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7	APPENDIX L
8	ECOREGION NARRATIVES
9	

1 1 ECOREGIONS ALONG THE NORTHERN BORDER

- 2 An ecoregion is a large area encompassing similar climate and ecosystem patterns. The
- 3 similarities include types of plant and animal species, natural habitat types, climate, soils, and the
- 4 general topography of the landscape. Dr. Robert G. Bailey, a geographer for the U.S. Forest
- 5 Service (USFS), developed one of the most accepted systems to describe and map ecoregions
- 6 (Bailey, 1995). Federal agencies and non-governmental organizations, including the USFS, U.S.
- 7 Geological Survey (USGS), U.S. Fish and Wildlife Service (USFWS), The Sierra Club, and The
- 8 Nature Conservancy, use this ecoregion-based land classification system. The ecoregion
- 9 conceptual framework is used for projects such as biodiversity analysis, landscape planning, and
- 10 regional forest planning.
- 11 Twelve ecoregions make up the Northern Border (Figure 1.1-1), ranging from the Pacific
- 12 Lowland Forests of Washington to the Laurentian Mixed Forests in Maine. Map resources for
- 13 all the ecoregion figures in this Programmatic Environmental Impact Statement (PEIS) were
- 14 developed using U.S. Census, USGS, and Economic and Social Research Institute (ESRI) data.
- 15 Each ecoregion has a unique set of biological, climatic, and topographic characteristics, along
- 16 with unique challenges and opportunities for CBP. Each ecoregion description presented here
- 17 begins with a general overview of those unique characteristics followed by:
- Blocks of Regionally Significant Habitat;
- 19 Sensitive Habitats;
- Threatened and Endangered Species;
- Wildlife;
- Vegetative Habitat;
- Wetlands and Waterways; and
- Aquatic Resources.
- 25



Figure L-1. Ecoregions along the Northern Border

1.1CASCADE MIXED FOREST-CONIFEROUS FOREST-ALPINE MEADOW ECOREGION (M242)

- 3 The Cascade Mixed Forest Ecoregion encompasses a rugged mountain region with a narrow
- 4 coastal plain (Figure 1.1-2). Mountains along the coast have elevations of up to 5,000 feet
- 5 (1,500 meters) above sea level. The interior Cascade Range Mountains average 8,000 to 9,000
- 6 feet (2,400 to 2,700 meters), with a series of volcanoes of greater elevation (Bailey, 1995). Mt.
- 7 Rainier, an immense volcano, towers more than 14,000 feet (4,300 meters) high. Some portions
- 8 of this ecoregion have been extensively glaciated.
- 9 Washington is the only state within the 100-mile boundary in this PEIS.



Figure L-2. Ecoregions in the West of Rockies Region

- 1 Modified by its proximity to the Pacific Ocean, this ecoregion has milder temperatures that
- 2 average 35 to 50 degrees Fahrenheit (2 to 10 degrees Celsius) throughout the year. Precipitation
- 3 comes mostly as rain, with totals ranging from 30 to 150 inches (77 centimeters to 380
- 4 centimeters) per year, and the majority falling during winter. Further south, winter precipitation
- 5 is primarily rain with little or no snow. Coastal fog provides some summer moisture (Bailey,
- 6 1995). In the ecoregion's north, summer conditions remain dry for a shorter period and the area
- 7 experiences more snowfall in winter. On the eastern side of the Cascades, conditions are drier
- 8 than the western slopes; as little as 20 inches (51 centimeters) of precipitation falls on eastern
- 9 slopes each year.
- 10 A high proportion of the land within the 100-mile Northern Border region in Washington is
- 11 either publically owned or part of a Native American reservation. Much of the public land is
- 12 either national forest (U.S. Forest Service) or National Park Service (NPS) land (North Cascades
- 13 National Park), with smaller parcels managed by the U.S. Department of Defense and U.S.
- 14 Bureau of Land Management (BLM).
- 15 Marine and coastal waters form the northwestern portion of the U.S.-Canada border. The
- 16 exposed coast along the Pacific stretches south from Cape Flattery to the mouth of the Columbia
- 17 River. Much of this area has relatively shallow waters over the continental shelf; shorelines vary
- 18 from sand beaches to heavily forested rocky shores. Much of this outer rocky shore is
- 19 characterized by thick kelp beds, which constitute key habitat for many marine organisms,
- 20 including sea otters (*Enhydra lutris*) and abalone (*Haliotis* spp.).

21 1.1.1 REMAINING BLOCKS OF REGIONALLY SIGNIFICANT HABITAT

- 22 The blocks of regionally significant habitat below are relatively undeveloped and intact habitat
- that are protected as wilderness, state parks, and state and national forests. Regionally
- significant or intact habitat refers to areas of largely unfragmented habitat with few alterations or
- 25 disturbances, such as roads or other development. Most areas listed are protected by law
- 26 (wilderness areas, national parks) and often cross state and country boundaries, while others may
- 27 occupy large expanses of private land.
- 28 Selected regionally significant blocks that represent this region include:
- Mount Rainier National Park;
- 30 Olympic National Park;
- North Cascades National Park;
- Mount Baker Wilderness;
- Glacier Peak Wilderness;
- Pasayten Wilderness;
- Lake Chelan-Sawtooth Wilderness;
- Stephen Mather Wilderness; and
- Salmo-Priest Wilderness.
- 38

Mount Rainier National Park



2 3

4

5 1.1.2 SENSITIVE HABITATS

6 The Washington Department of Fish and Wildlife (WA DFW) designates certain areas as

7 "priority habitats," which are habitat types with unique or significant value to many species.

8 These habitats typically have a comparatively high fish and wildlife density or species diversity;

9 contain important breeding habitat, seasonal ranges, or movement corridors; have limited

10 availability or high vulnerability to habitat alteration; or provide habitat for unique species (WA

11 DFW, 2008). Priority habitat designation can inform regulatory decisions (e.g., planning

12 requirements under the Growth Management Act and Shoreline Management Act), but does not

13 carry regulatory significance on its own. For each of these habitat types, certain features are

14 considered priority due to their wildlife value.

15 Sensitive areas within this ecoregion include the following:

• Aspen stands–Pure or mixed stands of aspen greater than 0.4 hectare (1 acre);

Aspen Stand



2

3

4

5

6 7

- Biodiversity areas and corridors– Biologically diverse areas, or cities or urban growth areas with habitat valuable to fish or wildlife, mostly with native vegetation; corridors are zones of relatively undisturbed and unbroken tracks of vegetation that connect fish and wildlife habitat conservation areas, priority habitats, or areas identified as biologically diverse or valuable within city or urban growth areas;
- Eastside steppe–Non-forested vegetation dominated by forbs, perennial bunchgrasses, or
 a combination;
- Herbaceous balds–Variable-size patches of grasses and forbs on shallow soils over
 bedrock, commonly fringed by forest or woodland;
- Inland dunes–Sand dunes away from coastal areas;
- Juniper savannah–Juniper woodlands with a grassy understory;
- Old growth/mature forest–Forests of great age exhibiting specialized structural
 characteristics and rich biodiversity;
- Oregon white oak woodlands–Stands of oak or oak/conifer associations in which canopy coverage of the oak component exceeds 25 percent;
- Riparian–Areas adjacent to flowing or standing freshwater aquatic systems;
- Shrub-steppe–Non-forested vegetation consisting of one or more layers of perennial bunchgrasses and a conspicuous, but discontinuous, layer of shrubs;
- Westside prairie–Herbaceous, non-forested plant communities; either dry or wet prairie;
- Freshwater wetlands and fresh deepwater–lands transitional between terrestrial and
 aquatic systems where the water table is usually at or near the surface or shallow water
 covers the land; deepwater habitats are permanently flooded lands below the deepwater
 boundary of wetlands;
- Coastal nearshore–Relatively undisturbed, nearshore estuaries of Washington's outer coast; and
- Open coast nearshore–Relatively undisturbed, non-estuarine nearshore areas of
 Washington's outer coast

