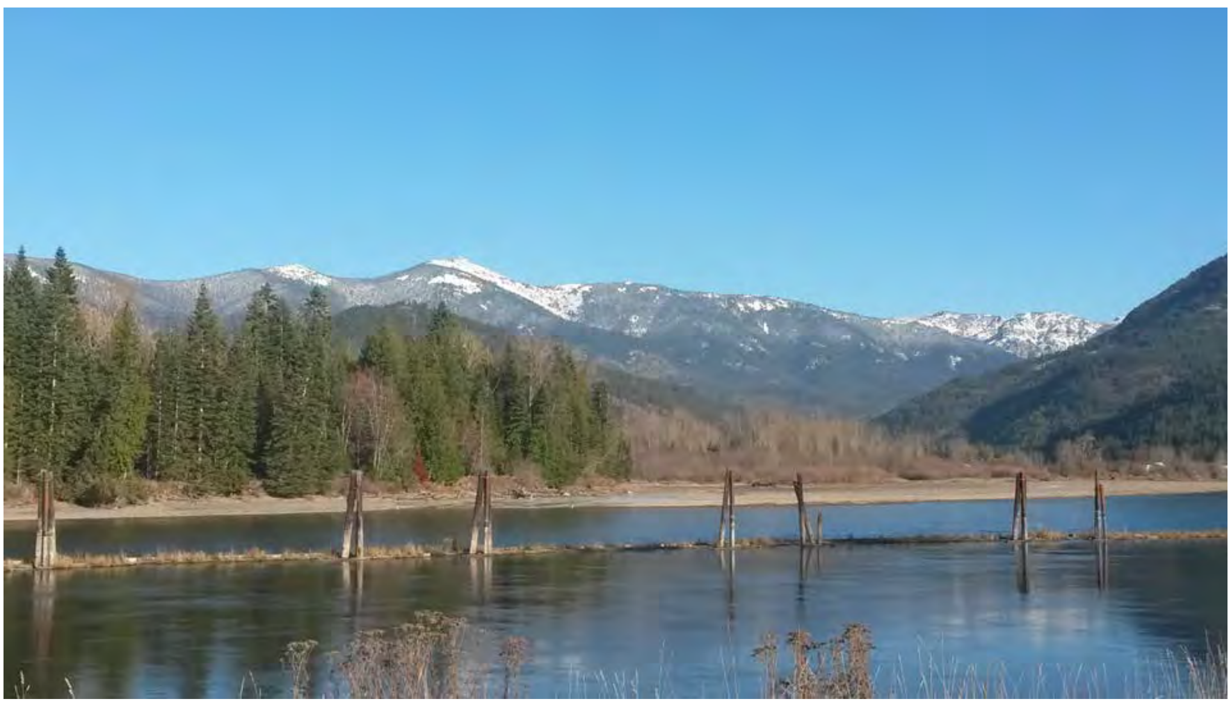
2. Flathead Valley Section

Section Description

The Flathead Valley, part of the Canadian Rocky Mountains Ecoregion, spans portions of Idaho, Montana, and British Columbia. The Idaho portion of the Flathead Valley comprises the northeast portion of the Idaho Panhandle from the Purcell Mountains in the north, south through the Cabinet Mountains to the Clark Fork River at its southern boundary (Fig. 2.1, 2.2). The Flathead Valley ranges from 541 to 2,141 m (1,775 to 7,024 ft) in elevation. This region is cool (average annual temperature ranges from 3.1 to 7.7 °C [37.6 to 45.9 °F]; PRISM 30-year annual temperature) and temperate and receives an annual precipitation of 61 to 234 cm (24 to 92 in; PRISM 30-year annual precipitation) (PRISM Climate Group 2012). Precipitation occurs mostly as snow from November to March, although rain on snow is common at lower elevations.



Cabinet Mountains © 2014 Britta Petersen

A sparsely-populated mountainous region, the Flathead Valley's largest communities are Moyie Springs, Hope, and Clark Fork, each having fewer than 1,000 full-time residents. Most activity in the region originates from larger neighboring towns such as Bonners Ferry or Sandpoint. Hunting, fishing, hiking, boating, wildlife watching, and snow activities are popular in the Flathead Valley; recreation in the area continues to grow. Timber harvest and limited agriculture (e.g., nonirrigated cropland and pasture) occur within the section.

The Cabinet and Purcell mountains are the prominent landforms within the Flathead Valley. The Idaho Purcell range, the southernmost extent of the Purcell Mountains, runs 300 mi north into southeastern British Columbia. The Cabinet Mountains straddle the Idaho and Montana border with the bulk of the range in Montana. Like the neighboring Selkirk Mountains, the Purcell and Cabinet ranges in Idaho have been carved by glaciation and have a maritime-influenced climate that produces warm wet winters and cool moist summers. However, the Purcell and Cabinet ranges also periodically receive blasts of cold arctic air that characterizes a continental climate pattern. Like the Selkirk range, the topography and climate produce environmental conditions favorable to dense, diverse forests.

Dominant forest cover types within the section include mountain hemlock (*Tsuga mertensiana* [Bong.] Carrière) and Engelmann spruce (*Picea engelmannii* Parry ex Engelm.)–subalpine fir (*Abies lasiocarpa* [Hook.] Nutt.) at higher elevations; Douglas-fir (*Pseudotsuga menziesii* [Mirb.] Franco), western larch (*Larix occidentalis* Nutt.), grand fir (*Abies grandis* [Douglas ex D. Don] Lindl.), western white pine (*Pinus monticola* Douglas ex D. Don), and lodgepole pine (*Pinus contorta* Douglas ex Loudon) at middle elevations; western redcedar (*Thuja plicata* Donn ex D. Don)–western hemlock (*Tsuga heterophylla* [Raf.] Sarg.) in moister sites at lower elevations; and ponderosa pine (*Pinus ponderosa* Lawson & C. Lawson) on drier sites at lower elevations. A diverse assemblage of wildlife species inhabit these forests, including Fisher (*Pekania pennanti*), Grizzly Bear (*Ursus arctos*), Moose (*Alces americanus*), and Black Swift (*Cypseloides niger*).

The Flathead Valley is intersected by several major rivers. The Moyie River divides the Purcell range in the very northeast corner of the state before flowing into the Kootenai River at Moyie Springs. The Kootenai River separates the Purcell range from both the Cabinet Mountains to the south and the Selkirk range to the west. Patches of intact riparian habitat along the Kootenai River and its low elevation tributaries serve as important wildlife corridors between the 3 mountain ranges. Bounded to the south by the Clark Fork River and Lake Pend Oreille, the Cabinet Mountains sustain large streams such as Lightning Creek and Grouse Creek, which feed into the Clark Fork and Pack rivers, respectively, and ultimately into Lake Pend Oreille. Fen peatlands, wet meadows, and depressional wetlands, including western redcedar–Engelmann spruce swamps, occur in mountain valleys around the numerous lakes and ponds, and glacial carved basins. Steep drainages, lined by alder (*Alnus* Mill.) and other riparian shrubs deliver water into the Kootenai, Upper Pack, Upper Priest, and Priest rivers. Species such as Western Toad (*Anaxyrus boreas*), White Sturgeon (*Acipenser transmontanus*), Burbot (*Lota lota*), Harlequin Duck (*Histrionicus histrionicus*), and Black Swift depend upon the rivers, streams, wetlands, and ponds found within the Cabinet and Purcell mountain ranges.

Conservation efforts in this section should strive to maximize the collaborative opportunities in Washington, British Columbia, and Montana given their close proximity and ecological connections.

