant is extremely rare, known from one historic location on the Tongass National Forest, at Hidden Glacier, in Russell Fjord on the Yakutat Ranger District. A specimen was collected during the Harriman Expedition in 1899, unfortunately there is no detailed location or habitat information with the specimen. However, the habitat for this plant is described as "along creeks in the mountains" (Hulten, 1968) or "gravelly sites" (Welsh, 1974), common habitats in the Region. The shores of Disenchantment Bay, Russell Fjord and associated waterways are essentially unexplored botanically and this plant is easily overlooked and can be confused with other *Stellari*. Therefore, surveys are needed in the entire area to learn about its distribution and abundance. Because little is known about the plant's dispersal capability, population trend, habitat trend, life history, or demographics, we recommend studies to clarify its status in the Alaska Region. Although the plant is rare, there is insufficient evidence suggesting downward trends in population numbers or habitat. We therefore recommend the removal of the circumpolar starwort from the Sensitive Species list.

Animals Recommended for Removal from the List

American Osprey (*Pandion haliaetus carolinensis*)

Osprey are distributed worldwide, except Antarctica. The *carolinensis* subspecies breeds across North America and the Caribbean, and winters in South America. Ospreys recovered from pesticide induced population crashes following WW II. The Alaska Region generally sees transient migrant osprey, although very few nest here. Viability concerns for raptors affected by pesticides following WW II have diminished since recovery following the elimination of DDT, and this is true for Osprey in general. This species is considered *Least Concern* by the IUCN since 1988 and reviewed for the 4th time in 2004. Osprey subspecies are no longer tracked by the

Alaska Natural Heritage Program, but *Pandion haliaetus* is listed as G5, S2B due to rarity in the state. Although rare in the Alaska Region, viability concerns are not apparent and no data indicate downward population trends, so the Osprey is recommended for removal from the Sensitive Species list.

Peale's Peregrine Falcon (*Falco peregrinus pealei*)

Peale's peregrine falcon is one of three peregrine falcon subspecies in Alaska. Peale's peregrine falcons number at least 600 pairs in Alaska, with populations increasing and no indication of viability concerns or downward population trends. The USFWS permits collection by falconers. The *pealei* subspecies is not listed under the ESA, and the other sub-species were de-listed from the ESA (1999). Viability concerns for raptors affected by pesticides following WW II have diminished since recovery following the elimination of DDT, and this is true for Peregrine Falcons in general. This species is considered *Least Concern* by the IUCN since 1988 and reviewed for the 4th time in 2004. Although rare in the Alaska Region, viability concerns are not apparent, so the Peale's peregrine falcon is recommended for removal from the Sensitive Species list.

Trumpeter Swan (*Cygnus buccinator*)

Trumpeter swan populations increased from about 3,000 in 1970 to approximately 20,000 individuals in 2000. As populations grew, nest distribution expanded across the state and across the Alaska Region. Nearly 6% of the world's breeding population nests in the Copper River Delta, an area specifically managed for the conservation of fish and wildlife. While trumpeter swans may be at risk on wintering grounds due to habitat loss and possible exposure to lead and other contaminants, populations appear healthy and continue to increase. The species is considered *Least Concern* by the IUCN since 1988 and reviewed for the 4th time in 2004. The trumpeter swan is not believed to approach the thresholds for the population decline criterion of the IUCN Red List (i.e., declining more than 30% in ten years or three generations). Viability does not appear to be a concern at this time. However, swan nest habitat on NFS lands is changing as a result of geological uplift and associated vegetation succession following from the 1964 Alaska earthquake. The rate of habitat change is rapid, underscoring the need to monitor swan abundance so that a downward trend, if and when one occurs, will be detected. The USFWS conducts spring and fall surveys annually on the Copper River Delta and additional range-wide surveys by the USFWS occur every 5 years. Because no current population viability concerns exist, the Trumpeter Swan is recommended for removal from the Sensitive Species list. If future USFWS surveys detect a downward trend, the swan's status will be re-examined as part of the annual review of this Sensitive Species List.

Montague Island Tundra Vole (*Microtus oeconomus elymocetes*)

Montague Island tundra voles have been described as either a unique species or a sub-species endemic to Montague Island, Prince William Sound, AK. Separate species distinction was originally characterized by size and color, later re-classified as subspecies, discussed as equivocal by Lance (in a Conservation Assessment), and in recent genetic analyses, shows clear phylogeographic separation from the holarctic population as a Montague/Hinchinbrook clade. The IUCN Redlist refers to this population as a sub-species, citing Osgood (1906) but showing the assessment as "Out-of-Date" (the assessment was made in 1996), and the conservation status is recognized as "Data Deficient" (27 November 2007). The ITIS database does not recognize

Microtus oeconomus elymocetes (28 November 2007). The recent genetic work (Galbreath and Cook 2004) appears to distinguish the clade but puts the clade in a broader context than previously described; additional genetic samples could further clarify the distribution and taxonomic status of the clade. Although Montague Island Tundra Voles were listed in 1994 as a Sensitive Species, the taxonomic status appears confused and indeterminate. Even if taxonomic status was clear, land management actions on Montague and Hinchinbrook Islands are minimal, and FS actions on those islands are not such that they would limit vole populations or vole habitat. Montague Island is under the Fish and Wildlife Conservation prescription specifically to provide for migratory bird and brown bear habitat; Montague Island is restricted from timber harvest during this planning period. Hinchinbrook Island is under the Backcountry prescription, set aside primarily for dispersed recreation. Since vole habitat is not limiting, there's no evidence of a downward population trend, little perturbation of habitat exists, and the risk to future habitat perturbations is low, the Montague Island Tundra Vole is recommended for removal from the Sensitive Species list.

Cook Inlet Beluga Whale (*Delphinapterus leucas*)

Because it was listed as Endangered and now has protections as established by the Endangered Species Act (NOAA 2008), the Cook Inlet Beluga Whale is recommended for removal from the Sensitive Species list.

King Salmon (King Salmon River, Wheeler Creek) (*Onchorhynchus tshawytscha*)

King salmon stocks have been identified in both the King Salmon River and Wheeler Creek. King salmon have also been found in nearby Greens Creek. This situation is unique as nowhere else in Southeast Alaska are endemic island stocks found. All of these streams are located on the northern end of Admiralty Island.

Good escapement data exists for King Salmon River as surveys of peak escapement counts have been conducted by the ADF&G since 1971 and a weir was operated to track total escapement from 1983 through 1992. Since 1971 king salmon escapements have averaged 190 large fish. The ADF&G has set an escapement goal of 120 to 240 large fish. Low escapements were seen in the late 1970s, but since 1981 numbers have remained constant and within or above the escapement goals. Much less information is available for the Wheeler Creek king salmon stock. Adult king salmon have been documented in the stream by local property owners as well as local sport fishers. Young of the year king salmon were observed in Wheeler Creek in July of 1993. There have been no attempts at establishing escapement counts of adults or counts of juvenile king salmon in Wheeler Creek. Wheeler Creek has approximately 2.4 km of mixed/contained (MC) and flood plan (FP) channel types accessible to salmon. This compares to 7.4 km available in King Salmon River. This might suggest that, for king salmon, the carrying capacity of Wheeler Creek is around 30% of that of King Salmon River. The carrying capacity may be so small that there may not really be a population. They may be strays from King Salmon River that irregularly spawn.

Tagging information obtained from hatchery reared King Salmon River stock suggests that the King Salmon River stock, and presumably the Wheeler Creek stock, ocean-rear primarily within Southeast Alaska. This makes the stocks available to local sport and commercial fisheries throughout their ocean phase. There are no targeted commercial or sport fisheries for either

stock. Because the population is stable and because the ADF&G has an escapement goal for the stock, which is similar to having a harvest limit, the King Salmon River stock is recommended for removal from the Sensitive Species list. Because there is no information to suggest that the Wheeler Creek population is in decline and because their habitat is protected by land use designations of the Tongass Land and Resources Plan, this stock is recommended for removal from the Sensitive Species list.

Chum Salmon (Fish Creek) (*Onchorhynchus keta*)

The Fish Creek chum salmon stock is known for its large fish. Fish Creek runs into the Salmon River near the head of Portland Canal near Hyder, Alaska. Salmon River is a glacial stream with a braided stream bed where Fish Creek enters. In the early 1960's through the mid-1970's annual glacial floods impacted the habitat in the lower reaches of Fish Creek. In the late 1970's dikes were built into the Salmon River to protect the lower Fish Creek and the adjacent road. In 1989 a spawning channel was constructed between Fish Creek and the Salmon River in an area protected by the dikes. These restoration and enhancement activities appear to have been successful in maintaining quality spawning habitat.

Escapement estimates from 1971 through 2007 range from 2,800 in 1997 to a high of 90,800 in 2004. A regression analysis of the escapement data shows a decreasing trend of about 1.7% per year over the past 21 years. A tagging study conducted on Fish Creek chum salmon from 1991 through 1995 shows an annual exploitation rate of 56.7% by the commercial fishery. During years of large returns, the Fish Creek stock provides a significant contribution to the Portland Canal mixed stock commercial fishery. Because the habitat and population are not in significant decline, the stock is recommended for removal from the Sensitive Species list.

Northern Pike (Pike Lakes) (*Esox lucius*)

Northern pike are found in five lakes, referred to as Pike Lakes, about 23 miles east of Yakutat. These lakes are shallow, with high concentrations of humic acid and peat-filled margins. The northern pike in Pike Lakes are the only natural-occurring pike in Southeast Alaska. Genetic analysis supports the theory that this population is part of small refugia and has been isolated from other stocks since the last glaciation.

Little information exists about the biology or population size and structure of this stock. Common to other small populations of Pike, they are likely very cannibalistic as little other food exists for the mature fish. The largest management concern for this stock is that they do not spread to other waters within the Yakutat forelands and have a negative impact on the salmon production. The Pike Lakes watershed is located within a Land Use Designation II, which would not allow significant resource development that would negatively impact the habitat quality. Because there is little fishing pressure on this stock, the habitat is protected by its land use status, there is no evidence that the stock is in a significant downward trend, and the stock has persisted since the last significant glacial advance, this stock is recommended for removal from the Sensitive Species list.

Plants Recommended for Retention on the List

Eschscholtz's little nightmare (*Aphragmus eschscholtzianus* Andr. ex DC.)

The Alaska Natural Heritage Program ranks this plant as a G3S3 (rare or uncommon globally and within Alaska). It is distributed from the Aleutians east along Alaska Range and Wrangell St. Elias Mountains to the southern Yukon and into the Tatschenshini River area of British Columbia; there are also disjunct populations on the Seward Peninsula and in the Brooks Range. Recent genetic analysis resulted in moving the genus *Lignariella* into *Aphragmus*. Eight species are recognized. *Aphragmus* generally occurs in Asia. *A. eschscholtzianus* is the only member of the genus in North America (Warwick *et al.*, 2006). In the Alaska Region it is extremely rare, known from one location in the Palmer Creek Valley on the Seward Ranger District. It is likely to occur on Glacier, Cordova and Yakutat Ranger Districts because of proximity to known populations and because habitat exists on these districts. Habitat is generally in the alpine, on moist bouldery solifluction slopes, wet mossy seeps, wet seepage areas among rocks (herbarium label data), snow melt areas, fine gravel saturated by snow melt water (Rollins, 1993).

The habitat for this plant is relatively fragile and vulnerable to modification; in addition, alpine tundra is slow in recovering from disturbance. Some of this habitat is being impacted by modern stressors such as communications sites, recreation and minerals activities. Given the lack of information about population trends, life history, demographics, and distribution, this species is recommended for study to clarify its status in the Alaska Region. In the meantime, because of the plant's extreme rarity and the fragility of its habitats, it is recommended for retention on the Sensitive Species list.

Moosewort fern (*Botrychium tunux* Stensvold & Farrar)

The Alaska Natural Heritage Program ranks the moosewort as G1G2S1S2 (critically imperiled to imperiled globally and within Alaska). However, based on the results of 2007 field surveys and genetic analysis, these rankings may be conservative. Distribution extends from the Pribilof Islands in the west to Unalaska in the Aleutians, east to insular southeastern Alaska, north and east to the Wrangell-St Elias Mountains, and south and east to the to the Rocky Mountains of Alberta south to Nevada (genetic studies suggest the taxon may also occur in northern Norway). Moosewort was found at 13 of 27 sites visited along the Alaska Highway and in the Wrangell St. Elias Mountains (Stensvold & Farrar, 2008) where the plant grows in well drained relatively dry areas. This dry, well drained habitat is rare in the Alaska Region.

In the Alaska Region the plant grows on sandy beaches along the Yakutat Forelands, a scarce habitat in the region (these Yakutat plants are morphologically distinct from all other mooseworts and morphological and genetic studies are ongoing to learn more about the relationship between the Yakutat mooseworts and all the other mooseworts). Surveys have been conducted on the sandy beaches (and Copper River dunes) from the Cordova area east to the southern side of Malaspina Glacier, and none have been found on these sandy habitats. Isolated populations are in the alpine of Dall Island, northeast Chichagof Island and in the Whitestripe area of West Chichagof Island. The plant is rare in the Region and stochastic events such as tsunami or storms could imperil the plant's existence along shorelines. Plants or populations along the Yakutat beaches could be obliterated by trampling related to the increased amount of

tourism and recreational use taking place in the area. Disturbance in upper beach meadows and in sandy areas adjacent to beach meadows may be causing population numbers of the plants to drop. Increased amounts of trampling and off road vehicle traffic on upper beach meadows may be leading to a decline in habitat quality. NatureServe (2008) considers some of these populations to be under substantial threat. In some areas on the forelands, population numbers are declining due to natural vegetative succession. The new Yakutat Access and Travel Management Plan may help prevent future damage to the plants and their habitat.

In alpine habitats the plant is very rare with few widely scattered individuals. The alpine habitats are not undergoing substantial modification. However, increases in recreation, mineral exploration, and communications sites could affect habitat. Because of potential downward trends in populations and habitat, ANHP assessing the condition of the taxon as imperiled to critically imperiled in Alaska, and the rarity of the species in the Alaska Region, the moosewort is recommended for retention on the Sensitive Species list.

