2 Area Description and Resources

USFWS

Swan River in winter.

This chapter describes the biological, cultural, and socioeconomic resources most likely affected by establishing the Swan Valley CA.

BIOLOGICAL ENVIRONMENT

In this section climate; climate change; adaptation, mitigation, and engagement responses to climate change; geologic resources; habitat; and wildlife of the Swan Valley are discussed.

CLIMATE

The Upper Swan Valley is at the eastern limit of the Pacific maritime climatic influence, common to northern Idaho and northwestern Montana. The Mission Mountains experience more of the maritime influence than the Swan Range. The climate is generally cool and dry with precipitation increasing from south to north in the valley. Precipitation in the form of snow and rain varies between an average of 30 inches on the valley floor to over 100 inches along the Swan and Mission divides. The highest precipitation usually comes from late October to mid-February and again from mid-May to early July. The highest precipitation intensity occurs when a moist weather front from the Pacific collides with cool continental weather. Swan River receives a yearly average of 28.36 inches of precipitation and 125 inches of snow. Maximum snowfall was 256 inches from the fall of 1996 to the spring of 1997, and the maximum precipitation was 37.73 inches in 1964.

At the lower elevations the average annual temperature approximates 40°F. The average maximum temperature at Swan Lake is 55.3°F with the coldest average minimum temperature of 15.6°F occurring in January and the warmest average high temperature of 81.4°F occurring in July. Occasionally, cold arctic air slips over the Continental Divide from the northeast and down the valley, bringing extreme subzero temperatures from the continental weather system. Summer temperatures average in the 80s at the lower elevations with extreme temperatures of 90°F to 100°F during drought years. The relatively short growing season (2 to 3 months) limits widespread agricultural development. Frosts can occur any month of the year. Therefore, conversion of forest types to cultivated crops has been limited in comparison to other western Montana valleys. The highest temperature recorded was 103°F on August 24, 1969 and the lowest recorded temperature was -40°F on February 29, 1968 (Western Regional Climate Center 2010).

The average maximum temperature in Seeley Lake in the southern part of the valley is also 55.3°F. Annual precipitation in Seeley Lake is 20.9 inches, with average annual snowfall totaling 120 inches. The highest temperature recorded in Seeley Lake was 102°F on July 7, 2007 and the lowest recorded temperature was -53°F on January 7, 1937 (Western Regional Climate Center 2010).

Climate Change

Climate change is the pre-eminent issue for conservation in future decades. Current trends in climate change are expected to affect high mountain ecotypes and lower elevation, snowmelt-dependent watersheds, such as those found in the Swan Valley, more acutely than some other landscape ecotypes. Predictions regarding the specific effects of climate change in the Swan Valley are in the early stages. Empirical data indicates that during the twentieth century, the region has grown warmer, and in some areas drier. Annual average temperature has increased 1–3 degrees over most of the region. This seemingly modest increase masks much larger shifts in minimum winter temperatures (10°F) and shifts in maximum summer temperatures (7°F). In the "2007 Introduction to the Summary for Policy Makers Synthesis Report," the Intergovernmental Panel on Climate Change stated that average air temperatures may rise by up to six degrees by the end of this century, according to regionally downscaled models from the Pacific Northwest (USFWS 2009c).

Changes in temperature and precipitation are expected to decrease snowpack and will affect streamflow and water quality throughout the Swan Valley. Warmer temperatures will result in more winter precipitation falling as rain rather than snow throughout much of the region, particularly in mid-elevation basins where average winter temperatures are near freezing. This will result in

- Less winter snow accumulation;
- Higher winter streamflows;
- Earlier spring snowmelt;
- Earlier peak spring streamflow and lower summer streamflows in rivers that depend on snowmelt (USFWS 2009c).

As glaciers and alpine snow fields melt and winters warm in Montana, specialized habitat for fish and wildlife species is expected to diminish. Snow conditions that facilitate hunting success for forest carnivores, such as Canada lynx, are now changing due to winter warming (Stenseth 2004). High elevation forest plants such as whitebark pine, an important food source for grizzly bears and other birds and mammals throughout the Crown of the Continent and Greater Yellowstone ecosystems (Kendall and Arno 1989), will also be negatively impacted by winter warming. Whitebark pine is susceptible to increased mortality as the incidence of drought, high elevation wildfire, and mountain pine beetle attacks, all associated with a warming climate increase (Hanna et al. 2009).

This warming may also have impacts on grizzly bears. Important food resources are expected to decline as warming causes an increase in whitebark pine blister rust, reducing the availability of the pine to bears. This may result in shifts in foraging elevations and a potential increase in grizzly bear conflict with humans and livestock.

