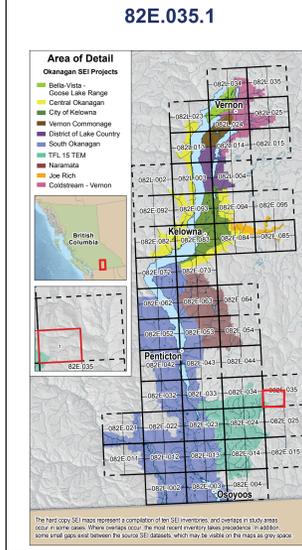
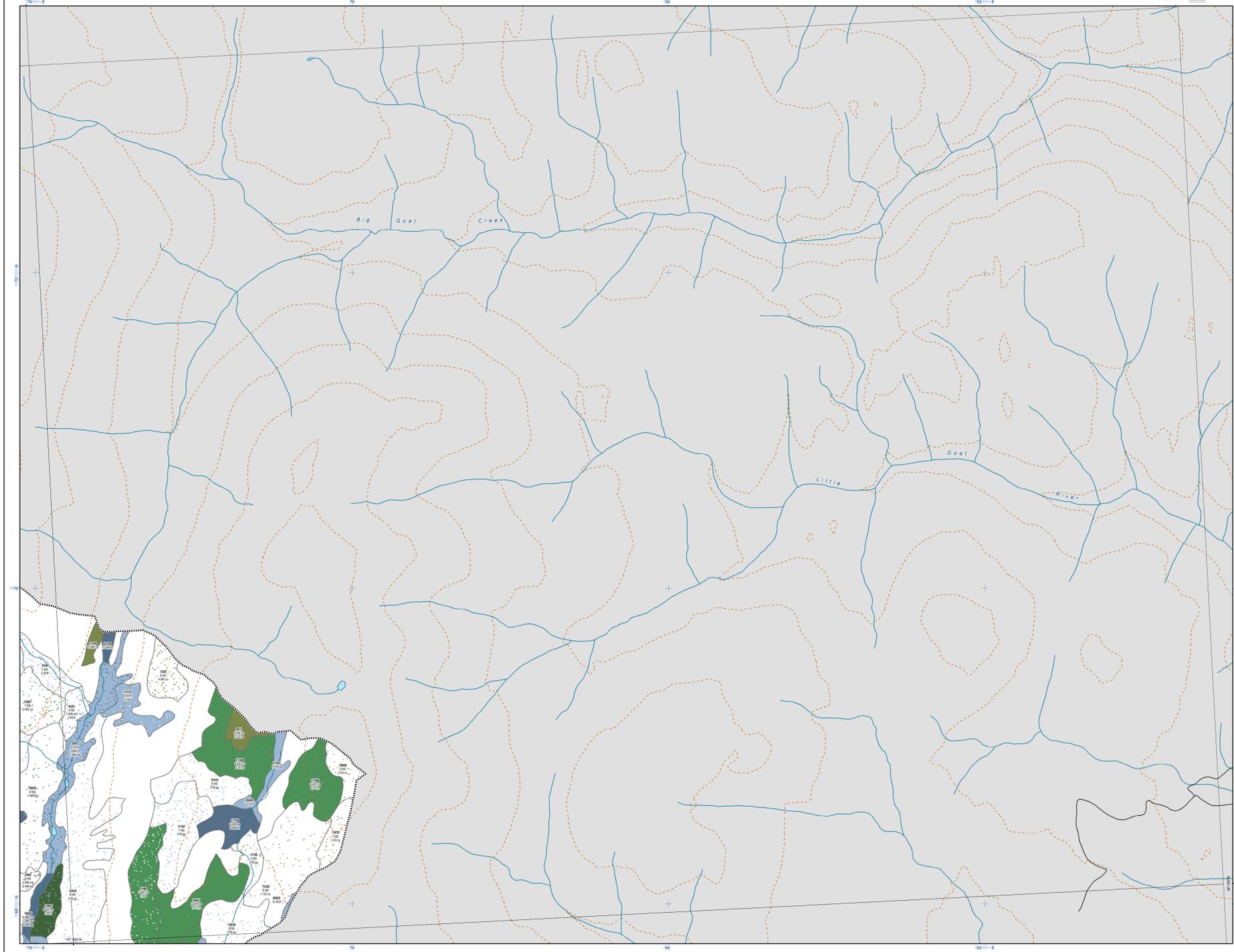