Moonwort fern, no common name (*Botrychium yaaxudakiet* Stensvold & Farrar)

The Alaska Natural Heritage Program ranks this moonwort as G2SS2 (imperiled globally and within Alaska). Based on the results of recent field surveys and genetic analysis, these rankings may be conservative. The plant is known from the St. Paul Island in the Pribilofs, Wrangell-St. Elias Mountains of Alaska, Yukon and British Columbia; the Yakutat forelands and Glacier Bay, central British Columbia, Alberta, Montana and northern California. In the Alaska Region the plant grows on sandy beaches along the Yakutat Forelands, a scarce habitat in the region. Surveys have been conducted on the sandy beaches (and Copper River dunes) from the Cordova area east to the southern side of Malaspina Glacier, and none have been found on these sandy habitats. The plant is rare in the Region and stochastic events such as tsunami or storms could imperil the plant's existence. Plants or populations along the Yakutat beaches could be obliterated by trampling related the increased amount of tourism and recreational use taking place in the area. Disturbance in upper beach meadows and in sandy areas adjacent to beach meadows may be causing population numbers of the plants to drop. Increased amounts of trampling and off road vehicle traffic on upper beach meadows may be leading to a decline in habitat quality. In some areas on the forelands, population numbers are declining due to natural vegetative succession. Hopefully the Yakutat Access and Travel Management Plan will help prevent future damage to the plants and their habitat. Because of potential downward trends in populations and habitat, ANHP assessing the condition of the taxon as imperiled in Alaska, and the rarity of this species in the Alaska Region, the moonwort fern is recommended for retention on the Sensitive Species list.

Edible thistle (*Cirsium edule* Nutt. var. *macounii* (Greene) D. J. Keil)

The Alaska Natural Heritage Program ranks the edible thistle as G4S1 (Apparently secure globally, but cause for long-term concern and critically imperiled in Alaska). This ranking is for *Cirsium edule* only; it does not reflect the ranking of the recently segregated, var. *macounii*. In *Flora of North America*, Keil (2006) recognizes 3 varieties of *Cirsium edule*. The variety in our area of interest is var. *macounii*, which is distributed from the North Cascades and Olympics of Washington north to extreme southern southeastern Alaska. Three populations are documented in the Tongass National Forest, all of which are within the Misty Fjords National Monument Wilderness. Edible thistle has also been documented in the Hyder area of British Columbia. This

rare thistle grows in moist to mesic meadows, open forests, open areas in higher elevations (Douglas *et al.*, 1998b), and talus slopes. Since this is a relatively large, distinctive plant it stands out in its habitat; thus there is a low likelihood that it has been overlooked during surveys. Little is known about the plant's, life history or demography; further surveys are needed to learn more about its abundance and distribution.

Current and proposed development projects in the Hyder area may affect populations of the plant and its habitat, resulting in downward population trends. A potential threat to the plant is its similarity to invasive thistles. If confused with invasive thistles found in its habitat, enthusiastic invasive plant pullers might accidentally remove this distinctive native plant. Because little is known about the thistle's population trends, life history, and demography, we recommend it for study to clarify its status in the Alaska Region. In the meantime, given its rarity, ANHP assessing the condition of the taxon as critically imperiled in Alaska, and known potential threats, we recommend retaining the edible thistle on the Sensitive Species list.

Calder's loveage (*Ligusticum calderi* Mathias & Constance)

The Alaska Natural Heritage Program ranks Calder's loveage as G3S1 (Rare or uncommon globally, and critically imperiled in Alaska). The species is relatively new to science, being named in 1959 (Mathias & Constance, 1959). This narrow endemic is known from a historical collection in a possible glacial refugium on Kodiak Island (Hulten, 1973) but has not been relocated during recent rare plant surveys; disjunct to southern southeastern Alaska, coastal British Columbia (Queen Charlotte Islands and adjacent islands) and disjunctly south to northern Vancouver Island and the adjacent islands. In the Tongass National Forest the plant is documented from Bokan Mountain and Gardner Bay on southern Prince of Wales Island, Grace Mountain and a mountain near Windy Cove on Dall Island and on Sumez Island. The plant grows in subalpine meadows in areas that many biogeographers and botanists consider as glacial refugia. It is also often associated with a calcareous substrate. Although there appears to be stable amounts of suitable habitat, we can not make inferences about population trends since we know so little about the plant. The plant grows in subalpine situations that are relatively inaccessible, thus only a small amount of potential habitat may have been affected by human activities. These activities include communications sites, recreation and minerals activities. There is a potential decline in its habitat quality and quantity due to minerals exploration and potential minerals activities in the Bokan Mountain area. Since Calder's loveage is so rare, little is known about its dispersal capability, population trends or demography. Because of the questions about its dispersal capability, population trends, life history, and demography we recommend the Calder's loveage for study to clarify its status in the Alaska Region. In the meantime, given its rarity and ANHP assessing the condition of the taxon as critically imperiled in Alaska, we recommend retaining Calder's loveage on the Sensitive Species list.

Pale poppy (*Papaver alboroseum* Hult.)

The Alaska Natural Heritage Program ranks the pale poppy as G3G4S3 (rare or uncommon to apparently secure globally, but cause for long-term concern; and rare to uncommon within Alaska). The poppy is distributed from the northern Kurile Islands through Kamchatka east disjunctly across the Aleutians (one known element occurrence) to south-central Alaska, east to the east side of Juneau Icefields (BC Conservation Data Centre, 2008), and disjunct to a single north central British Columbia population (University of Alaska Herbarium). There are about 30

element occurrences documented in the Alaska Natural Heritage and University of Alaska databases (2008). This plant is known in the Chugach National Forest, documented from the Glacier Ranger District in the upper Portage Valley; Seward Ranger District, near Ptarmigan Lake, growing on a terminal moraine at Palmer Creek; near Kenai Lake; and near Crescent Lake. Pale poppy grows in open, well-drained gravelly areas. Kiger and Murray (1997) in *Flora of North America* indicate that the plant is infrequent at scattered sites within its range, and particularly note that the plant is abundant in the Portage Glacier area.

The pale poppy requires an open, well-drained habitat; occasional disturbance either creates or maintains this habitat. One-time (as opposed to recurring) disturbances by humans can create habitat for the poppy. Examples include stabilized road sides, railroad trackbeds, and disturbed gravelly areas such as old gravel pits. While some human disturbance may help maintain suitable open habitat, repeated disturbance, as in the Portage Valley, may have affected the plant's ability to reproduce (Charnon, 2007). Invasions of exotic plants are flourishing in some areas of pale poppy habitat and are shading out the poppies. The Glacier Ranger District is attempting to pull the shading plants, but the rapid vegetative succession in the Portage Valley makes it difficult to keep up. A conservation assessment is underway for the pale poppy to learn more about the plant, evaluate threats, and develop a plan to manage it. In the meantime, because of the plant's extreme rarity, threats to its habitat, and known declines in its population, the pale poppy is recommended for retention on the Sensitive Species list.

Unalaska mist-maid (*Romanzoffia unalaschensis* Cham.)

The Alaska Natural Heritage Program ranks this plant as G3S3 (Rare or uncommon globally, and rare or uncommon in Alaska). Its range extends from the eastern Aleutians, across the south coast to southeastern Alaska, where the eastern edge of the plant's range is in the Tongass National Forest. The plant is rare across its range, with about 28 documented occurrences in North America, all in Alaska. Twenty three of the 28 known occurrences are located from Kodiak Island west to the Aleutians. In the Alaska Region this plant is extremely rare, known from two locations on the eastern part of the Chugach National Forest; Cape St. Elias on Kayak Island, and at Hawkens Creek on Hawkens Island; and known from one location on the Tongass National Forest, Bald Mountain on Heceta Island. Two other plants are documented from southeastern Alaska, one from the Grindle Hills near Bering Glacier and the other was collected near Sitka. The Sitka population has not been relocated and was apparently destroyed in connection with road building.

The plant grows in gravelly areas along streams, and on ledges and crevices in rock outcrops, often along the coast. Because this plant is so rare, little is known about the plant's dispersal capability, population trend, life history and demography. There is a potential decline in the Unalaska mist-maid's habitat quality and quantity due to road construction, hydroelectric projects, minerals activities, stream restoration projects and fisheries projects. Questions remain about the Unalaska mist-maid's population trends, abundance, distribution, life history and demography; therefore, we recommend studies to clarify its status in the Alaska Region. Because of the plant's rarity, potential downward trends in habitat and population, we recommend retaining it on the Sensitive Species list.

Animals Recommended for Retention on the List

Kittlitz's Murrelet (*Brachyramphus brevirostris*)

Because it is listed as a USFWS Candidate Species, Kittlitz's Murrelet is recommended for retention on the Sensitive Species list.

Queen Charlotte goshawk (*Accipiter gentilis laingi*)

USFWS recently determined that the goshawk populations in Alaska and British Columbia each qualify as distinct segments under the Endangered Species Act, and thus qualify for individual consideration as threatened or endangered. USFWS found that habitat loss in Canada makes the entire British Columbia population a likely candidate for threatened or endangered listing. USFWS does not support listing the Alaska goshawk population as threatened or endangered because of conservation strategies in place on the Tongass National Forest, including designation of substantial areas of the forest in no-harvest status and use of both goshawk-specific and indirect (e.g., legacy, karst) standards and guidelines that result in retention of habitat in those portions of the forest open to timber harvest. Still, we know little about the future role young growth will play in providing nesting habitat, particularly the role that structure will play in providing resources for prey populations. Because there continues to be uncertainty about goshawks in some geographic areas with concentrated past timber harvest (e.g., Prince of Wales Island in southeast Alaska) which has resulted in a vulnerability of habitat conditions on certain islands, because population trend is unknown, and because Tongass National Forest management continues to play a large role in the conservation of this species, the Queen Charlotte Goshawk is recommended for retention on the Sensitive Species list.

Dusky Canada goose (*Branta canadensis occidentalis*)

The majority of the known Dusky Canada Goose population nests on the Chugach National Forest, largely on the Copper River Delta, and on Middleton Island. The Dusky Canada Goose is ranked as globally secure (G5) but vulnerable to extirpation or extinction at the state level (S3); special consideration is given to this species due to the high percentage of breeding birds on NFS lands in Alaska. Little information exists as to whether the geese have moved into other breeding areas on NFS lands, but recently the Prince William Sound populations were re-evaluated and named as Dusky Canada Geese. Because this species is a Chugach National Forest Management Indicator Species, and because the populations in Prince William Sound are now considered the Dusky sub-species, it is recommended that additional work should be performed to determine breeding range and population size on NFS lands. Survey estimates from 1986-2006 show a range of 10,000 to 18,000 breeding birds. The population declined from highs in the 1970s of 24,000 to 28,000. One of the causes of initial population decline was habitat change due to seismic uplift. The decline was mitigated in part by the use of artificial nests on the Copper River Delta, and in part by the management of goose hunting. It is uncertain as to whether the decline has stabilized. The Chugach National Forest in concert with USFWS and other partners continue to monitor populations. While they are incidentally taken during goose hunts, a management plan is in place to reduce the Dusky harvest and to enhance the population of the subspecies. The building, maintenance, and monitoring of artificial nests has been successful and will continue as a major portion of work for the Cordova Ranger District. Because population trends have not stabilized, the Dusky Canada Goose is recommended for

retention on the Sensitive Species list. Future evaluation of population trend should provide the interagency monitoring effort with information to revise this recommendation on 3–5 yr intervals.

Plants Recommended for Addition to the List

Spatulate moonwort (*Botrychium spathulatum* Wagner)

The Alaska Natural Heritage Program ranks the spatulate moonwort as G3S1 (Rare or uncommon globally, and critically imperiled in Alaska). This moonwort is distributed from the upper Great Lakes east to southeastern Quebec; the range skips to the west, where it grows in the mountains of northern Montana/Idaho northwest along the mountains into the Wrangell-St. Elias Mountains of Alaska (Farrar, 2005). In southeastern Alaska, the plant is known from a small population on upper beach meadows at Sea Lion Cove on Kruzof Island; this is on State of Alaska lands adjacent to the Tongass National Forest. Although many beaches have been searched for *Botrychium*, the first sighting of this fern was made in Alaska in 2003. Since then a small population has been found on the Tongass National Forest at White Stripe Mountain on Chichagof Island. There is a suspected downward population trend at Sea Lion Cove due to the increased amount of tourism taking place in the area. Specifically, a rebuilt trail to Sea Lion Cove has become popular with commercial tour guides, substantially increasing foot traffic in the area. *Botrychium* habitat in sandy upper beach meadows is also being affected by increased recreation use. Habitat modification has occurred in some areas including North Beach on Kruzof Island, some beaches on the Yakutat forelands, and some sandy areas in the vicinity of the Copper River Highway in the Chugach National Forest. The alpine habitats are not undergoing substantial modification. However, increases in recreation, mineral exploration, and communications sites may affect habitat. Because of the plant's rarity in Alaska, ANHP assessing the condition of the taxon as critically imperiled in Alaska, and concerns about downward population trends and habitat modification, the spatulate moonwort is recommended for addition to the Sensitive Species List.

Sessileleaf scurvygrass (*Cochlearia sessilifolia* Rollins)

The Alaska Natural Heritage Program ranks the sessileleaf scurvygrass as G1G2Q S1S2 (critically imperiled to imperiled globally, taxonomically questionable taxon and critically imperiled to imperiled within Alaska). Welsh (1974) and Hulten (1968) treated the plant as *C. officinalis* L. subsp. *arctica* (Schlecht.) Hulten var. *sessilifolia* (Rollins) Hulten. In 1974 Welsh simplified matters by treating it as *C. officinalis* L. var. *sessilifolia* (Rollins) Welsh. The plant is currently recognized as it was originally named in 1941 by Rollins as *C. sessilifolia* (Lipkin & Murray, 1997; USDA, NRCS, 2008). This is a narrow endemic of south coastal Alaska known from Nuka Bay in Kenai Fjords (Arctos database, 2008); Shoup Bay, inside the outer sandbar; Valdez, tide flats (Alaska Natural Heritage Program, 2008). Kodiak and Sitkalidak Islands (Lipkin & Murray, 1997). Sessileleaf scurvygrass is likely to occur on the Chugach National Forest in the Glacier and Seward Ranger Districts. The plant grows in low energy estuarine sites, in the intertidal zone, on gravel bars or spits, inundated at high tide (Rollins, 1993). Habitat or population connectivity is limited due to separation of low energy estuarine sites. Dispersal among patches is limited. This habitat is naturally distributed as isolated patches with limited opportunity for dispersal among patches. Some local populations may be extirpated due to sea level changes resulting from earthquakes changing sea levels and from tsunamis. Sessileleaf

scurvygrass is rare throughout its range and current abundance is low enough that stochastic and other factors could lead to potential imperilment. The habitat is very much vulnerable to the effects of uplift or subsidence resulting from tectonic events and from the effects of tidal waves. Habitat may also be impacted by modern stressors such as construction, invasive species, and recreation; this is especially true of the populations reported from Valdez Arm. Little is known about the plant's life history or demographics, however the Fish and Wildlife Service is funding studies to learn more about the plant's taxonomy, distribution, abundance, habitat requirements life history and demographics. Because of questions about population and habitat trends we recommend it for study to clarify its status in the Alaska Region. In the meantime, its limited distribution, rarity, concerns about habitat vulnerability and ANHP assessing the condition of the taxon as imperiled to critically imperiled in Alaska lead us to recommend the sessileleaf scurvygrass for addition to the Sensitive Species list.

Spotted lady's slipper orchid (*Cypripedium guttatum* Sw.)