According to Service Grizzly Bear Recovery Coordinator, Chris Servheen (University of Montana, Missoula, MT; personal interview, 11 June 2008), it is highly likely that grizzly bear delayed fall den entry dates and earlier spring-emergence dates will begin occurring in the Swan Valley as they have in the Greater Yellowstone area, related to climate change. This will also potentially increase the likelihood of human-caused mortality from increased encounters (Endangered Species Coalition 2009).

As late summer flows are affected by global warming, fewer rivers will be able to supply the ample cold water that is required by species such as bull trout. Bull trout distribution is expected to be negatively impacted by heightened ambient air temperatures (Endangered Species Coalition 2009).

The impacts of climate change will extend beyond the boundaries of any single refuge or easement project and will require large-scale, landscape level solutions that extend throughout the CoCE. The collective goal of each of the project areas (Blackfoot Valley, Rocky Mountain Front, and Swan Valley) is to build resilience in ecological systems and communities, so that, even as climate conditions change, the CoCE will continue to support its full range of native biodiversity and ecological processes. Building resilience includes maintaining intact, interconnected landscapes, and restoring fragmented or degraded habitats.

Adaptation, Mitigation, and Engagement

The Service's strategic response to climate change involves three core strategies: adaptation, mitigation, and engagement (USFWS 2009c).

Through adaptation, the impacts of climate change on wildlife can be reduced by conserving habitats that are expected to be resilient. Increased landscape connectivity is one of the most effective methods to help wildlife adapt to climate change. Large landscapes, especially those within mountains, and the ability to move between them, provide the best chances for plant and animal species, as well as ecosystems and ecological processes, to survive changing conditions. The ability to migrate to higher latitudes, higher elevations, or cooler exposures can make possible the successful adaptation of plants and animals. The Yellowstone to Yukon ecosystem, which includes the CoCE, is the most intact mountain ecosystem remaining on earth and is one of the world's few remaining areas with the geographic variety and biological diversity to accommodate the wide-scale adaptive responses that might allow whole populations of animals and plants to survive (Yellowstone to Yukon Conservation Initiative 2009).

One of the results of changing climates is the

alteration of the habitats upon which wildlife depend. Wildlife will have to adapt to changes in habitat to survive. Protecting and linking contiguous blocks of unfragmented habitat will facilitate movement of wildlife responding to climate change.

Carbon sequestration forms one of the key elements of mitigation. The Swan Valley CA will protect large forested areas from subdivision. Forests are critically important in the effort to remove carbon dioxide from the atmosphere and mitigate climate change. The carbon dioxide from the atmosphere is absorbed by trees through photosynthesis and stored as carbon in tree trunks, branches, foliage, and roots, with oxygen as a byproduct. The organic matter in forest soils, such as the humus produced by the decomposition of dead plant material, also acts to store carbon.

Engagement involves cooperation, communication, and partnerships to address the conservation challenges presented by climate change (USFWS 2009c). The Swan Valley CA is located in an area that is designated as a high priority for conservation and linkage protection by many of our partners including Montana Fish, Wildlife and Parks (MFWP), The National Fish and Wildlife Foundation, The Nature Conservancy, The Kootenai River Network, The Swan Ecosystem Center, The Northwest Connections, Vital Ground, Trout Unlimited, Trust for Public Lands, and The Yellowstone to Yukon Initiative. Many of these organizations are involved in trans-boundary conservation, protecting and connecting habitat in the United States and Canada. Strong partnerships have already been developed to meet the challenges of climate change and wildlife resources.

Given the level of public and private partnerships focused on land protection within the Swan Valley CA, this landscape is an extremely promising large-scale opportunity in North America to improve species resiliency and adaptation in the face of climate change.

Geological Resources

The Mission Mountains and Swan Range resulted from the uplifting of ancient sea sediments laid down millions of years ago. The first phase pushed and bent these compressed sediments eastward along fault zones. The sediments were then formed into thick beds of compressed limestone, mudstone, and sandstone called the Belt Sedimentary Formation. Other rock deposits were added over millions of years.

Swan Valley was created by block faulting, with a large block of rock being pushed up along the fault lines forming the steep Swan Range on the east side of the valley and the west side of the fault, dipping down, forming the Mission Mountains along the west side. The general direction of the faulting was northwest to southeast, with the mountain ranges tilted in an easterly direction. This faulting history generally left steeper and more rugged mountains in the Swan Range. Both the Mission Mountains and the Swan Range are Precambrian sedimentary formations.