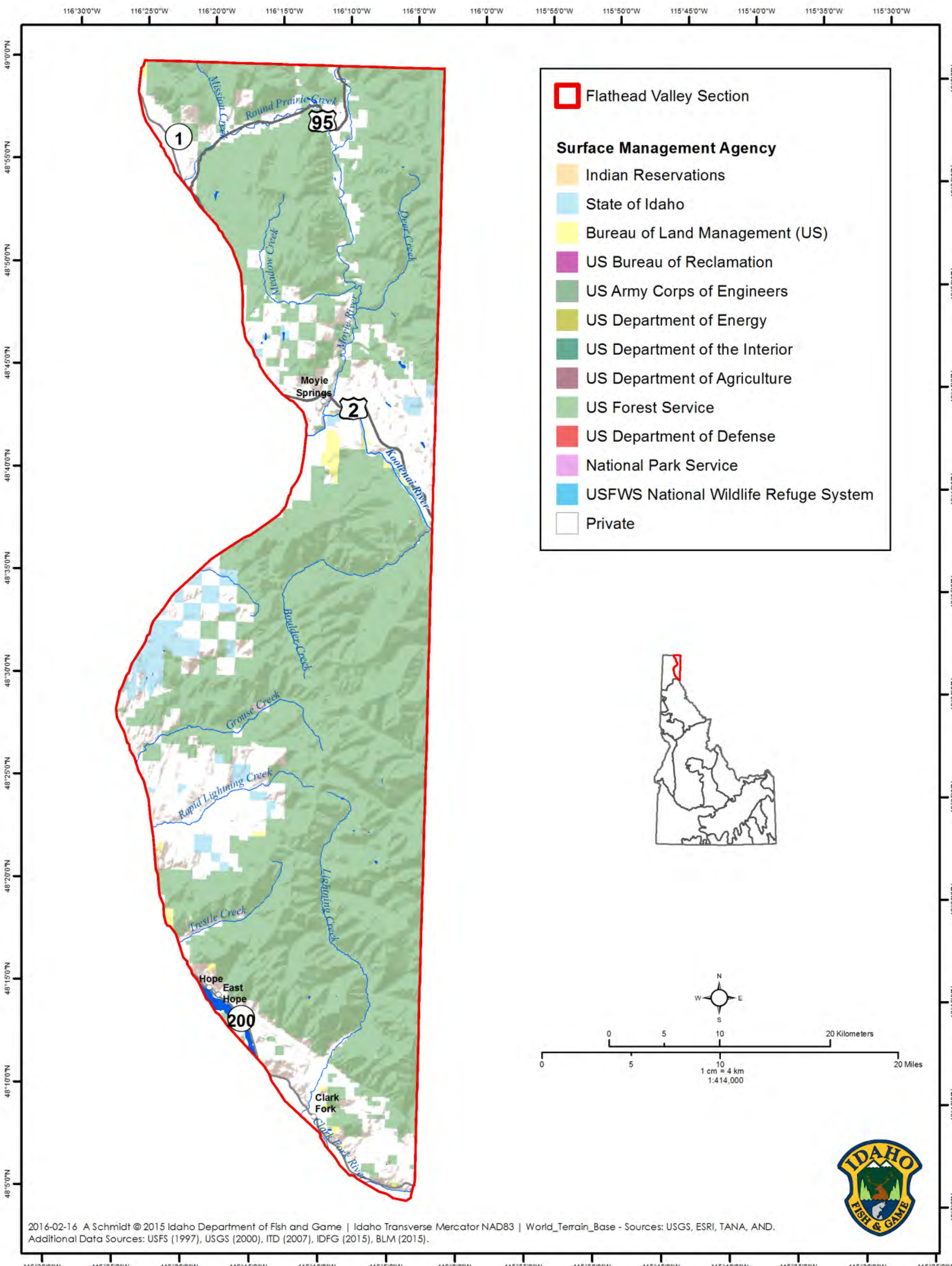


Fig. 2.1 Map of Flathead Valley surface management

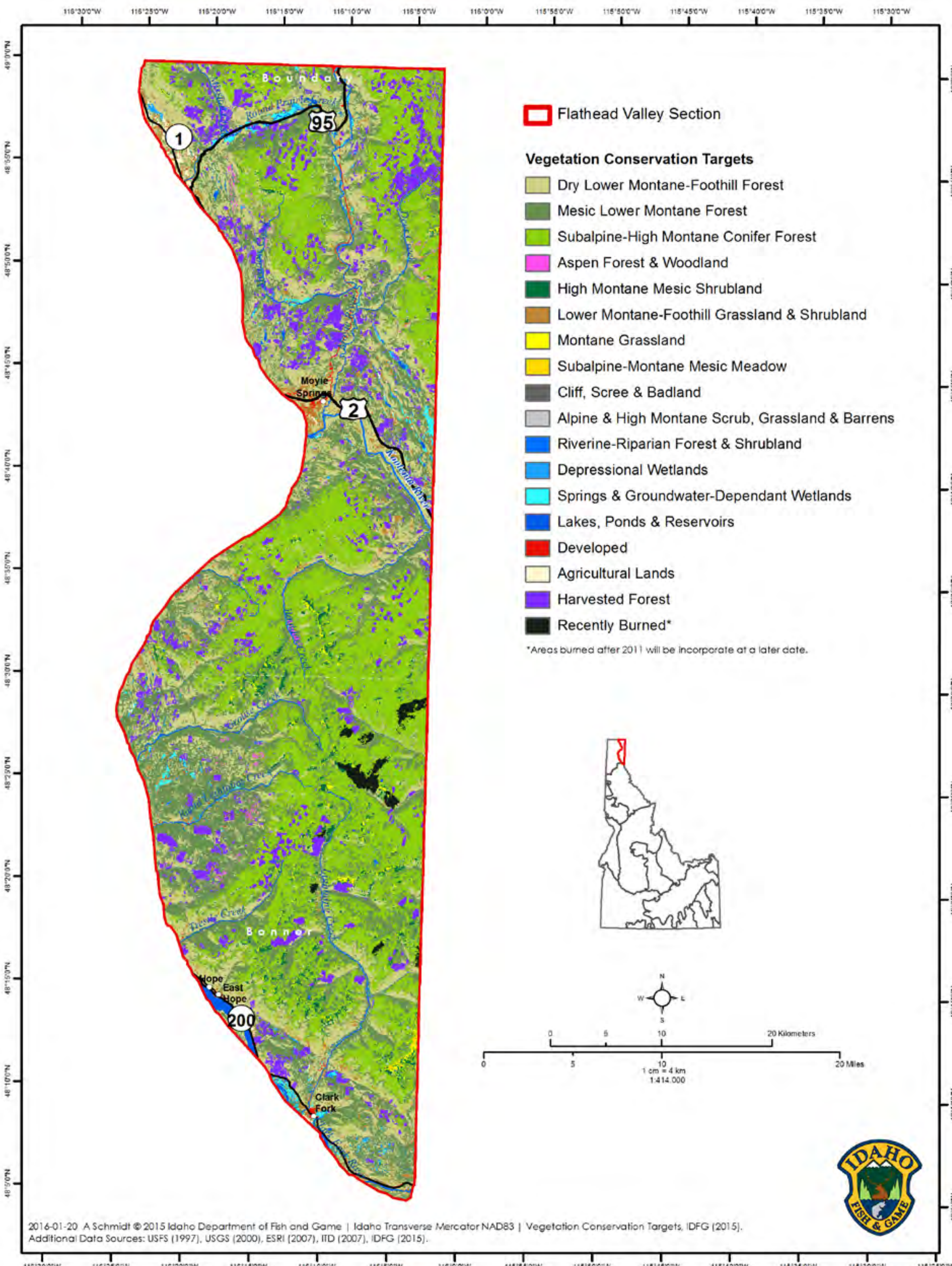


Fig. 2.2 Map of Flathead Valley vegetation conservation targets

Conservation Targets in the Flathead Valley

We selected 6 habitat targets (3 upland, 3 aquatic) that represent the major ecosystems in the Flathead Valley as shown in Table 2.1. Each of these systems provides habitat for key species of greatest conservation need (SGCN), i.e., "nested targets" (Table 2.2). All SGCN management programs in the Flathead Valley have a nexus with habitat management programs. Conservation of the habitat targets listed below should conserve most of the nested species within them. However, we determined that 6 taxonomic groups (Pond-Breeding Amphibians, Lake-Nesting Birds, Low-Density Forest Carnivores, Grizzly Bear, Ground-Dwelling Invertebrates, and Pollinators) have special conservation needs and thus are presented as explicit species targets as shown in Table 2.1.

Table 2.1 At-a-glance table of conservation targets in the Flathead Valley

Target	Target description	Target viability	Nested targets (SGCN)	
Dry Lower Montane–Foothill Forest	Northern Rocky Mts. Douglas-fir and ponderosa pine woodland and savannah systems at lower elevation forests in the Purcell and Cabinet mountains.	*Fair.* Substantial encroachment by other habitat types due to lack of natural fire cycle.	*Tier 3*	Common Nighthawk Olive-sided Flycatcher Townsend's Big-eared Bat Little Brown Myotis
Mesic Lower Montane Forest	Commonly referred to as a "cedar–hemlock" forest but also includes lodgepole pine and aspen–mixed conifer forest at lower elevations in the Purcell and Cabinet mountains.	*Fair.* Altered fire regimes, fragmented by forest practices, and loss of western white pine.	*Tier 2* *Tier 3*	Silver-haired Bat Olive-sided Flycatcher Townsend's Big-eared Bat Little Brown Myotis
Subalpine–High Montane Conifer Forest	Engelmann spruce–subalpine fir forest and whitebark pine woodlands at higher elevations in the Cabinet and Purcell mountains.	*Poor* to *Fair*. Subject to altered fire regimes and forest insects and disease, and climate change; reduction in whitebark pine woodlands.	*Tier 1* *Tier 3*	Wolverine Grizzly Bear Clark's Nutcracker Mountain Goat Hoary Marmot
Riverine–Riparian Forest & Shrubland	Rivers and streams, including aquatic habitats and their associated terrestrial riparian habitats. Includes Moyie River, Kootenai River, Lightning Creek, Grouse Creek, and tributaries.	*Fair*. Riverine systems in the lower valleys impacted by hydroelectric operations and invasive species. Higher elevation headwaters threatened by climate change.	*Tier 1* *Tier 2* *Tier 3*	White Sturgeon (Kootenai River DPS) Burbot Harlequin Duck Black Swift A Mayfly (*Ephemerella alleni*) Western Ridged Mussel
Depressional Wetlands	Surface-water-fed systems ranging from infrequent to semipermanent or	*Fair*. Lower elevations experiencing altered hydrologic regimes	*Tier 2*	Western Toad Northern Leopard Frog Silver-haired Bat

Target	Target description	Target viability	Nested targets (SGCN)	
	permanently flooded. Typically pond sized or smaller. Includes vernal pools, and most marshes.	and invasive species and disease. Higher elevations threatened by climate change.	*Tier 3*	Townsend's Big-eared Bat Little Brown Myotis
Springs & Groundwater-Dependent Wetlands	Groundwater-dependent slope wetlands including peatland fens, wet meadows, and headwater springs.	*Good.* Primary threat is altered hydrology caused by climate change.	*Tier 2* *Tier 3*	Western Toad Northern Bog Lemming
Pond-Breeding Amphibians	Amphibians that primarily breed in lentic wetlands.	*Poor.* Northern Leopard Frogs extirpated from section and face invasive species and disease threats.	*Tier 2*	Western Toad Northern Leopard Frog
Lake-Nesting Birds	Common Loon is listed as an Intermountain West Waterbird Conservation Plan priority species due to habitat concerns and impacts from recreational boating.	*Poor.* Only 1 nest has been detected in the Flathead Valley and was abandoned before hatch.	*Tier 2*	Common Loon
Low-Density Forest Carnivores	Wide-ranging mammalian mesocarnivores.	*Poor* to *Good.* No resident Wolverine known to occur. Fisher population appears stable.	*Tier 1* *Tier 2*	Wolverine Fisher
Grizzly Bear	Grizzly Bear is listed as threatened under ESA. Population within the Cabinet–Yaak ecosystem in northeastern Idaho is thought to be <15 bears.	*Fair.* Population appears to be stable to increasing.	*Tier 1*	Grizzly Bear
Ground-Dwelling Invertebrates	Assemblage of terrestrial invertebrates found on forest and other habitat floors.	*Good.* Habitat and threat data deficient. Many species are data deficient with respect to taxonomy and distribution.	*Tier 1* *Tier 3*	Magnum Mantleslug Kingston Oregonian Pale Jumping-slug Coeur d'Alene Oregonian Western Flat-whorl Shiny Tightcoil Spur-throated Grasshopper (*Melanoplus*) Species Group
Pollinators	Species delivering pollination ecosystem service.	*Fair.* Many pollinators declining rangewide.	*Tier 1* *Tier 3*	Morrison's Bumble Bee Western Bumble Bee Suckley's Cuckoo Bumble Bee Monarch

Table 2.2 Species of greatest conservation need (SGCN) and associated conservation targets in the Flathead Valley

Taxon	Conservation Targets: Dry Lower Montane–Foothill Forest	Mesic Lower Montane Forest	Subalpine–High Montane Conifer Forest	Riverine–Riparian Forest & Shrubland	Depressional Wetlands	Springs & Groundwater-Dependent Wetlands	Pond-Breeding Amphibians	Lake-Nesting Birds	Low-Density Forest Carnivores	Grizzly Bear	Ground-Dwelling Invertebrates	Pollinators
RAY-FINNED FISHES												
White Sturgeon (*Acipenser transmontanus* ([Kootenai River DPS])[1]				X								
Burbot (*Lota lota*)[1]				X								
AMPHIBIANS												
Western Toad (*Anaxyrus boreas*)[2]					X	X	X					
Northern Leopard Frog (*Lithobates pipiens*)[2]					X		X					
BIRDS												
Harlequin Duck (*Histrionicus histrionicus*)[2]				X								
Common Loon (*Gavia immer*)[2]								X				
Common Nighthawk (*Chordeiles minor*)[3]	X											
Black Swift (*Cypseloides niger*)[2]				X								
Olive-sided Flycatcher (*Contopus cooperi*)[3]	X	X										
Clark's Nutcracker (*Nucifraga columbiana*)[3]			X									
MAMMALS												
Townsend's Big-eared Bat (*Corynorhinus townsendii*)[3]	X											
Silver-haired Bat (*Lasionycteris noctivagans*)[2]	X	X										
Little Brown Myotis (*Myotis lucifugus*)[3]	X	X										
Wolverine (*Gulo gulo*)[1]			X						X			
Fisher (*Pekania pennanti*)[2]	X	X							X			
Grizzly Bear (*Ursus arctos*)[1]			X							X		
Mountain Goat (*Oreamnos americanus*)[3]			X									
Northern Bog Lemming (*Synaptomys borealis*)[3]												
Hoary Marmot (*Marmota caligata*)[3]			X									
TERRESTRIAL GASTROPODS												
Western Ridged Mussel (*Gonidea angulata*)[3]				X								
Pale Jumping-slug (*Hemphillia camelus*)[3]											X	
Magnum Mantleslug (*Magnipelta mycophaga*)[1]											X	
Coeur d'Alene Oregonian (*Cryptomastix mullani*)[3]											X	
Kingston Oregonian (*Cryptomastix sanburni*)[1]											X	

Taxon	Dry Lower Montane–Foothill Forest	Mesic Lower Montane Forest	Subalpine–High Montane Conifer Forest	Riverine–Riparian Forest & Shrubland	Depressional Wetlands	Springs & Groundwater-Dependent Wetlands	Pond-Breeding Amphibians	Lake-Nesting Birds	Low-Density Forest Carnivores	Grizzly Bear	Ground-Dwelling Invertebrates	Pollinators
	Conservation Targets											
Western Flat-whorl (*Planogyra clappi*)[3]											X	
Shiny Tightcoil (*Pristiloma wascoense*)[3]											X	
INSECTS												
A Mayfly (*Ephemerella alleni*)[2]				X								
Morrison's Bumble Bee (*Bombus morrisoni*)[1]												X
Western Bumble Bee (*Bombus occidentalis*)[1]												X
Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)[1]												X
Monarch (*Danaus plexippus*)[3]												X
Spur-throated Grasshopper (*Melanoplus*) Species Group[3]											X	

Target: Dry Lower Montane–Foothill Forest

In the Flathead Valley, nearly 20% of the land cover is classified as Dry Lower Montane–Foothill Forest. Although this habitat group can be located at all aspects and slopes, it is predominantly found on the warm–dry, south–southwest, and moderately steep slopes within the Cabinet and Purcell Mountains (Cooper et al. 1991). It also extends into the valleys that surround the mountain ranges. Elevations typically range from 538 to 1,920 m (1,765 to 6,300 ft) in the Flathead Valley, although there are some occurrences at higher elevations and also in valley bottoms. Douglas-fir is a codominant climax species with ponderosa pine (*Pinus ponderosa* Lawson & C. Lawson) in mixed or single species stands (Rocchio 2011). Species such as lodgepole pine, western larch, and grand fir only occasionally occur and are found in the wetter microsites (Cooper et al. 1991). Ponderosa pine woodlands are dominant on the driest sites where fires are frequent and of low severity (Cooper et al. 1991). Historically, fires were thought to be frequent and moderate to low severity, which maintained open stands of fire-resistant species. Low fire frequency has resulted in a dominance of shrubs and tree species such as grand fir and Douglas-fir in the understory. Currently, the habitat group contains a variable understory physiognomy ranging from shrub-dominated and dense with mallow ninebark (*Physocarpus malvaceus* [Greene] Kuntze) and oceanspray (*Holodiscus discolor* [Pursh] Maxim.), to bunchgrass-dominated and open, with Idaho fescue (*Festuca idahoensis* Elmer) and bluebunch wheatgrass (*Pseudoroegneria spicata* [Pursh] Á. Löve).