# Sensitive Ecosystems Inventory of the Okanagan Valley: Vernon to Osoyoos



**WHAT IS A SENSITIVE ECOSYSTEM?**

For the purpose of this study, an ecosystem is considered to be a portion of the landscape with relatively uniform dominant vegetation.

Sensitive Ecosystems are ecosystems that are ecologically sensitive and/or at risk in the landscape.

**Map Symbols**

- Polygon Boundary
- Study Area Boundary
- Roads
- Highways
- Rail Line
- 100m contours
- Rivers
- Lake/Major River
- Buildings
- Municipal Boundaries
- Areas Outside the Okanagan Study Area

**Sensitive Ecosystems (SE) Label**

Polygon Number: 13788

SE Class: 6 WDO, 2 WDO, 2 WNO

SE Incidents: 1st Component, 2nd Component, 3rd Component

**Ecosystem Components**

This cartographic product uses Dot Density to indicate where more than one ecosystem class is mapped in a polygon. The number of dots indicates the proportion of the polygon represented by the 2nd and 3rd ecosystem; the colour of the dots indicates the 2nd and 3rd ecosystem class.

**Map Symbols**

- Yellow: The base colour represents the first ecosystem component.
- Coloured dots overlaid upon the base colour indicate a second or third ecosystem component.
- Two colours of dots indicate a second and third ecosystem.

**Scale**

0 100 200 300 400 500 Meters

UTM Projection Zone 18 NAD83  
100m Contour Interval  
February 16, 2010

The SE labels are based on a 1:50,000 scale air photo but are displayed here as 1:10,000. The extent of many ecosystems in the landscape is much larger than the scale of the map. The extent of many ecosystems in the landscape is much larger than the scale of the map.

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## Sensitive Ecosystems Legend

Sensitive ecosystems are fragile and/or rare, or are ecologically important because of the diversity of species they support and the ecosystem services they provide. Some are at risk and plant species are associated with Sensitive Ecosystems, and are listed below. Species at Risk are those species which are considered Endangered, Threatened or of Special Concern. Please note that many of the species listed in this map can be found in other sensitive ecosystems throughout the Okanagan Valley.

Note: Information on Species at Risk is included in the map legend to highlight the species habitat values of the sensitive ecosystems. This map series does not include the actual mapping of species locations. For information on species location mapping see the B.C. Conservation Data Centre reference below.

### Antelope-brush Steppe (AS):

Antelope-brush communities are dryland ecosystems characterized by abundant shrub dominated by antelope-brush. These communities occur in the southern portion of the Okanagan Valley, on sandy soils in the warm, dry valley bottoms. They commonly occur on sites that are very amenable to development – primarily for vineyards and housing. Disturbed by domestic livestock and the introduction and spread of invasive plants threaten this ecosystem. Antelope-brush ecosystems are recognized as one of the four most endangered ecosystems in Canada. Antelope-brush Steppe ecosystems are dominated by antelope-brush and bunchgrasses (AS-B) and disturbed antelope-brush steppe dominated by antelope-brush and invasive alien plants (AS-I).

