Environmental Issues and Options
For the South Okanagan Regional Growth Strategy

Volume 1: Background

Prepared by Hobson & Associates
for the
Environmental Advisory Committee
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The team of Hobson and Associates is grateful for the opportunity to have provided environmental background information to the Regional Growth Strategy process and is hopeful that it will be of benefit to the Strategy and its implementation.

For the purposes of this project, Hobson and Associates consisted of the following team members: Angela Hobson, Sue Austen, Anne Hargrave, Mike Sarell, Allison Haney and Robert Hobson.

Disclaimer

The information covered in this report has come from a wide variety of sources including numerous reference documents, personal conversations and anecdotal remarks. The report is intended to provide the reader with an understanding of the scope of environmental issues and options in the south Okanagan. It is not meant to be “all inclusive”, although there has been an attempt to scan as many relevant environmental matters and documents as possible.

This final report is based on the original draft of June 2005 and has been updated and/or expanded within the confines of a given timeframe and available resources. Although a few anomalies may remain, the overall intent is the same in that there is a wealth of background environmental information from which to draw.
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1. Introduction

British Columbia’s south Okanagan Valley is, ecologically, an extremely unique area. Lying in the rain shadow of the Coast Mountains and lined with terraces formed during the last glaciation, this region is host to a diverse set of habitats – wetlands, grasslands, rocky outcrops – and supports one of Canada’s greatest concentrations of species diversity.¹

In recent years, the south Okanagan has felt the pressures of increasing human development, and is projected to experience significant growth over the next two decades. As such, a clear vision is needed to ensure the protection of this region’s sensitive and unique ecosystems, and to enable development that is cognizant of the natural environment.

The purpose of this paper is to introduce existing environmental issues, as well as seek others that will demand attention in the south Okanagan over the next several years, and to identify options for their management. Specifically, it seeks to accomplish the following:

1. provide an overview of the region’s environmental attributes and unique ecological values;
2. consider recent and projected human settlement patterns in the area;
3. identify both government and non-governmental organization (NGO) roles and responsibilities in environmental management;
4. discuss emerging environmental issues; and
5. provide recommendations for environmental management policies and practices, including performance indicators and monitoring programs.

a. Growth: Past and Projected

Southern British Columbia has seen significant growth in the last two decades, and this trend is projected to continue. While the south Okanagan has not witnessed a population increase on par with that of communities in the lower mainland or Vancouver Island, it too has experienced the impacts of a rapid increase in population and accompanying development.

A recent population projection for the Regional District of Okanagan-Similkameen² indicated a total population increase of 30% between 2004 and 2031, adding 24,506 residents to the existing population of 80,822. The area covered by the Regional Growth Strategy, the south Okanagan, accommodates the majority of the people. This trend would see a gradual increase in the annual growth rate from 0.5% in the next several years to a sustained rate of nearly 1% by 2010. Penticton is projected to experience the most significant increase in population growth at 32%, while the communities around Oliver and Osoyoos are expected to see an increase of 27%.

In order to consider the impacts of housing on land use, it is necessary to further deconstruct this general population trend. While the Regional District population is anticipated to increase by 30%, the reality of an aging population and increasing maintainer rates in the 60+ age group, meaning that our older population is

living longer, will result in a housing occupancy demand increase of 38%, with the projected increase in apartment demand at 43%, compared to a 37% increase in ground-oriented demand.

Consideration of these trends in the broader regional context is telling: the Thompson-Okanagan as a whole is the second fastest growing region in the province. In 1971, the population of the Okanagan was approximately 114,000, a figure which had more than doubled by 2001, to a total population of 300,000. And this trend shows no sign of abating: a growth rate of 40% is projected over the 2001-2031 period, to a total population of 450,000. In addition to permanent residents, large numbers of tourists visit the valley, primarily in summer. In the mid 1990s, the Okanagan hosted 4.8 million tourists.

The south Okanagan is likely to experience both benefits and impacts as a result of this general population influx. As such, proactive environmental policy and the establishment of the tools necessary to see it implemented is crucial to the ecological protection of this unique region.

b. The Regional Growth Strategy: An Invaluable Environmental Management Tool

The Regional Growth Strategy (RGS) is an invaluable tool for guiding environmental protection, given that both the regional scale and the required 20-year timeline are well suited to the implementation of sound environmental management policies. Introduced in 1995 by the provincial government, the RGS is intended to establish "a regional vision that commits affected municipalities and regional districts to a course of action to meet common social, economic and environmental objectives." As such, it provides a venue for coordinated management of environmental issues that straddle municipal boundaries – a critical area for cooperation, given that environmental phenomena rarely respect political borders.