Target Viability

Fair. There has been substantial encroachment in the habitat type by more shade-tolerant overstory species due to the lack of normal fire intervals. This has resulted in increased risk of stand eliminating, severe wildfires.

Prioritized Threats and Strategies for Dry Lower Montane–Foothill Forest

Very High Threats for Dry Lower Montane–Foothill Forest in the Flathead Valley

Altered fire regimes (fire suppression & stand-replacing wildfires)

Historically, moderate- and low-severity fires burned, on average, every 10–30 years. Fires maintained the open understory and predominance of shade-intolerant species such as ponderosa pine in the overstory (Smith and Fischer 1997). However, decades of fire suppression activities, aided by a cool period in the Pacific decadal oscillation, prevented most moderate fires and stand-replacing fires and enabled shade-intolerant species to establish and heavy fuel loads to build (USFS 2013). This resulted in the encroachment of shade-tolerant species and a decrease in fire-tolerant species, alongside increased vertical stand structure, canopy closure, vertical fuel ladders, fire intensity and severity, and insect and disease epidemics (Keane et al. 2002). Fire management over the past 15 years has attempted to simulate and reestablish the vegetative composition of regular fire patterns, but is hampered by policy that does not allow natural fires to burn. Additionally, human development has increased the Wildland-Urban Interface (WUI) and often prevents the use of fire as a management tool.

Objective	Strategy	Action(s)	Target SGCNs
Restore a natural fire interval that promotes historical forest conditions (USFS 2013).	Use prescribed and natural fires to maintain desired conditions (USFS 2015).	Reduce fuels through mechanical removal or controlled burns on lands within the WUI (USFS 2015). Leave fire-killed trees standing as wildlife habitat if they pose no safety hazard (USFS 2015). Remove perceived barriers to allow more prescribed natural fire on state and private forest lands. Promote/facilitate the use of prescribed fire as a habitat restoration tool, on both public and private lands where appropriate. Increase membership and participation in Idaho Forest Stewardship Programs, American Tree Farm System, and NRCS.	Common Nighthawk Olive-sided Flycatcher Townsend's Big-eared Bat Little Brown Myotis
Simulate natural	Design and	Actively remove shade-tolerant	Common Nighthawk

Objective	Strategy	Action(s)	Target SGCNs
fire regimes.	implement silvicultural prescriptions that simulate natural disturbance regimes.	species. Increase markets to pay for ecological forest management activities, e.g., explore markets to thin trees so that they can ward off fire and insect threats.	Olive-sided Flycatcher Townsend's Big-eared Bat Little Brown Myotis

High Threats for Dry Lower Montane–Foothill Forest in the Flathead Valley

Invasive & noxious weeds

In the drier habitat types such as the Dry Lower Montane–Foothill Forest, invasive and noxious weeds have migrated from disturbed areas such as roads, railroads, and utility right-of-ways to undisturbed habitats. Across the Idaho Panhandle National Forest (IPNF), nearly 82% of the warm/dry habitat type is at high risk for invasion by nonnative weeds (USFS 2013). Additionally, surveys done in the Flathead Valley found 2 sites in the Dry Lower Montane–Foothill Forest type (n=39) had spotted knapweed (*Centaurea maculosa*) or tansy (*Tanacetum vulgare*) present (Lucid et al. 2016). Species such as spotted knapweed, diffuse knapweed (*Centaurea diffusa*), yellow star-thistle (*Centaurea solstitialis* L.), leafy spurge (*Euphorbia esula*), and Dyer's woad (*Isatis tinctoria*) are particularly invasive within the IPNF and have dispersed into undisturbed areas and displaced native species over large areas (USFS 2013).

Objective	Strategy	Action(s)	Target SGCNs
Identify and eradicate any potential invasive species prior to establishment (USFS 2013).	Coordinate invasive and noxious weed monitoring and treatment across agencies. Implement the Idaho Invasive Species Council Strategic Plan.	Train agency staff to document presence/absence of noxious weeds during field/site visits. Develop a noxious weed database for all lands across Idaho. Use Global Positioning Systems (GPS), remote sensing, and Geographic Information Systems (GIS) technologies to efficiently collect, store, retrieve, analyze, and display noxious weed information (ISDA 1999). Implement actions described in the 2012–2016 Idaho Invasive Species Strategic Plan (ISDA 2012).	Common Nighthawk Olive-sided Flycatcher Townsend's Big-eared Bat Little Brown Myotis
Contain and reduce widespread weeds in areas that are already infested (USFS 2013).	Coordinate invasive and noxious weed monitoring and treatment across agencies. Identify and treat dispersal vectors to prevent further spread of invasive and noxious weeds. Restore treated	Treat weeds in high impact areas and along roads (USFS 2013). Treat equipment used during timber harvest or fire suppression activities to be "weed-free" (USFS 2013, IDL 2015). Revegetate treatment areas with native species and monitor restoration (KTOI 2009). Implement actions described in the 2012–2016 Idaho Invasive Species	Common Nighthawk Olive-sided Flycatcher Townsend's Big-eared Bat Little Brown Myotis

Objective	Strategy	Action(s)	Target SGCNs
	areas with native species.	Strategic Plan (ISDA 2012). Incorporate noxious weeds into a multitaxa monitoring program.	

Species designation, planning & monitoring

Multiple species identified as SGCN are declining as a result of unknown causes. The priority for many of these species in the coming years is to identify the root causes and develop a strategy to address them.

Objective	Strategy	Action(s)	Target SGCNs
Determine causes of decline for nightjar species in Idaho.	Work with WWG PIF and the Pacific Flyway Nongame Technical Committee (PFNTC) to assess causes(s) of decline.	Assist WWG PIF with adjusting current Nightjar Survey Network protocols to collect data that will inform potential cause(s) of decline, including assessments of insect prey populations and their habitats. Work with WWG PIF and PFNTC to identify opportunities for research on contaminant impacts.	Common Nighthawk
Determine causes of decline in Olive-sided Flycatcher.	Determine relative importance of known and suspected threats to Olive-sided Flycatcher, its prey, and its habitats (see Canada's recovery plan, Appendix B; Environment Canada 2015*b*). Investigate factors affecting reproductive output, survival, and fidelity to breeding sites.	Promote cooperation and collaboration with Western Working Group Partners in Flight (WWG PIF) to fill knowledge gaps and to mitigate threats.	Olive-sided Flycatcher

Target: Mesic Lower Montane Forest

In the Flathead Valley, 42% of the land cover is classified as Mesic Lower Montane Forest. Within the Cabinet and Purcell mountains, this habitat group is located on the slopes, valley bottoms, ravines, canyons and benches with high soil moisture and cool summer temperatures. Elevation ranges from 538 to 1,900 m, Commonly referred to as a cedar–hemlock forest, western hemlock and western redcedar are common in the overstory with grand fir, Douglas-fir, Engelmann spruce, western white pine, and western larch as frequent associates within the canopy (Cooper et al. 1991). Lodgepole pine also forms woodlands within this habitat group in areas that are drier and cooler (Crawford 2011). The understory is composed of short and tall shrubs, perennial graminoids, forbs, ferns, and mosses, often at levels of in-stand diversity approaching or equal to the diversity found in some eastern deciduous forests (Reid 2013). In depressional areas with a high water table, devilsclub (*Oplopanax horridus* [Sm.] Miq.) is regularly encountered. Forests within this habitat group are often centuries old with fire only passing through every 500 years. The fire interval is long with stand-replacing fires occurring 150–500 years and moderate fires 50–100 years (Crawford 2011). Fire suppression has created mixed-aged stands that form fuel ladders, which make the forest more susceptible to high-intensity and stand-replacing fires. Disturbance in the form of insect, disease, windfall and ice generally produce canopy openings for the regeneration of forest types. Western white pine was once a predominant canopy species within this habitat group; however, logging, fire and the introduction of the white pine blister rust (*Cronartium ribicola*) has decimated this species to below 90% of its historical prevalence (Cooper et al. 1991).

Target Viability

Fair. Altered fire regime, fragmentation due to forest management, and loss of western white pine have negatively affected the viability of this habitat.

Prioritized Threats and Strategies for Mesic Lower Montane Forest

Very High Threats for Mesic Lower Montane Forest in the Flathead Valley

Altered fire regimes (fire suppression & stand-replacing wildfires)

Historically, fires were as variable as the tree species in the forest stand, with an average mean interval of 200-250 years but some stands burning with a mean of 18 years (Smith and Fischer 1997). Stands with fire intervals shorter than 140 years were often dominated by western white pine, western larch, Douglas-fir and grand fir (Smith and Fischer 1997). However, decades of fire suppression activities, aided by a cool period in the Pacific decadal oscillation, were effective in preventing most moderate-severity and enabled shade and fire-intolerant species to establish and heavy fuel loads to build (USFS 2013). This resulted in a decrease in fire-tolerant species, alongside increases in vertical stand structure, canopy closure, vertical fuel ladders, fire intensity and severity, and insect and disease epidemics (Keane et al. 2002). Fire management over the past 15 years has attempted to simulate and reestablish the vegetative composition of regular fire patterns but is hampered by policy that does not allow natural fires to burn. Additionally, human population increases have increased the WUI that often prevents the use of fire as a management tool.