**Antelope Brush Steppe Ecosystems provide the following services:**

- Carbon storage
- Nutrient cycling and maintenance of productive soils
- Sediment retention
- Pollination
- Pest regulation
- Food production

**Some species associated with Antelope-brush Steppe Ecosystems are:**

- Great Basin Sparrowhawk
- Tiger Salamander
- Belt's Henshawite
- Pallid Bat
- Peregrine Falcon
- Nuttall's Cottontail
- Common Nighthawk
- Great Basin Gophersnake
- Racer
- Common Nighthawk
- Nuttall's Cottontail

**Species at Risk:**

- Belt's Henshawite (Endangered)
- Common Nighthawk (Special Concern)
- Nuttall's Cottontail (Special Concern)

### Sagebrush Steppe (SS):

Sagebrush Steppe ecosystems are dryland ecosystems characterized by abundant big sagebrush. These communities occur on similar sites to grassland ecosystems, where conditions are too warm and dry for trees to establish. This ecosystem is mostly found in the southern reaches of the study area, where they are dominated by bunchgrasses with scattered forbs and a soil crust dominated by mosses and lichens. These ecosystems commonly occur on sites that are amenable to urban or agricultural development, where livestock trampling and invasive plants threaten remaining Sagebrush Steppe ecosystems. Sagebrush Steppe are generally strongly ecosystems dominated by big sagebrush and bunchgrasses (SS-B), steep, shallow soil sagebrush steppe (SS-S), and disturbed sagebrush steppe dominated by big sagebrush and invasive alien plants (SS-I).

**Sagebrush Steppe Ecosystems provide the following services:**

- Carbon storage
- Erosion control
- Nutrient cycling and maintenance of productive soils
- Pollination
- Pest regulation

**Some species associated with Sagebrush Steppe Ecosystems are:**

- Great Basin Sparrowhawk
- Western Skink
- Pallid Bat
- Peregrine Falcon
- Nuttall's Cottontail
- Half-moon Henshawite
- Western Skink
- Common Nighthawk
- Shiny Thrasher
- Nugget Moss
- American Badger

**Species at Risk:**

- Shiny Thrasher (Endangered)
- Nugget Moss (Special Concern)
- American Badger (Special Concern)

### Grasslands (GR):

Grassland ecosystems occur areas that are generally hot and dry for forests to establish, and are dominated by bunchgrasses (grassland, GR-gr), steep slope grasslands (GR-st), steep, shallow grasslands (GR-sl), and disturbed grasslands dominated by invasive alien plants (GR-I). Large areas of grasslands have been lost to agriculture and urban development and degraded by invasive alien plants. Most of the remaining grasslands have become wet and are considered to be Disturbed Grasslands through partial invasion by noxious weeds. Given the very limited extent of remaining grasslands, these are important sites for grassland restoration, soil conservation, and maintenance of many other grassland values, including habitat for many at-risk and endangered species.

**Grassland Ecosystems provide the following services:**

- Carbon storage
- Erosion control
- Nutrient cycling and maintenance of productive soils
- Pollination
- Pest regulation
- Food production
- Sediment retention

**Some species associated with Grassland Ecosystems are:**

- Burrowing Owl
- Pallid Bat
- Peregrine Falcon
- Nuttall's Cottontail
- Tiger Salamander
- Columnar Carpet Moss
- Shiny Thrasher
- Western Skink
- Common Nighthawk
- Shiny Thrasher
- Nugget Moss
- Long-billed Curlew

**Species at Risk:**

- Shiny Thrasher (Endangered)
- Nugget Moss (Special Concern)
- Long-billed Curlew (Special Concern)

### Sparsely Vegetated (SV):

Sparsely vegetated ecosystems are sites where rock or talus (angular rock fragments) limits vegetation establishment, vegetation cover is discontinuous and interspersed with bedrock or blocks of rock. Sparsely vegetated ecosystems are subdivided into four sub-categories: shrub, talus, cliff, and rock outcrop ecosystems, Cliff (SV-cl), grassy or un-vegetated Rock Outcrop (SV-ro), Shrubby Rock Outcrop (SV-sh), and Talus Slope (SV-ts). Many of these ecosystems are at risk, and their coarse or shallow soils make them sensitive to disturbance and soil erosion.

