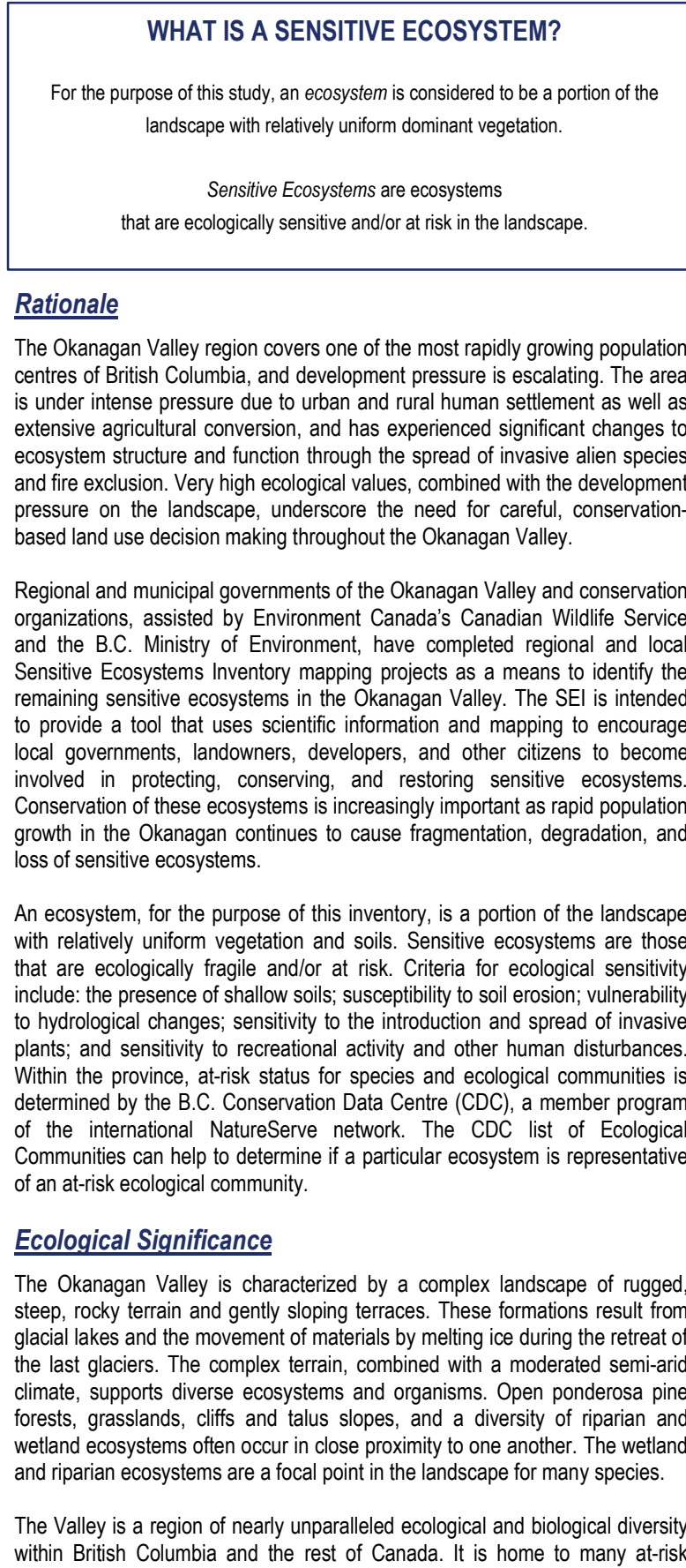


Other Important Ecosystems



processes and ecological communities, bringing some ecosystems unique to Canada: broadleaf woodlands, wetland-bog systems, seagrass beds, and riparian forests. The province's climate is also unique, with some of the coldest winters. Vancouver, like all coastal cities, has a temperate maritime climate. Vancouver, like all coastal cities, has a temperate maritime climate. Vancouver, like all coastal cities, has a temperate maritime climate.