1 1.1.3 THREATENED AND ENDANGERED SPECIES

- 2 Appendix F3 lists the Federal and state-listed threatened and endangered species.
- 3 Each region of the USFS designates certain fish and wildlife species as sensitive. Sensitive
- 4 species on USFS lands are species for which population viability has become a concern due to a
- 5 significant downward trend in population or habitat capacity. These species require special
- 6 management to maintain and improve their status on national forests and grasslands and prevent
- 7 listing under the Endangered Species Act. The BLM also has a designation for sensitive species
- 8 on their lands.
- 9 A prime example of a marine-endangered species is the leatherback turtle (*Dermochelys*
- 10 *coriacea*), the only sea turtle capable of surviving in cold waters. It ranges more widely than
- 11 other sea turtles, including in the Pacific Ocean north to the coasts of Washington and British
- 12 Columbia. Leatherbacks live almost all of their lives in the marine environment, although
- 13 females must return to shore to lay eggs. In the United States, the National Oceanic and
- 14 Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) has
- 15 jurisdiction over sea turtles at sea; the USFWS has jurisdiction of them on land (nesting
- 16 beaches). Leatherbacks are listed as endangered in both the United States and Canada.

17

Leatherback turtle hatchlings



18 19

(Coral Reef Alliance)

20 The grizzly bear, a prominent, federally listed species in this ecoregion, requires contiguous,

21 relatively undisturbed, mountainous habitat with significant vegetative and topographic diversity.

22 Its habitat needs include valley bottoms, wetland and riparian areas, rugged montane areas, and

- 23 alpine meadows. The USFWS identified recovery zones needed for revitalization of the grizzly
- bear population (USDOI, 2009). In Washington, there are two grizzly bear recovery zones: the
- 25 northern Cascades zone, and the Selkirk zone in northeast Pend Oreille County. The northern
- Cascades zone currently has a remnant population of fewer than 20 bears (USDOI, 2010a), but is capable of supporting a larger population.
- Also in this region are the federally listed spotted owl (*Strix occidentalis*) and the marbled
- 29 murrelet (Brachyramphus marmoratus); both are species that depend on old-growth conifer
- 30 forest habitat for breeding.

1 **1.1.4 WILDLIFE**

- 2 The Cascade Mixed Forests of this ecoregion are home to many wildlife species, including game 3 (legally burted) species, such as deer and ally and non-game (legally protected but not
- 3 (legally hunted) species, such as deer and elk, and non-game (legally protected, but not
- 4 endangered or threatened) species, including birds and mammals, reptiles and amphibians, and
- 5 invertebrates. Many bird species migrate into or out of this province in spring and fall each year, 6 although avian migration here is not as temporally or geographically concentrated as many areas
- although avian migration here is not as temporally or geographically concentrated as many areas
 of the eastern United States. Several mammals and many permanent resident bird species remain
- 8 in the province throughout the year.

(NPS)

9

Mountain lion



- 10 11
- 12 In the dominant coniferous forest habitats within the Cascade Province, elk (Cervus candensis),
- 13 mountain lion (Puma concolor), Townsend's warbler (Dendroica townsendi), and varied thrush
- 14 (*Ixoreus naevius*) are a few of the sensitive species typical of this ecoregion. Steller's jay
- 15 (*Cyanocitta stelleri*), chestnut-backed chickadee (*Poecile refescen*), and black-backed
- 16 woodpecker (*Picoides arcticus*) are examples of permanent resident (non-migratory) bird species
- 17 in the conifer forests . The black bear (Ursus americanus), boreal toad (Anaxyrus boreas), rough-
- 18 skinned newt (*Taricha granulosa*), and brown elfin butterfly (*Callophrys augustinus*) offer
- 19 additional examples of wildlife species living in various habitats of this ecoregion.

20 1.1.5 VEGETATIVE HABITAT

- 21 The Cascade Province is mountainous, with elevations varying from sea level to above 5,000 feet
- 22 (1,500 m). Douglas-fir (*Pseudotsuga_menziesii*) is the most abundant species at low elevations
- 23 in the region. At the lowest elevations, dense conifer forests of Douglas-fir, western red cedar
- 24 (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), grand fir (*Abies grandis*), silver fir (*A*.
- 25 *amabilis*), Sitka spruce (*Picea sitchensis*), and Alaska-cedar (*Chamaecyparis nootkatensis*) grow.
- 26 Numerous shrub species thrive in this forest and at its margins. In many places, this vegetation
- 27 is practically impenetrable.
- 28 A dry forest of ponderosa pine (*Pinus ponderosa*) grows along the dry eastern slopes of the
- 29 Cascades typically open forest mixed with grass and shrubs. The high, snowcapped
- 30 mountains of the Cascades have a well-marked subalpine forest belt that reaches into British
- 31 Columbia. Important trees are mountain hemlock (*T. mertensiana*), subalpine fir (*A. lasiocarpa*),
- 32 white-bark pine (*P. albicaulis*), and Alaska cedar or Nootka cypress (*Callitropsis nootkatensis*).

- 1 To the north, the subalpine forest becomes fragmented or disappears completely. Riparian
- 2 forests in the Pacific Northwest provide an exception to the general rule that conifers dominate
- 3 the region. Broadleaf species, such as black cottonwood (*Populus trichocarpa*) and red alder
- 4 (*Alnus rubra*), grow along the many rivers and creeks.
- 5 Examples of invasive plants in this ecoregion include the following species, which have already
- 6 caused or are expected to cause problems: wild chervil (Anthriscus sylvestris), absinth
- 7 wormwood (Artemisia absinthium), kochia (Kochia scoparia), plumeless thistle (Carduus
- 8 *acanthoides*), nodding thistle (*C. nutans*), slenderflower thistle (*C. pycnocephalus*), and
- 9 longspine sandbur (Cenchrus longispinus) (USDA, 2010). Non-native invasive plant species can
- 10 negatively affect natural areas, agriculture, and horticulture (Simberloff, 1996).

11 **1.1.6 WETLANDS AND WATERWAYS**

12

Rocky coastline typical of Washington



- (National Geographic)
- 15 Wetlands in the Cascade Mixed Forest–Coniferous Forest–Alpine Meadow Province portion of
- 16 the project area include approximately: 129,535 acres of forested or scrub-shrub wetland; 51,500
- 17 acres of emergent wetlands; 12,595 acres of ponds; 133,635 acres of lakes; and 45,275 acres of
- 18 riverine habitats. Since this province extends around Puget Sound to the Pacific Ocean, it also
- 19 includes 340 acres of marine and estuarine deepwater habitats and 6,025 acres of marine and
- 20 estuarine wetlands (USDOI, 2010b).
- 21 In the study area, marine habitats are associated with the Strait of Juan de Fuca, Puget Sound
- 22 (most of which lies within the Pacific Lowland Mixed Forest Province described in section
- 23 3.3.1.12), Haro Strait, Boundary Pass, the Strait of Georgia, and the Pacific Ocean. Overall,
- 24 Washington State has 127 Marine Protected Areas that cover 6 million feet of coastline (Van
- 25 Cleve et al., 2009).
- 26 The Skagit River, which crosses this province and the Pacific Lowland Mixed Forest Province, is
- 27 a designated Wild and Scenic River. Lakes and reservoirs protected under the Washington
- 28 Shoreline Management Act in this province include Rock Island Pool, Wenatchee Lake, Chelan
- 29 Lake, Wells Reservoir, Ozette Reservoir, and Baker Lake.