An RGS typically includes population and employment projections, and establishes actions to be taken to ensure projected needs are met. The resulting discussion is a valuable opportunity for communities to establish regional environmental needs, securing a commitment to the collaborative protection of shared natural attributes such as sensitive ecosystems and water resources. The RGS serves as a guide to development spanning a 20-year period, more than twice the length of time considered in most Official Community Plans (OCPs). Given the complexity and uncertainty surrounding many of the environmental issues in the south Okanagan, this extended timeline provides a crucial opportunity for proactive and adaptive management of development within this changing environmental context.

The south Okanagan is fortunate in that several other regional districts in southern British Columbia have already completed Regional Growth Strategies, each of which incorporated environmental policies to some extent. These include, but are not limited to, Central Okanagan, Capital, Thompson-Nicola, Nanaimo, and Comox-Strathcona Regional Districts. As part of their comprehensive vision, most RGSs have an environmental vision to identify and protect unique natural attributes and natural resources such as air and water, thus ensuring the long-term health and sustainability of both natural and human communities. In addition, some include a goal to preserve “livability”, others specifically mention air and water quality, and still others note ecosystems of special significance to the region.

The specific environmental policies which support those visions are as diverse as the regional districts that created them. Most, however, highlight five key principles:

- the importance of *environmental review* of development;
- directing urban development *away* from environmentally sensitive areas (ESAs);
- identifying, conserving and preserving the *diversity* of ESAs;
- the creation of a *system* of interconnected natural areas (nodes and corridors); and
- the importance of good, up-to-date, accessible *information* on ESAs (both spatial and descriptive).

In addition to these general principles, several RGSs have created an opportunity for innovative implementation of environmental policy. Resulting management tools include ecosystem mapping, Environmentally Sensitive Areas (ESAs), Environmental Impact Assessments (EIAs), Environmentally Sensitive Development Permit Areas (ESDPAs), environmental advisory/review boards, greenway and waterway strategies, urban containment boundaries and resource atlases. The common theme among all of these approaches is *early identification of environmental attributes*, and a commitment to managing development and human activity to ensure their protection. It is increasingly being recognized by forward-thinking BC regional districts and municipalities that environmental protection almost never incurs long-term costs, and almost always produces invaluable benefits.

The Capital Regional District (CRD) Regional Growth Strategy (RGS) is one example of an RGS that has proven particularly effective with respect to protection of natural spaces. In 1997, the CRD created a Regional Green/Blue Spaces Strategy, key elements of which include protection of a Sea to Sea Green/Blue belt running from Saanich Inlet to Juan de Fuca Strait, and the development of an integrated system of parks and trails linking urban areas to rural green space areas. Dedication of the CRD and member municipalities to this clearly defined goal and use of complementary regulatory measures make the CRD’s RGS exemplary. Complementary regulatory measures include development permit areas within official community plans and zoning bylaws, financial incentives, Environmental Certification (provided by organizations such as The Land Conservancy to landowners who adhere to certain protection requirements in the use of their property) and land securement measures such as Conservation Covenants and acquisitions, excellent resources for private land stewardship, and cooperation with local land trusts.

c. **Benefits of Ecological Protection in Community and Economic Planning**

The benefits of preserving ecological health accrue not just to the natural environment, but equally to society and the economy. Perhaps the most significant benefit is the retention of ecological or environmental services through ecosystem functions, inherent in an intact ecosystem. Such services, difficult or impossible to replace and offered ‘free of charge’, include climatic modification, soil, air and water renewal, nutrient and chemical cycling, production of materials, pollination, dilution and detoxification of pollutants, pest control, erosion prevention and genetic diversity. Generally taken for granted until they cease to function, these services are essential to quality of life and to the success of local economies.

