



Smart Growth on the Ground

FOUNDATION RESEARCH BULLETIN: Greater Oliver

Research compiled by:

South Okanagan
Similkameen
Conservation
Partnership

No. 4
April, 2006

CONSERVATION OF BIODIVERSITY AND ECOLOGICAL FUNCTIONS

1.0 Introduction

Geography, geology and climate have combined to make the South Okanagan a unique part of Canada. The landscape is a complex array of habitats, including desert-like grass and shrub valley slopes, riparian habitats along the Okanagan River and tributaries, and upland mature forests and rocky terrain. Due to habitat diversity and the fact that these ecosystems are in such close proximity, the region supports one of the most diverse assemblages of species in Canada. Many of these species are not found elsewhere in Canada. For this reason, the South Okanagan is our national "hotspot" for species richness and rarity.

Animals such as the Yellow-breasted Chat, Pallid Bat and Tiger Salamander are among approximately 55 federally listed species at risk by the Committee On the Status of Endangered Wildlife In Canada (COSEWIC) and 256 provincially listed species that depend on habitats that are found in the South Okanagan. Due to increasing human pressures for agriculture and residential developments, and also due to invasive plant species degrading remaining habitats, both habitats and the species that depend on them are under increasing threat. The goal of local concerned citizens is to ensure that our heritage of wildlife and plant species of the South Okanagan is conserved (protected, restored and where feasible enhanced) in perpetuity.

The Okanagan Valley corridor is also integral to maintaining the biological diversity and ecological adaptation of natural environments throughout interior British Columbia. The corridor provides a vital link for plants and animals between the interior grasslands of British Columbia and the Great Basin and dry interior desert ecosystems to the south.

The Greater Oliver area is located in approximately the middle of this high priority habitat of the South Okanagan. This area has much of the remaining key riparian and grasslands habitats and is also key to maintaining the north-south corridor.



Figure 1: Canada's pocket desert



Figure 2: Remaining wetlands adjacent to the channelized Okanagan River

2.0 Conservation Issues

2.1 Priority Habitats

The Greater Oliver area has a number of major habitat types, including: (1) Aquatic habitats such as the Okanagan River which support a variety of migratory and non migratory fish and bird species; (2) Riparian habitats in the old floodplain and non channelized parts of the Okanagan River and adjacent tributaries; (3) Shrub-steppe grasslands containing Antelope-brush plant associations; (4) Rocky terrain, which serves as habitat to bats, snakes and other animals including bighorn sheep; and (5) Mature coniferous forests with ponderosa pine at lower elevations, and Douglas fir, larch and spruce found with increasing elevation.

Of these habitat types, two priority habitats in the Greater Oliver area are the Grasslands-Shrub Steppe and the Riparian/Wetlands.

2.1.1 Grasslands-Shrub Steppe

Grassland-Shrub Steppe habitat is known as Canada's pocket desert. Home to species such as badgers, sage thrasher, burrowing owls and the rare Behr's Hairstreak butterfly, these habitats are extremely dry and fragile environments. Being an extension of the American Great Basin deserts to the south, these grasslands are corridors for the migration of desert-adapted wildlife and plant species. With sandy soils and lack of precipitation, these habitats are easily damaged and slow to heal.

The conservation goals are to minimize the loss of habitat, and to reduce damage or destruction of these areas while maintaining connectivity for the movement of species. Antelope brush habitat is limited in Canada to 4,000 ha, approximately 40% of its original area.

2.1.2 Riparian/Wetlands

Riparian and wetland habitats are biologically very productive, providing shelter and food for animals such as the Western Screech Owl, the Yellow Breasted Chat and the Great Basin Spadefoot toad. Wetland/riparian habitats are the most imperilled in the South Okanagan. Approximately 90% of the historical wetland and riparian habitats along the Okanagan River have been lost due to river channelization and land development for agriculture and residential use.

Conservation and restoration of remaining wetland and riparian habitats are a very high priority. A major effort is underway to the north of the town of Oliver, where several parcels of land adjacent to the Okanagan River have been purchased to naturalize a section of the river and restore riparian and aquatic habitats.