The Spotted lady's slipper is ranked as G5S4 (demonstrably secure globally and apparently secure within Alaska). The plant is widespread in temperate/boreal Eastern Europe, Asia, across the Aleutians, through the Alaska Range east to the Yukon and Northwest Territories. Hulten (1943) does not indicate any plants in southern Alaska east of Kodiak Island, yet in 1968 indicates a site on the Kenai Peninsula, and Sheviak (2002) includes the Kenai on the range map in Flora of North America. The plant is not known to occur in British Columbia (Douglas *et al.*, 2002; B.C. Conservation Data Centre. 2008; Sheviak,2002). The Chugach National Forest is at the southern edge of the plant's North American range. A single, small population of less than 10 plants was known from National Forest System lands on the Chugach National Forest from the Portage Valley about 2.4 km west of the outlet of Portage Lake (a specimen from this population is at the University of Alaska herbarium). The population was obliterated when a gravel pit was created. The nearest known population is from north of Palmer, about 100 km north (Across the Chugach Mountains) of Portage (University of Alaska Herbarium, 2008). A plant of open forests (Luer, 1975), this striking orchid is hard to overlook, thus its rarity on the Chugach Forest appears to be true. The population trend in the Alaska Region is significantly downward since the only known population was destroyed. In the Portage area the habitat trend is downward since habitat has been modified by various construction projects and creation of gravel pits and associated roads. Other undocumented populations are vulnerable to flower pickers, plant collectors, and people who dig wild plants for transplanting, this is especially true in the Portage Area, which is on the Anchorage road system. Because of the plant's rarity on the Alaska Region, concerns about habitat modification and threats by plant collectors, and the fact that a known population has been destroyed, we recommend the spotted lady's slipper for addition to the Sensitive Species list.

Mountain lady's slipper orchid (*Cypripedium montanum* Dougl.)

The Alaska Natural Heritage Program ranks the mountain lady's slipper as G4S1 (apparently secure globally and critically imperiled in Alaska). This orchid has a Cordilleran distribution ranging from California north to British Columbia and east to the Rockies of Alberta, Idaho and Montana. (Luer, 1975; Sheviak, 2002). The distribution is somewhat disjunct to southeastern Alaska, where the northwestern extent of the plant's range is in northern southeast. Element occurrences off National Forest System lands include: Haines mile 8 Haines Highway; Haines area, upper Takhin River valley; Glacier Bay, Adams Inlet and Garforth Island. On National

Forest System lands the plant is known from three locations, the Stikine River near the mouth of Clearwater River (Kikahe River), on Etolin Island (population of 400 plants) and upper Lynn Canal near the mouth of Endicott River (one plant). Since this is such a showy orchid and a considerable number of rare plant surveys have been conducted with the plant being only been found three times, we feel this is indeed a rare species. The plant is known from an array of habitats, including open forest and beach meadows.

The population trend is suspected of moving downward. The population on Etolin Island had evidence of severe herbivore impacts in 2006 and 2007, so herbivores (suspected as deer or elk) may also cause the population to decrease over time. Elk were introduced to Etolin Island several years ago. There may be a decline in habitat quality, substantial modification of habitat has occurred adjacent to the Etolin Island population. The habitat may be affected by changes in hydrology, timber harvest, invasive plants and recreational use. Modifications include a newly constructed logging road and the timber above the existing population is scheduled for harvest. Access to the population and changes to the hydrology may result in a decline in the habitat at this site. Upper beach meadow habitats may be affected by increased recreation use along beaches. These orchids have large purple and white, showy flowers, making them vulnerable to flower pickers, plant collectors, and people who dig wild plants for transplanting. Because of this orchid's rarity on the Alaska Region, ANHP assessing the condition of the taxon as critically imperiled in Alaska, as well as concerns about downward population trends, habitat modification and threats by plant collectors, the mountain lady's slipper is recommend for addition to the Sensitive Species list.

Large yellow lady's slipper orchid (*Cypripedium parviflorum* Salisb. var. *pubescens* (Willdenow) O. W. Knight)

The large yellow lady's slipper orchid is ranked as G5T5S2S3 (secure globally and imperiled to rare or uncommon within Alaska). *Cypripedium parviflorum* Salisb. is comprised of three varieties (Sheviak, 2002) var. *parviflorum*, var. *makasin* (Farw.) Sheviak and var. *pubescens*. The variety occurring on the Tongass National Forest (var. *pubescens*) has the largest flowers of the three varieties (Wallace & Case, 2000). Charles Sheviak (orchid authority) verified the variety growing on Prince of Wales Island, and said he was not aware of the plant on the islands of southeastern Alaska. Distribution of this variety is discontinuous and extends south and east from the Brooks Range and Ogilve Mountains across boreal North America, south along the Rockies to Arizona and New Mexico, and south from the eastern Great Plains to the east coast (Sheviak, 2002). The plant has been collected about 45 miles NE of the Chugach Forest boundary near the Chitna River about 25 miles above the confluence with the Copper River (University of Alaska Herbarium database). The orchid is rare in the Alaska Region and known only from the Tongass National Forest where it was first discovered in 2006. It is known from two populations on northern Prince of Wales Island, where it is growing in peatlands. In 2006 one site had 15 stems, the sites have not been revisited, thus the population trend and habitat trends are not known. The plant is also known from the Klukwan area in the northern panhandle. According to NatureServe (2008) there are few populations that are demonstrably secure across the wide range of the plant, and population trends are downward throughout its range.

We know little about the plant's specific habitat. In the Tongass, the plant is known from peatland habitats. Wallace & Case (2000) mention that in Michigan, very large populations are

found in open areas on limestone substrate. The areas in the Tongass Forest where these plants are known from are also on limestone substrate. Currently there are stable amounts of peatland habitat on the Forest. Human caused modification of peatlands, such as roads can change hydrology, which could affect the habitat and thus the plant. However, it is notable that one of the populations is growing adjacent to a Forest road. There is a high potential for mortality due to this being a showy orchid, it is vulnerable to flower pickers, plant collectors, and people who dig wild plants for transplanting. Because of the plant's rarity on the Alaska Region, uncertainty about population and habitat trends, and threats by plant collectors, the spotted lady's slipper is recommended for addition to the Sensitive Species list.

Lichen (*Lobaria amplissima* (Scop.) Forssell)

Lichens are generally understudied and therefore not all have a global or state ranking. This lichen has a limited distribution outside Alaska. One sterile fragment found in California was published to be this lichen, but no other specimens from the New World have been found outside Alaska. In Europe it is very rare and on the European Community Red List. In the Tongass National Forest this lichen has been found in approximately 20 locations, generalized as follows: Mitkof Island, 2 populations (including the Sukoi Islets); Kuiu Island, 7 populations; Baranof Island, 1 population; Misty Fjords National Monument, 2 populations; South Prince of Wales 1 population, Yakutat 1 population, and Coronation and Warren Islands, 5 populations. *L. amplissima* was not detected in the hundreds of lichen community plots generated during the first lichen biomonitoring study in the early 1990s (Geiser *et al.*, 1994, 1998), nor in the research conducted on lichens of the *Pinus contorta* peatlands (Derr, 1994). More recently it has been found during lichen research on the forest beach fringe (Dillman 2004) and in air quality monitoring plots at the beach fringe (Dillman *et al.*, 2007). It is large, showy, and similar to other *Lobaria* species; therefore, it is very unlikely that it was overlooked in those earlier surveys.

This lichen appears to be habitat specific, found on trunks and main branches of *Picea sitchensis*, *Malus fusca*, and *Tsuga heterophylla* of old-growth beach fringe edges that are exposed to large bodies of ocean (Dillman, 2004). The locations where this lichen is found are isolated from each other by the marine waters and beach fringe forests that are not exposed to the same favorable environmental conditions. Known populations and quality and quantity of existing habitat have a suspected downward trend in Alaska due to stresses associated with natural events and processes such as windthrow, uplift of beaches, and tsunamis. Stresses from anthropogenic sources include log transfer facilities, recreational uses, localized air pollution, and tree removal in beach fringe habitat for permitted activities such as small salvage operations, subsistence and personal use, thinning for wildlife, and other purposes. Many occurrences of this lichen are within wilderness areas and in the beach buffer zone that is generally protected under the Forest Plan. However, four occurrences are within the footprint of recreation special use permit areas or undeveloped local recreation sites (Kuiu Island and Sukoi Islets) or within 20 feet of an existing road (Mitkof Island and Yakutat). Sensitive to air pollution, the lichen has three sightings within wilderness bays that are above Tongass thresholds for sulfur and nitrogen in lichens analyzed for air quality (Coronation, Tebenkof and Warren Islands) (Dillman *et al* 2007). This may be due to decades of use of these wilderness bays as marine vessel anchorages. This lichen has a low reproductive rate and sexual reproduction is not common in the Alaska material; therefore, dispersal of propagules is largely limited to fragmentation. Fragments may be dispersed by birds, slugs or rodents. This lichen is affected in Europe by acid rain and habitat modifications. The

populations in Alaska afford the best chance to sustain the health and viability of this lichen worldwide. Its presence also indicates areas of the landscape with high biodiversity in epiphytic lichen communities and therefore important ecosystem functions. Due to questions about its identity, genetic research is being conducted in Switzerland to help determine whether the Alaska lichen is in fact the same species as the European counterpart, or a different, undescribed lichen. Because of this lichens' rarity in the Alaska Region, the suspected downward trend of populations and habitats, current air pollution threats, and questions about it being an undescribed species, *Lobaria amplissima* is recommended for addition to the Regional Sensitive Species list.

Alaska rein orchid (*Piperia unalascensis* (Spreng.) Rydb.)

The Alaska Natural Heritage Program ranks the Alaska rein orchid as G5S2 (secure globally; and imperiled within Alaska). The distribution extends disjunctly from Unalaska east to northern southeastern Alaska south into northern California, south along the Sierra Nevadas into Mexico, and south along the Rocky Mountains into Utah. There are disjunct populations in Colorado, New Mexico, Montana, South Dakota and Newfoundland. The plant is scarce and isolated in the Alaska Region, currently only known from the Tongass National Forest. However, there is an unverified specimen from the Kenai Peninsula. On the Tongass National Forest it is known from Duke Island (on ultramafic rocks); Doolth Mt. on Chichagof Island; Gravina Island; Red Bluff Bay, Baranof Island; and Rio Roberts, Prince of Wales Island. Habitat includes dry open sites, under tall shrubs in riparian zones, mesic meadows, and drier areas in coniferous and mixed evergreen forests from low elevation to subalpine.

Insufficient information is known to draw inferences about the Alaska rein orchid's dispersal capability. However, orchids produce copious amounts of seeds that are adapted for wind dispersal. Without endosperm in the seeds, orchids are dependent on a mycorrhizal association with a fungus to provide nutrition. The species and habitat requirements of these fungi are not known. This dependency upon the fungal symbiont may limit the orchid's ability to reproduce. Thus the production of millions of tiny seeds does not guarantee a high reproductive rate. This orchid is rare and plants are generally solitary or populations have only one to a few individuals. The current abundance is low enough that stochastic and other factors could lead to potential imperilment. There is not enough information to draw inferences about population trends in the Alaska Region, although surveys have failed to relocate the Rio Roberts population on Prince of Wales Island. Studies underway on *Piperia* should shed more light on the orchid's abundance, dispersal capability, population trends, life history and demographics. There is a potential decline in the Alaska rein orchid's habitat quality and quantity due to minerals exploration and potential mining, timber harvest, recreation, road construction and invasive plants. Because of the lack of information about the rein orchid's abundance, population trends, and concerns about habitat modification, the Alaska rein orchid is recommended for study to clarify its status in the Alaska Region. In the meantime its rarity and ANHP ranking of imperiled within Alaska lead us to recommend its addition to the Sensitive Species List.

Lesser round-leaved orchid (*Platanthera orbiculata* (Pursh) Lindley)

The Alaska Natural Heritage Program ranks the lesser round-leaved orchid as G5S2 (secure globally; and imperiled within Alaska). This orchid is widely distributed across North America, from southern southeastern Alaska disjunctly across boreal and north temperate North America.

In the west it grows south to Washington State (possibly extirpated from Oregon), Wyoming in the Rockies; in the east south along the Appalachians to Tennessee and South Carolina. Southeastern Alaska is at the extreme northwest edge of the plant's geographic range. Some lesser round-leaved orchids in the extreme northwestern part of its range appear to be morphologically similar to the Asian orchid, *Platanthera freynii* Kränzlin. These plants are smaller, have fewer flowers and have narrower leaves than typical lesser round-leaved orchids (Sheviak, 2002). Botanists are investigating the systematics of *Platanthera* through the use of morphological and molecular techniques to learn more about genetic relationship in the genus. If the *P. orbiculata* in southeastern Alaska is genetically different from typical *P. orbiculata* it would mean the southeastern Alaska plants may represent a new entity. On the other hand, if they were genetically similar to *P. freynii*, they would be an impressive disjunct population of the Asian taxon.

In Alaska the orchid is known from 88 populations in the southern part of the Tongass National Forest including Etolin, Prince of Wales, Gravina, Duke and Revillagigedo Islands and the Cleveland Peninsula. Most populations have between one and eight plants although surveys in larger areas (such as a timber cutting units) have resulted in finding up to 50 plants. The habitat for the lesser round-leaved orchid includes wet coniferous forests (Sheviak, 2002), "damp rich humus in deep shade in heavily forested areas" (Luer, 1975). In the southern Tongass, primary habitat for the orchid includes low elevation forested wetlands; medium to high volume old growth hemlock forests; slopes between 15 and 75%; high bryophyte cover; red cedar component; low forb cover; forest edges or near gaps in otherwise shady forests; near open water or boggy areas. This orchid produces millions of seeds that are adapted for wind dispersal or being carried by animals in their fur or on their feet. Seed germination and corm development are dependent infection by mycorrhizal fungi. The species and habitat requirements of these fungi are not known. This dependency upon the fungal symbiont may limit the orchid's ability to reproduce. Thus the production of millions of tiny seeds does not guarantee a high reproductive rate. Without monitoring, we are unable to accurately assess the current population trend. Forests where the lesser round-leaved orchid grows are generally desirable for timber harvest, with an average volume of 9 to 30 MBF per acre. Of the known occurrences, 76% are in timber use land use designations, and many are located in proposed timber units and road locations. From the large amount of past logging, much of which has occurred in lesser round-leaved orchid habitat, we can infer a downward population trend for the orchid. Because of past and proposed timber harvest and road construction there is also a decline in habitat quantity and quality. Because questions remain about the orchid's taxonomy, abundance, and distribution, we recommend it for study to clarify its status in the Alaska Region. In the meantime, because of its rarity and limited distribution in the Alaska Region, ANHP assessing the condition of the taxon as imperiled within Alaska, inferred downward population trends and decline in habitat quantity, the lesser round-leaved orchid is recommended for addition to the Sensitive Species List.