Objective	Strategy	Action(s)	Target SGCNs
Restore a natural fire interval that promotes historical forest conditions (USFS 2013 [monitoring and evaluation program]).	Use prescribed and natural fires to maintain desired conditions (USFS 2015).	Reduce fuels through mechanical removal or controlled burns on lands within the WUI (USFS 2015). Leave fire-killed trees standing as wildlife habitat if they pose no safety hazard (USFS 2015). Remove perceived barriers to allow more prescribed natural fire on state and private forest lands. Where appropriate, promote/facilitate the use of	Common Nighthawk Olive-sided Flycatcher Townsend's Big-eared Bat Silver-haired Bat Little Brown Myotis

Objective	Strategy	Action(s)	Target SGCNs
		prescribed fire as a habitat restoration tool, on both public and private lands. Increase membership and participation in Idaho Forest Stewardship Programs, American Tree Farm System, and NRCS.	
Simulate natural fire regimes.	Design and implement silvicultural prescriptions that simulate natural disturbance regimes.	Actively remove shade-tolerant species. Increase markets to pay for ecological forest management activities, e.g., explore markets to thin trees so that they can ward off fire and insect threats.	Common Nighthawk Olive-sided Flycatcher Townsend's Big-eared Bat Little Brown Myotis

High Threats for Mesic Lower Montane Forest in the Flathead Valley

Forest insect pests & disease epidemics

When at endemic population levels, native forest insects and disease play a critical role in maintaining the health of the forest ecosystem by removing individuals or small groups weakened by drought, injury or fire (USFS 2010). However, when large stands of trees are stressed by prolonged drought and/or dense stocking, outbreaks of forest insects and disease can impact tree growth, forest composition and cause extensive tree mortality (USFS 2010). Severe outbreaks of forest insects and pathogens can even cause the conversion of forest to shrublands or grasslands. The impact on forest composition from large-scale outbreaks is predicted to increase as climate change decreases precipitation and increases temperatures (USFS 2010). Currently, 15–20% of lodgepole pine stands in the IPNF are at high risk for attack by the Mountain Pine Beetle (*Dendroctonus ponderosae*), whereas 25–30% of Douglas-fir stands are at high risk for attack by the Douglas-fir Beetle (*Dendroctonus pseudotsugae*), with each beetle predicted to kill 80% and 60%, respectively, of the basal area in high-risk stands (USFS 2010). The introduction of the nonnative white pine blister rust has reduced western white pine to 5% of its original distribution across the interior Pacific Northwest. This caused changes in forest composition from a relatively stable, fire- and disease-tolerant western white pine forests to early seral forests dominated by the fire and disease-intolerant species such as Douglas-fir, grand fir, and subalpine fir (USFS 2013).

Objective	Strategy	Action(s)	Target SGCNs
Reduce risk of stand-replacing pine beetle or root fungus infestations.	Use integrated pest management strategies. Increase diversity of stand ages, size classes, and tree species (KPNZ Climate 2010). Promote	Use pheromones to protect stands (beetle whispering) (Kegley and Gibson 2004). Target removal of diseased and appropriate size class trees. Remove debris that attracts pine beetles. Cut out infected trees (mistletoe) (IDL	Common Nighthawk Olive-sided Flycatcher Townsend's Big-eared Bat Silver-haired Bat Little Brown Myotis

Objective	Strategy	Action(s)	Target SGCNs
	responsible firewood harvest/transport.	2015).	
Increase number of rust-resistant western white pine in the ecosystem (USFS 2013).	Continue to develop genetics of disease-resistant trees. Plant rust-resistant western white pine during restoration efforts.	Conserve and protect any old-growth western white pine on the landscape. Determine if rust-resistant (Neuenschwander et al. 1999). Plant rust-resistant trees in openings that are also *Ribes* free (Neuenschwander et al. 1999). Monitor and remove any signs of the rust on planted trees (USFS 2013).	Common Nighthawk Olive-sided Flycatcher Townsend's Big-eared Bat Little Brown Myotis

Species designation, planning & monitoring

Multiple species identified as SGCN are declining as a result of unknown causes. The priority for these species in the coming years is to identify and address the root causes.

Objective	Strategy	Action(s)	Target SGCNs
Determine causes of decline for nightjar species in Idaho.	Work with Western Working Group Partners in Flight (WWG PIF) and the Pacific Flyway Nongame Technical Committee (PFNTC) to assess causes(s) of decline.	Assist WWG PIF with adjusting current Nightjar Survey Network protocols to collect data that will inform potential cause(s) of decline, including assessments of insect prey populations and their habitats. Work with WWG PIF and PFNTC to identify opportunities for research on contaminant impacts.	Common Nighthawk
Determine causes of decline in Olive-sided Flycatcher.	Determine relative importance of known and suspected threats to Olive-sided Flycatcher, its prey, and its habitats (see Canada's recovery plan, Appendix B; Environment Canada 2015*b*). Investigate factors affecting reproductive output, survival, and fidelity to breeding sites.	Promote cooperation and collaboration with Western Working Group Partners in Flight (WWG PIF) to fill knowledge gaps and to mitigate threats.	Olive-sided Flycatcher
Assess future changes to species status.	Monitor population status.	Incorporate species into multitaxa monitoring program.	Common Nighthawk Olive-sided Flycatcher

Target: Subalpine–High Montane Conifer Forest

At the higher elevations within the Cabinet and Purcell mountains, the Subalpine–High Montane Conifer Forest is the prevalent habitat. The Subalpine–High Montane Conifer Forest is predominantly found at elevations between 900 to 2,133 m in the Cabinet and Purcell mountains. Engelmann spruce, lodgepole pine, and subalpine fir characterize the overstory. Douglas-fir, western larch, and western white pine are intermixed at lower elevations on warmer sites. Thinleaf huckleberry (*Vaccinium membranaceum* Douglas ex Torr.) and grouse whortleberry (*Vaccinium scoparium* Leiberg ex Coville) are common species in the understory and provide important wildlife forage (Smith and Fischer 1997). Whitebark pine replaces lodgepole pine in higher elevations and becomes dominant as the elevation and climate severity increases. At timberline, the transition zone between continuous forest and the limited alpine, only Engelmann spruce, subalpine fir, subalpine larch (*Larix lyallii* Parl.) and whitebark pine persist. The timberline zone is impacted by drying winds, heavy snow accumulation and subsurface rockiness that lead to stunted growth and a clustered distribution (Cooper et al. 1991, Smith and Fischer 1997). At timberline, whitebark pine is commonly the species that colonizes sites and provides habitat for less hardy species. Whitebark pine also provides food resources for numerous wildlife species such as Grizzly Bear, Clark's Nutcracker (*Nucifraga columbiana*), and other small mammals and birds in the form of large high caloric-value seeds (Fryer 2002). It is a long-lived and slow-growing species that is often overtopped by faster-growing, shade-tolerant species such as subalpine fir and Engelmann spruce. Fire and other disturbances such as ice, windthrow, rockslides and landslides help to maintain whitebark pine as the climax species within the upper elevations of the subalpine. However, fire suppression, invasion of white pine blister rust, and Mountain Pine Beetle have all contributed to the recent precipitous declines of whitebark pine across its range (Smith and Fischer 1997, Fryer 2002).

Scotchman's Peak Mountain Goats © 2012 Britta Petersen

Target Viability

Poor to Fair. Subject to altered fire regimes, forest insects, disease, and climate change resulting in a reduction in whitebark pine woodlands.

Prioritized Threats and Strategies for Subalpine–High Montane Conifer Forest

Very High Threats for Subalpine–High Montane Conifer Forest in the Flathead Valley

Altered fire regimes (fire suppression & stand-replacing wildfires)

Historically, mixed severity fires burned between 60-300 years with nonlethal burns in the understory of whitebark pine stands at an average interval of 56 years (Smith and Fischer 1997). However, tree regeneration in the upper elevation is dependent on soil moisture, temperature, and whitebark pine seed cache and may be slow in some areas. For example, the lack of whitebark pine regeneration after the Sundance Fire (a 56,000-acre wildfire that started on Sundance Mountain in Bonner County in 1967) is thought to be due to a lack of seed cache after mature trees were killed by Mountain Pine Beetle or infected with blister rust (Smith and Fischer 1997). As with the other habitat types, decades of fire suppression activities, aided by a cool period in the Pacific decadal oscillation, were effective in preventing most moderate-severity and stand-replacing fires that enable shade-intolerant species to establish at the expense of fire-tolerant species (USFS 2013). This also resulted in increased vertical stand structure, canopy closure, vertical fuel ladders, biomass, fire intensity and severity, and insect and disease epidemics (Keane et al. 2002). Fire management over the past 15 years has attempted to simulate and reestablish the vegetative composition of regular fire patterns, but is hampered by policy that does not allow natural fires to burn.

Objective	Strategy	Action(s)	Target SGCNs
Restore a natural fire interval that promotes historical forest conditions (USFS 2013 [monitoring and evaluation program]).	Use prescribed and natural fires to maintain desired conditions (USFS 2015).	Reduce fuels through mechanical removal (if minimal impact to subalpine soils is ensured) or controlled burns on lands (USFS 2015). Leave fire-killed trees standing as wildlife habitat if they pose no safety hazard (USFS 2015). Remove perceived barriers to allow more prescribed natural fire on state and private forest lands. Where appropriate, promote/facilitate the use of prescribed fire as a habitat restoration tool, on both public and private lands.	Clark's Nutcracker Wolverine Grizzly Bear Mountain Goat Hoary Marmot
Simulate natural fire regimes.	Design and implement silvicultural prescriptions that simulate natural disturbance regimes.	Actively remove shade-tolerant species where impacts to fragile subalpine soils can be minimized.	Clark's Nutcracker Wolverine Grizzly Bear Mountain Goat Hoary Marmot

High Threats for Subalpine–High Montane Conifer Forest in the Flathead Valley

Climate change

Global climate change is expected to have widespread effects on temperature and precipitation regimes worldwide and mean annual global air temperatures are predicted to rise within the 2 to 4.5 °C range by the end of the century (Meehl et al. 2007). Conditions in the Pacific Northwest are expected to trend toward hotter drier summers and warmer wetter winters (Karl et al. 2009). Snowpack depth and duration are predicted to decrease, reducing summer soil moisture, impacting species dependent on mesic conditions. Climate change is expected to further alter fire extent and severity while allowing for larger-scale and more persistent Mountain Pine Beetle infestations. As a result, whitebark pine is expected to decrease in extent.

Delineating temperature refugium for cool water or air temperature dependent species is a relatively new idea (Isaak et al. 2015). Recent microclimate monitoring work in the Idaho Panhandle identified within the Flathead Valley pockets of annually cool air (Lucid et al. 2016). Continued monitoring of microclimate along with co-occurrence of cool air dependent organisms will provide bedrock information for research determining best management practices for cool air associated species.

Objective	Strategy	Action(s)	Target SGCNs
Climate monitoring.	Monitor climate variables and species co-occurrence over time.	Develop climate monitoring program using a variety of microclimate variables along with co-occurrence of associated SGCN.	Clark's Nutcracker Wolverine Grizzly Bear Mountain Goat Hoary Marmot Magnum Mantleslug Spur-throated Grasshopper (*Melanoplus*) Species Group
Implement other state management plans.	Implement *Management Plan for the Conservation of Wolverines in Idaho 2014–2019* (IDFG 2014).	Implement specific actions outlined in climate section of *Management Plan for the Conservation of Wolverines in Idaho 2014–2019* (IDFG 2014).	Wolverine

Forest insect pests & disease

When at endemic population levels, native forest insects and disease play a critical role in maintaining the health of the forest ecosystem by removing individuals or small groups weakened by drought, injury or fire (USFS 2010). However, when large stands of trees are stressed by prolonged drought and/or dense stocking, outbreaks of forest insects and disease can impact tree growth, forest composition and cause extensive tree mortality (USFS 2010). Severe outbreaks of forest insects and pathogens can even cause the conversion of forest to shrublands or grasslands. The impact on forest composition from large-scale outbreaks is predicted to increase as climate change decreases precipitation and increases temperatures (USFS 2010). The introduction of the nonnative white pine blister rust has reduced whitebark pine by nearly a quarter to a half in subalpine ecosystems in Northern Idaho and Montana (USFS 2010) by reducing the ability of the species to produce cones. In the Selkirk Mountains, an average of 70% of live whitebark pine is already infected by blister rust (Kegley and Gibson 2004). Additionally, Mountain Pine Beetle often kills whitebark pine that is rust resistant (Schwandt 2006). As a keystone species within subalpine ecosystems, the loss of whitebark pine is predicted to negatively impact forest composition, wildlife communities, soil structure, and alpine hydrology (Schwandt 2006).