**Sparsely Vegetated Ecosystems provide the following services:**

- Carbon storage
- Nutrient cycling and maintenance of productive soils
- Pollination
- Soil formation

**Some species associated with Sparsely Vegetated Ecosystems are:**

- Great Basin Sparrowhawk
- Western Skink
- Pallid Bat
- Peregrine Falcon
- Nuttall's Cottontail
- Rubber Boa

**Species at Risk:**

- Western Skink (Special Concern)
- Pallid Bat (Special Concern)
- Nuttall's Cottontail (Special Concern)

### Old Forest (OF):

Old Forest Ecosystems are dominated by large, old trees, usually greater than 150 years of age. Most of these forests have been lost to selective logging of larger trees, ingrowth of dense trees resulting from fire exclusion, and development. Only small remnants of these forests remain today. These old forest ecosystems contribute to climate regulation, soil stability, moisture retention and the old trees in them provide important habitat for many species including many woodpeckers, owls, and mice. Old forest ecosystems include old-growth Woodlands (OF-co) and Broadleaf Woodlands. Old-growth forests are included in the Riparian category.

**Old Forest Ecosystems provide the following services:**

- Climate regulation
- Air quality
- Erosion control
- Sediment retention
- Nutrient cycling and maintenance of productive soils
- Flood control
- Pollution control
- Pest regulation
- Food production

**Some species associated with Old Forest Ecosystems are:**

- Willamson's Sapsucker
- White-headed Woodpecker
- Western Toad
- Wolverine
- Lewis's Woodpecker
- Flammulated Owl
- Common Nighthawk
- White-headed Woodpecker
- Olive-sided Flycatcher
- Western Goshawk
- American Badger
- Lyle's Marsh Wren
- Shiny Thrasher

**Species at Risk:**

- White-headed Woodpecker (Endangered)
- Olive-sided Flycatcher (Special Concern)
- Western Goshawk (Special Concern)
- American Badger (Special Concern)
- Lyle's Marsh Wren (Special Concern)

### Broadleaf Woodlands (BW):

Broadleaf Woodland ecosystems are often dominated by trembling aspen which occur in depressions and moist areas (Aspen Capes, BW-ac) in grassland areas, and aspen sedge (BW-as) slopes; however, unusual old forest Broadleaf Woodlands are also present in the water table. They are unusual in that they are sensitive to changes in the water table. They are unusual in that they are sensitive to disturbance and soil erosion.

**Broadleaf Woodland Ecosystems provide the following services:**

- Drought recovery
- Fresh water
- Storm protection
- Nutrient cycling and maintenance of productive soils
- Climate regulation
- Pollination
- Pest regulation
- Food production

**Some species associated with Broadleaf Woodland Ecosystems are:**

- Western Rattlesnake
- Western Screech Owl
- Lewis's Woodpecker
- Flammulated Owl
- Rubber Boa

**Species at Risk:**

- Western Rattlesnake (Special Concern)
- Western Screech Owl (Special Concern)
- Lewis's Woodpecker (Special Concern)
- Flammulated Owl (Special Concern)
- Rubber Boa (Special Concern)

### Coniferous Woodlands (WF):

Coniferous Woodlands are open stands of Douglas-fir or ponderosa pine (WD-co), often on shallow soils, with grassy understorey, old Coniferous Woodlands are part of the Old Forest category. They most commonly occur in the drier climates of the Okanagan Valley, on sites with limited moisture, on rocky knolls and on warm south-facing slopes. Numerous sites have been lost to development and altered by ingrowth of trees associated with forest exclusion, wind erosion, and other human disturbances.