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7 University of Wisconsin-Madison Department of Urban and Regional Planning. *Natural Areas and Ecological Services*. Retrieved February 27, 2005 from [http://urpl.wisc.edu/ecoplan/content/lit_naturalareas.pdf](http://urpl.wisc.edu/ecoplan/content/lit_naturalareas.pdf).
Secondly, recent studies have shown that adjacency to greenways and natural areas results in significant (15-20%) increases in property values. Contrary to local government concern that stream setbacks for conservation purposes have negative economic impacts on property values, it has been clearly documented that the attractive views, recreational opportunities and general increase in quality of life for adjacent residents improves, rather than degrades, property values. The clustering of homes to protect natural areas provides further economic and social benefits, including reduced costs for developers (and, indirectly, home buyers): where housing is more compact, infrastructure coverage is less extensive and therefore less costly to install.

Furthermore, in some jurisdictions where the environment is taken into consideration, public approval processes are generally more expedient and therefore less costly, as the public tends to support projects for which ecological studies have been completed. Also there are other economic benefits of ecologically sensitive planning and development such as better quality of life, savings in infrastructure and liability costs and payback from increased property values. In addition, the media is often interested in "green development", so coverage is more extensive and the issues better known to the public.

Finally, and of particular importance to the south Okanagan, environmental protection results in the retention of other important community values, such as sustainable land use, aesthetics/scenic, recreational and cultural values, environmental services, and benefits that are virtually invaluable for a region that draws considerable economic vitality from the tourist industry.

The spectacular natural setting and the wildlife that inhabits it have created a distinct “Okanagan lifestyle”, recognized by permanent residents and tourists alike. The climate – warm summers, cool, dry winters and little rain – in combination with varied topography and prominent bodies of water, make the region highly amenable to outdoor recreation. Natural features such as the Skaha Bluffs which are popular for rock climbing and hiking, as well as cultural features, such as the Kettle Valley Railroad, provide the opportunity for hiking, cycling, rock climbing. The potential for ecological and cultural tourism, particularly by local First Nations, is growing. Several large lakes - Okanagan, Skaha, Vaseux and Osoyoos Lakes in particular – offer the opportunity for aquatic recreation, including boating, fishing, swimming, and canoe/kayaking. The region is home to an involved community of naturalists and birdwatchers, who are active in advocating for the protection of natural areas and wildlife. There is currently a feasibility study underway to assess the economic, social and environmental potential for a National Park in the south Okanagan. In addition, interpretive sites have, among other things, facilitated environmental education about unique ecological areas. These include the Osoyoos Desert Centre and the Nk'Mip Desert and Heritage Centre both located in the Osoyoos area.

As articulated by the World Commission on Environment and Development, "ecology and economy are becoming ever more interwoven”…

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2. Environmental Overview

a. Environmental Attributes

The south Okanagan valley is part of what is referred to as “Canada’s Desert Country”, and makes up a richly biodiverse and unique environment. Although not truly a desert, this hot, dry semi-arid area is considered one of Canada’s top four endangered ecosystems. Part of the **Southern Interior Plateau**, the south Okanagan lies within the northerly reaches of the Western Great Basin of North America. A combination of climate, geology, natural history and geography makes this region exceptional.

i. Biogeoclimatic Zones and Broad Vegetation Types

BC has a provincial Biogeoclimatic Ecosystem Classification System – a system of delineating and classifying ecologically distinctive areas based on geologic, landform, vegetative, climatic, wildlife and water characteristics. Within this system, there exists a nested hierarchy of ecosystems, in which smaller ecosystems are encompassed within successively larger ones. Ecosystems are clearly not discrete entities: they are dynamic and interactive and their boundaries are rarely clearly defined. Nonetheless, five levels of ecosystem generalization exist. From more general to more detailed, they are: **Ecodomain, Ecodivision**, **Ecoprovince, Ecoregion and Eosection**.

The south Okanagan is part of the **Semi-arid Steppe Highland Ecodivision** and the **Southern Interior Ecoprovince**. It sustains numerous biogeoclimatic zones, including Interior Douglas-fir, Ponderosa Pine and Bunchgrass. Together, these zones support a range of ecosystems: grasslands, riparian and wetland areas, forests and rugged terrain, including the rocky cliffs that serve as habitat for a diversity of rare and endangered species.