2.2 Species Diversity and Risk

The Okanagan and Similkameen watersheds are home to a diverse range of fish, amphibian, reptile, bird, and mammal species. 329 species of birds have been observed in this area. Invertebrate

diversity is also significant. Eight species of invertebrates occurring here are found nowhere else in the world, and eight species of vertebrates and twenty-eight invertebrates occurring here are found nowhere else in Canada.¹

The area is home to 55 species of plants and animals listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as nationally extirpated, endangered, threatened or of special concern. For many of these species, actual populations are not well known, nor are the dynamics of their persistence in the South Okanagan - Similkameen region.

The following table illustrates the issues and threats causing species to be at risk within the Greater Oliver area.

Table 1: Species and threats in the Greater Oliver area

SPECIES	THREATS
Tiger Salamander	Habitat loss principally due to consumption of water by human population and the down-drawing of many water bodies. Predation by introduced fish species. Water pollution. Roads as barriers to migration. Pollution of aquatic environments.
Great Basin Spadefoot Toad	Destruction of habitat due to residential and agricultural development, cattle grazing and watering, off-road vehicle recreation. Introduced species that prey on larval stages, compete for food, or alter habitat. Water pollution. Anthropogenic alterations to water courses.
Pigmy Short-horned Lizard	Habitat loss due to agriculture and residential development. Road kills. Trampling and compaction of habitat by cattle.
Great Basin Gopher Snake	Habitat loss due to residential and agricultural development. Destruction of habitat in talus quarrying. Roads and habitat fragmentation that disrupt movement patterns. Predation by humans and domestic cats. Loss of rodent prey through human pest eradication actions.
Night Snake	Habitat loss due to residential and agricultural development. Destruction of habitat in talus quarrying. Roads and habitat fragmentation that disrupt movement patterns. Predation by humans and domestic cats.

Approximately 90% of the historical wetland and riparian habitats along the Okanagan River have been lost

Western Screech-Owl	Loss of suitable riparian habitat for nesting and roosting with adjacent open areas for foraging. Road kills.
Sage Thrasher	Clearing of sagebrush steppe habitat for agricultural use, particularly vineyards and for housing.
Yellow-breasted Chat	Reduction in quality and quantity of dense riparian thickets for breeding habitat due to housing development and intense agricultural practices.

2.3 Ecosystem Functions

Our natural ecosystems are not only important for providing services for the species that use and depend on them, but they also provide important infrastructure services for our communities. Nature plays an important role in providing “green infrastructure” for our communities. If we impair or remove these functions we will need to pay to replace these services in some way.

2.3.1 Water Quantity and Quality

Wetlands provide important ecological, social and economic functions in the landscape. Wetlands help to maintain the flow characteristics of the watershed as they provide an important function in the storage, movement and treatment of water through the landscape. The economic contributions may include well and surface water supplies for agriculture and domestic use, flood control, and natural treatment for improving water quality.

Ducks Unlimited Canada in their report for the Walkerton Enquiry² carried out a review of hydrological and water cleansing functions of wetlands. The report states:

“Wetlands are extremely complex systems and several characteristics contribute to their roles as nutrient sinks. They accumulate organic matter, retain nutrients in buried sediments, convert inorganic nutrients to organic biomass, promote sedimentation of solids, and their shallow water depth maximizes water-soil contact and therefore microbial processing of nutrients and other material in the overlying water. Wetlands can be effective nitrogen sinks in agricultural landscapes due to assimilation by microbes and denitrification. Other wetlands may retain nitrate and ammonium but may export organic nitrogen. Phosphorus retention in wetlands is accomplished through adsorption onto organic peat and clay particles, precipitation of insoluble phosphates with metals and incorporation into living biomass. Phosphorus retention rates for wetlands can be significant, however, under anoxic conditions previously retained phosphorus can be released. Wetlands are hydrologically, chemically and biologically linked to the landscape in which they occur and have variable nutrient-retention efficiencies depending on their position in the landscape, watershed hydrology, hydrogeologic characteristics and climate.”