**Coniferous Woodland Ecosystems provide the following services:**

- Climate regulation
- Air quality
- Erosion control
- Sediment retention
- Carbon storage
- Pest regulation
- Nutrient cycling and maintenance of productive soils
- Pollution control
- Food production

**Some species associated with Coniferous Woodland Ecosystems are:**

- Racer
- Rubber Boa
- Lewis's Woodpecker
- Flammulated Owl
- Great Basin Gophersnake
- Common Nighthawk
- White-headed Woodpecker
- Olive-sided Flycatcher
- Western Goshawk
- American Badger
- Lyle's Marsh Wren
- Shiny Thrasher

**Species at Risk:**

- White-headed Woodpecker (Endangered)
- Olive-sided Flycatcher (Special Concern)
- Western Goshawk (Special Concern)
- American Badger (Special Concern)
- Lyle's Marsh Wren (Special Concern)

### Riparian (RI):

Riparian ecosystems are streamside and lakeside ecosystems or sites with significant seepage, includes ecosystems on floodplains and benches along creeks and rivers (bench, RI-b), shrub-dominated Woodlands and Broadleaf Woodlands (RI-bw), riparian ecosystems on alluvial fans (RI-af), Alpine ecosystems on forested higher elevations in the South Okanagan (RI-fl), and sites with significant snow cover for large parts of the year. Alpine ecosystems are sensitive to disturbance, as the shallow soils and cold temperatures slow vegetation recovery.

**Riparian Ecosystems provide the following services:**

- Fresh water
- Flood control
- Storm protection
- Drainage and natural irrigation
- Nutrient cycling and maintenance of productive soils
- Climate regulation
- Soil and nutrient deposition
- Food production
- Pest regulation
- Food production

**Some species associated with Riparian Ecosystems are:**

- Western Painted Turtle
- Western Screech Owl
- Great Helebonia
- Purple Spikeshush
- Toothcup Meadow-lark
- Small Flowered Cuckoo
- Western Rattlesnake
- Western Painted Turtle
- Columbia Mottled Soupin
- Scrub Jay
- Scarlet Tanager
- Western Screech Owl
- Small Flowered Cuckoo
- Western Rattlesnake

**Species at Risk:**

- Western Painted Turtle (Special Concern)
- Columbia Mottled Soupin (Special Concern)
- Scrub Jay (Special Concern)
- Scarlet Tanager (Special Concern)
- Western Screech Owl (Special Concern)
- Small Flowered Cuckoo (Special Concern)
- Western Rattlesnake (Special Concern)

### Wetlands (WN):

Wetland ecosystems occur on sites where the water table is at, near, or above the soil surface for a sufficient period of time to influence soil and vegetation development; includes marshes (WN-m), swamps (WN-s), wet meadows (WN-wm) or windmills, fens (WN-f), and shallow open water (WN-aw) systems. They are extremely important because of their natural rarity in this area and the critically important ecosystem services they provide. Many Wetlands have been lost to development. It is estimated that 85% of the original wetland habitat in the Southern Okanagan has disappeared.

**Wetland Ecosystems provide the following services:**

- Drought recovery
- Fresh water
- Filtration and natural irrigation
- Nutrient cycling and maintenance of productive soils
- Silt storage
- Climate regulation
- Drainage and natural irrigation
- Fresh water
- Filtration and natural irrigation

**Some species associated with Wetland Ecosystems are:**

- Western Toad
- Tiger Salamander
- Western Painted Turtle
- Great Basin Sparrowhawk
- Peregrine Falcon
- Mexican Merganser
- Great Helebonia
- Northern Leopard Frog
- Western Toad
- Tiger Salamander
- Western Painted Turtle
- Great Basin Sparrowhawk
- Peregrine Falcon
- Mexican Merganser
- Great Helebonia

**Species at Risk:**

- Western Toad (Special Concern)
- Tiger Salamander (Special Concern)
- Western Painted Turtle (Special Concern)
- Great Basin Sparrowhawk (Special Concern)
- Peregrine Falcon (Special Concern)
- Mexican Merganser (Special Concern)
- Great Helebonia (Special Concern)

### Alpine (AP):

Alpine ecosystems are high-elevation alpine and parkland ecosystems including herbaceous ecosystems dominated by forbs or graminoid vegetation (AP-af), parkland forests where trees occur in distinct clumps and other low-lying shrubs, small mammals, and many types of plants. They are located along low-lying areas or former floodplains that have provided by characterization of creeks and rivers. In some cases, these areas could be restored to Wetland or Riparian ecosystems if natural flood regimes and vegetation are re-established.