Shrub-steppe grasslands, including the Big Basin Sagebrush and Antelope-Brush plant communities, occur in the hot, dry environments in the valley bottoms. They are dominated by perennial grasses, scattered shrubs, and a soil crust of lichens and mosses. Bordering the grasslands are marshes rich in biodiversity, moist cottonwood and birch woodlands, and ponderosa pine forests. Moving up the valley slopes, the dominant forms of vegetation are Douglas-fir, larch, lodgepole pine, spruce, and finally subalpine fir. It is a rich matrix of sensitive ecosystems in close juxtaposition to one another.

The south Okanagan’s unique ecology is the result of a dynamic geological and glacial history combined with a hot, dry climate and mild winters. The depression known as the Okanagan Valley was formed due to plate tectonics: a period of decompression allowed for faulting which created a deep rift when the pressure on the colliding plates abated. During this same process, the granitic basement rocks were exposed in

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12 South Okangan-Similkameen Conservation Program. *The South Okanagan-Similkameen: Canada’s Desert Country*.


14 Ibid.
various locations in the south Okanagan, as seen at locations such as McIntyre Bluff, the east side of Skaha Lake, and along both sides of Vaseux Lake. The Cordilleran Ice Sheet further modified the valley, and lakes formed in the existing depressions following its retreat several thousand years ago. The soils on the Valley's terraces formed from glacial rock flour, derived from predominantly nutrient-rich basaltic rock.

**ii. Climate**

Climate plays an integral role in shaping the south Okanagan’s environment. Lying in the rain shadow of the Coastal Mountains, the south Okanagan experiences low annual precipitation (250-350 mm/yr in the valley, and 600 mm at the tree line. The climate is dry continental, hot and dry in the summer, and cold in the winter. Latent heat from coastal winds also has a warming effect on the region. The Westerlies force moisture-laden air up over the mountains, the moisture condenses, and the heat released by the vapourization results in an increase in air temperature. The open waters of the valley lakes, however, serve to temper the climate of the south Okanagan. They cool the air on hot summer days, and retain heat in the winter, raising the air temperature. Atmospheric inversions create a thermal blanket of low cloud, which reduces the nighttime radiative cooling and thus has the effect of warming the valley in winter.

**iii. North-South Wildlife Corridor**

The south Okanagan is “the neck of an hourglass” between the dry landscapes of British Columbia’s central interior to the north, and the Great Basin desert to the south, which has similar habitat. Following the retreat of the Cordilleran Ice Sheet, the low elevations of the Okanagan and Similkameen valleys served as a habitat corridor, and a diversity of dry-adapted species expanded their range north through Oregon, Idaho and Washington to populate the south Okanagan region. Facing climate change and further adaptations in the future, the south Okanagan will remain a critical corridor for species adaptation. It will remain an essential link for wildlife, providing a critical connection between the dry landscapes of the province’s central interior and similar habitat to the south. The Okanagan River, which once facilitated the northward expansion of species dependent on riparian habitats, now serves as an essential route for migratory bird species. It provides cover from predators and the food needed to fuel semi-annual migrations between summer ranges in the interior of BC and winter ranges in grasslands and deserts to the south.

The unique environment created by these climatic, geological and geomorphic attributes has resulted in a diversity of regional habitats, which support a high degree of species richness. This high biodiversity, and the integral role the south Okanagan plays in facilitating the ecological adaptation and evolution of natural environments, will be discussed in detail in the following sections.

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14 Okanagan Similkameen “At the Cross-Roads” (PowerPoint Presentation)
17 South Okanagan-Similkameen Conservation Program. The South Okanagan-Similkameen: Canada’s Desert Country.
16 Ibid.
20 Okanagan Similkameen “At the Cross-Roads” (PowerPoint Presentation)
21 South Okanagan-Similkameen Conservation Program. The South Okanagan-Similkameen: Canada’s Desert Country.
iv. Ecological Compression

The south Okanagan’s diversity of habitats in close proximity to one another made it highly amenable for colonization by a rich and distinctive assortment of species from the south. Today, the conditions in the south Okanagan enable one of the highest ratings of species richness in Canada, with the diversity of species in some areas comparable to that of tropical regions. Species richness is assessed as having a high number of species sharing a range of habitats within a small area. For example, the south Okanagan is known for its breeding bird diversity, which includes over 200 species, arguably one of the highest concentrations in the continent.

In addition to the richness of species, the south Okanagan has a high degree of species rarity – the region hosts a large number of species that are found nowhere else in Canada, or in some cases, the world.