1 1.1.7 AQUATIC RESOURCES

- 2 The marine and coastal areas of northwest Washington form a complex marine border with the
- 3 Canadian Province of British Columbia. The 100-mile area south from the Canadian border
- 4 includes (from west to east) the outer coast of the Olympic Peninsula and the Pacific Ocean, and
- 5 the Strait of Juan de Fuca between the Olympic Peninsula and Victoria Island. In general, 12
- 6 nautical miles off the coast is considered territorial waters of the United States; however, since
- 7 the marine waters between Washington and British Columbia never surpass 24 nautical miles
- 8 wide, the border is designated as the middle of the water body (i.e., less than 12 nautical miles
- 9 from the shore). Washington State ownership extends three miles from its coastline.
- 10 The outer exposed coast along the Pacific stretches 150 miles south from Cape Flattery to the
- 11 mouth of the Columbia River. Much of this area has relatively shallow waters over the
- 12 continental shelf and shorelines that range from sand beaches to heavily forested rocky shores.
- 13 Many areas are bordered by steep cliffs with isolated sea stacks and rugged headlands. Much of
- 14 this outer rocky shore has thick kelp beds key habitat for many marine organisms, including
- 15 sea otters and abalone.
- 16 Rocky intertidal shorelines are shallow areas (by definition, exposed at some time between high
- 17 and low tides) along rocky coasts that are usually steep or where wave action is so strong that
- 18 sediment cannot accumulate. They provide important habitat for many marine organisms, such
- 19 as chitons (class–Polyplacophora), sponges (phylum–Porifera), limpet (saltwater/freshwater
- 20 snails), marine worms, anemones (order-Actiniaria), octopus (order-Octopoda), crabs
- 21 (infraorder–Brachyura), and many rockfish (Sebastes spp.).
- 22 Sand beaches also occur along the outer Pacific Coast of Washington. Fewer animals live on
- sand and gravel beaches than on rocky shores, due to the lack of solid substrate for attachment.
- 24 Several fish important prey for salmon lay eggs on high spring tides on sand beaches in
- 25 Washington, including sand lance (family–Ammodytidae), smelt (family–Osmeridae), and
- 26 herring (*Clupea harengus*).

27





(The Marine Mammal Center)

- 1 In Washington, straits and estuaries have abundant eelgrass (Zostera spp.) communities that are
- 2 highly productive for marine life and many birds. The Pacific harbor seal (*Phoca vitulina*)
- 3 largely relies on estuaries and frequently hauls out in these areas.
- 4 The rivers of this ecoregion province are generally excellent freshwater fish habitat high in
- 5 dissolved oxygen and largely unpolluted and provide ideal conditions for the Pacific
- 6 Northwest's salmon and trout species. Fisheries and aquatic resources are of great importance in
- 7 this ecoregion and the neighboring Pacific Lowland Ecoregion. Stream and river fishing for
- 8 trout and salmon remain quite important in western Washington. From 2003 to 2004,
- 9 Washington residents purchased 318,079 freshwater fishing licenses. State anglers catch large
- 10 numbers of salmon and several trout species annually (State of Washington, 2003). Agricultural
- 11 production that allows animals access to streams and rivers can cause streambank erosion and
- result in nutrient loading, which has a harmful effect on water quality and the habitat of salmon
- 13 and trout (Knight, 2009).
- 14 Aquatic invasive species are a concern within estuaries, wetlands, and rivers. Many species have
- 15 accidentally been introduced through release of ship ballast water. Aquatic invasive plants of
- 16 concern include caulerpa seaweed (*Caulerpa taxifolia*), Eurasian watermilfoil (*Myriophyllum*
- 17 *spicatum*), hydrilla (*Hydrilla verticillata*), parrotfeather (*M. aquaticum*), common reed
- 18 (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), and water chestnut (*Trapa*
- 19 natans). Aquatic invasive animals include mitten crab (Eriocheir sinensis), New Zealand mud
- 20 snail (*Potamopyrgus antipodarum*), northern snakehead (*Channa argus*), nutria (*Myocastor*
- 21 coypus), rusty crayfish (Orconectes rusticus), zebra mussel (Dreissena polymorpha), and quagga
- 22 mussel (Dreissena rostriformis bugensis). Viral hemorrhagic septicemia (VHS) is a deadly fish
- 23 virus of great concern in this region.

24 1.2PACIFIC LOWLAND MIXED FOREST ECOREGION (242)

- 25 The Pacific Lowland Mixed Forest Ecoregion sits in a narrow north-south longitudinal
- 26 depression between Washington's Coast Range and Cascade Mountains (Figure 1.1-2).
- 27 Elevations in this narrow band vary from sea level to approximately 1,500 feet (460 meters).
- 28 The valley adjacent to the Puget Sound is a tableland covered by older glacial and lake deposits.
- 29 The ecoregion incorporates some ranges of isolated hills and low mountains.
- This ecoregion province includes part of Washington State within 100 miles of the NorthernBorder.
- 32 Lying near the Pacific Ocean, the Pacific Lowland Mixed Forest Province has a climate that is
- 33 mild and generally without dramatic extremes throughout the year. Annual temperatures range
- between 48 and 55 degrees Fahrenheit (9 to 13 degrees Celsius). Rainfall is highest in winter;
- 35 summer is dry by comparison. Mean annual rainfall varies from 15 to 60 inches (38 to 153
- 36 centimeters), but mostly ranges between 30 to 45 inches (76 to 115 centimeters). A mild rain-
- 37 shadow effect caused by the coastal mountains produces the drier climatic conditions. Fog
- 38 brings some moisture to the forests in this ecoregion during the summer dry period (Bailey,
- 39 1995).
- 40 The region's principal trees are western red cedar (*Thuja plicata*), western hemlock (*Tsuga*
- 41 *heterophylla*), and Douglas-fir (*Pseudotsuga menziesii*). The coniferous forest is less dense in

- 1 interior valleys than along the coast and often contains deciduous trees, such as bigleaf maple
- 2 (Acer macrophyllum), Oregon ash (Fraxinus latifolia), and black cottonwood (Populus
- 3 *trichocarpa*). The prairies support open stands of oak or are broken by groves of Douglas-fir and
- 4 other trees; principal indicator species are Oregon white oak (*Quercus garryana*) and Pacific
- 5 madrone (Arbutus menziesii). Poorly drained sites with swamp or bog communities are also
- 6 abundant.
- 7 Estuaries characterize much of this ecoregion in Washington State, including Puget Sound,
- 8 Nisqually Delta, and Grays Harbor. Puget Sound is a large fjord formed by the retreat of
- 9 glaciers, and contains many fingers. Estuaries feature a mixture of salt and fresh waters; they are
- 10 extremely productive biologically and important to marine life. The state's estuaries contain
- 11 deltas, mudflats, and salt marshes all coastal wetlands.
- 12

Shorebirds on a mudflat



13 14

(USFWS)

15 1.2.1 REMAINING BLOCKS OF REGIONALLY SIGNIFICANT HABITAT

No major extensive or sizable blocks of regionally significant habitat remain in this heavilyurbanized part of Washington State.

18 **1.2.2 SENSITIVE HABITATS**

19 Within the 100-mile zone adjacent to the U.S.-Canada border are several ecological communities

- 20 described as sensitive habitats prone to disturbance. The Washington Department of Fish and
- 21 Wildlife (WDFW) has designated certain habitats as "priority habitats" a type of habitat with
- 22 unique or significant value to many species. These habitats typically have a comparatively high
- 23 fish and wildlife density and/or species diversity; contain important breeding habitat, seasonal
- 24 ranges, or movement corridors; have limited availability or high vulnerability to habitat
- alteration; or provide habitat for unique species (WA DFW, 2008). Priority habitat designation
- 26 may be used to inform regulatory decisions (e.g., planning requirements under the Growth
- 27 Management Act and Shoreline Management Act), but does not carry regulatory significance on
- 28 its own. Within each of these habitat types, certain features are also considered priority due to
- their wildlife value. Priority habitat features include caves, cliffs, snags and logs, and talus (WA
 DEW 2008)
- 30 DFW, 2008).

