



Alpine (AP):



Alpine Ecosystems provide the following services:

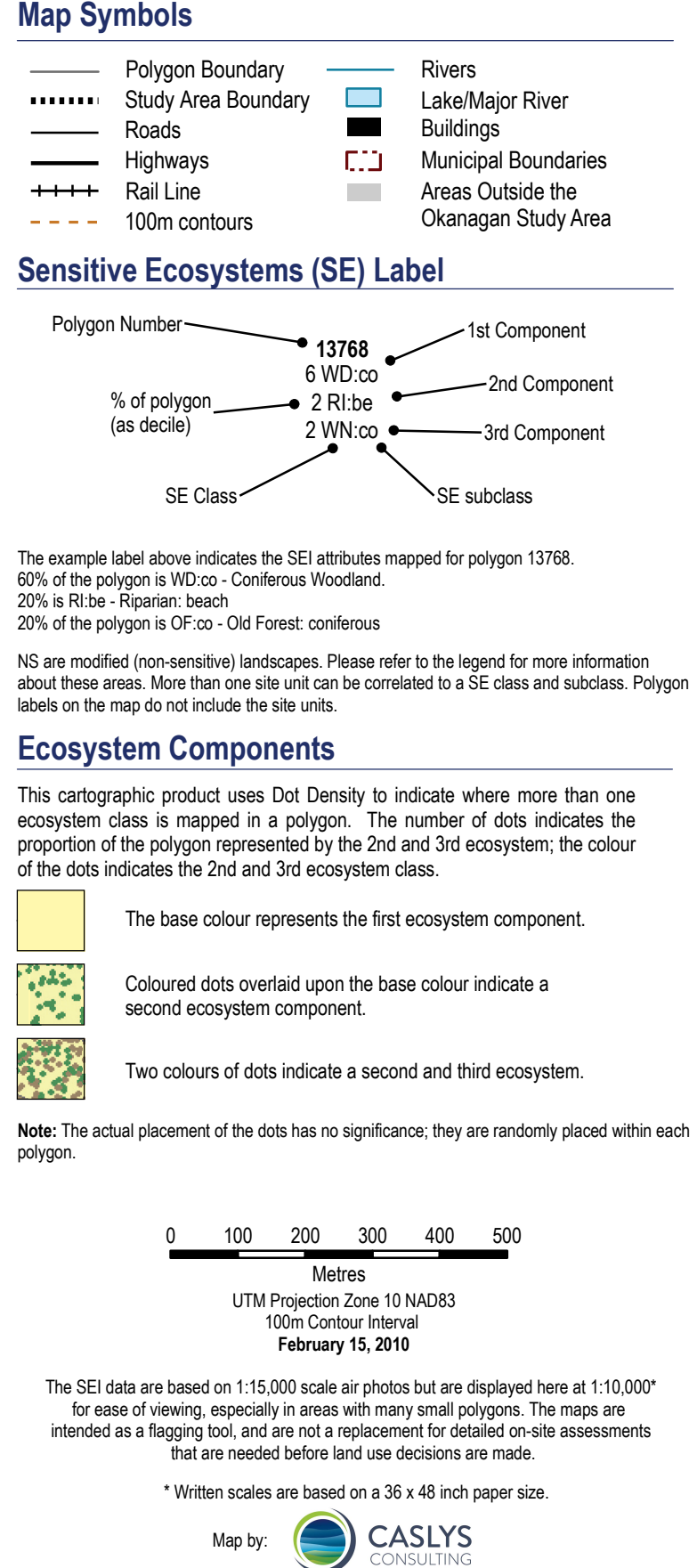
- Erosion control
- Fresh water
- Pollination
- Food production



Some species associated with Alpine Ecosystems are:

- American Badger
- Peregrine Falcon

American Badger
Taxidea taxus (mammal)
 (Mammal, Endangered)
 Photo by Parks Canada/W. Lynne



Inventory Results

Many of the sites identified by the SEI are at high risk of conversion to other land uses or further degradation. Within the study area, 47.9% was mapped as Sensitive Ecosystems (SE) and 7.9% fell into the Other Important Ecosystems category (see Legend). The inventory results indicated that wetlands, broadleaf woodlands, antelope-brush steppe, sagebrush steppe and old forest ecosystems were extremely rare - covering less than 5% of the study area. Although areas of grasslands, coniferous woodlands, and mature forests remain, many have been altered significantly and therefore low high quality sites remain. The study found many SES that have been degraded by fragmentation, human use, livestock grazing, and alien species.

The services and benefits SEs provide and the wildlife species they support are critically important to the quality of life in the Chaganan. With so few at-risk natural ecosystems remaining, it is essential that each site be carefully considered and that land use options be fully evaluated prior to initiating any changes in these areas.