Because so many species in the south Okanagan are at the furthest extent of their range – that is, conditions further afield are too adverse to allow their survival – many of the species present have diversified to ensure the survival of their populations. This genetic resilience is essential to their survival, and may well help them adapt to future environmental adversity, such as climate change. Should the core population of any species collapse, the resilience of the species at the periphery of the population may well provide the key for its continued survival.

In spite of the resilience of many of the species found in the south Okanagan, many are at high risk. Desert-like habitats are easily damaged and slow to heal, and highly attractive for land development. For these reasons, the south Okanagan is deemed one of the four most endangered ecosystems in Canada, and the area supports a number of federally-listed species at risk. Also, the region is home to 30% of BC’s Red-listed wildlife species, and 46% of the province’s Blue-listed species. Red-listed species are at extremely high risk. Blue-listed species include species that are not immediately imperiled, but of concern because of characteristics that make them particularly sensitive to human activity or natural events.

The combination of the south Okanagan’s species richness, rarity, resilience and risk makes the region an area of concentrated opportunity. In a region where habitat specificity is high and species do not have the option of expanding their range to different elevations or conditions, the south Okanagan provides a corridor along which species might extend northward and still encounter remnants of their habitat niches. This opportunity will become increasingly important as climate change alters climatic and ecological conditions.

The south Okanagan is exceptionally distinctive from the areas to the south and the north in its narrow corridor and high number of habitats in a small area and in close juxtaposition to one another. It is hotter

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22 Ibid.
23 Ibid.
27 Okanagan Similkameen Conservation Program. The South Okanagan-Similkameen: Canada’s Desert Country.
and drier than the areas to the north, and its lakes make it distinctive from the area to the south, both in climate and habitats.

With this concentration of unique ecological attributes coupled with the increasing pressures on the landscape for urban and agricultural development, the south Okanagan is a region of concentrated risk. The following sections will provide an overview of the key ecosystems in the south Okanagan, the species at risk that inhabit them, and the increasing ecological impacts and degradation that imperil both species and habitat.

b. **Major Ecosystems**

There are few places in the world where a relatively small region – the south Okanagan is only 2/3 the size of Prince Edward Island – hosts a wide range of ecosystems in such proximity. Grasslands, riparian areas and wetlands, forests, rugged terrain and aquatic ecosystems are all found within this region.

i. **Grassland (Shrub-Steppe)**

Grassland ecosystems are dominated by perennial grasses, and also contain scattered shrubs and a soil crust of mosses and lichens. South Okanagan grasslands are divided into bunchgrass and shrub-steppe grasslands, and the latter can be divided further into sagebrush and antelope-brush steppe. This ecosystem boasts an extremely high biodiversity, and has been highly impacted – over half of the Red- and Blue-listed species in the south Okanagan are associated with grasslands. Less than 40% of antelope-brush steppe remains in the south Okanagan, due largely to the extensive clearing of lands for vineyards. In addition, this ecosystem has been heavily impacted by forest encroachment, overgrazing by livestock, residential and recreational development, and invasive species.

ii. **Wetland and Riparian**

Wetlands are areas where the land is wet or flooded at least part of the year. They include bogs, marshes and areas of open water, and provide essential ecological services. They serve as storage basins for floodwaters and nutrients, filter harmful impurities from freshwater, and help to prevent soil erosion. In addition, they provide essential habitat for aquatic organisms, and breeding habitat for amphibians. Their structural complexity and the diverse vegetation they host provide nesting cover for birds and foraging opportunities for waterfowl and mammals. At various times of the year, wetlands serve as summer breeding habitat, feeding sites, moulting sites, migration stopovers and wintering habitat.

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Riparian areas are linear ecosystems occurring along the banks of rivers, lakes and streams. They also act as filters for overland flows carrying sediments and pollutants, and their continuity provides a natural corridor upon which many species depend for movement up and down the valley. Extensive and healthy riparian habitats are essential for supporting wildlife, particularly in semi-arid areas such as the south Okanagan, where riparian areas support plant and animal species for the entire region.²³

Both wetlands and riparian areas have been severely impacted by human development in the south Okanagan region. In BC, just 20% of original wetlands remain, in spite of their recognized importance. This massive loss is due in large part to draining and filling for agricultural and development purposes.

