

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

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 few high quality sites remain. The study found many SES that have been degraded by fragmentation, human use, livestock grazing, and alien species.

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The services and benefits SEs provide and the wildlife species they support are critically important to the quality of life in the Okanagan. With so few at-risk and fragile ecosystems remaining, it is essential that each site be carefully considered and all 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

the water table and on which the plants are distributed, or, if the plants are not in places upon the phreatic surface (see below), it is recommended that digital data be collected for the hydrologic scale of the phreatic surface. This may result in unacceptable distortion of the study region with other datasets. The ability to see specific distributions (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. In many cases these 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.

Species at Risk

restricted ranges, and some occur nowhere else in B.C. or Canada. A high proportion of these species considered at-risk, either provincially or federally, rely on the habitat values found only in the at-risk and sensitive ecosystems of the valley.

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 Endangered, Threatened, or of Special Concern. Endangered species face imminent extirpation or extinction. Threatened species may become

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

TFL 15: Bruhjiell, D. and S. Robertson. 1999. *Ecosystem Mapping of Weyerhaeuser Canada Ltd., Tree Farm License 15*. Prepared for Weyerhaeuser Canada Ltd., *Chaparral Falls*, in partnership with EDCO and

Vernon – Commagene: Iverson, Kristi. 2005. *Sensitive Ecosystems Inventory: Vernon Commagene* 2005. 120,000 maps.

Kelowna: Iverson, K. and P. Uunila. 2008. *Sensitive Ecosystems Inventory: Kelowna - Vernon*. 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. Unilua. 2006. Sensitive Ecosystems Inventory: Coastal Okanagan. Joe Rich. 1:20,000 maps.

British Columbia Conservation Data Centre (CDC). Ecosystems Branch.
BC Ministry of Environment. www.env.gov.bc.ca/cdc/

[Related Publications and Links](#)

Green Bylaws Toolkit for Conserving Sensitive Ecosystems and Green Infrastructure: www.greentrylaws.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 Exemptions, Environmental Assessment, Stormwater Management and other regulatory tools. It includes several examples and case studies of successful green

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_intro.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

and parkland ecosystems including **herbaceous** ecosystems dominated by forbs or graminoid vegetation (AP3p), **parkland forests** where trees occur in distinct stands with dwarf shrubs such as heather (AP3h). Alpine ecosystems are found at higher elevations in the South Okanagan (TFL 15) where there is significant snow cover. Alpine ecosystems are sensitive to disturbance, as the shallow soils and cold temperatures slow vegetation recovery.

<p>services:</p> <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</i> (affiliated) (Mammal, Endangered) Photo by Paula Canada, W. Lynch</p> 
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Walrus
Gale melanos
(Marine, Special Concern)
Photo by Parks Canada/W. Lynch

Other Important Ecosystems

Wetlands are converted fields that flood annually, providing important habitat for many species. They provide important habitat for amphibians, birds, 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. Wetlands are important ecosystems if natural flood regimes and vegetation are re-established.


Wetlands provide the following services:

- Carbon storage

Some species associated with Seasonally Flooded Agricultural Fields are:

- Great Green Spadefoot

Great Green Spadefoot
Scaphiophrynus
 (Amphibian, Threatened)
 Photo by Gary Nalls –
 WetlandWorld



- Maintenance of productive soils
- Pollination
- Pest regulation

- Long-billed Curlew
- Peregrine Falcon
- American Badger
- Greater Roadrunner




- Food production
- Great Basin Gophersnake
- Western Rattlesnake


Peregrine Falcon
Falco peregrinus anatum
 (Bird, Special Concern)



Photo by Peter Lang

mature 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 ment sites for Old Forests. Mature forest ecosystems have many important structural attributes, including some remaining large, old trees.



<p>Working services:</p> <ul style="list-style-type: none"> • Flood control • Pest regulation • Pollination • Oak-kickapoo 	<p>Some species associated with Mature Forest Ecosystems are:</p> <ul style="list-style-type: none"> • Lyall's Mariposa Lily • Wolverine • Williams' Sapsucker • Western Screech Owl • Flammulated Owl 	<p>Flammulated Owl <i>Otus flammulus</i> (Ext. Species Concern) Photo by Parks Canada/ W. Lynch</p> 
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- Pollination control
- Food production
- Olive-sided Flycatcher
- Showy Phlox
- Western Rattlesnake

Williamson's Sapsucker
Sphyrapicus thyroideus
 (Bird, Endangered)
 Photo by Jared Hobbs



not occupied by sensitive ecosystems, and include urban areas, disturbed rural landscapes, and young forests. Urban areas have human-influenced features (e.g., buildings, roads, and parking lots). Disturbed rural areas can be interspersed with range, farmland and native vegetation, or cultivated crops. Young forests are forested areas that have recently been established, and are not yet mature enough to support sensitive species. Non-forested land includes areas that are not forested, such as grasslands, wetlands, and agricultural land. Areas that are not forested and are not occupied by sensitive ecosystems are depicted in white).

Seasonally Flooded Agricultural Fields (FS):

Items are cultivated feeds that food annually, providing important migration and wintering habitat for birds. They provide important habitat for amphibians, bats, 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. To maintain or restore ecosystems if floodplain forest and vegetation are re-established.

systems provide the following services:

- Carbon storage
- Maintenance of productive soils
- Pollination
- Pest regulation
- Food production


Some species associated with Seasonally Flooded Agricultural Fields:

- Great Blue Swallowtail
- Long-billed Curlew
- Pied-billed Grebe
- Peregrine Falcon
- Arctic Skua
- Great Black Cormorant
- Western Tattler

Partridge Peas:
 Rare, perennial shrub
 10' tall
 Photo by Eric Lang

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 Rare, perennial shrub
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 Photo by Eric Lang

native trees, including **bradford** (MF) box, **conferosa** (MF) cypress, and **mixed** (MF) deciduous and **conferosa** forests; however it excludes **live oak** and **bradford** forests. **Marsh Forests** are an important buffer to sensitive ecosystems. They provide some of the same values associated with Old Field Forests as Old Fields. **bradford** forest forests have important structural attributes, including some remaining large, old trees.

<p>Working services:</p> <ul style="list-style-type: none"> • Flood control • Pest regulation • Pollination • Oak-kickout control 	<p>Some species associated with Mature Forest Ecosystems are:</p> <ul style="list-style-type: none"> • Lyall's Mariposa Lily • Wolverine • Williamsport's Sapsucker • Western Screech Owl • Flammulated Owl 	<p>Flammulated Owl <i>Otus flammulus</i> (Ext. Species Concern) Photo by Parks Canada/ W. Lynch</p> 
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not occupied by sensitive ecosystems, and include urban areas, disturbed rural landscapes, and young forests. Urban areas have human-influenced features (e.g., buildings, roads, and other infrastructure). Disturbed rural areas can be interspersed with range, farmland and native vegetation, or cultivated crops. Young forests are forested areas that have recently been established, and are not yet mature enough to be considered old-growth forests. In addition, some sensitive ecosystems (e.g., riparian areas, wetlands, and coastal areas) may be located within or adjacent to urban areas, and may be affected by urban development. Urban areas are depicted in white, and are not occupied by sensitive ecosystems.

may have a modified landscape interspersed with the sensitive ecosystem(s), in which the sensitive ecosystems are too small to map individually. These modified