Kruckeberg's swordfern (*Polystichum kruckebergii* W. Wagner)

The Alaska Natural Heritage Program ranks this fern as G4S1 (apparently secure globally and critically imperiled in Alaska). This fern was named in 1966 and it is a tetraploid of hybrid origin. Rare at widely disjunct sites in southeastern Alaska, in British Columbia widely disjunct and rare in the Cascades and Coast Range, south to the mountains of northern California (Calflora, 2008), and in the Rockies, centered on Idaho (Klinkenberg, 2007, Wagner, 1993).

According to Douglas *et al.*, (1998a) and Klinkenberg (2007), Alaskan *P. kruckebergii* is disjunct from the nearest British Columbian population by approximately 450 km. In Alaska, Kruckeberg's swordfern is known from Red Bluff Bay, Baranof Island; Redtop Mountain, Cleveland Peninsula; and Gold Hill, Annette Island (not on NFS lands). Kruckeberg's swordfern grows in sheltered cracks in the dunite rock of ultramafic outcrops. Dispersal is only through suitable habitat. In mid-summer the fern releases spores; most are shed in the vicinity of the plant (Peck *et al.*, 1990), although some may be dispersed via wind and some dispersed by animals. Spores will only germinate and grow to mature plants in appropriate habitat. We do not have sufficient information to draw inferences about population trends in the Alaska Region. Known populations need to be monitored for changes in populations, and other ultramafic outcrops need to be surveyed for the fern. There is a potential for decline in habitat quality or quantity due to minerals exploration and potential mining in ultramafic rock. Substantial modification of habitat could occur with conditions departing from HRV. Mining could potentially remove the fern's habitat. Except, the case of Red Bluff Bay where the ultramafic outcrop is protected by Wilderness designation (South Baranof Wilderness Area). Because of its rarity, ANHP assessing the condition of the taxon as critically imperiled in Alaska, lack of information about its abundance throughout its Alaskan range, and potential decline in habitat quantity, Kruckeberg's sword fern is recommended for addition to the Sensitive Species List.

Henderson's checkermallow (*Sidalcea hendersonii* S. Wats.)

The Alaska Natural Heritage Program ranks Henderson's checkermallow as G3S1 (the species is rare or uncommon globally and critically imperiled in Alaska). Endemic to the northwest coast of North America, this plant has limited distribution. This distribution extends along the Pacific coast from Douglas County, Oregon through Washington north to southern Vancouver Island and the adjacent mainland. Recent searches for the plant throughout its Oregon range have shown reduced distribution and abundance. It is now known by a single plant near Tillamook and by a population of 545 plants on an island in the Siuslaw River estuary (Gisler & Love, 2005). There are 32 known populations in Washington, with these being concentrated in Grays Harbor and Pacific Counties, although it occurs in other coastal counties. The populations appear to be stable (Federal Register, 2006). In British Columbia it is a taxon of Special Concern. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. The distribution is disjunct to Alaska, where it is known from a single population of three plants at Howard Bay on the southern Chilkat Peninsula (Tongass National Forest). This is a range extension of 1200 km to the northwest. Henderson's checkermallow is extremely scarce and isolated. Worldwide there are about 67 populations of *Sidalcea Hendersonii* (Federal Register, 2006).

This plant has very limited dispersal ability due to its unusual reproductive biology and seed predation by weevils. The plant is gynodioecious (it has both perfect flowers and flowers that are only pistillate). Pistillate (female) flowers are disadvantageous to the plant's dispersal capability because they do not contribute genes to the gene pool via pollen. We do not know how many of the Alaska population's flowers are perfect and how many are only pistillate. It is also unknown if weevils are feeding on the seeds of this very small population. Without knowledge of these factors it is difficult to analyze the plant's dispersal capability. Seed predation is an important factor relating to dispersal. In *Sidalcea hendersonii* inbreeding depression is high, this means that a high percentage of the offspring of inbred plants do not reproduce (Marshall & Ganders, 2001).

Since the Alaska population is so small, the lack of genetic variability is an issue. Without this genetic variability the plants are less likely to adapt to environmental changes.

The known abundance in Alaska is low enough that stochastic and other factors could lead to imperilment. It occupies estuarine habitats at the ecotone of the estuary and forest. Although this habitat is common in the Region, and there have been many surveys of these habitats, the plant was only first documented in Alaska in 2003 (Love, 2003; Stensvold and Anderson, 2005). The plant has large, showy scarlet flowers; therefore it is unlikely that it has been overlooked during previous rare plant surveys along shorelines.

The population trend is suspected of moving downward. The plant is being shaded out by a young Sitka spruce, which almost certainly will result in the death of the checkermallow. Isostatic rebound and tectonic uplift are affecting the beach meadows and beach meadow forest ecotone habitats, especially in the northern Tongass. As the land rises, estuaries are evolving into forests. Hopefully, the checkermallow will be able to “follow” its habitat to the seaward. With increased recreational use, and increasing human population, upper beach meadows are being more heavily affected by human use. There is a high potential for mortality due to the plant’s showy scarlet flowers, it is vulnerable to flower pickers, plant collectors, and people who dig wild plants for transplanting. Because of the plant’s rarity throughout its range and especially the disjunct population in Alaska, ANHP assessing the condition of the taxon as critically imperiled in Alaska, the potential drop in population and habitat trends, and threats by collectors, the Henderson’s checkermallow is recommended for addition to the Sensitive Species list.

Dune tansy (*Tanacetum bipinnatum* (L.) Sch. Bip. subsp. *huronense* (Nutt.) Breitung)

The Alaska Natural Heritage Program ranks the dune tansy as G5T4T5S3? (demonstrably secure globally with the subspecies being demonstrably secure globally to apparently secure globally and rare or uncommon in Alaska). In her treatment in *Flora of North America*, Watson (2006) recognizes *T. bipinnatum* to include *B. huronense*, *T. camphoratum*, and *T. douglasii*. She also recognizes subsp. *bipinnatum* and subsp. *huronense* within *T. bipinnatum*. This subspecies is distributed disjunctly across boreal and arctic North America, and disjunctly south along the Pacific coast to California (Douglas et al., 1998). Dune tansy is known from one location on National Forest System lands in the Alaska Region; on North Beach of Shelikof Bay on Kruzof Island, Sitka Ranger District of the Tongass National Forest. The plant occurs as an isolated patch about 10 meters square on an upper beach below a storm tide log deck. Its general habitat includes sand dunes and well drained soils; dispersal is only through suitable habitat. The nearest known occurrences are to the south on the Queen Charlotte Islands where it is infrequent in sand dunes (Calder & Taylor 1968); and to the west in Baxter Bog at Anchorage.

The plant is rare in the Alaska Region and the abundance is low enough that stochastic and other factors could lead to imperilment. The first sighting of this plant at Kruzof Island was made in 2003. Since then surveys in similar habitat on Kruzof Island and other islands have failed to locate more populations. Revisits at the North Beach population indicate downward habitat and population trends. This is due to heavy use of this beach by off road vehicles and recreationists. A Forest Service cabin has been constructed at the edge of the Forest on this beach for the use of off road vehicle users. The upper beach meadow is being affected by churning wheels of off road vehicles, and the logs that have been in part protecting the population are being removed and cut

as firewood. Stochastic events such as tsunamis or heavy storms may also affect the population. An additional factor that could affect the population (or previously unknown populations) is dune tansy's similar appearance to the invasive common tansy (*T. vulgare*); enthusiastic weed pullers might accidentally obliterate a population. Because of the plant's rarity in the Alaska Region, concerns about downward population and habitat trends, the dune tansy is recommended for addition to the Sensitive Species List.

Animals Recommended for Addition to the List

Aleutian Tern (*Onchopnon aleutica*)

Aleutian Terns breed in Alaska and Siberia. Although a database exists of previously detected colonies, current population counts are reduced upwards of 90% (Table 2). The IUCN Red List database was last updated in 2000, and does not include current observations, as in Table 2.

Table 2. Historical and recent observations of Aleutian Terns in Alaska.

Colony location	Historical Observation	Recent Observations	Sources
SE Kodiak Island	1559 (1979)	2 (2002)	USFWS Alaska Seabird Information Series
Prince William Sound	Declines of a min. of 50% (1972-2007)		Agler et al. 1999; D. Irons, <i>pers. comm.</i>
Black Sand Spit	3000 (1980)	513-2700 (2001-2007)	Alaska Audubon Important Bird Areas summary
Riou Spit, Icy Bay	515 (1995)	0-40 (2004-2007)	FWS, unpublished data

Population viability concerns have been raised (Aleutian Tern Working Group summary, Oct 2007) due to reduced size or disappearance of colonies in Kodiak, Prince William Sound, Yakutat, and Icy Bay. The largest colonies on record exist or existed on the Cordova and Yakutat Ranger Districts. An estimated population in the Cordova area of greater than 2,400 individuals in 1980 may be less than 400 now (E. Cooper Forest Service, D. Irons FWS, personal communication). Whereas some of the colonies are in remote sites, others exist in areas where FS permitting can cause or relieve site perturbations (e.g., Black Sand Spit in Yakutat). The Aleutian Tern Working Group recently reviewed the species status, natural history, uses, and threats; the data suggest to the Working Group a range-wide population decline with suspected causes of both natural and human-induced causes (e.g., isostatic rebound, structural changes in vegetation, shifts in forage prey populations, disturbances from human activities, access allowed through special use permits). Nothing is known about migratory routes or the wintering range, and little is known about diet and chick provisioning. However, based on steep declines in the population of the large breeding areas on NFS lands, and the potential for overlap of management activities with those breeding sites, the Aleutian Tern is recommended for addition to the Regional Sensitive Species List.

Black Oystercatcher (*Haematopus bachmani*)

This species is listed by the US, Canada, Alaska, British Columbia, Washington, Oregon, and California shorebird plans as a species of high concern, by Audubon as a Watchlist species, by

USFWS as a Focal Species, and is a Chugach MIS. Black Oystercatchers have a small global population (estimates of 8,500 – 11,000 individuals) with distribution from the Aleutian Islands down the Pacific Coast to Baja California. The majority (65%) of the population breeds in Alaska. Populations were affected by the 1989 Exxon Valdez oil spill in Prince William Sound, recovery has been slow, and oil still lingers in nesting areas. Extensive data collection has occurred the past 5 years from Kodiak Island to British Columbia showing these long-lived birds have high site fidelity but low reproductive rates and high inter-annual variability in nest success. Chick survival is low due to several natural and human-induced factors, including snow conditions, timing, prey availability, nest predation, and human use. Nest location data indicate extensive overlap between nesting territories and remote shoreline campsites. Because viability of this species remains a concern and populations in some areas have dramatically declined due to unknown causes (from 48 pairs to 2 pairs in Sitka Sound), and there is high overlap between nest sites and areas permitted for recreational use (e.g., Prince William Sound), the Black Oystercatcher is recommended for addition to the Sensitive Species list.

Other Plants Considered but not Recommended for Listing

The plants listed below were reviewed for sensitive species designation but are not currently recommended for designation as sensitive species. These plants are rare or suspected in the Alaska Region and are of NEPA concern in parts of the Alaska Region.

Yellow columbine (*Aquilegia flavescens* S. Wats.)

The Alaska Natural Heritage Program has not ranked this plant, its NatureServe rank is G5 (secure globally). It is known from one site in Alaska, where it was recently discovered. The site is on the Tongass National Forest, Juneau Ranger District located on the lower Taku River, along Yehring Creek, growing in a creek side meadow. The main part of the range extends from the Rockies of southeastern British Columbia south and east along the Rockies to Alberta, Washington, Idaho, Montana, Utah and Wyoming. A disjunct population is located in north central British Columbia (B. C. Conservation Data Centre, 2008; Whittemore, 1997). The Alaskan plant is located approximately 500 km northwest of this other disjunct population. With a single location for the plant in the Alaska Region it is considered to be rare. Because this is a distinctively colored columbine, it would stand out; thus there is a low likelihood that it has been overlooked during rare plant surveys, thus it is indeed rare, not merely overlooked in much of the Tongass National Forest. Very few rare plant surveys have been conducted in the upper Taku River area in appropriate habitat, specific surveys may reveal the plant to be more abundant than currently known. Although this plant is widely disjunct from the main part of its range, its dispersal ability in the Alaska Region is unknown; this might be attributed to the ephemeral habitat on the Taku River floodplain due to flooding and channel changes. The population trend for the plant is not known and we have insufficient information to draw inferences about the yellow columbine's habitat trends. Because it is secure globally and there is a lack of information about the plant's Alaskan distribution, abundance, population trends and habitat trends we do not have a true picture of the plant's rareness or potential imperilment, therefore yellow columbine is not recommended for addition to the Regional Sensitive Species List. Surveys are needed to determine this plant's distribution, abundance, habitat as well as trends in population and habitat.

Water-shield (*Brasenia schreberi* J. F. Gmelin)

The Alaska Natural Heritage Program ranks the water-shield as G5S1 (secure globally and critically imperiled within Alaska). The water-shield is distributed worldwide except Europe. In North America it grows in the eastern half of the United States, and in the west it is distributed from northern California to southern British Columbia; then is disjunct to southern southeastern Alaska (Douglas *et al.*, 1998c, 2002, Wiersema, 1997). In Alaska, it is rare, known only two sites in the extreme southern part of the panhandle. One is a Gravina Island pond (it is unknown if this specimen is from National Forest System lands) documented by a 1927 collection by J.P. Anderson (University of Alaska Herbarium and ANHP database); the other is a recent collection from a pond on Duke Island. Because of its widespread distribution, we infer that the plant readily disperses across landscapes; however, its disjunction and rarity in southeastern Alaska indicates unknown habitat requirements or potential stressors at the edge of its range. This plant may be reinvading the northern parts of its range after the last glacial maximum. Habitat may be affected by changes in water level or water quality. The plant is secure globally and there is a lack of information about the plant's Alaskan distribution, abundance, population trends, and habitat trends. We do not now have a true picture of the plant's rareness or potential imperilment. Because there is insufficient evidence to suggest downward trends in habitat or populations in the Alaska Region, water-shield is not now recommended for addition to the Regional Sensitive Species List. Surveys are needed to determine this plant's distribution, abundance and trends in population and habitat.

Scouler's harebell (*Campanula scouleri* Hook. ex A. DC.)