It is estimated that in the south Okanagan 85% of valley bottom riparian habitat has been lost due to development and flood control measures. The channelization of the Okanagan River between Okanagan and Osoyoos Lakes has had the most serious impact on riparian ecosystems in the region.

Wildlife use wetland and riparian ecosystems more than any other North American habitat. Remaining wetland and riparian habitats cover only 4% of the land base the south Okanagan and lower Similkameen region, and the species dependent upon them are placed at increasing risk. Other activities that have threatened both riparian and wetland ecosystems include agriculture, urban development, pollution, high human water consumption and grazing.²⁴

### iii. Forest

An array of forests cover 44% of the south Okanagan area, from ponderosa pine in the lowlands to spruce and fir trees in alpine ecosystems, and including Douglas-fir, western larch, Engelmann Spruce and subalpine fir. Many species depend on forest ecosystems, and particularly on dead trees or “snags”, for roosting, nesting and feeding. Historically, forests, especially Ponderosa Pine (PP) and Interior Douglas Fir (IDF), were managed by setting frequent small-scale forest fires to clear the majority of underbrush and regeneration, allowing only a few trees into the overstorey. As such, overstories tended to be multi-aged, and understories open and dominated by grasses and shrubs.²⁵ Large, veteran trees remained. New logging practices tend to remove most or all snags, removing an essential habitat feature for many species. Selective logging and fire suppression have resulted in a dramatic change in the structure of low elevation forests, which are now dominated by dense stands of young trees and occasionally ravaged by large-scale, intense fires. The result has been a severely degraded habitat quality for many species.

### iv. Rugged Terrain

The rugged terrain that is so apparent in the south Okanagan is critical to the survival of many species at risk. The cliffs and rocky ridges are essential habitat for many species of bird, mammal and reptile. They are used for over-wintering, raising young, and for escape from predators. Talus slopes frequently found in these areas are used by snakes, lizards, mice and birds for hibernation, foraging, and sunning. While these

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²⁴ Ibid.
ecosystems have traditionally been less vulnerable to development than others, due to their inaccessibility
and the difficulty in altering them, they are becoming increasingly isolated as the habitat corridors that
connect them are developed.

v. Aquatic

Aquatic ecosystems make up the final broad ecosystem category for the south Okanagan, and include
lakes, rivers and streams. A lake may be defined as a large body of water surrounded by land and fed by
rivers, springs or local precipitation. In the south Okanagan, as in many parts of Canada, the lakes were
formed as a result of retreating lobes of ice following the last glaciation.

Rivers and streams, by contrast, are bodies of fresh, flowing water that run either permanently or
seasonally, and are the natural drainage channels for surface waters. Surface waters are received in two
ways: from runoff, the part of precipitation that flows toward streams and rivers on the ground surface or
through the soil; and base flow, water which enters the stream channel from groundwater.

The valley floor of the south Okanagan contains a chain of significant lakes, including the Okanagan,
Skaha, Vaseux and Osoyoos Lakes. They are connected by way of the Okanagan River. Also there are
other higher elevation lakes such as Nickleplate Lake.

The majority of streams in the Okanagan Basin have been modified by humans – most are impounded at
their headwaters, and many are channelized to prevent flooding of adjacent communities. Furthermore,
they are, by and large, fully committed in terms of water allocation for domestic or irrigation purposes.

c. Species at Risk

To determine which species are at risk, the rarity and imperilment of a species are ranked from a variety of
perspectives; from globally to locally. This rank reflects the risk that the species or population is
experiencing, that could eventually lead to it being lost from its habitat.

The most comprehensive species listing currently is maintained by the BC Conservation Data Centre
(CDC). More thorough assessments for individual species are prepared by Committee on the Status of
Rare and Endangered Wildlife in Canada (COSEWIC), a federally appointed committee that gets its
mandate from the federal Species at Risk Act.