Objective	Strategy	Action(s)	Target SGCNs
Reduce risk of stand-replacing pine beetle infestations.	Use integrative pest management strategies. Increase diversity of stand ages, size classes, and tree species (KPNZ Climate 2010). Promote responsible firewood harvest/transport.	Use pheromones to protect stands (beetle whispering) (Kegley and Gibson 2004). Target removal of diseased and appropriate size class trees. Remove debris that attracts pine beetles.	Clark's Nutcracker Grizzly Bear
Increase number of rust-resistant whitebark pine in the ecosystem (USFS 2013).	Continue developing genetics of disease resistant trees for restoration efforts.	Monitor rust and beetle levels in live whitebark pine. Collect rust-resistant seed for testing and restoration (Schwandt 2006). Plant rust-resistant whitebark pine. Monitor and remove any signs of the rust on planted trees (USFS 2013).	Clark's Nutcracker Grizzly Bear
Assess changes in insect numbers over time.	Monitor insect populations and disease.	Incorporate insect and disease threats into a multitaxa monitoring program.	Clark's Nutcracker Grizzly Bear

Target: Riverine–Riparian Forest & Shrubland

In the Flathead Valley, the riverine ecosystem includes all rivers, streams, and smaller order waterways (1–3 order; Strahler stream order) and their associated floodplain and riparian vegetation. Major rivers (those designated as 4+ order in Strahler stream order) in the Flathead Valley includes the Moyie, Kootenai, and Clark Fork rivers. Low elevation riparian habitat along rivers and higher-order streams is dominated by black cottonwood (*Populus balsamifera* L. subsp. *trichocarpa* [Torr. & A. Gray ex Hook.] Brayshaw), western redcedar, or shrubs such as thinleaf alder (*Alnus incana* [L.] Moench), redosier dogwood (*Cornus sericea* L.), and rose spirea (*Spiraea douglasii* Hook.). Higher elevation lower-order streams are lined by Engelmann spruce, subalpine fir, Sitka alder (*Alnus viridis* [Chaix] DC. subsp. *sinuata* [Regel] Á. Löve & D. Löve), and other shrubs.

Moyie River, 2013 IDFG

The Kootenai River is the only drainage in Idaho with a native Burbot (ling) population and is home to a genetically distinct population of White Sturgeon. Fisheries for both of these species were closed for conservation purposes in 1984 in response to major declines in these populations. Alteration of the natural flow regime, substrate, temperature, and nutrients are believed to be the primary reasons for the lack of successful reproduction of sturgeon and burbot (IDFG 2008). Other rivers and streams in the region support numerous fisheries and provide host habitat for several mussel species. High-velocity mountain streams provide important nesting habitat for Harlequin Ducks. In the Flathead Valley, there are numerous waterfalls documented for the region. Waterfalls support aquatic organisms uniquely adapted to extremely high water velocities and plants and animals that require cool, constantly moist rocky habitats. Waterfalls also provide important nesting habitat for Black Swift. There are at least 3 Black Swift nesting colonies detected in the Flathead Valley (Miller et al. 2013).

Target Viability

Fair. Kootenai River is subjected to sometimes very high, to more often very low, levels of nutrients that influence aquatic invertebrate populations and, thus, fish populations. Changes to seasonal flooding impacts important habitat for fish and aquatic invertebrates, as well as maintenance and reproduction of riparian vegetation. The Clark Fork is also influenced by changed hydrographic regime due to upstream dam operations.

Prioritized Threats and Strategies for Riverine–Riparian Forest & Shrubland

Very High Threats for Riverine–Riparian Forest & Shrubland in the Flathead Valley

Aquatic invasive invertebrate & plant species

Aquatic invasive species are often the hardest to detect and eradicate. Across the nation, Zebra (*Dreissena polymorpha*)and Quagga Mussel (*Dreissena bugensis*) have disrupted food chains, competed with native species and cost millions of dollars of damage to municipalities by choking water intake pipes and other facilities (Pimentel et al. 2004). Although Zebra and Quagga Mussels have not yet been detected in the waterbodies of the Flathead Valley, several boat check stations in the region have found the mussels on boats traveling through the area (State of Idaho Agriculture, accessed on Nov 2, 2015). It is a goal of the state that neither mussel is ever established in any of the Idaho water ways. Other aquatic invasive species such as Eurasian watermilfoil (*Myriophyllum spicatum* L.), flowering rush (*Butomus umbellatus* L.), and curly pondweed (*Potamogeton crispus* L.) have been detected and established in the Kootenai and Clark Fork rivers (T. Woolf, pers. comm.). These species easily spread through the movement of boats between the recreational lakes, rivers, and streams in the region. For most of the aquatic plant species, only a fragment of the vegetated matter is necessary to establish the species in a new area. Aquatic invasive plant species, particularly Eurasian watermilfoil, often form dense mats that prevent the establishment of native aquatic plant species and degrade wildlife and fish habitat (ID Invasive Species Counsel and ID State Dept. of Agriculture 2007).

Objective	Strategy	Action(s)	Target SGCNs
Prevent the establishment of aquatic invasive species in noninvaded riverine systems.	Increase monitoring of riverine systems. Increase monitoring and treatment of dispersal vectors for invasive species.	Determine which riverine systems are not impacted by aquatic invasive species. Establish a monitoring schedule to visit noninvaded but high-risk riverine systems. Educate the public about the dangers associated with spreading an aquatic invasive species (ID Invasive Species Counsel and ISDA 2007). Maintain boat-check stations for the regular inspection for aquatic invasive species.	White Sturgeon (Kootenai River DPS) Burbot Western Ridged Mussel A Mayfly (*Ephemerella alleni*)
Contain and eradicate populations of Eurasian watermilfoil, flowering rush, and curlyleaf pondweed.	Implement actions indicated in the *2008 Statewide Strategic Plan for Eurasian Watermilfoil in Idaho* (Idaho Invasive Species Counsel and Idaho State Dept. of Agriculture 2007).	Survey invaded waters to determine extent of nonnative aquatic species distribution. Develop treatment priorities based on waterbody use. Develop strategies for eradication based on waterbody hydrology and use. Regularly monitor and re-treat areas after initial treatment (ID Invasive Species Counsel and ISDA 2007).	White Sturgeon (Kootenai River DPS) Burbot Western Ridged Mussel A Mayfly (*Ephemerella alleni*)

Invasive & noxious weeds

Invasive species often prevent the establishment of native species by forming dense monocultures and in some instances even change the soil chemistry or hydrology of the invaded area (Ricciardi et al. 2013). Riparian surveys conducted at several of the creeks within the Pend Oreille WMA found an overall increase in noxious weed coverage at several of the properties, up to 28% coverage (Cousins and Antonelli 2008). Rapid Lightning Creek was identified as having the highest cover of noxious weeds of all of the riparian areas (Cousins and Antonelli 2008). Reed canarygrass (*Phalaris arundinacea* L) was also dominant at many of the survey sites with 16% coverage of interior riparian areas (Cousins and Antonelli 2008). Reed canarygrass is a native species in the lower 48 states, but is considered a noxious weed in Washington and highly invasive elsewhere. It is thought to have hybridized with a nonnative invasive reed canarygrass (Lavergne and Molofsky 2007). Reed canarygrass forms dense monocultures that decreases plant diversity and degrades wildlife habitat.

Objective	Strategy	Action(s)	Target SGCNs
Identify and eradicate any potential invasive species prior to establishment (USFS 2013).	Coordinate invasive and noxious weed monitoring and treatment across agencies. Implement the Idaho Invasive Species Council Strategic Plan.	Train agency staff to document presence/absence of noxious weeds during field/site visits. Develop a noxious weed database for all lands across Idaho. Use GPS, remote sensing, and GIS technologies to efficiently collect, store, retrieve, analyze, and display noxious weed information (ISDA 1999). Implement actions described in *The Idaho Invasive Species Strategic Plan* 2012–2016 (ISDA 2012).	White Sturgeon (Kootenai River DPS) Burbot
Contain and reduce widespread weeds in areas that are already infested (USFS 2013).	Coordinate invasive and noxious weed monitoring and treatment across agencies. Identify and treat dispersal vectors to prevent further spread of invasive and noxious weeds. Restore treated areas with native species.	Treat weeds in high impact areas and along roads (USFS 2013). Treat equipment used during timber harvest or fire suppression activities to be "weed-free" (USFS 2013, IDL 2015). Revegetate treatment areas with native species and monitor restoration (KTOI 2009). Implement actions described in *The Idaho Invasive Species Strategic Plan* 2012–2016 (ISDA 2012).	White Sturgeon (Kootenai River DPS) Burbot

Species designation, planning & monitoring

In addition to conservation actions to address specific threats, several SGCN associated with Riverine–Riparian Forest & Shrubland require inventory and monitoring to assess its current status and distribution in the Flathead Valley.

Harlequin Duck

In Idaho, Harlequin Ducks are uncommon and occupy high-quality streams from the Canadian border south to the Selway River and in the Greater Yellowstone Ecosystem. Breeding streams are relatively undisturbed with high-elevation gradients, cold, clear, and swift water, rocky substrates, and forested bank vegetation. Harlequin Ducks use different stream reaches over the course of the breeding season depending on environmental conditions (e.g., timing and magnitude of stream runoff, food abundance) and reproductive chronology (i.e., prenesting, nesting, early and late brood-rearing), but remain closely tied to rivers and streams for food, security, and escape cover from predators. There are an estimated 50 pairs of Harlequin Ducks that breed in Idaho (IDFG unpublished data). From 1996 to 2007, there was no statistically significant change in the statewide population. However, there were possible declines on several rivers including the Moyie River, Granite Creek (Lake Pend Oreille drainage), and the St. Joe River. However, distribution and abundance of Harlequin Duck has not been assessed since 2007.

Objective	Strategy	Action(s)	Target SGCNs
Improve understanding of Harlequin Duck distribution, abundance, and population status.	Design studies that improve understanding of the factors that influence Harlequin Duck stream occupancy, survival, and reproduction.	Mark and track individuals on the breeding grounds to better understand habitat use, survival rates, causes and timing of mortality, patterns and timing of movements, linkages between breeding, molting, and wintering areas, and return rates. Seek partnerships with coastal states and provinces to study wintering ecology and habitat use. Investigate how human disturbance, changes in forest management, and stream flow characteristics (severity, timing, and frequency of peak and low stream flows) affect behavior, occupancy, reproductive success, and survival on breeding streams.	Harlequin Duck
Establish baseline population metrics for Harlequin Duck.	Implement a coordinated Harlequin Duck monitoring program.	Develop partnerships, funding, and capacity to conduct breeding surveys statewide on a regular basis following the protocol established in the Harlequin Duck Conservation Assessment and Strategy for the US Rocky Mountains (Cassirer et al. 1996) or other appropriate techniques. Where local declines are documented, expand surveys upstream of historically-occupied stream reaches. Coordinate surveys with MT, WY, OR, BC, and AB to facilitate a northwest regional population assessment. Incorporate Harlequin Duck surveys into riverine multitaxa monitoring programs.	Harlequin Duck Western Ridged Mussel A Mayfly (*Ephemerella alleni*)

Black Swift

Little is known about breeding Black Swifts in Idaho. Black Swifts are not generally detected during breeding bird surveys. Additionally, their cryptic nesting sites and small colony sizes are obstacles when determining distribution or abundance in the state. In 2013, a survey of breeding locations for Black Swift found evidence of nesting at 5 of the 16 waterfalls visited and roosting swifts at two of the waterfalls (Miller et al. 2013).

Objective	Strategy	Action(s)	Target SGCNs
Determine current breeding locations of Black Swifts.	Conduct a comprehensive survey of potential nesting locations.	Work with partners, including Intermountain Bird Observatory, to develop and implement a systematic survey.	Black Swift

Restoration tool: American Beaver

American Beaver populations currently exist at lower than historic levels across the western US, including northern Idaho. This results in a host of ecological consequences such as stream incision, lowered water table, and reduced extent and wetness of riparian habitat. Beaver restoration efforts have been shown to be an effective tool to restoring habitat and ecological function to riverine systems.