- North Pacific maritime mesic-wet Douglas-fir/western hemlock forest A component of
 the lowland and lower-elevation montane forests of western Washington; not typical of
 drier sites; Douglas-fir and western hemlock especially common here;
- North Pacific lowland riparian forest and shrubland Most abundant throughout low elevations west of the Cascades; includes red alder and bigleaf maple as dominant species;
- Oregon white oak woodlands Stands of Oregon white oak or oak/conifer associations in which oaks comprise 25 percent of the trees in a given patch, or where the total canopy coverage of a given site is less than 25 percent, but oaks make up more than 50 percent of the canopy (WADFW, 2008);
- Riparian Area adjacent to flowing or standing freshwater aquatic systems;
- Shrub-steppe Non-forested vegetation type with one or more layers of perennial
 bunchgrasses and a conspicuous, but discontinuous, layer of shrubs;
- Freshwater wetlands and fresh deepwater Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or shallow water covers the land; deepwater habitats are permanently flooded lands below the deepwater boundary of wetlands;
- Instream Combination of physical, biological, and chemical processes and conditions
 that interact to provide functional life history requirements for instream fish and wildlife
 resources; and
- Puget Sound nearshore Relatively undisturbed nearshore Puget Sound, including the
 Strait of Juan de Fuca, Admiralty Inlet, the San Juan Islands, and Hood Canal.

24 **1.2.3 THREATENED AND ENDANGERED SPECIES**

Sensitive areas in this ecoregion include the following:

- 25 Appendix F3 lists the threatened and endangered species in this ecoregion. The USFWS 26 designates certain fish and wildlife species as sensitive. Sensitive species on USFS lands are 27 those species for which population viability is a concern, evidenced by a significant downward 28 trend in population or habitat capacity. These species need special management to maintain and 29 improve their status on National Forests and Grasslands to prevent listing under the Endangered 30 Species Act. The Bureau of Land Management (BLM) also has a designation for species 31 considered sensitive and occurring on its lands. These species are in danger of extinction on all 32 or part of their range.
- 33 Chinook are the largest salmon in North America, occupying Pacific and Arctic waters (Page and
- Burr, 1991). As anadromous fish, they return to freshwater streams and rivers to spawn after
- 35 several years spent foraging in marine waters. In the project area, much of Puget Sound, the
- Strait of Juan de Fuca, Georgia Basin, and associated streams and rivers in Washington
 constitute critical habitat for the Chinook salmon (NOAA, 2007).
- 38 Many coniferous forests contain both Federal and state-listed species in this ecoregion. These
- 39 species include the marbled murrelet (*Brachyramphus marmoratus*), spotted owl (*Strix*
- 40 occidentalis), grizzly bear (Ursus arctos horribilis), and Canada lynx (Lynx canadensis).

- 1 Although some species are listed as endangered or threatened at either the Federal or state level,
- 2 others are categorized differently as species of "conservation concern" or "special concern."

3 **1.2.4 WILDLIFE**

- 4 The Pacific Lowland Mixed Forests of this ecoregion province are home to several wildlife
- 5 species, which include game (legally hunted) species such as deer, and non-game (legally
- 6 protected, but not endangered or threatened) species, including birds, mammals, reptiles,
- 7 amphibians, fish, and representative species of other taxa. Many bird species migrate into or out
- 8 of this province in spring and fall each year, although avian migration is generally not as
- 9 temporally or geographically concentrated as the eastern United States. Many mammals and
- 10 permanent resident bird species remain in the province throughout the year.
- 11 In the dominant lowland coniferous forest habitats in the Pacific Mixed Forest Province,
- 12 Townsend's warbler and varied thrush are a few of the sensitive species that could be affected,
- 13 especially during the breeding season (generally from March through July). The riparian
- 14 deciduous forest in this ecoregion is inhabited by sensitive species that include Hutton's vireo
- 15 (Vireo huttoni) and Wilson's warbler (Wilsonia pusilla).

16



A flock of snow geese

17 18

(USFWS)

19 Thousands of snow geese (Chen caerulescens) and trumpeter swans (Cygnus buccinator) winter

20 in the Skagit River estuary. The waterfowl feed on aquatic plants and crops in nearby

21 agricultural fields. Wide arrays of migratory bird species use the wetlands and coastal areas in

the province in spring and autumn. Mild weather allows many species, including seabirds,

23 waterfowl, raptors, gulls and terns, shorebirds, and some relatively winter-hardy songbirds, to

- 24 overwinter here. Other inhabitats include black bear (Ursus americanus), raccoon (Procyon
- 25 *lotor*), ringneck snake (*Diadophis punctatus*), and northwestern garter snake (*Thamnophis*
- 26 *ordinoides*).

27 1.2.5 VEGETATIVE HABITAT

28 The Lowland Mixed Forest Province is situated primarily between prominent mountain ranges,

- 29 varying in elevation from sea level to above 1,500 feet (460 meters). In Washington State, this
- 30 area has been largely modified by human use and cultivation. At the lowest elevations with

- 1 native forest cover, however, dense conifers include western red cedar, western hemlock, and
- 2 Douglas-fir.
- 3 In the Puget Sound region and interior valleys, coniferous tree species are less abundant than in
- 4 coastal areas. In these habitats, deciduous trees, such as bigleaf maple (*Acer macrophyllum*),
- 5 Oregon ash (*Fraxinus latifolia*), and black cottonwood (*Populus trichocarpa*), become more
- 6 common. Some remaining prairies have oaks, but also include groves of Douglas-fir. Oregon
- 7 white oak (*Quercus garryana*) and Pacific madrone (*Arbutus menziesii*) also occur as do
- 8 wetlands with swamp or bog plant communities (WWF, 2001).
- 9 Scotch broom (*Cytisus scoparius*) poses a serious threat to oak forests. An invasive shrub, scotch
- 10 broom currently grows on more than 700,000 acres in the northwest coastal regions of the
- 11 western coastal states. It displaces native plants, creating a serious dilemma for reforestation.
- 12 Native to Europe and North Africa, this plant is a competitive species with the capacity to
- 13 dominate a forest-shrub community and form dense monotypic stands.
- 14
- 15



16 17

(University of California, Berkeley)

- 18 Examples of invasive species that have already caused or are expected to cause problems in this
- 19 province include: wild chervil (Anthriscus sylvestris), absinth wormwood (Artemisia
- 20 absinthium), kochia (Kochia scoparia), plumeless thistle (Carduus acanthoides), nodding thistle
- 21 (also known as musk thistle, *Carduus nutans*), slenderflower thistle (*C. pycnocephalus*), and
- 22 longspine sandbur (Cenchrus longispinus), Russian knapweed (Acroptilon repens), and common
- 23 bugloss (Anchusa arvensis) (USDA, 2010). Non-native invasive plant species can negatively
- 24 affect natural areas, agriculture, and horticulture (Simberloff, 1996).

25 **1.2.6 WETLANDS AND WATERWAYS**

- 26 Wetlands within the Pacific Lowland Mixed Forest are abundant and include approximately
- 1,831,340 acres of marine and estuarine deepwater (namely, the Puget Sound); 78,035 acres of
- 28 marine and estuarine wetlands; 109,290 acres of forested or scrub-shrub wetland; 83,120 acres of

- 1 freshwater emergent wetlands; 11,820 acres of ponds; 90,000 acres of lakes; and 88,770 acres of
- 2 riverine habitats (USDOI, 2010b).
- 3 Puget Sound and its associated habitats represent an important marine resource in the project
- 4 area and form the focus of multi-agency, multi-disciplinary, conservation efforts (Puget Sound
- 5 Partnership, 2009).
- 6 The Skagit River is a designated Wild and Scenic River. Lakes and reservoirs protected under
- 7 the Washington Shoreline Management Act within this province include Mud Mountain
- 8 Reservoir, Chester Morse Lake Reservoir, along with Washington, Sammamish, Alder,
- 9 American, Tapps, Shannon, and Whatcom lakes.