In British Columbia, the provincial ranking is based on a standard set of criteria developed over the last 25
years by the international organization NatureServe. Though scientifically based, these rankings have no
legal implications. Each species is assigned a global, national and sub-national rank. It is from this that
BC’s Conservation Data Centre assigns the provincial rank, which takes into consideration such factors as

36 Ministry of Water, Land and Air Protection, Thompson and Okanagan Regions. Habitat Atlas for Wildlife at Risk: South
http://www.ouc.bc.ca/fwsc/oklimnol/oklimnol2.html.
estimated number of existing occurrences, viability of occurrences, trends in population size, range, and threats (actual or potential) facing the species or its habitat. In the south Okanagan, there are over 250 reasons to mind how the environment is managed: the BC Conservation Data Centre (CDC) has over 250 animal, plant and plant communities “at risk” in this area. This list will continue to grow as more is learned about some of the lesser-known organisms and others are monitored. Some of the species listed are naturally rare, while others have become rare due to habitat loss, displacement by invasive species and over hunting. In fact, at least five species that we know of have already been lost from the south Okanagan, including the Burrowing Owl, Sage Grouse, Sharp-tailed Grouse, White-tailed Jackrabbit, and Pigmy Short-horned Lizard.

This ranking methodology establishes five categories that denote degree of risk:

- **Critically Imperiled** because of extreme rarity or factors making it especially vulnerable to extirpation and extinction
- **Imperiled** because of rarity or factors making it especially vulnerable to extirpation and extinction
- **Vulnerable**: because rare and local, found only in a restricted range or because of other factors making it susceptible to extirpation or extinction
- **Apparentely secure**: because uncommon but not rare, and usually widespread in the province
- **Secure**: because common to very common, typically widespread and abundant, and not susceptible to extirpation or extinction under present conditions

Following ranking, species are provincially listed, a process that allows species to be sorted into rankings with similar conservation risks. The provincial government has distilled these five categories down to a three-tiered ranking for simplicity:

- **Red list**: ecological communities, and indigenous species and subspecies that are extirpated, endangered or threatened in British Columbia. Red-listed species and sub-species have, or are candidates for, official Extirpated, Endangered or Threatened Status in BC. Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation.
- **Blue list**: ecological communities, and indigenous species and subspecies of special concern (formerly vulnerable) in BC.
- **Yellow list**: ecological communities and indigenous species which are not at risk in BC.

The federally appointed Committee on the Status of Rare and Endangered Wildlife in Canada (COSEWIC) is an independent scientific body that assigns national rankings. COSEWIC is an arm’s length panel of scientists, government managers and non-governmental specialists who have demonstrated expertise in relevant fields. The Committee uses an international ranking system adapted from that of the World Conservation Union (IUCN). Species that meet the Committee’s criteria regarding taxonomic validity, native origin, regularity of occurrence and dependence on Canadian habitat may be listed here. Species on this

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list are placed in Schedule 1 of the Species at Risk Act, and become designated Species at Risk if they are
deemed Extirpated, Endangered, Threatened or of Special Concern.

COSEWIC designations are as follows:

**Extinct (X)** - A wildlife species that no longer exists.

**Extirpated (XT)** - A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.

**Endangered (E)** - A wildlife species facing imminent extirpation or extinction.

**Threatened (T)** - A wildlife species likely to become endangered if limiting factors are not reversed.

**Special Concern (SC)** - A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

**Data Deficient (DD)** - A wildlife species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.

**Not At Risk (NAR)** - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

The Species at Risk Act (SARA) is the enabling federal legislation to protect species. The Governor in
Council reviews COSEWIC listings and then may add the species to Schedules attached to the Act, which
forms the SARA list of Species at Risk. The Act has prohibitions that protect the individual, its residence,
and its critical habitat on all Federal lands, including Indian Reserves.

The following sections provide summaries of provincial and federal listings of each broad taxonomic group. Further to this table, Appendix C to this report provides a detailed list of species at risk in the south Okanagan.

<table>
<thead>
<tr>
<th>Taxonomic Group</th>
<th>Provincial listing</th>
<th>Federal listing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Red</td>
<td>Blue</td>
</tr>
<tr>
<td>Plant Communities</td>
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<td>8</td>
</tr>
<tr>
<td>Plants</td>
<td>78</td>
<td>47</td>
</tr>
<tr>
<td>Invertebrates</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>Vertebrates</td>
<td>27</td>
<td>35</td>
</tr>
</tbody>
</table>

**Table 1: Key Provincial and Federal Listing Summaries for Taxa in the RGS Study Area**

### i. Plants and Plant Communities

The CDC has listed a total of 32 plant species on the Red and Blue lists, including the scarlet ammannia,
Lyall's mariposa lily and small-flowered lipocarpha. COSEWIC recognizes 8 plants at risk. Important
ecosystems that are home to these plants are dry grasslands and the shores of lakes and ponds. Bryophytes (mosses, liverworts and hornworts) are also tracked by the CDC but have not been identified as
to which geographic areas that they are known, or likely to occur in.