Further alteration of the geological landscape in the Swan Valley resulted from mountain valley or alpine glaciation. During the Bull Lake Ice Age that peaked roughly 100,000 years ago, the northern end of the Mission Mountains split the Rocky Mountain Trench (or Cordilleran) Glacier which flowed south from British Columbia. One lobe of the glacier went through the Swan Valley south to the Blackfoot River forming a continuous sheet over the mountains, especially the northern portion of the Mission Mountains. Only the highest peaks and ridges remained uncovered.

Ice again advanced through the valley to the lower end of Salmon Lake during the Pinedale Ice Age about 15,000 years ago. After this massive ice sheet melted, large glaciers repeatedly moved down the Mission and Swan valleys. Gravel beds of meltwater streams within the receding glaciers remained as long ridges (eskers) of sand and gravel. Additionally, long tongues of ice thrust out of the mountains into the valley, depositing moraines at their edges. The last fingers of ice formed the high ridges or high moraines that now enclose glacial lakes such as Holland and Lindbergh lakes, as well as others at the mouths of canyons in the Mission Mountains and Swan Range. The alpine glaciers may have merged to form a very large ice sheet in the Swan Valley that flowed north to meet the Cordilleran ice sheet near Bigfork. Giant glacial grooves cut in the northern tip and the east flank of the Mission Mountains, and the west flank of the Swan Range may have been made by the south-flowing Cordilleran ice sheet or the north-flowing Swan Valley Glacier. As the valley glacier melted, dirt and debris were left behind. Large piles of these sediments remained as humps on the valley floor, or were pushed into ridges or eskers as the glaciers moved. In other areas, pockets of ice were left behind. When they melted, they left depressions that became lakes, ponds, potholes, or wetlands. This complex of wetlands intermingled with upland terrain is unique. (Swan Ecosystem Center 2004)

The Swan River Basin, tributary to Flathead Lake and Flathead River in the headwaters of the Columbia River, is approximately 1,286 square miles in area. A wide diversity of lakes, riparian areas, rivers, creeks, alpine and subalpine glacial lakes, and springs feed the basin (Frissell et al. 1995). The Swan and Mission mountains (peak elevations reaching over 9,000 feet), have picturesque canyons that were formed by streams cutting through the Precambrian Belt Series metasedimentary rock (Alt and Hyndman 1986). The Swan River forged from flows through the mountains, winds across the morainal foothills

and through the valleys forming braided delta areas. The river travels over a dense forest floor composed of variously graded porous glacial till and alluvium, averaging 6.2 miles wide at an elevation range of 2,500 to 9,000 feet (Frissell et al.1995). Several large lakes (250 to 2,700 acres) occur along the course of the river and its main tributaries. These large lakes within the valley were carved by large alpine glaciers (Alt and Hyndman 1986). Hundreds of kettle lakes, fens, bogs, and other lacustrine and palustrine wetlands, with many perched aquifers not directly connected to surface streams, lie scattered across the glacial and alluvial valley floors and foothills (Frissell et al. 1995). Forested riverine and palustrine wetlands fringe the river channel and dominate its extensive floodplains and relict paleochannels (an ancient inactive stream channel filled by the sediments of younger overlying rock).

Habitat

Swan Valley is a biologically rich coniferous forest ecosystem located between the Bob Marshall Wilderness and the Mission Mountains wilderness complexes, in the heart of the CoCE. The Swan Valley is unique among Montana's spectacular valleys in that it contains over 4,000 glacially derived wetlands. In fact, approximately 16% of the land in the Swan Valley is considered wetland habitat (lakes, rivers, ponds, marshes, wet meadows, peatlands, and riparian areas). By comparison, the remainder of Montana averages 1% wetland habitat. This fact, along with its diverse forest types, makes the Swan Valley ideal habitat for a diverse array of wildlife. Rare carnivores, threatened trout, and a high diversity of songbirds and waterfowl depend upon the Swan Valley's unique habitats.

The Swan Valley contains fourteen ecologically significant wetlands as identified in the Montana Natural Heritage Program's report; "Ecologically Significant Wetlands in the Flathead, Stillwater, and Swan River Valleys" (Greenlee 1999). There is a higher number of wetland-associated rare plant species in the Swan Valley, including federally threatened water howellia. Water howellia is found exclusively in small, shallow depressional wetlands scattered across the valley floor. The Swan Valley is believed to contain the world's greatest density of water howellia.