Study Area

The Okanagan Valley project is comprised of a number of individual SES that are located in the Okanagan Valley, British Columbia, Canada. The project area includes the following locations: Vernon Community District of Lake County, Joe Roth, T.H. Narasimha, Nelson Community District, and the South Okanagan. For more information about the project, please refer to the project description and the methods used, please refer to the references section on this map.

The purpose of the SES Okanagan Valley project is to combine all of the various SES that have been completed in the Okanagan Valley from various sources and to create a comprehensive map of the project area to use for land use planning and to encourage landscape-level conservation planning. The project area includes the following locations: Vernon Community District of Lake County, Joe Roth, T.H. Narasimha, Nelson Community District, and the South Okanagan. For more information about the project, please refer to the project description and the methods used, please refer to the references section on this map.

Sensitive Ecosystems Inventory Methods

Sensitive Ecosystems Inventory was developed as a conservation tool that is flexible and can be completed in a short time with limited funding when the project area is included within an at-risk ecological community or conservation planning and sustainable development.

Most Okanagan SES projects were developed by first identifying the Terrestrial Ecosystem Mapping (TEM), except in the Nanaimo project where the SES was developed using the Ecosystem-based Resource Mapping (ERM) tool. The TEM tool allows SES classes and sub-classes to be assigned to each TEM class and sub-class. The TEM tool allows SES classes and sub-classes to be assigned to each TEM class and sub-class. The TEM tool allows SES classes and sub-classes to be assigned to each TEM class and sub-class.

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Treated species that have been included in Schedule 1 of the Species at Risk Act are afforded protection on federal lands, and the new B.C. Wildlife Act will extend protection to private landowners and habitats or proceeds. Protection of Species at Risk and their important habitats on private lands is primarily achieved through careful land use planning and municipal bylaws.

Acknowledgements:

Project partners include: B.C. Ministry of Environment, Environment Canada, The Alsea Brooks Nature Centre, Regional District of Okanagan Similkameen, Regional District of Central Okanagan, City of Kelowna, City of Vernon, District of Lake Country, and the Regional District of Bulkley-Watson.

Financial or in-kind support for the project was provided by: The B.C. Ministry of Environment (B.C. Conservation Data Bank), Environment Canada (Canadian Wildlife Service), Real Estate Foundation of B.C., Habitat for Humanity, and the Forest Health Stewardship Program, Canadian Services Commission, Regional District of Okanagan, Regional District of Bulkley-Watson, Regional District of Fraser-Fort George, Alsea Brooks Nature Centre, City of Vernon, District of Lake Country, Westhruex Canada Ltd., District of Colwood, City of Kelowna, and B.C. Conservation Data Bank.

Cartography: Lisa Zetterberg and Ann Byth (Consulting Ltd.) for Jan Kirkby, Environment Canada (Canadian Wildlife Service). Thanks to Allison Hickey, Mike Searl, Kristin Iverson, Carmen Cadan, Jo-Anne Spacey, and Kim Everett for their assistance in developing the map data.

References

Information and access to full reports and map products for the Okanagan valley can be accessed at EcoCall: www.enr.gov.bc.ca/ecocal/.
SEI Okanagan Valley or the project area name as a keyword).

SEI Report:

Iverson, K., E. D., Curran, T.L., Fleming, and A.L. Henry. 2004. **Sensitive Species Inventory - Okanagan Valley, Vernon to Osoyoos, 2007**. Methods, Ecology, Observations, Results and Conservation Tools. Final report to the B.C. #25, Canadian Wildlife Service, Pacific and Yukon Region, British Columbia.

This map can be cited as:

Environment Canada, Sensitive Species Inventory - Okanagan Valley, Vernon to Osoyoos, 2008-2007. 12000 Vancouver, British Columbia Wildlife Service. #25, Canadian Wildlife Service, Pacific and Yukon Region.