10 1.2.7 AQUATIC RESOURCES

- 11 The marine and coastal portion of Washington forms a complex marine border with the Canadian
- 12 Province of British Columbia. The 100-mile area south of the Canadian border within the
- 13 Pacific Lowland Mixed Forest Province includes (from west to east): the Strait of Juan de Fuca
- 14 between the Olympic Peninsula and Victoria Island; Haro Strait between the San Juan Islands
- 15 and Victoria Island; Boundary Pass between the San Juan Islands and Salt Spring Islands: the
- 16 Strait of Georgia between the Washington coast near Bellingham and Blaine: and the Salt Spring
- 17 Islands of Canada. The U.S.-Canada border is the halfway point of these bodies of water. In
- 18 general, the 12-nautical-mile zone off the coast makes up the territorial waters of the United
- 19 States; however, since the marine waters between Washington and British Columbia never reach
- 20 24 nautical miles wide, the border is the middle of the water body (i.e., less than 12 nautical
- 21 miles from the shore).
- Also included within 100 miles of the Canadian border are many parts of Puget Sound and
- 23 contiguous water bodies, such as Hood Canal. The area from the outer Pacific Coast to the Strait
- 24 of Georgia (also called Georgia Basin) is a rich, productive, cold-water environment for many
- 25 marine and coastal organisms. Much of it is also an area of considerable human use with
- 26 extensive shipping channels, commercial and sport fisheries, and ferryboats.
- 27 Large estuaries, including Puget Sound, Nisqually Delta, and Grays Harbor, are located in this
- ecoregion province. Estuaries feature a mixture of salt and fresh water; they are biologically
- 29 productive and important to marine life. Included in the estuaries of Washington State are deltas,
- 30 mudflats, and salt marshes. Many estuaries have abundant eelgrass communities, which are also
- highly productive for marine life and many birds. The Pacific harbor seal largely relies on
- 32 estuaries and frequently hauls out in these areas.
- 33 The fast-flowing major rivers of the Pacific Lowland Mixed Forest Province constitute important
- habitat for various salmon and trout species. Chum (*Oncorhynchus keta*), coho (*O. kisutch*), pink
- 35 (O. gorbuscha), sockeye (O. nerka), and Chinook salmon species, along with steelhead, are
- 36 among the Pacific Northwest's most sought-after fish. Rivers, such as the Skagit and
- 37 Skykomish, are of great economic importance to the region's population and are also important
- 38 for native salmon and steelhead. The Skagit, for example, is the only large river system in
- 39 Washington that hosts all of the native salmon species and two trout species. Portions of the
- 40 Skagit River in the project area are designated as a National Wild and Scenic River, in part
- 41 because of abundant bald eagles (*Haliaeetus leucocephalus*) and an excellent fishery.

Sockeye salmon



2 3

1

(National Geographic)

- 4 Aquatic invasive species are a concern in estuaries, wetlands, and rivers with many species
- 5 introduced from ballast water. Aquatic invasive plants of concern include caulerpa seaweed
- 6 (*Caulerpa taxifolia*), Eurasian watermilfoil (*Myriophyllum spicatum*), hydrilla (*Hydrilla*
- 7 *verticillata*), parrotfeather (*Myriophyllum aquaticum*), and common reed (*Phragmites australis*).
- 8 Aquatic invasive animals include Atlantic salmon (*Salmo salar*), bullfrog (*Rana catesbeiana*),
- 9 green crab (Carcinus maenas), mitten crab (Eriocheir sinensis), nutria (Myocastor coypus), rusty
- 10 crayfish (Orconectes rusticus), zebra mussel (Dreissena polymorpha), and quagga mussel
- 11 (Dreissena rostriformis bugensis). Viral hemorrhagic septicemia (VHS) is a deadly fish virus of
- 12 great concern in this region.

13 1.3INTERMOUNTAIN SEMI-DESERT PROVINCE (342)

- 14 The Intermountain Semi-Desert Province sits in the northwestern United States and includes a
- 15 narrow portion of Washington State within the 100-mile project area (Figure 1.1-2).

Intermountain semi-desert



2 3

(USFS)

- 4 The Intermountain Semi-Desert Province includes broad plains and plateaus (mesas) of the
- 5 Columbia/Snake River. These plateaus incorporate most of the northwest expanses of lava
- 6 fields. Holocene Epoch lava flows covered areas adjacent to the plateaus and folded into ridges.
- 7 The mean elevation is approximately 3,000 feet (900 meters). Towards the south of this 8 ecoregion, the basins between mountain ranges jointly form a stream-dissected plateau.
- 9 Latitude and landscape features differentiate this area from nearby ecoregions with similar plant
- 10 associations, such as the Great Basin Shrub Steppe (occupying parts of Nevada, Idaho, Utah, and
- 11 northeastern and eastern California). The Intermountain Semi-Desert Ecoregion sits at a lower
- 12 elevation. The Snake/Columbia River basin region lacks the plant diversity typical of the Great
- 13 Basin Ecoregion province (Bailey, 1995).
- 14 The ecoregion is situated within the rain shadow of the Cascade Mountains, limiting
- 15 precipitation. Mean precipitation varies from less than 10 inches (26 centimeters) in the west
- 16 (within the rain shadow of the Cascade Range) to 20 inches (51 centimeters) in the east.
- Precipitation is distributed throughout the seasons, but summer routinely has the lowest amountof rain.
- 19 Fire and cattle grazing, along with wide variations in rain, snowfall, and temperature, are sources
- 20 of ecological disturbances in the ecoregion. Fire may stimulate the growth of grasses and hold
- 21 back the spread of sagebrush, but the long-term decline of perennial grass species is an
- 22 ecological problem driving biodiversity decline in this ecoregion (WWF, 2001).
- 23 The climate of the ecoregion is semiarid with a mean annual temperature of approximately 50
- 24 degrees Fahrenheit (10 degrees Celsius).

1 1.3.1 REMAINING BLOCKS OF REGIONALLY SIGNIFICANT HABITAT

- 2 No large, regionally significant areas occur in this ecoregion within 100 miles of the Northern
- 3 Border.

4 **1.3.2 SENSITIVE HABITATS**

- 5 Several ecological communities include sensitive habitats in this ecoregion. The sensitive
- 6 habitats described here are home to many of the threatened and endangered species in the next
- 7 section. For example, sagebrush steppe occurs in many areas in this broad geographic region
- 8 and is home to rare plant species, such as the Piper's daisy (*Erigeron piperianus*), as well as a
- 9 wide variety of common plant species, such as Indian ricegrass (*Oryzopsis hymenoides*). Some
- 10 habitat names used below, such as eastside steppe, describe habitats across several regional
- boundaries and are more general. Others, such as the microphytic crust or cryptogams (a type of
- 12 microscopic plant community), define much more specific ecological associations.
- 13

Piper's daisy



14 15

(University of Washington Botanic Gardens)

- 16 Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and
- 17 diverse areas. The list of sensitive habitats is based on habitats enumerated and described by the
- 18 World Wildlife Fund (2001), ecological system descriptions within the NatureServe.org
- 19 database, and each state's respective natural resources agency.
- Columbia Plateau steppe and grassland–Fires inhibit shrub re-growth and largely
 determine the vegetative habitat of this system. A microphytic or cryptogam crust (a
 collection of microscopic plants forming a crust) is a unique feature in this plant
 community.
- Eastside steppe–Dominated by ground-layer plants (those species which are not grasses are sometimes referred to as forbs), perennial bunchgrasses, or both. Shrubs other than sagebrush (in some sections) are absent or occasionally scattered.
- Juniper savanna–Dominated by Utah juniper (*Juniperus osteosperma*) interspersed with
 species of perennial bunch grasses and forbs. Species of sagebrush are also common
 (Washington Natural Heritage Program, 2007; WA DFW, 2008).