The Alaska Natural Heritage Program ranks the Scouler's harebell as G5S1 (secure globally and critically imperiled within Alaska). Cooley (1892) and Hulten (1948, 1968) indicate a single occurrence of this plant in the Wrangell area in southeastern Alaska. The identity of the specimen collected by Cooley at Wrangell was verified by S. G. Shelter of the Smithsonian's National Museum of Natural History (Shelter 2008, personal communication). This population, if truly found in 1891, is very likely to be extirpated. There are questions about this plant being an isolated accidental occurrence resulting from human transport, or being a mix up in collections (Cooley also collected in southern British Columbia during her 1891 field trip). The only other potential occurrence known from Alaska is a collection made on the Juneau road system in 1982. The specimen, held at the University of Alaska herbarium (Fairbanks) is referenced in the USDA Plants database. Recent examination of the specimen reveals it to be a misidentification of a probable cultivar. Neither location is likely to be on National Forest System Lands (Tongass National Forest). The Alaskan locations are disjunct from the main part of the plant's range, which extends south from southwest British Columbia, to central California. According to Douglas *et al.* (1998c) the plant's habitat includes mesic to dry forests, rock outcrops and talus slopes. Little is known about the plant's dispersal capability, Alaskan distribution, abundance, population trends, habitat trend, life history or demographics. Scouler's harebell is secure globally, and we suspect the Wrangell population to be an accidental collection or a mixed-up collection. There is a lack of information about the plant's Alaskan distribution, abundance, population trends and habitat trends we have insufficient information about the plant's rareness or potential imperilment. The plant is distinct morphologically, thus not likely to be overlooked by botanists, and it is known from a single questionable collection. This leads us to believe the plant does not occur in the Alaska Region. Therefore Scouler's harebell is not recommended for addition to the Regional Sensitive Species List.

Low bull rush (*Isolepis cernua* (Vahl) Roem. & J.A. Schult. var. *cernua*)

The Alaska Natural Heritage Program ranks the low bull rush as G5S1 (Demonstrably secure globally and critically imperiled within Alaska). Known from a single location on Prince of Wales Island at the head of Aiken Cove in Moira Sound; growing on an upper beach meadow at a tidal flat. Nearest location is on the Queen Charlotte Islands, then disjunct south to Vancouver Island and adjacent mainland (Klinkenberg, 2007; B.C. Conservation Data Centre, 2008). The distribution continues south along the Pacific Coast to Baha California (Calflora 2008). It also occurs in temperate South America, Africa Eurasia, Australia, New Zealand (Smith, 2002a). According to Muasya & Simpson (2002) it does not occur eastern Asia (i.e. China, Japan, Korea, Russia). The single location of this plant on the Tongass National Forest is the northern known edge of the plant's range. This is a plant of saline meadows, beaches and mudflats. It is not known how readily the plant disperses, however since it is so widespread throughout the world, it appears to have a high dispersal capability. In the Alaska Region, the plant is rare enough that stochastic and other factors could lead to potential imperilment. Because the site has not been visited since the plant was discovered in the 1990s, population trends are unknown and the habitat condition at the site is unknown. The habitat may be affected by increasing recreation use. Because it is secure globally and there is a lack of information about the plant's Alaskan distribution, abundance, population trends and habitat trends we do not have a true picture of the plant's rareness or potential imperilment, therefore low bull rush is not recommended for addition to the Regional Sensitive Species List. Surveys are needed to determine this plant's true Alaskan distribution, abundance, habitat as well as trends in population and habitat.

Water lobelia (*Lobelia dortmanna* L.)

The Alaska Natural Heritage Program ranks water lobelia as G4G5S1 (apparently secure globally, but cause for long-term concern to demonstrably secure globally; and critically imperiled within Alaska). The plant's range includes southwestern British Columbia, Vancouver Island and adjacent mainland, and the Queen Charlotte Islands. Scattered in northwestern Washington State where it is imperiled and Oregon where it is critically imperiled. The plant occurs sporadically across boreal North America, where it is rare in the middle of the continent. On the east coast it is known from Newfoundland to New Jersey, and it grows in northwest Europe (NatureServe, 2008). Known only in the extreme southern part of the Tongass National Forest from; Duke Island, shallow lake; Revilla Island, Ella Lake, lakeshore shallows with sandy substrate, Perseverance Lake and a shallow lake on Gravina Island. The southern Tongass appears to be the northwest edge of the plant's range. Water lobelia is an aquatic growing in sandy or gravelly lake and pond margins (Douglas *et al.*, 1998c). Its habitat is naturally distributed as isolated patches, with limited opportunity for dispersal among patches. Disperses only through suitable habitat (lakes and ponds), yet appears to readily disperse across landscapes, as implied by its widespread distribution. Since the plant is newly discovered in Alaska (1990s) little is known about its abundance, distribution, population and habitat trends. Habitat may be affected by changes in water level or water quality. Water lobelia is secure globally and there is a lack of information about the plant's Alaskan distribution, abundance, population trends, and habitat trends. We do not have a true picture of the plant's rareness or potential imperilment. Because there is insufficient evidence suggesting downward trends in habitat or populations in the Alaska Region, water lobelia is not now recommended for addition to the Regional Sensitive

Species List. Surveys are needed to determine this plant's distribution, abundance and trends in population and habitat.

Pygmy waterlily (*Nymphaea tetragona* Georgi)

The Alaska Natural Heritage Program ranks pygmy waterlily as G5S3S4 (secure globally; and rare or uncommon to apparently secure within Alaska). The plant has a scattered distribution across Eurasia. In North America, it occurs in south central Alaska, with a disjunct population in southern southeast Alaska, rare in Canada with the range including parts of British Columbia and a narrow band extending from Northeastern Alberta to southeastern Manitoba. According to Wiersema (1997) plants in eastern North America formerly considered to be this taxon (note distribution in Hulten (1968)) have been segregated as *Nymphaea leibergii*). Thus, *N. tetragona* does not occur in eastern North America. Found once in northwestern Washington, but believed to be extirpated (Wiersema, 1997). On the Chugach National Forest, it is known from two locations, at a small lake west of Silver Lake and Weed Lake. On the Tongass National Forest, known from one location in the southern Tongass, Princess Bay Lake, located on the east side of Princess Bay (University of Alaska Herbarium). The population and habitat trends for this plant are unknown, and surveys are needed to learn more about its abundance and distribution and population trends. There appears to be stable amounts of suitable habitat. The plant grows in various lakes and pools as well as beaver ponds; changes in beaver populations could affect population and habitat trends. Human activity affecting water levels in ponds and small lakes might also affect habitat quality. Habitat modification is likely to fall within the range of historical conditions, but is potentially impacted by modern stressors. The primary threat to *Nymphaea tetragona* is a change in the water quality of its habitats. The plant is secure globally and there is a lack of information about the plant's Alaskan distribution, abundance, population trends, and habitat trends. We do not have a true picture of the plant's rareness or potential imperilment. Because there is insufficient evidence suggesting downward trends in habitat or populations in the Alaska Region, pygmy waterlily is not now recommended for addition to the Regional Sensitive Species List. Surveys are needed to determine this plant's distribution, abundance and trends in population and habitat.

Water bullrush (*Schoenoplectus subterminalis* (Torrey) Sojak)

The Alaska Natural Heritage Program ranks water bullrush as G4G5S1 (apparently secure but with cause for long-term concern and critically imperiled in Alaska). Water bulrush has a wide distribution outside the Alaska Region. It is distributed across North America (Smith, 2002b), but it is rare in the Northwest (NatureServe, 2008). In Alaska it is known only from National Forest System lands; populations have been documented from Ella Lake, Princess Bay Lake, on Revilla Island; Duke Island; Gravina Island, pond adjacent to Grace Lake, and Big Port Walter on Baranof Island (University of Alaska Herbarium). This distinctive bulrush is emergent in shallow lakes and pools. The habitat is naturally distributed as isolated patches, with limited opportunity for dispersal among patches. Disperses only through suitable habitat (lakes and ponds), yet appears to readily disperse across landscapes, this is implied by its widespread distribution. The plant is rare, with the northwest edge of its range in the Tongass National Forest on the Sitka Ranger District. Current distribution in the Region is broad enough that demographic stochasticity is not likely to lead to rapid local extinction, but, in combination with highly variable environmental factors, could pose a threat.

There appears to be stable amounts of suitable habitat, but human activity affecting water levels in ponds and small lakes might affect habitat quality. Habitat modification is likely to fall within the range of historical conditions, but habitat modification is potentially impacted by modern stressors. Activities such as road building, minerals exploration, off road vehicle use could affect hydrology in bogs (muskeg pools). Water bullrush is secure globally and there is a lack of information about the plant's Alaskan distribution, abundance, population trends, and habitat trends. We do not have a true picture of the plant's rareness or potential imperilment. There is insufficient evidence suggesting downward trends in habitat or populations in the Alaska Region and therefore water bullrush is not now recommended for addition to the Regional Sensitive Species List. Surveys are needed to determine this plant's distribution, abundance and trends in population and habitat.

Oregon stonecrop (*Sedum oregonum* Nutt. subsp. *oreganum*)

The Alaska Natural Heritage Program ranks Oregon stonecrop as G5S1S2 (secure globally and imperiled to imperiled in Alaska). The range extends down the Pacific Coast from near Haines, Alaska (NatureServe, 2008; Alaska Natural Heritage Database, 2008) to northwest California (Hulten, 1968; Calflora, 2008). Alaskan populations are Disjunct from Central British Columbia (Douglas *et al.* 1998c, 2002). The plant is known from five locations in Alaska, all in southeastern. The sites are: the Haines area, Juneau and Hyder (it is not known if these two collections were made on National Forest System lands), Pybus Bay on Admiralty Island, and Baranof Lake, on Baranof Island (this site may be on State land). In spite of numerous surveys in appropriate habitat (mesic to dry rocky cliffs and talus slopes (Douglas *et al.*, 1998c) this distinctive plant has not been found in Alaska since 1963. Further habitat-specific surveys are needed to learn more about this plant's habitat, distribution, abundance, population trends and life history. There is not enough information available to make inferences about habitat trends although road building, bench cutting, and rock pit construction might have reduced habitat in some locations. The species is secure globally and there is a lack of information about its Alaskan distribution, abundance, population trends, and habitat trends. We do not have evidence suggesting downward trends in habitat or populations; therefore, Oregon stonecrop is not now recommended for addition to the Regional Sensitive Species List. Surveys are needed to determine this plant's distribution, abundance and trends in population and habitat.

Other Plants Reviewed

Reviews found that the following plants are more abundant in the Alaska Region than previously thought: *Arctophila fulva*, *Calamagrostis deschampsoides*, *Diapensa lapponica* subsp. *obovata*, *Galium kamtschaticum*, *Listeria convallarioides*, *Lonicera involucrata*, *Mimulus lewisii*, *Monotropa uniflora*, *Poa leptocoma*, *Poa macrantha*, *Potentilla drummondii*, *Primula eximia*, *Ranunculus occidentalis* var. *nelsonii*, *Ranunculus pacificus*, *Ranunculus pallasii*, *Salix hookeriana*, *Saussurea americana*, *Saxifraga occidentalis*, *Saxifraga tolmiei*, *Stachys emersonii*, *Thalictrum occidentale*, and *Tiarella trifoliata* subsp. *lacinata*.

Reviews found that there is insufficient evidence suggesting downward habitat or population trends for the following plants and that more information is needed: *Asplenium trichomanes* subsp. *trichomanes*, *Botrychium pinnatum*, *Dryopteris fragrans*, *Dulichium arundinaceum*, *Isoetes occidentalis* and *Mimulus tilingi*.

Reviews found that the following were possibly introduced and that more information is needed:

Clinopodium douglasii (*Satureja douglasii*) and *Trifolium wormskioldii*

Reviews noted that the following may be overlooked in the field and that more information is needed: *Acomastylis rossii* var. *rossii*, *Ambrosia chamissonis*, *Cardamine angulata*, *Carex gynocrates*, *Carex interior*, *Carex stipata*, *Juncus articulatus*, *Chimaphila umbellata*, *Cratogeomys douglasii* var. *douglasii*, *Danthonia intermedia*, *Danthonia spicata*, *Juncus covillei* subsp. *obtusatus*, *Juniperus horizontalis*, *Lactuca biennis*, *Luzula comosa* var. *comosa*, *Maianthemum stellatum* (*Smilacina stellata*), *Melica subulata*, *Poa macrocalyx*, *Salix prolixa*, *Viola biflora* ssp. *carlottae*, and *Viola sempervirens*.

Reviews found that the following are suspected to occur but not verified in the Alaska Region: *Botrychium alaskense*, *Botrychium lineare*, *Botrychium montanum*, *Enemion savilei*, *Geum schofieldii*, *Sedum divergens* and *Taraxacum carneocoloratum*.

Other Animals Considered but not Recommended for Listing

Based on the Heritage database rankings, Alaska has 25 G1 and G2 animal species. Of these globally critically imperiled and imperiled species, we considered those with range overlap on NFS lands, and those that could be affected by management actions. No G1 species overlap NFS lands. Two G2 species overlap NFS lands and could be affected by management actions: Keen's Myotis and Kittlitz's Murrelet. Because Kittlitz's Murrelet is a USFWS Candidate Species, we have retained it on the Regional Sensitive Species List. We discuss Keen's Myotis below. There are 19 G5T2S2 species on the Heritage zoology list. These are species that are globally secure but have infraspecific status (or sub-species designation) that is considered imperiled at the State level. Four of these species overlap NFS lands in Alaska: Queen Charlotte Goshawk, Prince of Wales Island Flying Squirrel, Montague Island Tundra Vole, and Montague Island Hoary Marmot. We listed information above for Queen Charlotte Goshawk (retain on list) and Montague Island Tundra Vole (remove from list), and discuss the other two species below. There are 5 G5S2 species (Western Screech Owl, Barred Owl, Long-legged Myotis, California Myotis, and Silver-haired Bat). Rarity in Alaska does not necessarily indicate imperilment, and these species fit that category. The owl populations are globally secure but considered rare in Alaska. Since there's no indication of downward population trend or viability concerns for either species (indeed, Barred Owls may be expanding across the northwest and in Alaska), we did not include in this document more information on those species, although we discuss Long-legged Myotis and Silver-haired Bat below. Eight G3 species do not overlap NFS lands in Alaska, and were not considered for inclusion in the list: Steller's Eider, Pribilof Island Shrew, St. Lawrence Island Shrew, Laysan Albatross, Mottled Petrel, Buller's Shearwater, Black-vented Shearwater, and American White Pelican. There are a few other species to discuss because they have received much attention from agencies and public stakeholders, are ranked of concern, or are on other watch lists, and they include Olive-sided Flycatchers, Rusty Blackbirds, Columbia Spotted Frogs, and Western Toads. We also briefly discuss the problem with listing of some island endemic species.

Keen's Myotis (*Myotis keenii*)

Debate still exists as to the taxonomic status of Keen's Myotis, especially the relationship between *M. keenii*, *M. septentrionalis*, and *M. evotis*; *M. keenii* and *M. evotis* were shown to be

genetically similar (Tanya Dewey, unpublished data; on www.natureserve.org), with a distant relationship to *M. septentrionalis*. Molecular phylogeny suggests that *M. keenii* and *M. evotis* are conspecific (www.natureserve.org). This is not resolved.