Narrative: Datzell, R.D. 2006. **Narrative Sensitive Species Inventory, 12000 Vancouver.**

Citations (including such topics): Hanley, A. and K. Iverson. 2009. **Conservation analysis and updated ecosystem mapping for the Central Okanagan valley.** Central Okanagan, Scotty Kelowna, Elkanor and Joe Iverson. 2009. **Central Okanagan Collaborative Conservation Management Plan.** report prepared for the Okanagan Collaborative Conservation Program.

Iverson, K., and C. Edwin. 2001. 2002. **Ecosystem Mapping of Portions of the Okanagan Valley.** Report prepared for the Okanagan Collaborative Conservation Program and the Ministry of Sustainable Resource Management. 12,000 maps.

Lake Country: Iverson, K. and P. Umlauf. 2006. **Sensitive Ecosystems Inventory.** 12,000 maps. 2005. 12,000 maps.

THL BSA: Buffel, J. and L. Robertson. 1989. **Ecosystem Mapping of the Thompson-Hill-Burnaby Area.** Tree Farm Analysis No. 19 prepared by Westhruex Canada Ltd., Okanagan Field, in partnership with FRBC and Ministry of Forests. Kelowna, BC. 12,000 maps.

Vernon – Commagene Inverness: Kraft, 2006. **Sensitive Ecosystems Inventory.** Vernon Commagene Inverness. 12,000 maps.

Bella Vista – Goose Lake Range: Iverson, K. and J. Shipkyo. 2004. **Sensitive Ecosystem Mapping of the Bella Vista – Goose Lake Range.** 12,000 maps.

Coldestream – Vernon: Iverson, K. and P. Umlauf. 2006. **Sensitive Ecosystems Inventory.** Vernon Coldestream. 12,000 maps.

Kelowna: Iverson, K. and P. Umlauf. 2008. **Sensitive Ecosystems Inventory.** City of Kelowna. 12,000 maps.

South Okanagan: Iverson, K. and A. Henry. 2009. **Refined and updated ecosystem mapping for the South Okanagan Valley.** Report prepared for the Regional District of the Okanagan – Shilshum.

Map Products:

Iverson, K. 2005. **Terrrestrial Ecosystems Mapping South Okanagan – This is an update to Lea, E. and M. Maxwell. 1993. Biophysical Habitat Values of the South Okanagan.** 12,000 maps.

Joe Iverson, K. and P. Umlauf. 2006. Sensitive Ecosystems Inventory. Central Okanagan. 12,000 maps.

British Columbia Conservation Data Bank (CDB). Ecosystems Branch. B.C. Ministry of Environment. www.enr.gov.bc.ca/cdb/

Related Publications and Links

Green Bylaws Toolkit for Conserving Sensitive Ecosystems and Open Infrastructure: www.greenbylaws.org/

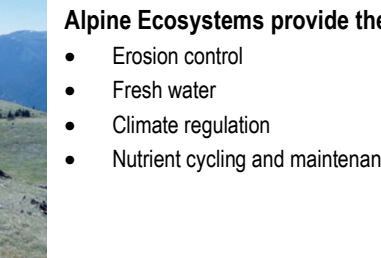
The Toolkit contains practical examples of bylaw provisions currently in use in British Columbia, and provides information on Regional Growth Strategies, Official Community Plans, development permit Areas, Zoning, Tax Exemptions, and other tools available to local governments to conserve regulatory tools. It includes several examples and case studies of successful green infrastructure projects and plans.