1 1.3.3 THREATENED AND ENDANGERED SPECIES

- 2 Appendix F3 itemizes Federal and state threatened and endangered species. The pygmy rabbit
- 3 (Brachylagus idahoensis) and showy stickseed (Hackelia venusta) are federally listed
- 4 endangered species in this ecoregion. Other important species include the northern spotted owl
- 5 (Strix occidentalis caurina) and grizzly bear (Ursus arctos horribilis), which are federally listed
- 6 threatened species and are also state-listed endangered species in this ecoregion. The upland
- 7 sandpiper (*Bartramia longicauda*), and ferruginous hawk (*Buteo regalis*) are state-listed species;
- 8 the populations of these species are in decline and have become increasingly rare. In the
- 9 dominant sagebrush and grassland habitats within the ecoregion, the golden eagle (Aquila
- 10 chrysaetos) and burrowing owl (Athene cunicularia) are state candidate species for threatened
- 11 status listing. Both are considered sensitive species in this area.

12 **1.3.4 WILDLIFE**

- 13 Wildlife species in the Intermountain Semi-desert Ecoregion are similar to those in the Great
- 14 Basin to the east. The sagebrush steppe, subalpine forests, and high-elevation grasslands in this
- 15 ecoregion province are home to several wildlife species, which include game (legally hunted)
- 16 and non-game (legally protected, but not endangered or threatened) species. Many bird species
- 17 migrate into or out of this province in spring and fall each year. Several mammals and some
- 18 permanent resident bird species remain in the region throughout the year. Common species are
- 19 the white-tailed jackrabbit (Lepus townsendii), black-tailed prairie dog (Cynomys ludovicianus),
- 20 and Brewer's sparrow (*Spizella breweri*), all of which are widespread throughout sagebrush
- 21 habitat. Among reptiles, the western or prairie rattlesnake (*Crotalus viridis*) is fairly common
- 22 and the bullsnake (*Pituophis catenifer sayi*) is more common.
- 23

Black-tailed prairie dog



24 25

(National Geographic)

26 1.3.5 VEGETATIVE HABITAT

- 27 The vegetation of this ecoregion, sometimes called sagebrush steppe, is largely sagebrush (the
- 28 majority of which is big sagebrush (Artemisia tridentatata) and shadscale (Atriplex
- 29 confertifolia), with some short grasses. In many areas, ground-layer vegetation makes up less
- 30 than 25 percent of the total cover so shrubs constitute the dominant vegetation. Greasewood
- 31 (Sarcobatus vermiculatus) often grows in wetter alkaline areas. Adjacent to streams near the

- 1 mountains, willows (*Salix* spp.) and sedges line the valleys; greasewood (*Sarcobatus*
- 2 *vermiculatus*) and other alkaline-tolerant plants may replace them farther away from the
- 3 mountains (McNab and Avers, 1994).
- 4 Various bunchgrass species vegetate areas in the Columbia River Basin that receive more than
- 5 10 inches (26 centimeters) of rainfall per year. In cultivated areas, these landscapes have been
- 6 used successfully for growing wheat.
- 7 Bluebunch wheatgrass (*Pseudoroegneria spicata*) is especially common, as is Idaho fescue
- 8 (Festuca idahoensis). Rough fescue (Festuca campestris) and Sandberg bluegrass (Poa
- 9 *secunda*) are also important grassland components.
- 10 Forests of Douglas-fir (*Pseudotsuga menziesii*), subalpine fir (*Abies lasiocarpa*), and aspen
- 11 (Populus spp.) cover the wetter parts of the mountain ranges. Cottonwoods (P. deltoides and
- 12 other cottonwood species) and willows (*Salix* spp.) often border the riparian zones.
- 13 Invasive plants can harm native vegetation, wildlife, and entire ecosystems along the Northern
- 14 Border, as elsewhere in the United States. These invasive species often displace native plants,
- 15 degrade habitat for wildlife and livestock, and diminish opportunities for outdoor recreation.
- 16 They can affect soils and increase the frequency of fire. Invasive plants threaten the existence of
- 17 endangered plants and negatively modify biodiversity. One estimate suggests that invasive plant
- 18 species have affected 420,000 acres of national forests and grasslands in the Pacific Northwest
- 19 (Pacific Northwest Invasive Plant Council, 2010). Examples of invasive species in this
- 20 ecoregion include: yellow starthistle (Centaurea solstitialis), velvetleaf (Abutilon theophrasti),
- 21 Russian knapweed (Acroptilon repens), jointed goatgrass (Aegilops cylindrica), camelthorn
- 22 (Alhagi maurorum), garlic mustard (Alliaria petiolata), blackgrass (Alopecurus myosuroides),
- 23 and indigo bush (Amorpha fruticosa).
- 24

Velvetleaf



25 26

(University of Wisconsin, Stevens Point)

27 1.3.6 WETLANDS AND WATERWAYS

- 28 Wetlands within the Intermountain Semi-desert Province portion of the project area include
- 29 approximately: 840 acres of forested/scrub-shrub wetland; 11,655 acres of emergent wetlands;
- 30 1,810 acres of ponds; 93,590 acres of lakes; and only 430 acres of riverine habitat. The small

- 1 acreages are due to the smaller amount of this ecoregion within the study area, but also the arid 2 climate.
- 3 Washington State identifies some 300+ rivers, creeks, and other waterways as protected under
- 4 the Shoreline Management Act. The Washington Administrative Code (WAC) Chapter 173-18
- 5 defines specific protected reaches of these waterways.
- 6 Lakes and reservoirs protected under the Washington Shoreline Management Act in this
- 7 province include the Wanapum Dam Reservoir, Sprague Lake, and Stevens Lake. These lakes
- 8 are protected under the State of Washington's Shoreline Management Act.

9 **1.3.7 AQUATIC RESOURCES**

- 10 Due to the arid nature of this ecoregion, surface water is of critical importance to fish and aquatic
- 11 wildlife. Alpine lakes and streams, along with lakes and rivers of the Intermountain Semi-desert
- 12 Province, are susceptible to disturbance from construction, which can affect water quality as well
- 13 as fish and other aquatic organism populations. These activities can negatively influence
- 14 streambed sedimentation, water quality, and invertebrates.
- 15 Stream, river, and lake fishing for trout, salmon, walleye, and other freshwater fish remain
- 16 important in southeastern Washington. During 2003 to 2004, Washington residents purchased
- 17 318,079 freshwater fishing licenses. Between April 1, 2003 and March 31, 2004, a total of
- 18 342,884 salmon were caught in the state's fresh waters (State of Washington, 2003). State
- 19 anglers also caught large numbers of several trout species, walleye, and bass.

1.4NORTHERN ROCKY MOUNTAINS STEPPE-CONIFEROUS FOREST-ALPINE MEADOW PROVINCE (M333)

- 22 The Northern Rocky Mountain Steppe–Coniferous Forest–Alpine Meadow Ecoregion is largely
- composed of mountainous terrain with elevations up to 9,000 feet (2,700 meters) (Figure 1.1-2).
- 24 Most of the region has prominent glacial features. The Rocky Mountain trenches have broad,
- 25 flat-bottomed valleys, some of which are several miles in width (Bailey, 1995).
- This ecoregion occupies sections of the northwestern states, including parts of Montana, Idaho,and Washington.
- 28 Severe winters are typical of this ecoregion. The average temperature of the coldest winter
- 29 month is below 32 degrees Fahrenheit (0 degrees Celsius); the average temperature of the
- 30 warmest summer month is below 72 degrees Fahrenheit (22 degrees Celsius). Summer days are
- 31 very warm. Precipitation of annual rain and snow averages between 20 to 40 inches (51 to 102
- 32 centimeters), falling primarily in fall, winter, and spring. Summers are usually much drier.
- 33 These factors result in a climate gradient from north to south and from east to west. Snowfall
- 34 during winter is typically heavy, especially at higher elevations.
- 35 Natural areas in this ecoregion include intermountain valley systems, large rivers and their
- 36 tributaries, riparian areas and associated wetlands, and alpine habitats. Denning habitat exists for
- 37 bears (*Ursus* spp.), wolverines (*Gulo gulo*), and other carnivores; the lower-elevation valleys
- 38 provide winter range for ungulates. A variety of mixed-forest habitats offer shelter, forage,
- 39 migration routes, breeding habitat, and cover for diverse sensitive species. Many of these natural

- 1 areas have enhanced wildlife value due to their remote locations and rugged topography, with
- 2 little or no human disturbance.