If considered as a unique species, Keen's Myotis has one of the most limited distributions of any bat species in North America. This species is distributed principally in the coastal forest regions of southeast Alaska to Washington, including Queen Charlotte Islands and the British Columbia Coast. The population in Alaska is unknown; however, it can be considered small and rare, and the range in Alaska can be considered southeast Alaska north to Juneau. Keen's Myotis are associated with cool, wet, coastal montane forests and karst features. Its small size, low wing-loading ratio, and very low intensity echolocation call makes it well adapted for flying and foraging within structurally complex old forest. Keen's Myotis has been found roosting in southwest facing rock crevices, geothermally heated rocks, tree cavities, bark crevices, and buildings. Maternity roosts and summer feeding occur at elevations below 240 m, while known hibernation sites occur over 400 m elevation in caves over 100 m long (migration for this species is presumed elevational, not latitudinal). Trees used as summer roosts (n = 86) in southeast Alaska were primarily large in diameter with structural defects and were either located in old-growth forests or had a high abundance of roost-like trees nearby (Bolund 2007). Summer tree roosts were generally located by landscapes with a high abundance of old-growth and riparian habitat. Summer tree roosts were primarily snags in early to intermediate decay surrounded by a high relative abundance of roost-like trees.

Keen's Myotis is listed as globally and state imperiled (Heritage rank: G2G3; S2) and listed in Canada on British Columbia's Red List (The Red list includes species that have been legally designated as Endangered or Threatened under the Federal Species At Risk Act, have habitat protected under the Wildlife Act, are extirpated, or are candidates for such designation). This is based on estimated number of existing occurrences and the expected viability of these occurrences. Keen's Myotis is considered Lower Risk on the IUCN Red List; this assessment occurred in 1996 and is considered "out of date" (IUCN 05 Dec 2007). Keen's Myotis are long-lived with low reproductive rates. Low densities in conjunction with these life history traits may make populations of forest-dwelling bats in Southeast Alaska vulnerable to decline due to habitat perturbations, climate change, or a combination of factors. Timber harvest of some old-growth sites, and recreation and mineral extraction in karst caves may be a threat to hibernacula. Bolund (2007) suggested a likely importance of large trees in low elevations, based on her capture success in those areas. Availability of large tree old growth has decreased since the 1950s, particularly on the southern Tongass, although the majority of existing old-growth is protected in the 2008 Tongass Forest Plan. Although there is evidence tying reproduction to certain elements of forest structure, there is no clear evidence that the population is declining. Although the population is considered scarce or rare, no population or population trend information is available. Sampling by Bolund (2007) increased the known distribution of this species northward on the Tongass National Forest by 300 mi to the Juneau area. The higher rate of detection by Bolund (2007) does not necessarily indicate she found a higher density than other studies but rather may simply indicate a better approach to sampling. Protections exist in the Tongass Forest Plan to conserve old-growth and defect trees and to protect riparian areas. Keen's Myotis has a small population with a limited north Pacific coast range, is broadly distributed across NFS lands in SE Alaska, and is listed in British Columbia, but no information

exists as to the population viability or trend. Little information exists as to the actual habitat selection by this species, but if it is old-growth, the majority of existing old-growth is protected in the 2008 Tongass Forest Plan. The Heritage G2G3 ranking considered in conjunction with the lack of population data leads to a conundrum as to the true detection, rareness, or imperilment of this species. This species should be reviewed regularly, and further study is recommended to yield taxonomic status and information on population number and trend. Although it is not recommended for sensitive species listing at this time, Keen's Myotis should be re-evaluated when new information becomes available.

Prince of Wales Island Flying Squirrel (*Glaucomys sabrinus griseifrons*)

The Prince of Wales flying squirrel is an island endemic associated with old-growth forests and may be a good indicator of landscape connectivity. Island endemics are particularly vulnerable to risks of extinction because of restricted ranges, small population sizes, minimal genetic variation, and susceptibility to random events. The 2008 Tongass Land Management Plan includes standards and guidelines for reducing extinction risks to island endemics. The density of flying squirrels in the Alexander Archipelago of Southeast is among the highest documented in North America. Smith and Nichols (2003) reported mean densities of 7.9 and 4.2 squirrels per acre (3.2-1.7/ha) on Prince of Wales Island in old-growth hemlock spruce forest and muskeg-bog scrub forest, respectively. Because viability concerns are not apparent, this species is not recommended for listing at this time.

Montague Island Hoary Marmot (*Marmota caligata sheldoni*)

Montague Island Hoary Marmots are known to exist only on Montague Island. The hoary marmot, from Montague Island, south-central Alaska, was classified as a distinct subspecies based on smaller size and skull characteristics relative to other island and mainland populations. The taxonomic validity of the Montague Island marmot is questionable, as conclusions were based on the analysis of no more than eight specimens. With the exception of one relatively recent sight record, Montague Island marmots have not been reported or collected since the early 1900s. Land management actions on Montague and Hinchinbrook Islands are minimal, and FS actions on those islands do not limit vole populations or its habitat. Montague Island is under the Fish and Wildlife Conservation prescription specifically to provide for migratory bird and brown bear habitat; Montague Island is restricted from timber harvest during this planning period. Hinchinbrook Island is under the Backcountry prescription, set aside primarily for dispersed recreation. Currently, the Montague Island marmot is not provided any protective status. It has been assigned the threat category data deficient by the IUCN Red List (06 December 2007) and classified G5 T2 S2 by Alaska Natural Heritage Program because it occurs only on one island, its population size and trends are unknown, and there is a potential threat timber harvest. The IUCN information states that further study is required to determine the distribution and relative abundance of *Marmota caligata sheldoni* on Montague Island. Further research is also required to determine the taxonomic validity of the subspecies and the effects of ongoing development of the island. Since marmot habitat is not limiting, the taxonomic status is in question, and little perturbation of habitat exists, Montague Island Hoary Marmot is not recommended not listing on the Sensitive Species list.

Long-legged Myotis (*Myotis volans*)

This species ranges across most of western North America from central Mexico to western Canada (59.5° N. in Atlin, BC) and southeast Alaska (57.5° degrees N. on Admiralty Island, TNF). Long-legged Myotis uses a variety of habitat types, from forested mountainous areas to desert lowlands, but primarily in riparian areas. They roost in tree hollows and under bark, in crevices and buildings, and hibernate in caves and mine tunnels. They occupy an elevation range from sea level to 3,770 m. Ranked by the Alaska Natural Heritage Program as G5, S2, the species is globally secure, but the lower State score is due to rarity from unknown populations. In general, this species forms nursery colonies of up to several hundred animals. No other evidence indicates that this species is imperiled, and rarity should not necessarily indicate imperilment, thus Long-legged Myotis is not recommended for listing as a sensitive species.

California Myotis (*Myotis californicus*)

Although the species is widespread (G5) across the western US and Mexico, very little is known about this species in the State of Alaska. The State ranking (S2) may be entirely related to rarity as only twelve unique occurrences have been found in Alaska. In Southeast Alaska specimens were collected from Long Island (SW coast of Prince of Wales Island) and from El Capitan Cove on Prince of Wales Island (Parker et al. 1997), and as far north as Juneau (Windfall Lake; Boland 2005). The nearest specimens in British Columbia are from the Queen Charlotte Island at Massett (Parker et al. 1997). California Myotis appears to reach its northern range limit in temperate rainforests of Southeast Alaska, south of 59°N (Parker et al. 1997).

The temperate rainforest of Southeast Alaska contains abundant live trees, snags, and fallen logs in a variety of sizes. Natural roosts of *M. californicus* may be located in snags, under loose bark, or in hollow trees (Parker et al. 1997). The extensive karst formations in Southeast Alaska also provide numerous caves where hibernating bats have been observed and collected (Parker et al. 1997). Although the species has been found across riparian and terrestrial habitats, Boland (2007), in southeast Alaska, captured 62% over creeks; this species was captured in Juneau and on Mitkof and Prince of Wales Islands. This represented a range increase of approximately 300 mi, and the first records of reproductive females and juveniles.

The species is globally secure (G5) and widely distributed. Although little is known about the species, it is rare in Alaska, but recent sampling has greatly increased the distribution and range. Although there's no evidence of population declines or viability concerns, more work in Alaska could provide greater detail. Habitat is adequately protected through the conservation strategy of Alaska Region National Forests, and *M. californicus* is not recommended for sensitive species listing at this time.

Silver-haired Bat (*Lasionycteris noctivagans*)

Widely distributed throughout much of North America from southeast Alaska and southern Canada, south to northern Mexico and the Coastal Plain of the southeastern United States, the Silver-haired bat is ranked G5, S2. Four specimens have been collected as far north as Juneau in Southeast Alaska (Parker et al. 1996). This species is rare in southeast Alaska. No other evidence besides rarity in Alaska indicates that this species is imperiled. Because this species is globally secure and rarity in Alaska does not necessarily indicate imperilment, the silver-haired bat is not recommended for listing as a sensitive species at this time.

Olive-sided Flycatcher (*Contopus cooperi*)

This Neotropical migrant species is distributed widely across northern North America. Although they occur naturally in low densities, this species has shown a widespread and consistent population decline over the last 30 years. Overall, based on Breeding Bird Survey (BBS) data, Olive-sided flycatchers have declined 67% since 1966, and declines accelerated during the 1980-1996 time period. The northern Pacific rainforest is one of 8 BBS physiographic regions with highly significant declines. In Canada, the population declined 79% from 1968 to 2006 and 29% from 1996-2006, resulting in a recent status change in Canada to Threatened (www.cosewic.gc.ca). The Olive-sided Flycatcher is a Species of Management Concern by Office of Migratory Bird Management in 6 of 7 USFWS regions, designated as a Sensitive Species by the Forest Service Rocky Mountain Region, listed as a Maryland State Endangered Species, and a Species of Concern in Oregon and Connecticut. The species is also an Alaska State Species of Special Concern, an Audubon Alaska Watchlist species, a Sensitive Species for U.S. Bureau of Land Management, a Partners in Flight Priority Species for USGS, and is listed as *Near Threatened* on the IUCN Red List, as assessed in 2004 (17 December 2007). The Heritage program ranks this species as globally secure (G4, S3S5) with cause for a long-term concern. There are an estimated 1.2 million olive-sided flycatchers estimated across North America and 300,000 in Alaska, although that is considered a minimum because the BBS data for which this is based does not include much of the boreal forest which has no roads (see summary of BBS data in Sauer et al. 2008). Nora Rojek (USFWS), at the 2008 Annual Meeting of BPIF, summarized the risk as an estimated 1% decline in Alaska and a range-wide population decline of 70% since 1966.

Olive-sided Flycatchers are found across mixed deciduous and coniferous forests, although they are considered an indicator species of the coniferous forest biome throughout North America. They are most often found in stands of open canopy spruce (*Picea glauca* and *P. mariana*), and are usually associated with openings (muskegs, meadows, burns, and harvested areas) and water (streams, beaver ponds, bogs, and lakes). They apparently require an uneven canopy or openings for aerial hawking, and wet areas productive of insect prey (S. Matsuoka, USFWS, personal communication).

Since population declines have occurred throughout the species breeding range, despite different forest management issues on the breeding ground, one hypothesis suggests that populations are affected mostly habitat loss or alteration on the wintering grounds. No work has been conducted to examine this hypothesis. Although deforestation in its Andean winter range is discussed as a reason for the declines, the full set of reasons are unclear. Limiting factors on breeding grounds include habitat loss/alteration, reduced availability of food resources (particularly hymenopterans), and nest predation, and are likely exacerbated by the fact that genus *Contopus* has lowest reproductive rate of all passerine genera in North America. The USFWS do not have sufficient information to support listing the Alaskan breeding population at this time (Nora Rojek, USFWS, at the 2008 BPIF Annual Meeting). An estimated 8% of the habitats of the Olive-sided Flycatcher are located on NFS lands, and these are primarily protected white and black spruce on the edge of wetlands, areas that are adequately protected through the conservation strategy of Alaska Region National Forests. This species is not recommended for listing at this time.

Rusty Blackbird (*Euphagus carolinensis*)

The Rusty Blackbird has suffered one of the steepest declines of any bird species in North America (87–99% decline since the mid 1960s) Greenberg and Droege 1999; Greenberg et al. *in review*). BBS data from Alaska indicate a 5.3% decline ($n = 27$ routes, $P = 0.04$) from 1980–2005. The global population estimate is 2 – 5 million birds, and the state population is estimated as high as 570,000 birds. Rusty Blackbirds are both a National and Alaska Audubon WatchList species. They are considered vulnerable (S3) on their non-breeding range but apparently secure on the breeding range by the Alaska Natural Heritage Program and are considered vulnerable on the IUCN Red List.

The distribution and abundance of Rusty Blackbirds on National Forestlands in Alaska are relatively unknown. Although the Alaska Region National Forests participate in the ALMS and BBS programs, Rusty Blackbirds are poorly sampled by these surveys because the species occurs at low breeding densities throughout its range; they specialize in using wetlands habitats that are not well sampled by these programs; and, they are most detectable prior to incubation (5–20 May), but the surveys occur in June. Recent targeted surveys of this species in Alaska in mid-May indicate that this species may be more common than indicated from previous omnibus point-count surveys conducted in June (S. Matsuoka, USFWS, personal communication).

The Rusty Blackbird breeds principally in low elevation wetlands throughout North America's boreal zone. However, the species also breeds in wetland habitats along the major rivers in the coastal forest region in southeast and southcentral Alaska. It has been recorded along most of the major mainland rivers in southeast Alaska (Johnson et al. 2008), Yakutat (Andres and Browne 2007), the Copper River delta (Kessel and Isleib 1973; P. Meyers, unpublished data), Resurrection Bay (Kessel and Isleib 1973, Van Hermert et al. 2006), and Resurrection Valley (Kessel and Isleib 1973). The USFWS projects that Rusty Blackbirds likely occur in other low elevation, wetlands habitats in the Chugach National Forest (i.e., wetlands along Cook Inlet). Habitats across Alaska remain intact and little disturbance is estimated in the areas of occurrence. Nest site availability does not likely limit the distribution of the species (S. Matsuoka, USFWS, personal communications).

Availability of foraging habitat is likely more limiting for this species. Recently conducted studies in Alaska and Maine indicated that foraging habitat (shorelines and shallow waters with emergent wetland vegetation) are best predictors of the species' occurrence or abundance (S. Matsuoka, unpublished data; L. Powell, unpublished data). These are areas where this species forages on large aquatic insects such as dragonflies. Because they feed principally on high trophic-level insects, lower productivity wetlands (i.e., acidic kettle ponds) are not often used for nesting unless they are in close proximity to more productive wetlands. Thus, disturbances that lead to losses in the size and productivity of wetlands with surface water would likely degrade important habitat for foraging in this species. Nonetheless, most suitable habitat in Alaska studied in 2007-2008 was occupied (S. Matsuoka, USFWS, personal communication; Steve contributed greatly to the material summarized here). Alaska Region conservation strategies protect wetlands. The Rusty Blackbird is not recommended for inclusion in the Sensitive Species list.