Data Limitations

The SEI information is intended to alert local and regional decision-makers to the presence of sensitive and other important ecosystems and ecological features. The SEI mapping does not replace the need for on-site assessments in areas where land use changes are proposed. The accuracy of polygon boundaries is limited by the scale (1:15,000 for all projects except the City of Kelowna which was based on 1:10,000 digital aerial photographs) and date of

have taken place since the photos were taken). It is recommended that digital data not be altered significantly before the scale of the photos, as this may result in unacceptable distortion and faulty registration with other datasets. The ability to see specific disturbances (e.g., invasive plants) is limited when interpreting air photos, and field sampling is needed to supplement the interpretation. It can also be difficult to delineate small sensitive ecosystems. Many types of ecosystems are captured as a small component of a larger polygon that is dominated by another ecosystem. It is important to remember that a polygon may contain a complex, or mosaic, of ecosystems, and sensitive ecosystems may only occupy a portion of that polygon.

Within the province, species are assessed by the B.C. Conservation Data Centre. Species at risk are identified on the B.C. Red and Blue lists. Red-listed species are extirpated, endangered, or threatened; blue-listed species are of special concern due to low or declining populations and are sensitive to human activities or natural events. Nationally at-risk species are ranked by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Extinct, Threatened, or Special Concern. Endangered species are facing imminent extirpation or extinction; Threatened species may become endangered if limiting factors are not reversed. Species of Special Concern are particularly sensitive to human activities or natural events. Endangered or

Lake Country: Iverson, K. and P. Uunila. 2006. *Sensitive Ecosystems Inventory: Lake Country, 2005*. 1:20,000 maps.

Bella Vista – Goose Lake Range: Iverson, K. and J. Shyptika. 2002. *Terrestrial Ecosystem Mapping Of the Bella Vista – Goose Lake Range*. 1:20,000 maps.

Goldstream – Vernon: Iverson, K. and P. Uutla. 2008. *Sensitive Ecosystems Inventory: Goldstream - Vernon*. 1:200,000 maps.

Kelowna: Iverson, K. and P. Uutla. 2008. *Sensitive Ecosystems Inventory: City of Kelowna*. 1:20,000 maps.

South Okanagan: Iverson, K. and A. Haney. 2009. *Refined and updated ecosystem mapping for the South Okanagan and lower Similkameen Valley*. Unpub. report prepared for the Regional District of the Okanagan - Similkameen.

Joe Rich: Iverson, K. and P. Uunila. 2006. Sensitive Ecosystems Inventory: Central Okanagan Joe Rich. 1:20,000 maps.

[Related Publications and Links](#)

Green Bylaws Toolkit for Conserving Sensitive Ecosystems and Green Infrastructure: www.greenbylaws.ca



The Toolkit contains practical examples of bylaw provisions currently in use in B.C., including model provisions for Regional Growth Strategies, Official Community Plans, Development Permit Areas, Zoning, Tax Exemption, Environmental Assessment, Stormwater Management and other regulatory tools. It includes several examples and case studies of successful green infrastructure projects and bylaws.

Climate Change: Wilson, S.J. and R.H. Hebda. *Mitigating and Adapting to Climate Change through the Conservation of Nature*. Available at: www.landtrustalliance.bc.ca/research.html

Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia. BC Ministry of Environment
www.env.gov.bc.ca/wild/documents/bmp/devwithcare2006/develop_with_care_nov_n.html

Taking Nature's Pulse: The Status of Biodiversity in British Columbia
 Austin, M.A., D.A. Buffett, D.J. Nicolson, G.G.E. Scudder and V. Stevens (eds.). 2008. *Taking Nature's Pulse: The Status of Biodiversity in British Columbia*. Biodiversity BC, Victoria, BC. 268 pp. Available at: www.biodiversitybc.org

parkland ecosystems including **herbaceous** ecosystems dominated by forbs or graminoid vegetation (AP.hp), **parkland forests** where trees occur in distinct by dwarf shrubs such as heather (AP.sh). Alpine ecosystems are found at higher elevations in the South Okanagan (TFL 15) where there is significant systems are sensitive to disturbance, as the shallow soils and cold temperatures slow vegetation recovery.

<ul style="list-style-type: none"> • Pollination • Food production • Soil formation 	<p>Some species associated with Alpine Ecosystems are:</p> <ul style="list-style-type: none"> • American Badger • Peregrine Falcon • Wolverine 	<p>American Badger <i>Taxidea taxus jeffersonii</i> (Abundant, Endangered) Photo by Parks Canada (W. Lynch)</p>	 
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Wolverine
Gulo gulo luscus
(Mammal, Special Concern)
Photo by Parks Canada/ W. Lynch

Other important Ecosystems

are cultivated fields that flood annually, providing important migration and wintering habitat for birds. They provide important habitat for amphibians, and many types of predators. They are located along low-lying areas of some floodplains that have been isolated by channelization of creeks and rivers. Wetland or riparian ecosystems if natural flood regimes and vegetation are re-established.