**Alpine Ecosystems provide the following services:**

- Erosion control
- Climate regulation
- Nutrient cycling and maintenance of productive soils
- Pollination
- Food production
- Soil formation

**Some species associated with Alpine Ecosystems are:**

- American Badger
- Peregrine Falcon
- Wolverine

**Species at Risk:**

- American Badger (Special Concern)
- Peregrine Falcon (Special Concern)
- Wolverine (Special Concern)

### Seasonally Flooded Agricultural Fields (FS):

Seasonally Flooded Agricultural Fields ecosystems are cultivated fields that flood annually, providing important migration and wintering habitat for birds. They provide important habitat for amphibians, waterfowl and other birds, small mammals, and many types of plants. They are located along low-lying areas or former floodplains that have provided by characterization of creeks and rivers. In some cases, these areas could be restored to Wetland or Riparian ecosystems if natural flood regimes and vegetation are re-established.

**Seasonally Flooded Agricultural Fields Ecosystems provide the following services:**

- Flood control
- Drainage and natural irrigation
- Fresh water
- Filtration and natural irrigation

**Some species associated with Seasonally Flooded Agricultural Fields are:**

- Great Basin Sparrowhawk
- Peregrine Falcon
- American Badger
- Great Basin Gophersnake
- Western Rattlesnake

**Species at Risk:**

- Great Basin Sparrowhawk (Special Concern)
- Peregrine Falcon (Special Concern)
- American Badger (Special Concern)
- Great Basin Gophersnake (Special Concern)
- Western Rattlesnake (Special Concern)

### Mature Forest (MF):

Mature Forest ecosystems are dominated by mature trees, including broadleaf (MF-b) forests, coniferous (MF-c) forests, and mixed (MF-m) deciduous and coniferous forests; however it includes mature riparian forests, and mature coniferous and broadleaf woodlands. Mature Forests are an important habitat for sensitive ecosystems. They provide some of the same values associated with Old Forest ecosystems and can also be important recruitment sites for Old Forests. Mature Forests have many important structural attributes, including some remaining large, old trees.

**Mature Forest Ecosystems provide the following services:**

- Carbon storage
- Air quality
- Erosion control
- Sediment retention
- Nutrient cycling and maintenance of productive soils
- Silt storage
- Climate regulation
- Drainage and natural irrigation
- Fresh water

**Some species associated with Mature Forest Ecosystems are:**

- Willamson's Sapsucker
- Olive-sided Flycatcher
- Shiny Thrasher
- Western Skink
- Western Rattlesnake
- Willamson's Sapsucker
- Olive-sided Flycatcher
- Shiny Thrasher
- Western Skink
- Western Rattlesnake

**Species at Risk:**

- Olive-sided Flycatcher (Special Concern)
- Shiny Thrasher (Special Concern)
- Western Skink (Special Concern)
- Western Rattlesnake (Special Concern)

### Non-sensitive Landscapes (NS):

Non-sensitive Landscapes are modified areas not occupied by sensitive ecosystems, and include urban areas, disturbed rural landscapes, and young forests. Urban areas have human-influenced features or disturbances that are dominant across the landscape. Disturbed rural areas can be interspersed with forest, farmland and natural vegetation, or cultivated crops. Young forests are conifer-dominated stands with an age range between 1 and 80 years. Non-sensitive Landscapes are shown in white in the areas that are not developed by a sensitive ecosystem. In addition, many sensitive ecosystem polygons occur to urban or other areas; may have a modified landscape interspersed with the sensitive ecosystems, in which the sensitive ecosystems are so small to map individually. These modified areas are depicted as NS (non-sensitive) on the map.

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