The Swan Valley also supports a rich diversity of forest types ranging from high elevation whitebark pine communities to dry ponderosa pine communities on the valley floor, to wet cedar/hemlock and Engelmann spruce/subalpine fir communities on the east side of the valley.

Wildlife

The Swan Valley's moist low elevation forest ecosystem supports a rich diversity of fish and wildlife species (see appendix A). The federal trust species that will benefit from habitat protection include listed and candidate species such as grizzly bear, gray wolf, wolverine, pine marten, and Canada lynx; migratory birds such as harlequin duck, common loon, red-necked grebe, black tern, peregrine falcon, and greater sandhill crane; and native salmonoids such as the westslope cutthroat trout and bull trout.

Amphibians and Reptiles

The Montana Natural Heritage Database (MNHP 2010) documents ten species of amphibians and reptiles on record within the Swan Valley (see appendix A). Many of the species documented include S4 Status Species (apparently secure, though it may be quite rare in parts of its range or is suspected to be declining) such as common garter snake, painted turtle, rubber boa, Columbia spotted frog, long-toed salamander, and Rocky Mountain tailed frog. The northern alligator lizard is listed as an S3 Status Species (species potentially at risk because of limited or declining numbers, range, or habitat, even though it may be abundant in some areas of Montana). The western toad is listed as an S2 Status Species (species at risk because of very limited or potentially declining population numbers, range, or habitat, making it vulnerable to global extinction or extirpation in Montana). The northern leopard frog is listed as an S1 Status Species (at high risk because of extremely limited or rapidly declining population numbers, range, or habitat, making it highly vulnerable to global extinction or extirpation in Montana).

Species not listed in the Natural Heritage Database, but known to occur in the valley include: Pacific treefrog, western skink, eastern racer, gopher snake, terrestrial garter snake, and western rattlesnake (Werner et al. 2004). A total of sixteen species of amphibians and reptiles are known to inhabit the diverse habitats within the Swan Valley.

Fish

Common fish species of the Swan Valley include longnose suckers, largescale suckers, and slimy sculpin. In addition, potential species of concern within the project area include the brook stickleback and pygmy whitefish. Westslope cutthroat trout are currently a species of special concern, and utilize the clear, cold lakes and streams found in the project area.

Swan Valley Conservation Area is within the designated recovery area for the federally threatened bull trout. Critical habitat has been designated for bull trout within the project area.

Mammals

The Montana Natural Heritage Database (MNHP 2010) documents forty-two species of mammals on record within the Swan Valley (see appendix A). Many of the species documented include S2 Status Species such as grizzly bear and Townsend's bat. Other species include S3 Status Species such as wolverine, fisher, hoary bat, fringed myotis, hoary marmot, and Canada lynx, a federally threatened species.

Game species not listed in the Natural Heritage Database, but known to occur in the valley include: moose, elk, white-tailed deer, mule deer, bighorn sheep, and mountain goat (Foresman 2001). Other species documented to occur within the valley include: northern pocket gopher, southern red-backed vole, long-tailed vole, montane vole, heather vole, northern grasshopper mouse, house mouse, Norway rat, northern bog lemming, yellow-bellied marmot, northern flying squirrel, coyote, red fox, striped skunk, long-tailed weasel, mink, badger, raccoon, white-tailed jackrabbit, mountain cottontail, and porcupine (Foresman 2001).

A total of sixty-nine species of mammals are known to inhabit the diverse habitats within the Swan Valley. This vast array of species including large charismatic megafauna such as the grizzly bear, black bear, elk, moose, lynx, mountain lion, and gray wolf to more sublime species such as long-tailed voles and yellow-bellied marmots.

Migratory and Other Birds

Over 160 bird species are known to occur in the watershed with 110 breeding bird species documented.

Wetland complexes in the Swan Valley provide important breeding habitat for twenty species of waterfowl including: mallard, lesser scaup, wood duck, redhead, ring-necked duck, canvasback, American wigeon, Canada goose, green-winged teal, blue-winged teal, cinnamon teal, northern shoveler, gadwall, common goldeneye, Barrow's goldeneye, harlequin duck, bufflehead, hooded merganser, common merganser, red-breasted merganser, and ruddy duck.

The Swan Valley is one of the only watersheds in the western continental United States that supports breeding common loons. Currently, there are a total of six breeding pairs in the Swan Valley (Van, Loon, Summit, Lindbergh, Swan, and Holland lakes). Historical records indicate Shey and Peck lakes as being previously occupied by common loons.