Some species associated with Seasonally Flooded Agricultural Fields are:

- Great Blue Sparrows
- Shorebirds



... provide the following services:

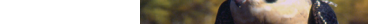
- Carbon storages
- Maintenance of productive soils
- Pollination
- Pest regulation

Some species associated with Secondary Forests agricultural fields are:

- Great Basin Spottedfoot
- Long-billed Curlew
- Peregrine Falcon
- American Badger

Conservation of Wildlife

(Arnprior, Threatened)
Photo by Gary Nells -
Californiakeeps.com



<ul style="list-style-type: none"> • Food production 	<ul style="list-style-type: none"> • Great Basin Gophersnake • Western Rattlesnake 	<p>Peregrine Falcon: <i>Falco peregrinus anatum</i> (Bird, Special Concern) Photo by Fred Liang</p>	
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ure trees; including **broadleaf** (MF-bd) forests, **coniferous** (MF-co) forests, and **mixed** (MF-mx) deciduous and coniferous forests; however it excludes broadleaf woodlands. Mature Forests are an important buffer to sensitive ecosystems. They provide some of the same values associated with Old Forest sites for Old Forests. Mature forest ecosystems have many important structural attributes, including some remaining large, old trees.

- Flood control
- Pest regulation
- Pollination
- Pollution control

• Lyall's Mariposa Lily
 • Wolverine
 • Williamson's Sapsucker
 • Olive-sided Flycatcher

• Western Screech Owl
 • Flammulated Owl

(Bird, Special Concern)
 Photo by Parks Canada/W. Lynch

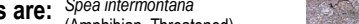
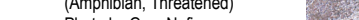


<ul style="list-style-type: none"> • F-35 production 	<ul style="list-style-type: none"> • Showy Phoenix • Western Rattlesnake 	<p>Williamson's Sapsucker <i>Sphyrapicus thyroideus</i> (Bird, Endangered) Photo by Jared Hobbs</p>	
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occupied by sensitive ecosystems, and include urban areas, disturbed rural landscapes, and young forests. Urban areas have human-influenced features such as buildings, roads, and other infrastructure. Disturbed rural areas can be interspersed with range, farmland and native vegetation, or cultivated crops. Young forests are conifer-dominated forests that have been established in the last 100 years. Non-sensitive landscapes are shown in white in the areas that are not designated by a sensitive ecosystem. In addition, many sensitive ecosystems are small and fragmented, and are often interspersed with non-sensitive ecosystems, which the sensitive ecosystems are too small to map individually. These modified

Seasonally Flooded Agricultural Fields (FS):

are cultivated fields that flood annually, providing important migration and wintering habitat for birds. They provide important habitat for amphibians, and many types of predators. They are located along low-lying areas or former floodplains that have been isolated by channelization of creeks and rivers. Wetland or Riparian ecosystems if natural flood regimes and vegetation are re-established.

<p>items provide the following services:</p> <ul style="list-style-type: none"> • Carbon storage • Maintenance of productive soils • Pollination • Pest regulation • Food production 	<p>Some species associated with Seasonally Flooded Agricultural Fields are</p> <ul style="list-style-type: none"> • Great Basin Sparrowhawk • Long-billed Curlew • Peregrine Falcon • American Badger • Great Basin Gophersnake 	 <p>Great Basin Sparrowhawk (perched, threatened) Photo by City Media © National Wildlife Service</p>
		 <p>Peregrine Falcon</p>

- Western Harlequin

Falco peregrinus anatum
(Belt, Special Concert)
Photo by Fred Lang




Some species associated with Mature Forest Ecosystems are:

<ul style="list-style-type: none"> • Flood control 	<ul style="list-style-type: none"> • Rusty-Margined Flycatcher • Western Goshawk 	<ul style="list-style-type: none"> • Flammulated Owl • Orib. Barred Owl • (Bird, Special Concern)
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- Food control
- Pest regulation
- Pollination
- Pollution control
- Food production

• Western Hattensnake

Scaphiopsis brevicauda
(Blatt, Endangered)
Photo by Jared Hobbs



bed as sensitive or other important ecosystems are depicted in white)

occupied by sensitive ecosystems, and include urban areas, disturbed rural landscapes, and young forests. Urban areas have human-influenced features such as buildings, roads, and parks. Disturbed rural areas can be interspersed with range, farmland and native vegetation, or cultivated crops. Young forests are conifer-dominated forests that have been established in the last 100 years. Non-sensitive landscapes are shown in white in the areas that are not designated by a sensitive ecosystem. In addition, many sensitive ecosystems have a modified landscape interspersed with the sensitive ecosystem(s), in which the sensitive ecosystems are too small to map individually. These modified