Climate Change: Wilson, S. and R.H. Hedda. **Mitigating and Adapting to Climate Change in the Okanagan Valley.** Available at www.infrastructurebc.ca/research.html

Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia. BC Ministry of Environment. www.enr.gov.bc.ca/devwithcare/index.cfm?document=2006-developw.htm_1

Taking Nature's Pulse: The Status of Biodiversity in British Columbia Austin, M.A., D.A. Buffel, D.J. Nicholson, G.G. de Gooijer and V. Stevens (eds.). 2008. Taking Nature's Pulse: The Status of Biodiversity in British Columbia. Ecovision World Wide Fund for Nature. Available at www.worldwildlife.org/biodiversity/

Alpine (AP):



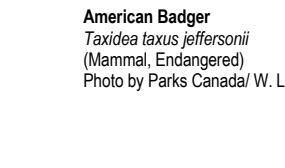
Alpine ecosystems are high-elevation alpine and parkland ecosystems including **herbaceous** ecosystems dominated by forbs or graminoid vegetation (AP1), **parkland forests** where trees occur in distinct clumps (AP2), and **shrub ecosystems** dominated by dwarf shrubs such as heather (AP3). Alpine ecosystems are found at higher elevations in the South Okanagan (T1, 15) where there is 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.

Alpine Ecosystems provide the following services:

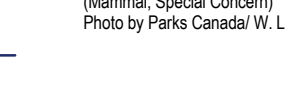
- Erosion control
- Fresh water
- Climate regulation
- Nutrient cycling and maintenance of productive soils

Some species associated with Alpine Ecosystems are:

- American Badger
- Peregrine Falcon
- Wolverine



American Badger
Taxidea taxidea
Photos by Patia Gaudin W. Lynch



Peregrine
Falco peregrinus
Photos by Patia Gaudin W. Lynch

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 species, small mammals, 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. 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:

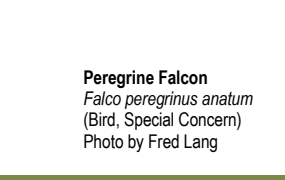
- Flood control
- Drifted energy
- Storm protection
- Drainage and natural irrigation
- Fresh water

Some species associated with Seasonally Flooded Agricultural Fields are:

- Great Basin Sparfied
- Long-billed Curlew
- Peregrine Falcon
- American Badger
- Great Basin Gophersnake
- Western Rattlesnake



Great Basin Sparfied
Spizella monticola
Photos by Cary Hells



Peregrine Falcon
Falco peregrinus
Photos by Patia Gaudin W. Lynch

Mature Forest (MF):


Mature Forest ecosystems are dominated by mature trees, including **broadleaf** (MF-b) forests, **coniferous** (MF-co) forests, and **mixed** (MF-m) deciduous and coniferous forests; however it excludes mature riparian forests, and mature coniferous and broadleaf woodlands. Mature Forests are an important buffer to 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 Forest ecosystems have many important structural attributes, including some remaining large, old trees.

Mature Forest Ecosystems provide the following services:

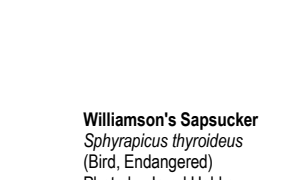
- Climate regulation
- Carbon storage
- Air quality
- Erosion control
- Sediment retention
- Nutrient cycling and maintenance of productive soils

Some species associated with Mature Forest Ecosystems are:

- Lyall's Marmosa Lylei
- Western Screech Owl
- Western Rattlesnake
- Willemson's Sapsucker
- Olive-sided Flycatcher
- Shrews
- Western Rattlesnake



Lyall's Marmosa Lylei
Marmosa lylei
Photos by Patia Gaudin W. Lynch



Western Screech Owl
Screech Owl
Photos by Janel Hobbs

Non-sensitive Landscapes (NS): (Areas not mapped as sensitive or other important ecosystems are depicted in white)

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 range, terraced and native vegetation, or cultivated crops. Young forests are cone-dominated stands with an age range between 0 and 50 years. Non-sensitive landscapes are shown in white in the areas that are not designated by a sensitive ecosystem. In addition, many sensitive polygons close to urban or disturbed areas may have a modified landscape interspersed with the sensitive ecosystem. (In this the sensitive ecosystems are too small to map individually. These modified areas are described as NS.)