Objective	Strategy	Action(s)	Target SGCNs
Restore hydrologic function and restore riparian habitats.	Use American Beaver to accomplish hydrologic and habitat restoration.	Determine past and current status of American Beaver populations. Determine feasibility of using American Beaver in restoration efforts. Implement actions delineated by above analysis.	Western Ridged Mussel A Mayfly (*Ephemerella alleni*)

Target: Depressional Wetlands

Depressional Wetlands are any wetlands found in a topographic basin. Depressional Wetlands include vernal pools, old oxbows, disconnected river meanders, and constructed wetlands. In the Flathead Valley, this includes many of the wetlands found within the Pend Oreille WMA and within the floodplains of the Moyie River, Round Prairie Creek, Kootenai River and Clark Fork River. Other

Cabinet Mountains © 2014 Shannon Ehlers

Depressional Wetlands are found within the Purcell and Cabinet mountains wherever the elevational lines close and surface waters accumulate (e.g., glacial carved kettles). Small depressional ponds (less than 2 m deep) commonly occur within the Purcell and Cabinet mountains and provide breeding habitat for Western Toads. Depressional Wetlands often support emergent marsh that are composed of broad-leaf cattail (*Typha latifolia* L.), bulrush

(*Schoenoplectus* [Rchb.] Palla spp.), sedges (*Carex* spp. L.), or other emergent and aquatic species such as Rocky Mountain pond-lily (*Nuphar lutea* [L.] Sm. ssp. *polysepala* [Engelm.] E.O. Beal). Depressional Wetlands commonly support tree or shrub-dominated swamps dominated by western redcedar, Engelmann spruce, rose spirea (*Spiraea douglasii* Hook.), and thinleaf alder (*Alnus incana* [L.] Moench), with devilsclub and American skunkcabbage (*Lysichiton americanus* Hultén & H. St. John) in the understory. In the valley bottoms, reed canarygrass often forms impenetrable monocultures that limit species diversity within the wetlands (Cousins, personal comm.). Amphibians, waterbirds, marshbirds, and waterfowl all use Depressional Wetlands for breeding and foraging habitats.

Target Viability

Fair. Lower elevation wetlands have experienced, or are currently threatened by, filling and draining, altered hydrologic regimes (e.g., disconnection from floodplain due to levees, water diversion), and invasive species or disease. Higher elevation wetlands are threatened by climate change impacts to hydrology.

Prioritized Threats and Strategies for Depressional Wetlands

Very High Threats for Depressional Wetlands in the Flathead Valley

Invasive & noxious weeds

Invasive species often prevent the establishment of native species by forming dense monocultures and in some instances even change the soil chemistry or hydrology of the invaded area (Ricciardi et al. 2013). In plant surveys within the Pend Oreille WMA, noxious weeds such as oxeye daisy (*Leucanthemum vulgare*), spotted knapweed, and common tansy were documented to cover 0.45–28.45% of the overall sites (Cousins and Antonelli 2008). Additionally, all of the wetland sites were classified as reed canarygrass dominant (Cousins and Antonelli 2008). Reed canarygrass is a native species in the lower 48 states, but is considered a noxious weed in Washington and highly invasive elsewhere; it is thought to have hybridized with a nonnative invasive reed canarygrass (Lavergne and Molofsky 2007). Reed canarygrass forms dense monocultures that decreases plant diversity and degrades wildlife habitat. Additionally, surveys done in the Flathead Valley found 12 of the ponds, small lakes, and emergent wetlands (n = 44) surveyed had spotted knapweed or tansy present (Lucid et al. 2016).

Objective	Strategy	Action(s)	Target SGCNs
Identify and eradicate any potential invasive species prior to establishment (USFS 2013).	Coordinate invasive and noxious weed monitoring and treatment across agencies. Implement the Idaho Invasive Species Council Strategic Plan.	Train agency staff to document presence/absence of noxious weeds during field/site visits. Develop a noxious weed database for all lands across Idaho. Use GPS, remote sensing, and GIS technologies to efficiently collect, store, retrieve, analyze, and display noxious weed information (ISDA 1999). Implement actions described in the 2012–2016 Idaho Invasive Species	Western Toad Northern Leopard Frog Townsend's Big-eared Bat Silver-haired Bat Little Brown Myotis

Objective	Strategy	Action(s)	Target SGCNs
		Strategic Plan (ISDA 2012).	
Contain and reduce widespread weeds in areas that are already infested (USFS 2013).	Coordinate invasive and noxious weed monitoring and treatment across agencies. Identify and treat dispersal vectors to prevent further spread of invasive and noxious weeds. Restore treated areas with native species.	Continue annual noxious weed control program and coordinate weed management activities with Bonner County and the Selkirk Cooperative Weed Management Area (Cousins and Antonelli 2008). Treat weeds in high impact areas and along roads (USFS 2013). Treat equipment used during timber harvest or fire suppression activities to be "weed-free" (USFS 2013, IDL 2015). Revegetate treatment areas with native species and monitor restoration (KTOI 2009). Implement actions described in the 2012–2016 Idaho Invasive Species Strategic Plan (ISDA 2012).	Western Toad Northern Leopard Frog Townsend's Big-eared Bat Silver-haired Bat Little Brown Myotis

High Threats for Depressional Wetlands in the Flathead Valley

Climate change

In the Pacific Northwest, climate change is expected to trend toward hotter, drier summers and warmer, slightly wetter winters (Karl et al. 2009). This scenario may result in snowpacks that are shallower and earlier melting. Although Depressional Wetlands may fill with water, it may occur earlier in the year. Less snowpack may mean less surface and groundwater being available to sustain wetland hydrology later in summer, resulting in more Depressional Wetlands drying out earlier in summer. How this will affect SGCN dependent on Depressional Wetlands is not known. More information is needed to make appropriate wetland management decisions needed to sustain wetland functions with a changing climate.

Objective	Strategy	Action(s)	Target SGCNs
Climate monitoring.	Monitor climate variables and species co-occurrence over time.	Develop climate monitoring program using a variety of microclimate variables along with co-occurrence of associated SGCN.	Western Toad Northern Leopard Frog Townsend's Big-eared Bat Silver-haired Bat Little Brown Myotis

Target: Springs & Groundwater-Dependent Wetlands

In the Flathead Valley, peatlands are one of the most conspicuous types of groundwater-dependent wetlands with over 7 sites identified (Lichthardt 2004) within the section. Fens form in areas with cold temperatures and waterlogged soils with at least 30 cm peat accumulation. They range from nutrient poor (poor fens) to nutrient rich (rich sedge-dominated fens and swamps) (Bursik and Mosely 1992). They often host a diversity of boreal plant species that are disjunct from, or at the edge of, their core range and species that are unique in their ability to persist in nutrient- and oxygen-poor soils (e.g., *Sphagnum* moss, sundew (*Drosera* L. spp.), bladderwort (*Utricularia* L. spp.), buckbean (*Menyanthes trifoliata* L.) (Lichthardt 2004). In the Flathead Valley, fens most often occur as floating mats around ponds and lakes. Surveys for Northern Bog Lemming (*Synaptomys borealis*) in Montana (Reichel and Corn 1997) and Idaho (Groves 1994) have found the species frequently in wetland habitats with a peat component. Other groundwater-dependent wetlands such as cold-water springs and wet meadows dominated by sedges and bluejoint (*Calamagrostis canadensis* [Michx.] P. Beauv.), are also widespread within the Purcell and Cabinet mountains, particularly within the glacial-carved troughs and headwater stream valleys. They often provide a cold air and cold-water refugia for invertebrate and vertebrate species (Issak et al. 2015).

Cabinet Mountains-Round-leaf Sundew © 2014 Andrew Gygili

Target Viability

Good. Many groundwater-dependent wetlands in mountainous locations are in relatively good ecological condition and only minimally impacted by surrounding land uses (e.g., forest management, roads). However, valley fens and meadows in the Flathead Valley are sometimes negatively impacted by livestock grazing, invasive plant species, and other human land uses (Lichthardt 2004). Climate change is likely to alter the hydrologic regime, potentially decreasing the amount and timing of groundwater supply to these wetlands.

Prioritized Threats and Strategies for Springs & Groundwater-Dependent Wetlands

Very High Threats for Springs & Groundwater-Dependent Wetlands in the Flathead Valley

Invasive & noxious weeds

Invasive species often prevent the establishment of native species by forming dense monocultures and, in some instances, even changing the soil chemistry or hydrology of the invaded area (Ricciardi et al. 2013). In plant surveys within the Pend Oreille WMA, noxious weeds such as oxeye daisy, spotted knapweed and common tansy were documented to cover 1–28% of the overall sites (Cousins and Antonelli 2008). Additionally, all of the wetland sites were classified as reed canarygrass-dominated (Cousins and Antonelli 2008). Reed canarygrass forms dense monocultures that decreases plant diversity and degrades wildlife habitat. In the Flathead Valley, the source of nonnative plant species in wetlands is sometimes from adjacent pasture and grazing land.

Objective	Strategy	Action(s)	Target SGCNs
Identify and eradicate any potential invasive species prior to establishment (USFS 2013).	Increase monitoring for invasive and noxious weeds. Coordinate invasive and noxious weed monitoring and treatment across agencies.	Train agency staff to document presence/absence of noxious weeds during field/site visits. Develop a noxious weed database for all lands across Idaho. Use GPS, remote sensing, and GIS technologies to efficiently collect, store, retrieve, analyze, and display noxious weed information (ISDA 1999). Implement actions described in *The Idaho Invasive Species Strategic Plan 2012–2016* (ISDA 2012).	Western Toad Northern Bog Lemming
Contain and reduce widespread weeds in areas that are already infested (USFS 2013).	Coordinate invasive and noxious weed monitoring and treatment across agencies. Identify and treat dispersal vectors to prevent further spread of invasive and noxious weeds. Restore treated areas with native species.	Continue annual noxious weed control program and coordinate weed management activities with Bonner County and the Selkirk Cooperative Weed Management Area (Cousins and Antonelli 2008). Treat weeds in high impact areas and along roads (USFS 2013). Treat equipment used during timber harvest or fire suppression activities to be "weed-free" (USFS 2013, IDL 2015). Revegetate treatment areas with native species and monitor restoration (KTOI 2009). Implement actions described in *The Idaho Invasive Species Strategic Plan 2012–2016* (ISDA 2012).	Western Toad Northern Bog Lemming

High Threats for Springs & Groundwater-Dependent Wetlands in the Flathead Valley

Climate change

Climate change in northern Idaho may result in increased summer temperatures and drought, and warmer, slightly wetter winters. This will lead to more precipitation falling as rain, and shallower, earlier melting snowpacks. As a result, there may be less groundwater to support wetlands, decreasing their extent and late-season wetness. Beavers have historically been important in slowing and storing surface water runoff, raising groundwater tables, expanding wetland habitat, and improving soil moisture for wetland vegetation. Restoration of American Beaver populations may play an important role in mitigating the effects of climate change in watersheds. In addition, delineating refugia such as fens for cool water or air temperature dependent species is a relatively new idea (Isaak et al. 2015). Recent microclimate monitoring work in the Idaho Panhandle identified within the Flathead Valley pockets of annually cool air (Lucid et al. 2016). Continued monitoring of microclimate along with co-occurrence of cool air dependent organisms will provide bedrock information for research determining best management practices for cool air associated species.

Objective	Strategy	Action(s)	Target SGCNs
Climate monitoring.	Monitor climate variables and species co-occurrence over time.	Develop climate monitoring program using a variety of microclimate variables along with co-occurrence of associated SGCN.	Western Toad Northern Bog Lemming
Determine current status of American Beaver populations.	Determine past and current status of American Beaver populations	Determine feasibility of using American Beaver in restoration efforts. Implement actions delineated by above analysis.	Western Toad Northern Bog Lemming

Target: Pond-Breeding Amphibians

Amphibians are a highly vulnerable taxonomic group which, globally, hosts more species in decline than birds or mammals (Stuart et al. 2004). Amphibian populations have been declining worldwide for decades (Houlahan et al. 2000) and sometimes occur rapidly in seemingly pristine environments (Stuart et al. 2004). Amphibians are susceptible to pathogens, climate change, environmental pollution, ultraviolet-b exposure, and invasive species (Bridges and Semlitsch 2000, Cushman 2006, Kiesecker et al. 2001, Stuart et al. 2004). In addition, they tend to have relatively low vagilities (Bowne and Bowers 2004, Cushman 2006) and often have narrow habitat requirements (Cushman 2006).