Columbia Spotted Frog (*Rana luteiventris*)

The Columbia Spotted Frog was split from its parent taxa in 1997, and this species has a moderately large range in the Pacific Northwest and Rocky Mountains. Although southern, disjunct populations in Utah and Nevada are declining and face major threats, including habitat loss/degradation (especially dewatering), exotic species, and possibly global climate change, the species is still common in British Columbia and the Rocky Mountains. They are primarily associated with permanent water (e.g., outwash ponds, backwater lakes, beaver ponds, muskeg ponds, river channels, and streams). In southeast Alaska, this species is associated with large river systems. Population studies conducted at isolated ponds in the Taku, Stikine and Unuk River corridors estimated local populations ranged from 7 to 594 Columbia spotted frogs/pond and densities ranging from 0.07 to 1.49 spotted frogs/m² of pond habitat.

IUCN listed this species as Least Concern (2004) in view of its wide distribution, presumed large population, and because it is unlikely to be declining fast enough to qualify for listing in a more threatened category. The Alaska Natural Heritage Program ranked this species as G4, S2, but further reading about this ranking implies the low state score is related more to rarity than imperilment. Historically the population of this species in Alaska is rare. It is also currently rare, but recent research on NFS lands in Alaska show that these low numbers are not a viability concern per se (S. Pyare, personal communications). Further, the areas used by this species are generally under prescriptive states unlikely to cause populations reductions. For these reasons, we recommend the Columbia Spotted Frog not be listed as Sensitive.

Western Toad (*Bufo boreas*)

Originally with broad distribution across western North America, many Western Toad populations have declined or been extirpated. Significant losses in the Rocky Mountains resulted in USFWS candidate species listing for that population and Sensitive Species status in the two Forest Service Rocky Mountain Regions (Regions 1 and 2). Western Toads are distributed across British Columbia and Alberta, although they are considered to be of special concern in Canada because numbers of western toads in south coastal B.C. are declining. Western Toads are considered “near threatened” on the IUCN Red List (12 December 2007), as assessed in 2004: “this species is probably in significant decline (but probably at a rate of less than 30% over ten years) because of disease (including chytridiomycosis), thus making the species close to qualifying for Vulnerable.” Western Toads are ranked G4, S3S4 by the Alaska Natural Heritage Program. The causes for population declines are still uncertain, but a combination of threats is suspected. Impacts on Western Toad populations may be due to habitat change, development on or around pond and wetland habitat, pollution or contaminants, and introduced or invasive predators/competitors. Large-scale concerns such as global warming and ozone depletion affect Western Toads by changing temperatures, affecting water levels, and increasing ultraviolet radiation. Fungal disease is known for mass die-offs of western toads in southwest U.S., and is likely a response to the synergistic stress of impacts on the populations. However, *Batrachochytrium dendrobatidis*, which has been found in SE Alaska, is not known to survive freezing temperatures.

Western toads are found in coastal rainforests on the mainland and islands throughout Southeast Alaska, northward along the Gulf Coast to Prince William Sound (PWS). The Chugach and Tongass National Forests manage a significant proportion of this species habitat in Alaska.

Although formerly abundant and widespread, anecdotal reports suggest they are not observed as frequently as before. Concerns about stressors related to climate change and habitat modification may exacerbate the primary cause of decline (fungal infection). There are risks of extinction or extirpation related to chytrid fungus. Occurrence of chytrid fungus appears related to climate change and independent of the management activities on either of the National Forests in Alaska. Although previous impacts were demonstrated on Prince of Wales, due to large-scale habitat change, current conservation strategies on the Tongass provide for habitat protections for breeding sites and toad access to breeding sites. In general habitat change on NFS lands in Alaska is not occurring at a rate that would threaten western toads. Forest Plan Standards & Guidelines should ensure that management activities do not exacerbate breeding habitat impacts (e.g., avoiding perturbations of breeding ponds during timber harvest). Management should not be a threat to Western Toads in Alaska. Based on recent work completed on NFS lands in Alaska, populations in Alaska remain stable, and therefore we recommend not listing western toads as sensitive at this time.

Island Endemic Species

The Alexander Archipelago is an interesting complex derived from periods of intense glaciations followed by demographic isolation. Recent genetic analyses have allowed researchers to start to describe the speciation that has resulted from separation. Island endemics are covered in part through the conservation strategy of the 2008 Tongass Forest Plan. If these species are differentiated, and if viability is in question and populations are declining, then we will consider them for listing. However, some of these are not officially recognized as separate species (Prince of Wales Spruce Grouse, Glacier Bear, Wrangell Island Red-backed Vole), some are debated as species (Pacific Coast Marten), some are treated as game animals like the species they are genetically differentiated from (Admiralty Island Ermine, Queen Charlotte Ermine, Western Arctic Ermine-PWS, Queen Charlotte Marten, Pacific Coast Marten, Alexander Archipelago Wolf, Admiralty Island Beaver), some will not have management actions that influence them (Glacier Bay Marmot, Glacier Bay Water Shrew), and some are simply considered least concern by the IUCN (Revillagigedo Island Red-backed Vole, Meadow Jumping Mouse). The Regional Forester's Sensitive Species list intends to provide additional protections for species on National Forest System lands within the Alaska Region that are experiencing viability concerns or have declining trends that could result in population viability concerns. Until such time as taxonomic certainty occurs and state regulations help clarify harvest regulations, and until such time as we are able to determine whether these species exhibit viability concerns or declining populations, we will be unable to manage these Alexander Archipelago sub-species as Forest Service Sensitive.

Other Animals Reviewed:

In addition to the species already discussed, we looked at the following species which were brought forward through agency or public input: Surfbird, Black Swift, Black Turnstone, Northwestern Salamander, Northern Harrier, Short-eared owl, Wandering Tattler, Blackpoll Warbler, Red-throated Loon, Black Scoter, Lesser Yellowlegs, Wolverine, Gray-crowned Rosy Finch, Yellow-billed Loon, Long-tailed Duck, Dusky Shrew, Marbled Murrelet, Northern Wheatear, Ancient Murrelet, Water shrew, Arctic Tern, Snow Bunting, Hoary Marmot, Pacific Coast Myotis, Rock Sandpiper, Ermine, Violet-green Swallow, Brant, Gray-cheeked Thrush, Wolf, Pacific Coast Black Bear, Brown Bear, Sitka Black-tailed Deer, American Marten, Kenai

Red Fox, Short-tailed Albatross, Red-faced Cormorant, Greater White-fronted Goose, Emperor Goose, Common Eider, King Eider, Black Scoter, Marbled Godwit, Dunlin, Queen Charlotte Marten, Harbor Seal, and Black Bear. We did not include a detailed write-up on these species because they are either globally (G4-G5) or state (S4-S5) secure or they do not occur on NFS lands in Alaska.

Using and Updating the List

Proposed changes to the 2002 Sensitive Species List are summarized in Table 3. The revised (2009) Alaska Region Sensitive Species List takes effect upon approval by the Regional Forester signs approval. The revised list will be distributed to the forests for use in resource planning and management. This full report documenting the changes will be available on the Alaska Region website

Exemptions

For newly designated sensitive species, current or planned Forest Service actions that are well underway at the time an updated sensitive species list goes into effect are exempt from requirements to conduct a biological evaluation for that species. This exemption is intended to enable actions that have been planned using the previous sensitive species list to go forward. Exemption in these instances does not relieve the responsible official from compliance with other statutory and regulatory mandates, including: 1) NEPA requirements to evaluate significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts (40 CFR 1502.9, FSH 1909.15, section 18); and 2) NFMA requirements when developing, maintaining and revising plans to specify guidelines for wildlife and fish and to provide for diversity of plant and animal communities (16 USC 1600), and to maintain viable populations of existing native and desired nonnative vertebrate species (36 CFR 219.19, Sept. 30, 1982). Analyses for newly-designated species should be documented as necessary in the planning record.

How to Suggest Changes to the List

The list is meant to be a living document that changes as needed to reflect current situations and the best information. Forest Supervisors, agencies, and other interested parties may recommend additions or deletions to the list based on the factors used in this assessment. Recommendations and supporting information should be provided to the Regional Director of Wildlife, Fisheries, Ecology, Watershed, & Subsistence Management (WFEWS). Additionally, the Regional Director of WFEWS will issue a letter every year asking the forests to review the list and provide any new information indicating that the status of one or more species should be re-evaluated for possible removal or addition.

A species will be removed from the sensitive species list when sensitive status is superseded by listing or proposed listing under the Endangered Species Act or when it is determined that the species no longer meets the criteria for sensitive species status. A species removed from listing under the Endangered Species Act because recovery criteria have been met will automatically be added to the sensitive species list for at least five years to ensure that its recovery is maintained and monitored.

Table 3. Proposed changes to the current (2002) Alaska Region Sensitive Species List. Y indicates known occurrence and S indicates suspected occurrence on the Chugach National Forest (CNF) and Tongass National Forest (TNF).

Common Name	Scientific Name	Occurrence		Action	Designation
		CNF	TNF		
Plants					
Eschscholtz's little nightmare	<i>Aphragmus eschscholtzianus</i>	Y	S	Retain	FS Sensitive
Moosewort fern	<i>Botrychium tunux</i>	S	Y	Retain	FS Sensitive
Moonwort fern, no common name	<i>Botrychium yaaxudakeit</i>	S	Y	Retain	FS Sensitive
Edible thistle	<i>Cirsium edule</i> var. <i>macounii</i>		Y	Retain	FS Sensitive
Calder's loveage	<i>Ligusticum calderi</i>	S	Y	Retain	FS Sensitive
Pale poppy	<i>Papaver alboroseum</i>	Y	S	Retain	FS Sensitive
Unalaska mist-maid	<i>Romanzoffia unalascensis</i>	Y	Y	Retain	FS Sensitive
Spatulate moonwort	<i>Botrychium spathulatum</i>	S	Y	Add	FS Sensitive
Sessileleaf scurvygrass	<i>Cochlearia sessilifolia</i>	S		Add	FS Sensitive
Spotted lady's slipper	<i>Cypripedium guttatum</i>	Y		Add	FS Sensitive
Mountain lady's slipper	<i>Cypripedium montanum</i>	S	Y	Add	FS Sensitive
Large yellow lady's slipper	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	S	Y	Add	FS Sensitive
Lichen, no common name	<i>Lobaria amplissima</i>		K	Add	FS Sensitive
Alaska rein orchid	<i>Piperia unalascensis</i>	S	Y	Add	FS Sensitive
Lesser round-leaved orchid	<i>Platanthera orbiculata</i>		Y	Add	FS Sensitive
Kruckeberg's swordfern	<i>Polystichum kruckebergii</i>		Y	Add	FS Sensitive
Henderson's checkermallow	<i>Sidalcea hendersonii</i>		Y	Add	FS Sensitive
Dune tansy	<i>Tanacetum bipinnatum</i> subsp. <i>huronense</i>	S	Y	Add	FS Sensitive
Norberg's arnica	<i>Arnica lessingii</i> subsp. <i>norbergii</i>	Y	Y	Remove	
Goose-grass sedge	<i>Carex lenticularis</i> var. <i>dolia</i>	Y	Y	Remove	
Tundra whitlow-grass	<i>Draba kananaskis</i>	Y		Remove	
Davy mannagrass	<i>Glyceria leptostachya</i>		Y	Remove	
Wright's filmy fern	<i>Hymenophyllum wrightii</i>		Y	Remove	
Truncate quillwort	<i>Isoetes xtruncata</i>	Y	Y	Remove	
Queen Charlotte butterweed	<i>Packera subnuda</i> var. <i>moresbiensis</i> was <i>Senecio moresbiensis</i>		Y	Remove	
Bog orchid	<i>Platanthera gracilis</i>		Y	Remove	
Loose-flowered bluegrass	<i>Poa laxiflora</i>	Y	Y	Remove	

Smooth alkali grass	<i>Puccinellia glabra</i>	Y		Remove	
Kamchatka alkali grass	<i>Puccinellia kamtschatica</i>	S	Y	Remove	
Circumpolar starwort	<i>Stellaria ruscifolia</i> subsp. <i>aleutica</i>	S	Y	Remove	
Animals					
Kittlitz's Murrelet	<i>Brachyramphus brevirostris</i>	Y	Y	Retain	FS Sensitive*
Cook Inlet beluga whale	<i>Delphinapterus leucas</i>	Y		Remove	Endangered
Dusky Canada goose	<i>Branta canadensis occidentalis</i>	Y		Retain	FS Sensitive
Queen Charlotte goshawk	<i>Accipiter gentilis laingi</i>		Y	Retain	FS Sensitive
Aleutian Tern	<i>Sterna aleutica</i>	Y	Y	Add	FS Sensitive
Black oystercatcher	<i>Haematopus bachmani</i>	Y	Y	Add	FS Sensitive
Montague Island tundra vole	<i>Microtus oeconomus elymocetes</i>	Y		Remove	
Trumpeter swan	<i>Cygnus buccinator</i>	Y	Y	Remove	
American osprey	<i>Pandion haliaetus carolinensis</i>	Y	Y	Remove	
Peale's peregrine falcon	<i>Falco peregrinus pealei</i>	Y	Y	Remove	
Northern Pike (Pike Lakes)	<i>Esox lucius</i>		Y	Remove	
Chum Salmon (Fish Creek)	<i>Onchorhynchus keta</i>		Y	Remove	
King Salmon (King Salmon River)	<i>Onchorhynchus tshawytscha</i>		Y	Remove	
King Salmon (Wheeler Cr)	<i>Onchorhynchus tshawytscha</i>		Y	Remove	

* Based on our Alaska Region and National Forest System policy, USFWS and NMFS Candidate species are considered and treated as FS Sensitive.

References

- Al-Shehbaz, I. A., M. D. Windham, R. Elven, G. A. Mulligan and D. F. Murray. In Press. *Draba* in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 7: Magnoliophyta: Salicaceae to Brassicaceae*. Oxford University Press, New York.
- Agler B. A., S. J. Kendall, D. B. Irons, and S. P. Klosiewski. 1999. Long-term population change of marine birds in Prince William Sound, Alaska. *Waterbirds*. 22:98–103.
- Andres, B. A., and B. T. Browne. 2007. The birds of Yakutat, Alaska. USDA Forest Service Region 10 Technical Publication 141.
- Barkworth M. E., L. K. Anderson. 2007. *Glyceria*. Pp. 68-88 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 24: Magnoliophyta: Commelinidae (in part): Poaceae, part 1*. Oxford University Press, New York.
- B.C. Conservation Data Centre. 2008. Species Summary: *Papaver alboroseum*. B.C. Ministry of Environment, Victoria, B. C. Available: <http://srmapps.gov.bc.ca/apps/eswp/> (accessed July 17, 2008).