Species of Special Concern

Twenty-seven of the 160 known bird species in the project area are Intermountain West Joint Venture conservation priority species. The U.S. Forest Service lists flammulated owl, bald eagle, black-backed woodpecker, common loon, and peregrine falcon as sensitive species occurring in the valley.

The "Partners In-Flight Draft Bird Conservation Plan for Montana" (Rich et al. 2004) identifies thirty-six species designated as conservation priority occurring in the Swan Valley Conservation Area:

- **4 Level 1 Priority Species:** Common loon, black-backed woodpecker, olive-sided flycatcher, and brown creeper.
- **14 Level 2 Priority Species:** Barrow's goldeneye, hooded merganser, bald eagle, northern goshawk, peregrine falcon, Vaux's swift, calliope hummingbird, Lewis' woodpecker, ruffed grouse, three-toed woodpecker, pileated woodpecker, willow flycatcher, Hammond's flycatcher, Cordilleran flycatcher, winter wren, red-naped sapsucker, and red-eyed vireo.
- **28 Level 3 Priority Species:** Northern harrier, sharp-shinned hawk, blue grouse, killdeer, western screech-owl, treat tray owl, rufous hummingbird, downy woodpecker, Clark's nutcracker, chestnut-backed chickadee, American dipper, golden-crowned kinglet, Townsend's solitaire, varied thrush, gray catbird, Cassin's vireo, warbling vireo, Townsend's warbler, American redstart, MacGillivray's warbler, chipping sparrow, song sparrow, red-winged blackbird, yellow-headed blackbird, Brewer's blackbird, Cassin's finch, and red crossbill.

The U.S. Fish and Wildlife Service Division of Migratory Bird Management report "Birds of

Cornell Lab of Ornithology/USFWS

Willow flycatcher.

Conservation Concern 2008" (USFWS 2008a) has identified the following twenty-two species of concern occurring in the Swan Valley Conservation Area:

- **7 Species on Bird Conservation Region 10 (Northern Rockies) List:** Bald eagle, peregrine falcon, calliope hummingbird, Lewis' woodpecker, olive-sided flycatcher, and willow flycatcher.
- **8 Species on USFWS Region 6 (Mountain-Prairie Region) List:** American bittern, bald eagle, golden eagle, peregrine falcon, prairie falcon, Lewis' woodpecker, willow flycatcher, and Cassin's finch.
- **7 Species on National List:** Bald eagle, peregrine falcon, calliope hummingbird, rufous hummingbird, Lewis' woodpecker, olive-sided flycatcher, and willow flycatcher.

Federally listed animal species found in the Swan Valley include the threatened bull trout, grizzly bear, and Canada lynx. The gray wolf, which was delisted from endangered status in March 2009 and relisted as endangered in August 2010, is found in the Swan Valley. The bald eagle, which was delisted from threatened status in July 2007 and the fisher, which is a candidate for listing, also occurs in the watershed (USFWS 2009b). The relationship of the watershed to Endangered Species Act planning units is as follows:

Bull Trout

For listing purposes, the Service divided the range of bull trout into distinct population segments, and twenty-seven recovery units (RUs). Swan River valley falls within the Clark Fork River RU, and the Upper Clark Fork Recovery Subunit. Within this subunit, the watershed has been identified as a core recovery area (USFWS 2002).

Within the Clark Fork Recovery Area (all of western Montana, except the Kootenai River, plus parts of Idaho), the Swan Lake bull trout population has remained strong. The Swan Lake population is stable because fish can access about 150 miles of high quality tributary spawning habitat. Most bull trout populations are declining, because of habitat degradation, but many of the Swan Valley's tributary streams are in good to excellent condition.

Continuous identifiable female bull trout nesting areas (redd) count history dating to 1982 is available for bull trout for four index streams in the Swan River watershed (MFWP 2009). Bull trout may have reached equilibrium in this system at a population level of about 2,000 adults and the current trend appears stable. The total redd count was 598 in 2008, representing roughly 2,000 adults in the spawning run. Given that some adults do not spawn every year, the total adult population is likely over 2,500 adult bull trout.

Dave Menke/USFWS

Lewis' woodpecker.

Grizzly Bear

Grizzly bears are currently listed as a federally threatened species in the Northern Continental Divide Ecosystem (NCDE) (USFWS 2009b). The NCDE is an area of the northern Rocky Mountains, contained within the CoCE, with large blocks of protected public land containing some of the most pristine and intact environments found in the contiguous United States. The NCDE supports the largest population (765 individuals) of grizzly bears in the lower forty-eight states. Despite dramatic losses of habitat throughout North America, the grizzly has maintained a presence in Montana and bears occur in many portions of the Swan Valley watershed. The watershed is the southern boundary for the NCDE grizzly bear recovery zone. The Grizzly Bear Recovery Plan (USFWS 1993) includes all of Swan River watershed as suitable or occupied habitat.