Table 2: Range of percentage retention for nitrogen, phosphorus sediment, coliforms and pesticides in wetlands (from Gabor et al. 2001)

Nitrogen - Nitrate	Up to 80 percent
- Ammonium	Up to 95 percent
Phosphorus	Up to 92 percent
Sediment	Up to 70 percent
Coliforms (Constructed Wetlands)	Up to 90 percent
Pesticides	Less than 1 day up to several months (time for residues to decrease by 50 percent)

As can be seen from this table, wetland and riparian buffer areas can make a significant contribution to maintaining or improving water quality.

2.3.2 Other Services

Healthy grasslands and wetlands also provide important services such as erosion control and provide areas for ground water recharge. They help to mitigate storm water runoff and flooding, minimize low water flows and can provide important open space for communities.

3.0 Opportunities Presented by the Local Ecology

The Greater Oliver area is strategically located in the South Okanagan valley. Oliver can and does benefit socially and economically from the unique ecology of the South Okanagan. Marketing of the unique ecology such as the branding of "Canada's Pocket Desert" will help the wine industry to attract additional tourism to the area. In addition, conservation efforts will also play a role in maintaining or improving water quality as well as helping accomplish important regional and national conservation goals.

Conservation and restoration of wetlands and grasslands provide natural open spaces and contribute to the maintenance and enhancement of the quality of life and character of the Oliver region. The direct benefits from conservation include recreational values and educational opportunities, such as from bird watching, photography, hunting, hiking, fishing and research. The longer term vision of Greater Oliver as a sustainable or "green" community will help attract new businesses to the area and the employees and customers for these businesses who will want to move into the area because of the lifestyle amenities the area has to offer.

4.0 Recommendations for Land Use Planning

Developing a long-term vision for Greater Oliver, and the land use policies that need to be implemented to accomplish this, must incorporate progressive policies for conservation of important environmental values. The steps in this planning process include:

- a) Identifying and mapping sensitive areas. Priority sensitive areas will include areas of wetlands and riparian habitat, and grasslands containing priority Antelope-brush habitats.

- b) Creating opportunities for zoning land as "Open Space" and as "Natural Areas." Open Space may include lands in both urban and rural areas, with recreation facilities where the priority use is on recreation. Natural Areas include sensitive ecosystems and should be managed with the primary interest of conserving natural values and secondarily for recreation use.
- c) Developing Environmental Development Permit Areas (EDPA's) based upon the mapping of environmentally sensitive areas. Presently this would only apply to non-ALR (Agricultural Land Reserve) lands. Areas designated as EDPA should be avoided in development planning, but if proposed for development, would require an Environmental Assessment to determine the potential environmental impact and to outline opportunities to mitigate these impacts.
- d) Encouraging landowner stewardship opportunities. In the Greater Oliver area there are currently significant efforts by local landowners to maintain or improve environmental values on their properties. This effort should be encouraged on private lands both inside and outside the ALR.

References

- 1 SOSCP. August 2003. Recovery Strategy for Species at Risk in the South Okanagan and Lower Similkameen Valleys of BC. SOSCP, Penticton, BC.
- 2 Gabor, S. T., A. Kiers North, L.C.M. Ross, H.R. Murkin, J.S. Anderson, M. Raven. 2004. Natural Values, The Importance of Wetlands and Upland Conservation Practices in Watershed Management. Ducks Unlimited Canada. Institute for Wetland and Waterfowl Research. Oak Hammock Marsh. Manitoba.

Credits

Figure 1: Joanne Muirhead, Osoyoos Desert Society
Figure 2: Rob Hawes

Contact Us

Design Centre for Sustainability

University of British Columbia, 394-2357 Main Mall, V6T 1Z4
t. 604-822-5148, f. 604-822-2184

For more information visit the following websites:

www.designcentreforsustainability.org, www.sgog.bc.ca