- B.C. Conservation Data Centre. 2008. Species summary *Aquilegia flavescens*. B.C. Minist. Of Environment, Victoria, BC. Available: <http://a100.gov.bc.ca/pub/eswp/> (accessed August 20, 2008).
- Boland, J. 2007. Distribution of Bats in Southeast Alaska and Selection of Day-roosts in Trees by Keen's Myotis on Prince of Wales Island, Southeast Alaska. M.S. Thesis, Oregon State University, Corvallis, OR. 127 pp.
- Calder, J. A. and R.L. Taylor. 1968. *Flora of the Queen Charlotte Islands, Part 1*. Canada Department of Agriculture, Research Branch, Monograph No. 4 Part 1. Ottawa.
- Calflora: Information on California plants for education, research and conservation. [web application]. 2008. Berkeley, California: The Calflora Database [a non-profit organization]. Available: <http://www.calflora.org/>. (Accessed: July 2, 2008).
- Charnon, B. 2007. Conservation assessment for the pale poppy (*Papaver alboroseum*). Unpublished administrative paper. USDA Forest Service, Glacier Ranger District, Chugach National Forest, Girdwood, Alaska.
- Cooley, G. 1892. Plants collected in Alaska and Nanaimo, B. C., July and August, 1891. *Bull. Torr. Club* 19:239-247.
- Davis, J. I., L. L. Consaul. 2007. *Puccinellia* Parl.. Pp 459-477 in *Flora of North America* Editorial Committee, eds. *Flora of North America, north of Mexico, Part 24: Magnoliophyta: Commelinidae (in part): Poaceae, part 1*. Oxford University Press, New York.
- Derr, C.C. 1994. *Lichen communities in Pinus contorta peatlands in southeast Alaska*. In *Lichen Biomonitoring in southeast Alaska and western Oregon*, M.S. Thesis, Oregon State University, Corvallis.
- Dillman, K. 2004. *Epiphytic Lichens of the Forest-Marine Ecotone of Southeastern Alaska*. M.S. Thesis, Arizona State University, Tempe.
- Douglas, G. W., G. B. Straley, and D. Meidinger. 1998a. *Rare Native Vascular Plants of British Columbia*. B.C. Environment, Victoria, British Columbia.
- Douglas, G.W., G.B. Straley, D. Meidinger, & J. Pojar. 1998b. *Illustrated Flora of British Columbia. Vol. 1: Gymnosperms and Dicotyledons (Aceraceae through Asteraceae)*. B.C. Ministry of Environment, Lands & Parks and B.C. Ministry of Forests. Victoria.
- Douglas, G.W., G.B. Straley, D. Meidinger, & J. Pojar. 1998c. *Illustrated Flora of British Columbia. Vol. 2: Dicotyledons (Balsaminaceae through Cuscutaceae)*. B.C. Ministry of Environment, Lands & Parks and B.C. Ministry of Forests. Victoria.
- Douglas, G.W., D. Meidinger and J. Pojar (eds.). 2002. *The Illustrated Flora of British Columbia, Volume 8 - General Summary, Maps and Keys*. B.C. Minist. Sustainable Resour. Manage. and Minist. For., Victoria, B.C.
- Endangered and Threatened Wildlife and Plants; 90-day Finding on a Petition to List *Sidalcea hendersonii* (Henderson's checkermallow) as Threatened or Endangered *Federal Register* 71:32 (16 February 2006) pp. 8252-8257.
- ESA. 1999. Peale's peregrine falcon recovery. See <http://www.fws.gov/endangered/pdfs/FR/f990825.pdf> and http://www.fws.gov/endangered/pdfs/peregrin/Recovery_road.pdf
- Farrar, D. R. 1993. Hymenophyllaceae Link: Filmy fern family. Pp 190-197 in *Flora of North America* Editorial Committee, eds. *Flora of North America, north of Mexico, Part 2: Pteridophytes and gymnosperms*. Oxford University Press, New York.

- Farrar, D. R. 1998. The tropical flora of rockhouse cliff formations in the eastern United States. *Journal of the Torrey Botanical Society*. 125(2) pp. 91-108.
- Farrar, D. R. 2005. *Moonwort (Botrychium) Systematics*. Herbarium, Iowa State University. (Prepared for USDA Forest Service, Alaska Region).
<http://www.public.iastate.edu/~herbarium/botrychium.html> (Accessed multiple times between 2006 and 2008).
- Galbreath, K.E., and J.A. Cook. 2003. Genetic consequences of Pleistocene glaciations for the tundra vole (*Microtus oeconomus*) in Beringia. *Molecular Ecology* 13: 135-148.
- Geiser, L.H., C.C. Derr & K.L. Dillman. 1994. *Air quality monitoring on the Tongass National Forest: methods and baselines using lichens*. U.S.D.A. Forest Service. Alaska Region Admin. Doc. R10-TB-46.
- Geiser, L. H., K.L. Dillman, C.C. Derr, & M.C. Stensvold. 1998. Lichens and allied fungi of southeast Alaska, pp. 201-243, *In* M.G. Glenn, R.C. Harris, R. Dirig & M.S. Cole (eds.), *Lichenographia Thomsoniana: North American Lichenology in Honor of John W. Thomson*. Mycotaxon Ltd., Ithaca.
- Gisler, M. M. and R. M. Love. 2005. Henderson's checkermallow; the natural, botanical, and conservation history of a rare estuarine species. *Kalmiopsis* 12 1-8.
- Greenberg, R., and S. Droege. 1999. On the decline of the Rusty Blackbird and the use of ornithological literature to document long-term population trends. *Conservation Biology* 13:553-559.
- Greenberg, R., D. W. Demarest, S. Droege, D. Evers, P. B. Hamel, T. H. Hodgman, J. Luscier, S. M. Matsuoka, C. Mettke-Hofmann, L. L. Powell, D. Shaw, M. A. Avery, K. A. Hobson, P. J. Blancher, D. K. Niven, S. L. Van Wilgenburg. *In review*. Understanding declines in Rusty Blackbirds. *Studies in Avian Biology*.
- Hulten, E. 1943. *Bot. Not.* p. 270.
- Hulten, E. 1941-1950. *Flora of Alaska and Yukon*, 1-10. Lunds Universitets Arsskrift N.F., Aud. 2. Vols. 37-46. Lund, Sweden.
- Hulten, E. 1968. *Flora of Alaska and Neighboring Territories*. Stanford University Press, Stanford, California.
- Hulten, E. 1973. Supplement to flora of Alaska and neighboring territories: A study in the flora of Alaska and the transberingian connection. *Bot. Not.* 126:459-512.
- Johnson, J. A. B. A. Andres, and J. A. Bissonette. 2008. Birds of the major mainland rivers of southeast Alaska. Gen. Tech. Rep. PNW-GTR-739. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 88 p.
- Keil, D. J. 2006. *Cirsium* Pp. 95-164 *in* Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Volume 19: Magnoliophyta: Asteridae, part 6: Asteraceae, part 1*. Oxford University Press, New York.
- Kessel, B., and M. E. Isleib. 1973. Birds of the North Gulf Coast-Prince William Sound Region, Alaska. *Biological Papers of the University of Alaska* 14.
- Kiger, R. W., D. F. Murray. 1997. *Papaver*. Pp 323-333 *in* Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 3: Magnoliophyta: Magnoliidae and Hamamelidae*. Oxford University Press, New York.
- Klinkenberg, Brian. (Editor) 2007. E-Flora BC: Electronic Atlas of the Plants of British Columbia [www.eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. [Accessed: 7/2/2008]
- Lipkin, R. and D. Murray. 1997. *Alaska Rare Plant Field Guide*, U.S. Dept. Interior, Washington, D.C.

- Love, R. 2004. *Sidalcea* Summer: Our Petition Has Been Sent. *Bulletin of the Native Plant Society of Oregon*. 37(1): 1. Available: http://www.npsoregon.org/arch/bull/04/NPSO_0401.PDF. Accessed: 2005.
- Luer, Carlyle. 1975. *The Native Orchids of the United States and Canada Excluding Florida*. New York Botanical Garden, New York.
- Marshall, M., and F. R. Ganders. 2001. Sex-based seed predation and the maintenance of females in a gynodioecious plant. *American Journal of Botany* 88(8): 1437-1443.
- Mathias, M. E., L. Constance. 1959. New North American Umbelliferae -- III. *Bull. Torr. Bot. Club* 86:374-382.
- Muasya A. M. and D. A. Simpson. 2002. A Monograph of the Genus *Isolepis* R. Br. (Cyperaceae) *Kew Bulletin*, Vol. 57, No. 2, pp. 257-362
- NatureServe. 2008. NatureServe Explorer: An online encyclopedia of life [Plants/Animals]. Version 7.0. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: July 16, 2008).
- NatureServe. 2008. *Cypripedium parviflorum* NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.0. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: September 12, 2008).
- NOAA 2008. 73 FR 62919, October 22, 2008. Final determination to list a Distinct Population Segment of the beluga whale, *Delphinapterus leucas*, found in Cook Inlet, Alaska, as endangered under the Endangered Species Act of 1973, as amended. See also <http://alaskafisheries.noaa.gov/frules/73fr62919.pdf#esa> (accessed November 18, 2008).
- Parker, D.I., B.E. Lawhead, and J.A. Cook. 1997. Distributional Limits of Bats in Alaska Arctic. 50(3):256-265.
- Parker, D.I., J.A. Cook, and S.W. Lewis. 1996. Effects of timber harvest on bat activity in southeastern Alaska's temperate rainforest. Pp. 277-292, in, *Bats and Forests Symposium*, October 19-21, 1995, Victoria, British Columbia, Canada (eds. R.M.R. Barclay and R.M. Brigham), Research Branch, B.C. Ministry of Forests, Victoria, B.C., Working Paper 23/1996, 292pp.
- Peck, J. H., C. J. Peck, and D. R. Farrar. 1990. Influences of life history attributes on formation of local and distant fern populations. *American Fern Journal* 80:126-142.
- Rollins, R. C. 1993. *The Cruciferae of Continental North America, Systematics of the Mustard Family from the Arctic to Panama*. Stanford University Press, Stanford, California.
- Rollins, R. C. 1941. Some new or noteworthy North American crucifers. *Contr. Dudley Herb.* 3:174-184.
- Sauer, J.R., J.E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966-2007. Version 5.15.2008. Accessed at <http://www.mbr-pwrc.usgs.gov/bbs/bbs.html>.
- Sheviak, C. J. 2002. *Cypripedium* L. Pp 499-507 in *Flora of North America* Editorial Committee, eds. *Flora of North America, north of Mexico, Part 26: Magnoliophyta: Liliidae: Liliales and Orchidales*. Oxford University Press, New York.
- Sheviak, C. J. 2002. *Platanthera* Richard. Pp 551-571 in *Flora of North America* Editorial Committee, eds. *Flora of North America, north of Mexico, Part 26: Magnoliophyta: Liliidae: Liliales and Orchidales*. Oxford University Press, New York.
- Smith, S. G. 2002a. *Isolepis* Pp. 137- 149 in *Flora of North America* Editorial Committee, eds. *Flora of North America, north of Mexico, Part 23: Magnoliophyta: Commelinidae (in part): Cyperaceae*. Oxford University Press, New York.

- Smith, S. G. 2002b. *Schoenoplectus* Pp. 44- 60 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 23: Magnoliophyta: Commelinidae (in part): Cyperaceae*. Oxford University Press, New York.
- Smith, W.P., and J.V. Nichols. 2003. Demography of the Prince of Wales flying squirrel, an endemic of southeastern Alaska temperate rain forest. *Journal of Mammalogy* 84: 1044-1058.
- Standley, L.A. J. Cayouette and L. Bruederle. 2002. *Carex* L. sect. *Phacocystis* Dumortier. Pp. 379- 401 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 23: Magnoliophyta: Commelinidae (in part): Cyperaceae*. Oxford University Press, New York.
- Stensvold, M. C. and E. Anderson. 2005. *Henderson's checkerbloom (Sidalcea hendersonii) Newly Discovered in Alaska*. Unpublished report for the USDA Forest Service, Alaska Region.
- Stensvold, M. C. and D. R. Farrar. 2008. *Moonwort Fern Surveys in the Wrangell-St. Elias Mountains and Genetic Analysis with an Emphasis on Botrychium tunux & Botrychium lineare*. Unpublished report for the US Fish and Wildlife Service 1011 East Tudor Road Anchorage, Alaska 99503-6619.
- Taylor, W. C., N.T. Luebke, D.M. Britton, R. J. Hickey and D. F. Brunton. 1993. Isoeataceae Reichenbach: quillwort family. Pp. 64-75 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 2: Pteridophytes and gymnosperms*. Oxford University Press, New York.
- Trock, D. K. 2006. *Packera*. Pp. 570-602 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 204: Magnoliophyta: Asteridae (in part): Asteraceae, part 2*. Oxford University Press, New York.
- University of Alaska Museum of the North. 2008. *Arctos database* Fairbanks, Alaska 99901. Available: <http://arctos.database.museum/SpecimenResults.cfm> (accessed 8 July 2008).
- USDA, NRCS. 2008. *The PLANTS Database* (<http://plants.usda.gov>, 8 July 2008). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- Wagner, D.H. 1993. *Polystichium*. Pp. 290-299 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 2: Pteridophytes and gymnosperms*. Oxford University Press, New York.
- Wallace, L. E. & M. A. Case. 2002 contrasting allozyme diversity between northern and southern populations of *Cypripedium parviflorum* (Orchidaceae): implications for Pleistocene refugia and taxonomic boundaries. *Systematic Botany* 25(2) 281-296.
- Warwick, S. I., I. A. Al-Shehbaz, and C. A. Sauder. 2006. Phylogenetic position of *Arabis arenicola* and generic limits of *Aphragmus* and *Eutrema* (Brassicaceae) based on sequences of nuclear ribosomal DNA. *Can. J. Bot.* 84: 269–281.
- Watson, L. E. 2006. *Tanacetum*. Pp. 489-491 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 19: Magnoliophyta: Asteridae (in part): Asteraceae, part 1*. Oxford University Press, New York.
- Welsh, S.L. 1974. *Anderson's Flora of Alaska and adjacent parts of Canada*. Brigham Young University Press, Provo, Utah.
- Whittemore, Alan T. 1997. *Ranunculus*. Pp. 88-135 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 3: Magnoliophyta: Magnoliidae and Hamamelidae*. Oxford University Press, New York.

- Wiersema, J. H. 1997. *Nymphaea*. Pp. 71-77 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 3: Magnoliophyta: Magnoliidae and Hamamelidae*. Oxford University Press, New York.
- Van Hemert, C., C. M. Handel, M. N. Cady, and J. Terenzi. 2006. Summer inventory of landbirds in Kenai Fjords National Park. Unpublished final report for National Park Service. NPS/AKRSWAN/NRTR-2006/04. USGS Alaska Science Center, Anchorage, Alaska.
- Wolf, S. J. 2006. *Arnica*. Pp. 366-377 in Flora of North America Editorial Committee, eds. *Flora of North America, north of Mexico, Part 21: Magnoliophyta: Asteridae (in part): Asteraceae, part 3*. Oxford University Press, New York.