3 1.4.1 REMAINING BLOCKS OF REGIONALLY SIGNIFICANT HABITAT

- 4 The blocks of regionally significant habitat listed below are relatively undeveloped and intact
- 5 habitat protected as wilderness, state parks, and state and national forests. "Intact habitat" or
- 6 regionally significant habitat refers to areas of largely unfragmented habitat with few alterations
- 7 or disturbances, such as roads or other development. Most areas listed are protected by law
- 8 (wilderness areas, national parks) and often cross state and country boundaries, while others may
- 9 occupy large expanses of private lands.
- 10 Selected regionally significant blocks that represent this region include:
- 11 Bob Marshall Wilderness–Montana;
- 12 Part of Glacier National Park–Northern Montana;
- 13 Selway-Bitterroot Wilderness–Northeastern Idaho; and
- Cabinet Mountains Wilderness–Northwestern Montana.
- 15

Glacier National Park



16 17

18 **1.4.2 SENSITIVE HABITATS**

19 Within a 100-mile zone adjacent to the U.S.-Canada border are several ecological communities

20 that represent sensitive habitats. The sensitive habitats described here also exist in many of the

- 21 larger intact habitat areas in the prior section, and are home to many of the threatened and
- endangered species in the next section. For example, these sensitive habitats house rare or
- 23 protected species such as the lyre-leaf rockcress (*Arabidopsis lyrata*), as well as a wide variety of
- common plant species such as shooting star (*Dodecatheon* spp.). Some habitat names used
 below, such as alpine meadows, describe habitats across several regional boundaries and are
- 25 below, such as alphe meadows, describe habitats across several regional boundaries and are 26 more general in meaning. Others, such as subalpine forest (a type of plant community), define
- more general in meaning. Others, such as subalpine forest (a type of plant community), de
- 27 much more specific ecological associations.

1	 Alpine meadows – Open meadows at and above the timberline; 	
2 3	 Great Plains ponderosa pine woodland and savanna – Ponderosa pine woodlands surrounded by grasslands; 	
4 5	 Rocky Mountain riparian woodland and shrubland – Within the flood zone of rivers, on islands, bars, and adjacent streambanks; 	
6 7	 Northern Rocky Mountain montane Douglas-fir forest and woodland – Mixed deciduous/coniferous montane forest; 	
8 9	• Rocky Mountain subalpine-montane fen – Mountain wetland fed by mineral-rich surface water or groundwater; below alpine areas in elevation;	
10 11 12	 Subalpine forest – Northern Rocky Mountain subalpine dry parkland, Rocky Mountain lodgepole pine forest, Rocky Mountain subalpine dry-mesic spruce-fir forest and woodland; 	
13 14	• Rocky Mountain subalpine mesic spruce-fir forest and woodland–Forest of spruce and fir with a moderate moisture regime, just below timberline;	
15 16	 Rocky Mountain wooded vernal pool – Temporary pools, usually devoid of fish, that allow development of natal amphibian and insect species; 	
17 18	• Alpine dwarf-shrubland – Dwarf shrubs or dwarf willows that form a heath-type ground cover;	
19 20	• Spring Creek Canyon Natural Area Preserve (Washington) – Douglas-fir and ponderosa pine forest, as well as shrub-grassland ecosystems;	
21 22	 Barker Mountain Natural Area Preserve (Washington) – Shrub-grassland ecosystems ("shrub-steppe"), including antelope bitterbrush/Idaho fescue habitat; 	
23 24	 Dry conifer forest – Northern Rocky Mountain western larch woodland; found in mountainous regions at 2,000 to 9,800 feet elevation; 	
25 26	 Northern mesic conifer forest – Northern Rocky Mountain hemlock-western red cedar forest 	
27 28	• Palouse prairie – Columbia Basin, western portion of north-central Idaho, on gentle, rolling terrain at elevations of 2000 to 3000 feet; and	
29	• Riparian woodland – Columbia Basin foothill riparian woodland and shrubland.	
30 31 32	In Montana, Glacier National Park and the Bob Marshall Wilderness Area provide thousands of acres of habitat for a vast array of wildlife species, including endangered species such as the grizzly bear (<i>Ursus arctos horribilis</i>).	
33 34 35	Approximately half of the land along the border in Idaho is federally owned; most of that is national forest. The Bureau of Land Management has one wilderness study area (WSA): the Selkirk Crest WSA encompasses 720 acres about 18 miles northwest of Bonners Ferry.	
36 37 38	The Selkirk Mountain area along the northern Idaho border has great value for wildlife. Adjacent to the Salmo-Priest Wilderness Area in Washington, it also extends into British Columbia. This area provides habitat for several federally listed threatened or endangered species, including bull	

- 1 trout (Salvelinus confluentus), grizzly bear (Ursus arctos horribilis), gray wolf (Canis lupus),
- 2 and mountain caribou (*Rangifer tarandus caribou*).
- 3



4 5

(National Geographic)

- 6 Only one FWS National Wildlife Refuge exists in the 100-mile buffer zone within Idaho: the
- 7 Kootenai National Wildlife Refuge.
- 8 Wildlife Management Areas (WMAs) are established in the project area of this ecoregion. These
- 9 areas are managed for the protection of wildlife and recreation. In Idaho, the WMAs include
- 10 Boundary Creek, McArthur Lake, Pend Oreille, Farragut, Coeur d'Alene River, St. Maries, and
- 11 Snow Peak. In Montana, the WMAs include Kootenai Falls and Bull River. In Washington, the
- 12 WMAs include Sherman and LeClerc creeks.

13 **1.4.3 THREATENED AND ENDANGERED SPECIES**

- 14 Appendix F3 lists threatened and endangered species in this ecoregion. Montana lists some
- 15 species as "Species of Concern." The status represents a separate category, described as,
- 16 "Potentially at risk because of limited and/or declining numbers, range and/or habitat, even
- 17 though it may be abundant in some areas" (MTFWP, 2010).
- 18 Idaho does not list species as state endangered or threatened, but defers to Federal listings. The
- 19 Idaho equivalent state ranking for species of concern is S2; an Idaho state rank of S1 denotes
- 20 "Critically imperiled: at high risk because of extreme rarity."
- 21 Prime examples of endangered wildlife in this ecoregion are the grizzly bear (*Ursus arctos*
- 22 *horribilis*) and the Selkirk Mountains population of the woodland caribou (*Rangifer tarandus*
- *caribou*). The grizzly bear population in the Selkirk recovery zone is estimated at 40 to 50
- 24 individuals (USDOI, 2010a). Woodland caribou in the Selkirks are at risk because their numbers
- are very low and they have a slow reproductive rate (Zager et al., 1995).

Woodland caribou



2 3

(Canadian Parks and Wilderness Society)

- 4 Although some species are listed as endangered or threatened at either the Federal or state level,
- 5 others are categorized differently as species of "conservation concern" or "special concern" by
- 6 both state and Federal agencies.