Western Toads have experienced rangewide declines in western North America. This species could be experiencing similar declines in the Flathead Valley as it is not detected as frequently in this section as the neighboring Okanogan Highlands (Lucid et al. 2016). Northern Leopard Frogs (*Rana pipiens*) are abundant across their range, but have experienced severe declines in portions of their range, including northern Idaho. Northern Leopard Frogs appear to be extirpated from the Flathead Valley (Lucid et al. 2016).

Target Viability

Poor. Northern Leopard Frogs extirpated from section and extant species face invasive species/disease threats.

Prioritized Threats and Strategies for Pond-Breeding Amphibians

High rated threats to Pond-Breeding Amphibians in the Flathead Valley

Amphibian chytridiomycosis & other disease

Recent surveys for amphibian chytridiomycosis, a disease caused by a fungal pathogen, *Batrachochytrium dendrobatidis* (*Bd*), on Columbia Spotted Frogs (*Rana luteiventris*) across the Flathead Valley indicated the fungus is widespread, occurring at approximately 83% of surveyed sites. *Bd* was found more commonly at low- and high-elevation sites than mid-elevation sites. *Bd* is a known threat to Western Toads and has been documented to cause near total egg hatching failure of a Western Toad population in the Pacific Northwest (Blaustein et al. 1994). Further research is needed to assess the threat of *Bd* to Western Toads and Northern Leopard Frogs in Idaho. Local die-offs of Western Toads and other amphibians have been recorded in recent years. These die-offs may be disease related and those sites should be investigated and monitored.

Objective	Strategy	Action(s)	Target SGCNs
Determine level of disease threat.	Determine status of *Bd* in at occupied sites. Examine relationship of species occurrence, microclimate, and disease.	Visit known sites and swab amphibians for *Bd*. Collect microclimate variables at occupied sites and examine presence of *Bd* and other potential diseases.	Western Toad Northern Leopard Frog
Monitor amphibian disease.	Develop amphibian disease monitoring program.	Develop monitoring program that encompasses monitoring *Bd* presence, *Bd* levels, and other potential amphibian disease.	Western Toad Northern Leopard Frog

Species designation, planning & monitoring

Northern Leopard Frog

Extensive surveys indicate this species has been extirpated from the Flathead Valley (Lucid et al. 2016). The closest known colony of this species occurs at the Creston Valley Wildlife Management Area in British Columbia. This population could potentially serve as a source population for human-assisted reintroduction or natural recolonization efforts. Nonnative American Bullfrogs occur on the US side of the border but have not been detected on the British Columbia side. It is critically important to initiate immediate control and extirpation efforts on the most northern bullfrogs in Idaho to prevent their dispersal to the Creston Valley Wildlife Management Area.

Objective	Strategy	Action(s)	Target SGCNs
Address Northern Leopard Frog extirpation.	Work with transboundary partners in Idaho, Washington, and British Columbia.	Conduct a literature review to assess potential recovery options, including reintroduction and natural recolonization.	Northern Leopard Frog
Limit American Bullfrog distribution.	Prevent American Bullfrog expansion to the Creston Valley Wildlife Management Area Northern Leopard Frog colony.	Work with partners to conduct American Bullfrog control and extirpation actions near the Canadian border.	Western Toad Northern Leopard Frog

Target: Lake-Nesting Birds

The only lake-nesting bird detected in the Flathead Valley is Common Loon (*Gavia immer*). Common Loons build platform nests on lake edges or in shallow water. Nesting has only been documented in a few locations in Idaho but nonflying juvenile loons were observed on the north end of Priest Lake, Upper Priest Lake, and the Clark Fork Delta on Lake Pend Oreille in the 1990s (IDFG 2005); however, there have been no recent sightings.

Target Viability

Poor. One nest was abandoned in 2014, no other documentation of nesting loons in the region.

Target: Low-Density Forest Carnivores

Forest carnivores naturally occur at low densities and can be directly affected by human activities. This presents unique opportunities to directly affect positive conservation outcomes for these species. This group consists of mammals traditionally considered "furbearers," including Marten, Weasels, and Mink. Wolverine (*Gulo gulo*) and Fisher are the 2 native forest carnivore SGCN which occur within the Flathead Valley. Extensive surveys from 2010–2014 failed to detect a single resident Wolverine. However, several verified detections of the species did occur during that time frame (Lucid et al. 2016). There was a verified track and a verified photo. An individual animal was not identified despite extensive genetic surveys. This suggests the detections were of an animal moving across the landscape, not residing in it. The 2010–2014 surveys detected 33 individual Fisher in the Cabinet Mountains. This population may be the result

Cabinet Mountains Fisher, 2012 IDFG

of a reintroduction effort which occurred in the late 1980s and early 1990s (Vinkey et al. 2006). Wolverine conservation efforts in this section should focus on maintaining or improving ecosystem integrity conducive to the establishment of resident and reproductive individuals. Fisher conservation efforts should focus on population monitoring.

Target Viability

Poor. Only a few individuals known to occur in section.

Prioritized Threats and Strategies for Low-Density Forest Carnivores

High rated threats to Low-Density Forest Carnivores in the Flathead Valley

Genetic isolation

Wolverine and Fisher were nearly or completely extirpated from the lower 48 states in the early 20th century. A variety of natural (Wolverine) and human-mitigated (Fisher) recolonization events have likely affected the genetic structure of populations of the species (Aubry et al. 2007, Vinkey et al. 2006). Populations of both species likely have low genetic diversity due to founder affects. Proper habitat management and gene flow mitigation may help improve genetic isolation and increase species occurrence on the landscape.

Objective	Strategy	Action(s)	Target SGCNs
Monitor genetic isolation.	Determine current levels of genetic isolation.	Conduct genetic analyses to determine current population sizes and levels of gene flow. Maintain transboundary collaborations to assess and monitor Wolverine gene flow with Canadian populations.	Wolverine Fisher
Assess and enhance gene flow.	Manage connectivity habitat and assess potential to enhance gene flow.	Manage forested lowland habitat to maintain forested connectivity. Improve additional lowland forest to increase connectivity. Conduct analysis and literature review assessing potential recovery options including reintroduction and natural recolonization.	Wolverine Fisher

Winter recreation

The *Management Plan for the Conservation of Wolverines in Idaho 2014–2019* (IDFG 2014) outlines specific actions to minimize potential disturbance of Wolverine by oversnow recreation and ski area infrastructure.

Objective	Strategy	Action(s)	Target SGCNs
Manage winter recreation minimize disturbance.	Coordinate efforts between public and private entities.	Implement strategies outlined in the *Management Plan for the Conservation of Wolverines in Idaho 2014–2019* (IDFG 2014).	Wolverine

Inadequate understanding of population and distribution status to assess potential effects of incidental capture from trapping on populations of Wolverine and Fisher

Wolverine and Fisher are on occasion incidentally captured in the course of trapping other species with legal harvest seasons. Idaho has a mandatory reporting requirement for incidental capture and mortality of any nontarget species such as Wolverine and Fisher. Based on IDFG records, some individuals are found dead in the trap, while others are released alive. Information gaps regarding ecology and population dynamics of these species limit ability to draw conclusions about whether incidental capture has any population effects (e.g., whether patterns in capture numbers reflect cyclic changes in populations, greater exposure to trapping, or population increase and expansion).

Objective	Strategy	Action(s)	Target SGCNs
Narrow information gaps about ecology and population dynamics to evaluate threats, including the potential effect of incidental capture to local populations of Wolverine and Fisher.	Gather the necessary information to understand conservation priority related to incidental capture.	Implement strategies and actions outlined in the *Management Plan for the Conservation of Wolverines in Idaho 2014–2019* (IDFG 2014) particularly Objective 6 (and related strategies): Continue to minimize injury and mortality of Wolverines from incidental trapping and shooting. As part of educating trappers about techniques to minimize incidental capture, conduct interviews with trappers to obtain information about the condition and demographics of captured individuals, and the locations, habitats, and trap sets involved in incidental captures of Wolverine or Fisher.	Wolverine Fisher

Target: Grizzly Bear

Grizzly Bears in this section occupy the Cabinet–Yaak ecosystem which borders Canada and encompasses the Cabinet and Purcell mountain ranges in northeastern Idaho and northwestern Montana. A recent study by Kendall et. al (2016) estimates the Cabinet–Yaak population is currently 48–50 Grizzly Bears; less than 15 are estimated to occupy northeastern Idaho. Research has been conducted on the Grizzly Bear population since the early 1980s, primarily in the form of trapping and radiocollaring. More recently, researchers have included camera trap and DNA collection to the research effort. Grizzly Bears typically den at high elevations in the Cabinet–Yaak ecosystem but move to lower elevations or south-facing slopes following den emergence, taking advantage of early spring green-up. As the season progresses bears move to higher elevations, relying on a variety of berries with the huckleberry (*Vaccinium* sp.) as the most important forage. Domestic livestock grazing is limited in this section and is not an important consideration in Grizzly Bear management. The Cabinet–Yaak population appears to be stable to increasing at this time. Grizzly Bear is currently listed as threatened under the ESA.

Target Viability

Fair. Population appears to be expanding in both size and distribution.

Prioritized Threats and Strategies for Grizzly Bear

High rated threats to Grizzly Bear in the Flathead Valley

Anthropogenic attractants and roads and the resulting potential for excessive human-caused mortality pose high threats to the Grizzly Bear.

Anthropogenic attractants

Data collected during the 1980s indicated human-caused mortality to be the most important factor affecting population recovery (Knick and Kasworm 1989). Illegal mortality has been reduced through enforcement and education efforts and access restrictions in the form of road closures. The reduced human-caused mortality resulted in an expanding Grizzly Bear population, both in distribution and number. As a result, more human/bear interactions are now taking place in low elevation areas where humans have established year-round or seasonal residences. Anthropogenic attractants such as garbage, compost piles, sunflower bird feeders, small domestic livestock such as pigs, and corn deer feeders attract Grizzly Bears and can result in food-conditioned or habituated bears. Such bears require management actions including trapping and relocating animals, management removal (killing), or are killed by landowners and can increase the likelihood of mistaken identity kills during the American Black Bear hunting season.

Objective	Strategy	Actions	Target SGCNs
Reduce human-caused mortalities to allow for population growth.	Reduce anthropogenic attractants.	Work with FS on education and enforcement of food storage orders on USFS land. Public education about consequences of feeding and habituating bears.	Grizzly Bear

Roads

Roads can allow relatively easy access to areas that contain Grizzly Bears, thereby allowing more opportunities for mistaken identity kills, intentional poaching, or displacement of bears. Road management on federal lands, primarily US Forest Service ownership, has significantly improved conditions for Grizzly Bears and contributed to the reduction of human-caused mortalities. Access restrictions must be continued and evaluated to address mortality concerns.

Objective	Strategy	Actions	Target SGCNs
Reduce human-caused mortalities to allow for population growth.	Maintain access restrictions within the Bear Management Units.	Continue actions described in the Grizzly Bear Access Amendments within the 2015 Forest Service Management Plan (USFS 2015).	Grizzly Bear

Genetic isolation

Genetic isolation of any small population is of long-term conservation concern. Recent radiotelemetry and DNA data suggests that some interchange with adjacent Grizzly Bear populations is either occurring or possible; however, the human population continues to increase. Long-term conservation of Grizzly Bear must accommodate movement between adjacent ecosystems to ensure genetic interchange.

Objective	Strategy	Action(s)	Target SGCNs
Monitor genetic isolation.	Determine current levels of genetic isolation.	Conduct genetic analyses to determine current population sizes and levels of gene flow. Maintain transboundary collaborations to assess and monitor Grizzly Bear gene flow with Canadian populations.	Grizzly Bear
Assess and enhance gene flow.	Manage connectivity habitat and assess potential to enhance gene flow.	Manage forested lowland habitat to maintain forested connectivity. Improve additional lowland forest to increase connectivity.	Grizzly Bear

Target: Ground-Dwelling Invertebrates

Ground-Dwelling Invertebrates provide essential ecosystem services including decomposition, nutrient cycling, food for vertebrates, plant pollination, seed dispersal, and disease vectoring. They can also serve as effective indicators of environmental health (Jordan and Black 2012). This group encompasses a wide array of taxa. However, Flathead Valley SGCN in this group are limited to terrestrial gastropods and Spur-throated Grasshoppers.