The U.S. Geological Survey (USGS) Northern Divide Grizzly Bear Project, designed to estimate population size and distribution, confirmed the presence of forty-five grizzly bears in the Swan Valley in 2003 and 2004. The USGS estimates that at least sixty-one bears are present during all or part of the year in the watershed (USGS 2004). This area has been identified as an important habitat link for grizzlies moving between the Glacier National Park/ Bob Marshall Wilderness Complex and the Mission Mountains Wilderness. The Swan Valley is also believed to be the key linkage zone to the large and important Bitterroot/Selway Wilderness Complex to the southwest. As such, it provides an avenue of connectivity between the Canadian Rockies and the Central Rockies of Idaho and Wyoming. Maintaining habitat connectivity is critical to sustaining grizzly bear life histories and maintaining sustainable subpopulations within the southern portion of the NCDE.

Numerous studies by the Service and MFWP have documented significant grizzly bear use on private lands in the Swan Valley. Lakes, ponds, fens, and spring-fed creeks, common in portions of the valley floor, provide excellent bear habitat. Additionally, the vegetation found along certain reaches of the Swan

River and its tributaries provide bears with cover, food, and natural movement corridors.

Northern Rocky Mountain Gray Wolf

The Northern Rocky Mountain Gray Wolf Recovery Plan established three recovery zones in Montana, Idaho, and Wyoming. The Swan River watershed is in the Northwest Montana Recovery Area (USFWS 1987). In March 2009, the Service removed the gray wolf from the list of threatened and endangered species in the western Great Lakes; the northern Rocky Mountain states of Idaho and Montana; and parts of Washington, Oregon, and Utah (USFWS 2009b). As of 2009, MFWP has confirmed the presence of three resident wolf packs and estimates that at least fifteen to twenty-five wolves inhabit the watershed. In August 2010, the gray wolf was relisted as an endangered species.

Canada Lynx

The Canada Lynx Recovery Outline categorized lynx habitat and occurrence within the contiguous United States as (1) core areas, (2) secondary areas, and (3) peripheral areas. Core areas are defined as the areas with the strongest long-term evidence of the persistence of lynx populations. Core areas have both persistent verified records of lynx occurrence over time and recent evidence of reproduction. Six core areas and one "provisional" core area are identified within the contiguous United States (Nordstrom et al. 2005).

The Swan River watershed is located within the Northwestern Montana/Northeastern Idaho Core Area (Ruediger et al. 2000). The watershed is a stronghold for the Canada lynx in the northern Rocky Mountains. Based on ongoing research in the Blackfoot Valley and Swan Valley watersheds, lynx populations appear stable, although low reproductive rates are characteristic of this population. Since 1998, over eighty lynx have been monitored in this area, providing information on habitat use, reproduction, mortality, and movement. This research has shown that the Swan and Blackfoot watershed contains some of the best remaining habitat for lynx in the continental United States. Large, intact spruce/subalpine fir forests above 4,000 feet in this area provide high quality habitat for lynx and for snowshoe hares, the primary lynx food source. Regenerating forest stands are often used as foraging habitat during the snow-free months while older, multi-storied stands serve as denning and year-round habitat (Blackfoot Challenge 2005).

Conservation easements protecting critical forested/wetland habitats including ponderosa pine, cedar/hemlock, and Engelmann spruce/subalpine fir communities on the valley floor, as well as riparian areas, will have long lasting benefits for the species listed above.

See appendix B for a list of federally listed animals present in the project area.

CULTURAL RESOURCES

The Service has a trust responsibility to American Indian tribes that includes protection of the tribal sovereignty and preservation of tribal culture and other trust resources.

Currently, the Service does not propose any project, activity, or program that will result in changes in the character of, or adversely affect, any historical cultural resource or archaeological site. When such undertakings are considered, the Service takes all necessary steps to comply with section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The Service pursues compliance with section 110 of the NHPA to survey, inventory, and evaluate cultural resources.

SOCIOECONOMIC ENVIRONMENT

This section discusses landownership, property taxes, and public use and wildlife-dependent recreational activities.