7 **1.4.4 WILDLIFE**

- 8 Wildlife species in the Northern Rocky Mountains Steppe Ecoregion are similar to those living
- 9 elsewhere in the Rockies to the north and south. The alpine meadows, subalpine forests, and
- 10 high-elevation grasslands are home to many wildlife species, including game and non-game
- 11 species. Many songbird species migrate into or out of this province in spring and fall each year.
- 12 A wide variety of mammals and some permanent resident bird species remain in the province
- 13 throughout the year. Common mammals in this ecoregion include mule deer (*Odocoileus*
- 14 *hemionus*), yellow-bellied marmot (*Marmota flaviventris*), and pika (*Ochotona princeps*).
- 15 In forested habitats within the province, common birds include Steller's jay (*Cyanocitta stelleri*),
- 16 black-headed grosbeak (*Pheucticus melanocephalus*), and broad-tailed hummingbird
- 17 (Selasphorus platycercus). The northern goshawk (Accipiter gentilis), flammulated owl (Otus
- 18 *flammeolus*), and black-backed woodpecker (*Picoides arcticus*) are several of the more
- 19 uncommon or sensitive species in this ecoregion. Mammals include mule deer (Odocoileus
- 20 *hemionus*) and elk (*Cervus candensis*). Common reptiles and fish include the common garter
- 21 snake (Thamnophis sirtalis), spiny softshell turtle (Apalone spinifera), bull trout (Salvelinus
- 22 *confluentus*), and chum salmon (*Oncorhynchus keta*).

23 1.4.5 VEGETATIVE HABITAT

- 24 Mixed evergreen-deciduous forest is dominant in this ecoregion. The forests are primarily
- 25 composed of fir (Abies spp.), cedar (Thuja spp.), and hemlock (Tsuga spp.). Well-marked
- 26 altitudinal zones create a prominent feature of this ecoregion. No trees grow in the alpine zone.
- 27 Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*) dominate the
- 28 subalpine zone, just below the alpine zone.

Englemann spruce



2 3

(University of British Columbia Botanical Garden)

- 4 In some sections of this ecoregion, mountain hemlock (*Tsuga mertensiana*) is the climax tree of
- 5 the subalpine zone. Lodgepole pines grow primarily in the eastern part of the region. On the
- 6 west side of the continental divide and below the zone of Douglas-fir (*Pseudotsuga menziesii*),
- 7 ponderosa pine (*Pinus ponderosa*) becomes dominant, making up a relatively drier forest. Grand
- 8 fir (*Abies grandis*), western hemlock (*T. heterophylla*), western red cedar (*Thuja plicata*),
- 9 mountain hemlock, and western white pine (*Pinus monticola*) also grow in the forested areas of
- 10 this ecoregion. Larch (*Larix* spp.) invades areas that have experienced fire or been logged.
- 11 White pine may eventually outcompete larch, which is then replaced by hemlock, red cedar, and
- 12 lowland white fir (A. concolor). Depending on latitude, lower slopes and valleys of the montane
- 13 belt may be covered with grasses and sagebrush; these often constitute a "semi-desert"
- 14 vegetation of sagebrush or grass-covered steppe (Bailey, 1995).
- 15 Conditions to the east of the Bitterroot Mountains are more arid; as a result, forests grow mostly
- 16 on the northern and eastern slopes. Although the south and west-facing slopes receive similar
- 17 amounts of rain or snowfall, temperatures are warmer. Fewer forests grow there due to the drier
- 18 conditions, so shrubs and grasses dominate.
- 19 In addition to the extensive conifer forests, this ecoregion contains several other vegetation
- 20 community types: alpine meadows, grasslands, wooded riparian stands, and higher-elevation
- 21 tree-line and alpine communities. The consequences of the dramatic elevation changes include
- rain shadows, effects of prevailing winds, and thermal inversions (Peet, 1988).
- 23 Non-native invasive plant species can negatively impact natural areas, agriculture, and
- 24 horticulture (Simberloff, 1996). Examples of invasive species in this ecoregion include: buffalo
- 25 burr (Solanum rostratum), common crupina (Crupina vulgaris), eggleaf spurge (Euphorbia
- 26 oblongata), goat's-rue (Tephrosia virginiana), Johnson grass (Sorghum halepense), and Vochin
- 27 knapweed (Centaurea nigrescens) (Idaho Weed Coordinating Committee, 2005; Washington
- 28 State Noxious Weed Control Board, 2010).

1 1.4.6 WETLANDS AND WATERWAYS

- 2 Wetlands within the ecoregion project area include approximately: 72,735 acres of
- 3 forested/scrub-shrub wetlands; 144,875 acres of emergent wetlands; 13,280 acres of ponds;
- 4 470,220 acres of lakes; and 28,110 acres of riverine habitats (USDOI, 2010b).
- 5 The Kootenai River is a major river in this province that flows from Canada to Montana, into
- 6 Idaho, and then back across the Canadian border. Dammed near Libby, Montana, the river forms
- 7 a large reservoir, Lake Koocanusa, which backs up into Canada.

8





9 10

(Montana Department of Natural Resources and Conservation)

- 11 The Flathead Wild and Scenic River designation includes three forks within 100 miles of the
- 12 Northern Border. The North Fork Flathead is designated from the Canadian border downstream

13 to its confluence with the Middle Fork; the Middle Fork Flathead is designated from its

14 headwaters to its confluence with the South Fork; and the South Fork Flathead is designated

15 from its origin to the Hungry Horse Reservoir.

- 16 Other major rivers in the project area include a portion of the Clarke Fork, the Moyie River
- 17 (which flows south from Canada), and the Flathead River system, along with the Coeur d'Alene,
- 18 Pack, and Priest rivers. The Clark Fork River drains into Lake Pend Oreille; the Pend Oreille
- 19 River drains out of Lake Pend Oreille.
- 20 The Similkameen River valley runs north-south across the Northern Border near the boundary of
- 21 the Cascade Mixed Forest–Coniferous Forest–Alpine Meadow Province and the Northern Rocky
- 22 Mountain Forest Steppe–Coniferous Forest–Alpine Meadow Province. One of the most
- 23 biologically diverse ecosystems in Canada, the Similkameen River valley is also one of Canada's
- 24 three most endangered natural systems (British Columbia Parks, 2010). The Ministry of Parks in
- 25 British Columbia is an active participant in the South Okanogan-Similkameen Conservation
- 26 Program.
- 27 Major lakes in the project area within this province include Lake Pend Oreille, along with Rufus
- 28 Wood, Banks, Long, Palmer, Osoyoos, Callispell, Sullivan, Priest, and Hayden lakes, Boundary
- 29 Reservoir, a portion of Coeur d'Alene Lake, and Little Bitterroot, Swan, Flathead, Whitefish,

L-30

- 1 and Medicine lakes. Glacier National Park has a series of large lakes including Kintla, Bowman,
- 2 Logging, McDonald, Sherburne, Mary, and Waterton, which crosses the Northern Border into
- 3 Waterton Park in Canada. Within the Blackfeet Reservation (east of Glacier National Park) are
- 4 Lower Saint Mary and Duck lakes. Major reservoirs include Lake Koocanusa and Hungry Horse
- 5 Reservoir. Lakes in the State of Washington are protected under the state's Shoreline
- 6 Management Act.

7 **1.4.7 AQUATIC RESOURCES**

- 8 Fisheries and aquatic resources are of great importance in this province. Idaho, Washington, and
- 9 Montana are famous for their high-quality fishing. Anglers in the Rocky Mountain region
- 10 increased 8.3 percent between 1991 and 1996, with 3,303,000 persons holding licenses in 1996
- 11 (USDOI, 2004). Numerous large natural lakes and reservoirs in these three states offer a variety
- 12 of fishing opportunities for warm and cold-water species, including salmon and steelhead trout.
- 13 Idaho's mountains contain more than 1,500 alpine lakes (IDFG, 2010)
- 14 Two river systems within the project area are designated as National Wild and Scenic Rivers: the
- 15 Flathead and Missouri rivers (see Wetlands and Waterways, above). The BLM's Lewistown
- 16 Field Office manages these segments of the Missouri River in Montana.