Target Viability

Good. Habitat and threat data deficient. Many species taxonomically and distributionally data deficient.

Species designation, planning & monitoring

Basic knowledge of ecological requirements, habitat needs, systematics, and distribution is lacking for most Ground-Dwelling Invertebrates. Spur-throated Grasshoppers are in need of basic taxonomic work. Although substantial knowledge of terrestrial gastropod distribution and microclimate requirements was obtained during work conducted from 2010-2014 (Lucid et al. 2016), much work remains to be done to gain an adequate understanding of basic conservation needs for these species. Four terrestrial gastropods are known to be associated with cooler than average mean annual air temperatures (Lucid et al. 2016). Managing microsites for these species for cool air temperatures and minimal disturbance is recommended until a better ecological understanding is developed through research and monitoring.

Cabinet Mountains, Magnum Mantleslug © Shannon Ehlers 2013

Objective	Strategy	Action(s)	Target SGCNs
Determine appropriate taxonomic status of subspecies within the Coeur d'Alene Oregonian species complex.	Investigate and validate taxonomic status.	Conduct field surveys to collect specimens. Conduct morphological and genetics work to determine species status.	Coeur d'Alene Oregonian
Conduct research and habitat conservation activities for cool air temperature associated gastropods (Lucid et al. 2016).	Develop a better understanding of requirements for these species.	Conduct research to assess ecological requirements for these species. Manage forest structure near microsites to maintain cool air temperatures. Manage these sites for minimal disturbance. Implement long-term monitoring of species and associated microclimate and other habitat requirements.	Pale Jumping-slug Magnum Mantleslug Western Flat-whorl Shiny Tightcoil
Determine appropriate taxonomic status of species within the Spur-throated Grasshopper (*Melanoplus*) Species Group.	Investigate and validate taxonomic status.	Conduct field surveys to collect specimens. Conduct morphological and genetics work to determine species status.	Spur-throated Grasshopper (*Melanoplus*) Species Group
Determine if range of Bitterroot Mountain invertebrate SGCN extends to Flathead Valley.	Implement actions to assess range of Bitterroot Mountain invertebrates.	Conduct targeted field surveys to collect specimens. Encourage incidental collection of invertebrates by other field workers or recreationists by developing protocols, providing equipment/supplies, providing educational opportunities such as training sessions.	Western Pearlshell Straight Snowfly Idaho Snowfly Palouse Snowfly Cascades Needlefly Idaho Forestfly Clearwater Roachfly Umatilla Willowfly A Click Beetle (*Beckerus barri*) A Riffle Beetle (*Bryelmis idahoensis*) A Mayfly (*Ameletus tolae*) Lolo Mayfly A Mayfly (*Paraleptophlebia falcula*) A Mayfly (*Paraleptophlebia jenseni*) A Mayfly (*Paraleptophlebia traverae*) A Mayfly (*Parameletus columbiae*) A Miner Bee (*Andrena aculeata*) A Miner Bee (*Perdita*

Objective	Strategy	Action(s)	Target SGCNs
			wyomingensis sculleni) Hunt's Bumble Bee A Mason Bee (*Hoplitis orthognathus*) A Caddisfly (*Apatania barri*) A Caddisfly (*Eocosmoecus schmidi*) A Caddisfly (*Homophylax acutus*) A Caddisfly (*Philocasca antennata*) A Caddisfly (*Rhyacophila oreia*) A Caddisfly (*Rhyacophila robusta*) A Caddisfly (*Goereilla baumanni*) A Caddisfly (*Sericostriata surdickae*)

Target: Pollinators

Pollinators provide an essential ecosystem service that benefits agricultural producers, agricultural consumers, and gardeners (Mader et al. 2011) in the Flathead Valley. A wide range of taxa including birds, bats, and a wide array of insects provide pollination activities. The Monarch (*Danaus plexippus*) Western Bumble Bee (*Bombus occidentalis*), and Suckley's Cuckoo Bumble Bee (*Bombus Suckleyi*) are 3 SGCN pollinators known to occur in the Flathead Valley.

Many pollinators, but particularly bees, are known to be experiencing population declines throughout North America (Mader et al. 2011) and those declines may be occurring within the Flathead Valley as well. Population declines and local die-offs occur for a variety of reasons including habitat loss, pesticide exposure, and climate change (Mader et al. 2011). The Flathead Valley is ripe with opportunity to address these threats and increase the status of SGCN pollinators. Farmers, habitat managers, roadway authorities, municipalities, and homeowners can all contribute to pollinator conservation in clear and productive ways.

Target Viability

Fair. Many pollinators declining rangewide.

Prioritized Threats and Strategies for Pollinators

High rated threats to Pollinators in the Flathead Valley

Pesticides

Pollinators are negatively affected by pesticides by absorbing pesticides through the exoskeleton, drinking nectar containing pesticides, and carrying pollen laced with pesticides back to colonies (Mader et al. 2011). Neonicotinoids are particularly harmful to bee populations and can cause dramatic die-offs (Hopwood et al. 2012). Although the most effective pollinator conservation strategy is to eliminate pesticide use, significant benefits can still be achieved by reducing use of and pollinator exposure to pesticides (Mader et al. 2011).

Objective	Strategy	Action(s)	Target SGCNs
Reduce native pollinator exposure to pesticides (Mader et al. 2011).	Educate habitat managers, farmers, municipalities, and small property owners in methods to eliminate pesticide use (Mader et al. 2011).	Conduct educational activities that encourage potential pesticide applicators to eliminate use of pesticides where practical. Where pesticides must be used, encourage applicators to apply the minimum amount of chemical necessary and apply when pollinators are least active (i.e., nighttime and when flowers are not blooming) (Mader et al. 2011). Specifically target urban homeowners in educational efforts in the elimination of or proper application of pesticides (Mader et al. 2011). Conduct workshops to discuss pesticides in relation to other pollinator habitat management concerns (Mader et al. 2011).	Morrison's Bumble Bee Western Bumble Bee Suckley's Cuckoo Bumble Bee Monarch
Reduce native pollinator exposure to pesticides on IDFG administered property (Mader et al. 2011).	Implement measures to reduce or eliminate pesticide use on IDFG WMAs and other properties (Mader et al. 2011).	Use the minimum recommended amount of pesticide (Mader et al. 2011). Apply pesticides at times when pollinators are least active such as nighttime, cool periods, low wind activity, and when flowers are not blooming (Mader et al. 2011). Mow or otherwise remove flowering weeds before applying pesticides (Mader et al. 2011).	Morrison's Bumble Bee Western Bumble Bee Suckley's Cuckoo Bumble Bee Monarch
Eliminate use of neonicotinoid insecticides (Hopwood et al. 2012).	Education measures on the detrimental effects of neonicotinoids on bees (Hopwood et al. 2012).	Develop and distribute educational material. Distribute to municipalities, counties, agriculture producers, habitat managers, and other property owners (Hopwood et al. 2012). Do not employ the use of neonicotinoids on IDFG administered lands (Hopwood et al. 2012).	Morrison's Bumble Bee Western Bumble Bee Suckley's Cuckoo Bumble Bee

Habitat loss

Pollinators require foraging and nesting habitat. Providing both types of habitat within close proximity to each other is the best way to ensure pollinator success. Protecting, enhancing, and creating pollinator habitat can be a fun and rewarding way to engage with local communities. Educating land managers about techniques to reduce land management impacts to pollinators is an essential component to pollinator habitat management.

Objective	Strategy	Action(s)	Target SGCNs
Reduce impact of land management practices on pollinators (Mader et al. 2011).	Educate about and implement practices that benefit pollinators. (Mader et al. 2011).	Reduce grazing impacts by limiting grazing to one-third to one-fourth of management areas per season (Mader et al. 2011). Implement pollinator beneficial mowing techniques including use of flushing bar, cutting at ≤8 mph, maintaining a high minimum cutting height of ≥12–16 inches, mowing only in daylight hours, mow in a mosaic instead of an entire site (Mader et al. 2011). Where prescribed fire is used, implement pollinator-friendly burning protocols including rotational burning of ≤30% of each site every few years, leave small unburned patches intact, avoid burning too frequently (no more than every 5–10 years), avoid high-intensity fires unless the burn goal is tree removal. Work with Idaho Transportation Department to implement proper roadside pollinator habitat management (Mader et al. 2011).	Morrison's Bumble Bee Western Bumble Bee Suckley's Cuckoo Bumble Bee Monarch
Conserve existing pollinator habitat.		Map existing major known pollinator habitat. Identify and recognize landowners providing pollinator habitat and provide habitat management educational opportunity (Mader et al. 2011). Conduct surveys for native milkweed. Initiate seed saving program (Mader et al. 2011).	Morrison's Bumble Bee Western Bumble Bee Suckley's Cuckoo Bumble Bee Monarch
Create new urban and rural pollinator habitat.	Develop programs to encourage urban landowners to create pollinator habitat.	Provide pollinator habitat workshops for homeowners and rural land owners. Provide other educational materials for homeowners. Provide an incentive program for homeowners to create pollinator habitat in urban yards. Convert most of lawn at IDFG Panhandle Regional office to pollinator habitat.	Morrison's Bumble Bee Western Bumble Bee Suckley's Cuckoo Bumble Bee Monarch

Objective	Strategy	Action(s)	Target SGCNs
		Work with municipalities and businesses to create urban pollinator habitat. Provide bee nest boxes for purchase at the IDFG IDFG Panhandle Regional office.	

Species designation, planning & monitoring

Actions to enhance pollinator habitat will be most effective with knowledge of the current status of SGCN populations. Initiation of long-term monitoring will allow a continuous data stream to assess conservation activities.

Objective	Strategy	Action(s)	Target SGCNs
Determine pollinator population status.	Conduct surveys and implement long-term pollinator monitoring program.	Conduct surveys to identify colonies and breeding locations of bee SGCN. Protect known breeding sites. Incorporate pollinators into regional multitaxa monitoring efforts that includes consideration for climate change impacts.	Morrison's Bumble Bee Western Bumble Bee Suckley's Cuckoo Bumble Bee Monarch

Flathead Valley Section Team

An initial summary version of the Flathead Valley Section project plan was completed for the 2005 Idaho State Wildlife Action Plan. A small working group developed an initial draft of the Section Plan (Miradi v 0.7 which was then reviewed by a much wider group of stakeholders at a 2-day meeting held at the Idaho Department of Fish and Game in February 2015 (this input captured in Miradi v 0.9). This draft was then subsequently revised. Materials in this document are based on Miradi v. 0.16. Individuals and organizations/agencies involved in this plan are shown in Table 2.3.

Table 2.3 Individuals, agencies, and organizations involved in developing this plan [a]

First name	Last name	Affiliation
Michael	Lucid*	Idaho Department of Fish and Game, Panhandle Region
Shannon	Ehlers*	Idaho Department of Fish and Game, Panhandle Region
Rita	Dixon	Idaho Department of Fish and Game, Headquarters
Carrie	Hugo	Bureau of Land Management (US)
Cristy	Garris	Foundations of Success
Wayne	Wakkinen	Idaho Department of Fish and Game, Panhandle Region
Jim	Fredericks	Idaho Department of Fish and Game, Panhandle Region
Laura	Wolf	Idaho Department of Fish and Game, Panhandle Region
Ryan	Hardy	Idaho Department of Fish and Game, Panhandle Region
T J	Ross	Idaho Department of Fish and Game, Panhandle Region
Colleen	Trese	Idaho Department of Fish and Game, Panhandle Region

[a] Apologies for any inadvertent omissions.
[b] An asterisk "*" denotes team leader(s) and contact point if you would like to become involved in this work.