LANDOWNERSHIP

The Swan Valley watershed ownership consists of 286,798 acres of federal (U.S. Forest Service and Service) lands, 45,676 acres of state (Montana Department of Natural Resources and Conservation) land, 66,066 acres owned by The Nature Conservancy, 12,154 acres owned by PCTC, and 51,808 acres of private lands. Most of the middle and high elevation forested lands within the watershed is administered by the U.S. Forest Service. Private lands are concentrated in the low elevation portions of the watershed (see figure 3, map of landownership).

In 2008, The Nature Conservancy and the Trust for Public Lands entered into an agreement with PCTC to purchase, in a three-phase project, a total of 312,500 acres in western Montana known as the Montana Legacy Project. A total of 65,630 acres are located on the valley floor in the Swan Valley. The USFS is scheduled to purchase 44,821 acres in 2010 and 20,809 acres will be purchased by the Montana DNRC in 2011. The Montana Legacy Project is the single largest conservation effort in the country to date. This transfer of ownership from corporate lands to public lands will have major benefits in reducing the checkerboard pattern of ownership within the valley and in protecting critical fish and wildlife habitat.

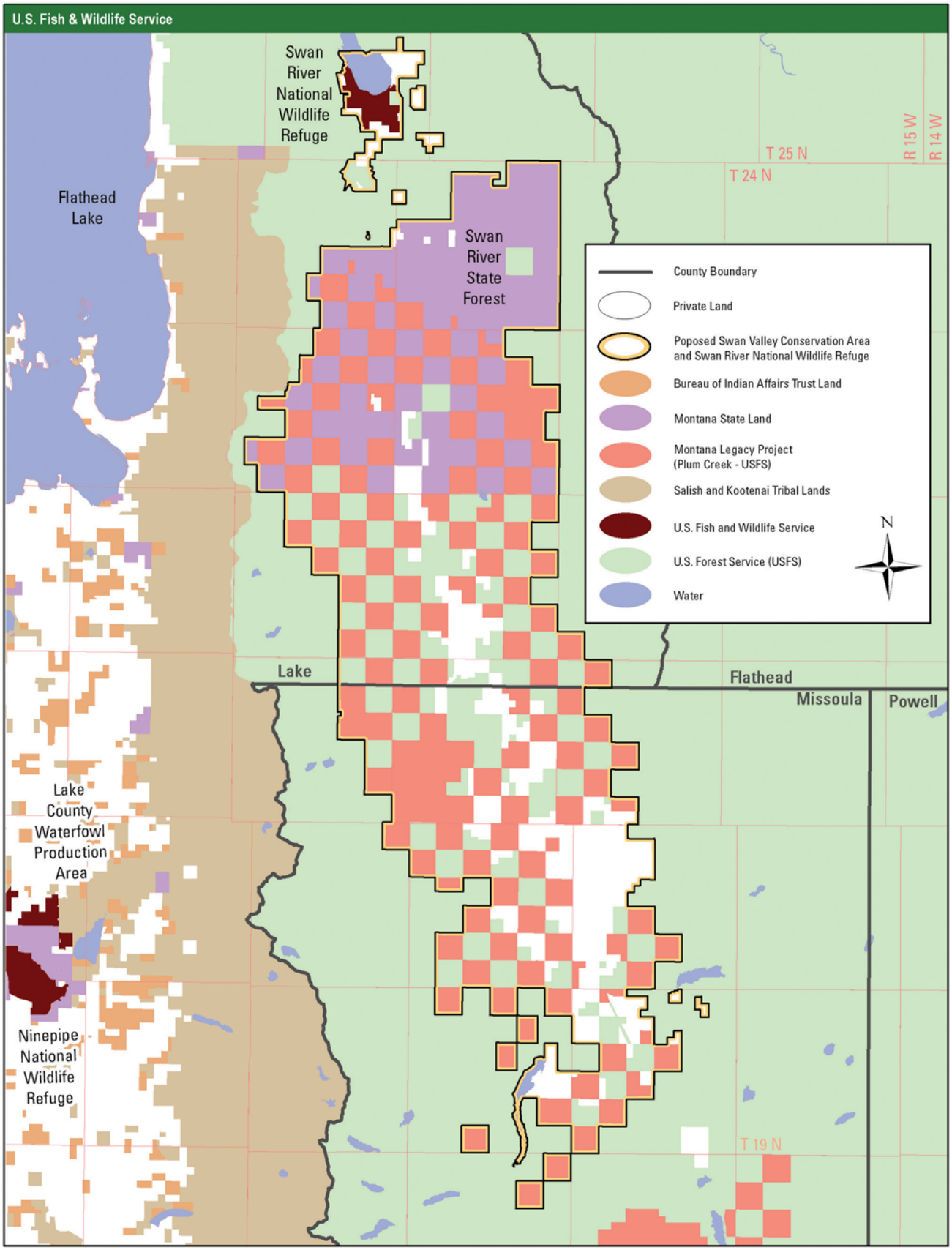

Figure 3. Landownership in the Swan Valley Conservation Area.

Timber Resources

The Swan Valley lies at the border of the maritime and continental climates and thus has a mixture of Pacific Coastal Forest and inter-mountain tree species (see tables 1–3). Western red cedar, grand fir, western hemlock, and western larch grow in the valleys, along with more familiar species such as Douglas-fir, Englemann spruce, ponderosa pine, and lodgepole pine.

Forest types range from wet riparian forest to drier ponderosa pine/snowberry communities. Cottonwood, aspen, and birch commonly surround the wetland and riparian areas or in other wetter upland sites. Cottonwood and spruce also dominate much of the Swan River's floodplain. Most of the lower elevation uplands consist of mixed conifers dominated by Douglas-fir, western larch, ponderosa pine, and lodgepole pine. Other common species include grand fir and subalpine fir. Stand types at most of the low elevation lands range from regenerated seedling and pole stands, to mixed-aged stands of mature timber. For the lower elevations, typical forest rotations for saw timber range from 50–75 years.

Forest types on the higher lands consist primarily of subalpine fir and lodgepole pine, with components of western larch, Douglas-fir, whitebark pine, and other species. Given the higher and colder conditions, typical forest rotations for saw timber range from 60–80 years.

Property Tax

Currently, landowners pay property taxes on their private lands to the counties. The Swan Valley CA is mainly a conservation easement project; the land does not change hands and, therefore, the property taxes paid by the landowner to the county are not affected. Minimal changes to the tax base are anticipated. Fee-title lands purchased will be subject to the Revenue Sharing Act (16 USC 715s) which requires revenue sharing payments to counties for the purchase of the land. The amount is based on the greatest of (1) ¾ of 1 percent of the market value, (2) 25 percent of the net receipts, or (3) 75 cents per acre.

Public Use and Wildlife dependent Recreational Activities

Hunting and fishing are very popular throughout the project area. Hunting for a variety of wildlife includes waterfowl, upland game birds, pronghorn, elk, moose, deer, black bear, bighorn sheep, mountain lion, and furbearers. Private landowners often give permission for hunting and fishing on their land. Under a conservation easement, control of public access to land will remain under the discretion of the landowner. Any parcels acquired in fee title adjacent to Swan River NWR, will be administered and managed as part of the refuge, where a variety of wildlife-dependent recreational opportunities are available to the public.

Table 1. Historical seral stages within the Swan sub-basin.

	Terrestrial Community Group		
	Subalpine	*Montane*	*Lower Montane*
Seral Stage	*Approx. Historic Range*	*Approx. Historic Range*	*Approx. Historic Range*
Late Seral (dominant trees >15" dbh*)	8-10%	20-22%	2-6%
Mid Seral (dominant trees 5"–15" dbh*)	7-10%	31-37%	2-5%
Early Seral (dominant trees <5" dbh*)	2-3%	7-18%	0-1%

*dbh is tree diameter at breast height.
(Source: Swan Lake Ranger District 1998)

Table 2. 1998 distribution of seral stages for the Swan sub-basin.

	Terrestrial Community Group		
	Subalpine	*Montane*	*Lower Montane*
Seral Stage	*Approx. 1998 Range*	*Approx. 1998 Range*	*Approx. 1998 Range*
Late Seral (dominant trees >15" dbh*)	2%	10%	1%
Mid Seral (dominant trees 5"–15" dbh*)	11%	52%	1%
Early Seral (dominant trees <5" dbh*)	2%	11%	1%

**dbh is tree diameter at breast height.*
(Source: Swan Lake Ranger District 1998)

Table 3. Forest habitat types of the Swan sub-basin, 1998.

Warm Dry	Ponderosa Pine and Douglas-fir/grass types
	Most Douglas-fir and dry grand fir types
	Douglas-fir/twinflower and most grand fir types
Warm Moist	Grand fir/queencup beadlilly types
	Western redcedar and western hemlock/queencup beadlilly and menziesia types
Cool Moist	Subalpine fir/queencup beadlilly and menziesia types
	Subalpine fir/beargrass and dwarf huckleberry types
Riparian	Western redcedar/devil's club types
	Subalpine fir/bluejoint types
Cold	Subalpine fir/grouse whortleberry and woodrush types
	Whitebark pine and alpine larch types

(Source: Swan Lake Ranger District 1998)