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41 [http://www.cosewic.gc.ca/eng/sct0/assessment_process_e.cfm](http://www.cosewic.gc.ca/eng/sct0/assessment_process_e.cfm), March 14, 2006
The CDC also recognizes 32 plant communities that are at risk in the south Okanagan, including the antelope-brush / needle-and-thread grass, Idaho fescue - bluebunch wheatgrass, and black cottonwood - water birch communities, just to name a few. COSEWIC has not assessed any plant communities and they are not covered by SARA.

**ii. Invertebrates**

The CDC is currently tracking 31 species of invertebrates. So far these include butterflies, dragon and damselflies, and mollusks. Many more invertebrate taxa remain to be reviewed. COSEWIC has assessed four species of invertebrates that are at risk, including the Behr’s Hairstreak and Western Ridged Mussel.

All three of the federally listed butterflies have specific native host plants for the larvae to grow on. In the case of the Behr’s Hairstreak, the eggs are laid on antelope brush and the larvae exclusively feed upon it until they pupate. The Western Ridged Mussel is known only from the Okanagan River and the main lakes, all south of Summerland.

**iii. Vertebrates**

The public and most of the scientific community is more aware of vertebrate species. All have been assessed by CDC with a total of 64 listed species for the south Okanagan. Each class of vertebrate is discussed below.

**iv. Fish**

Thirty-eight different fish species currently occur in the Okanagan. Fourteen of these are not native to valley, occurring from stocking by anglers locally and on the American side of the border. Historically, four species of fish have become locally extinct (extirpated): chum, coho, and pink salmon. The white sturgeon, Chiselmouth, and Umatilla Dace are on the Red List and Columbia Mottled Sculpin are on the provincial Blue List.

COSEWIC recently did an emergency listing on Chinook salmon, classifying it as Endangered. The status of steelhead and sockeye are currently under investigation. All of the anadromous fish have been affected by the damming of the Columbia River in the United States. (Note: anadromous fish are fish whose life cycles start and end in fresh water, but live in salt water during the balance of their lives.) When the Grand Coulee Dam was built on the Columbia River in 1939, fish passage into the upstream portion of the upper Columbia was eliminated. Thus, the Okanagan Basin remained the only Canadian basin on the Columbia system accessible to sea-run fish species. Restoration efforts are being implemented along the Okanagan River to help mitigate these losses.

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43 [http://www.obtwg.ca/reports/SOSB_Introduction.pdf](http://www.obtwg.ca/reports/SOSB_Introduction.pdf)

44 Ibid

Amphibians

The CDC tracks three species of amphibians in the south Okanagan while COSEWIC has listed four. These amphibians are at risk because of restricted ranges, loss of habitat and susceptibility to diseases and other environmental changes. Listed species include the Tiger Salamander that uses ponds and lakes, most of which have been recently stocked with predatory fish, the Northern Leopard Frog, and the Great Basin Spadefoot Toad that relies on ephemeral ponds for breeding and upland grasslands for burrowing.46

Reptiles

There are seven species of reptiles in the south Okanagan that are being tracked by the CDC and 6 that are listed by COSEWIC. All of the reptiles have small populations and their range is limited to the dry valleys of the Southern Interior, they have slow reproductive rates, and some have been persecuted by people.47 Their restricted range has also been subjected to heavy development activities. Listed reptiles in the south Okanagan inhabit forest, grassland and cliff ecosystems, and include the Pygmy Short-horned Lizard, Desert Night Snake, Painted Turtle, Rubber Boa, Racer, Gopher Snake and the Northern Pacific Rattlesnake (Western Rattlesnake)48

Birds

The CDC is tracking 28 species of birds in the south Okanagan while COSEWIC has listed 11 to be at risk. These species are at risk for one or more reasons: there are few breeding colonies in the province, they are migrant only in the south Okanagan, they have small, localized populations, the areas where they winter are threatened, they have suffered drastic population declines, and loss or degradation of habitat, and many of them have narrow habitat niches. These bird species inhabit a broad range of habitats, including: dry grasslands; shrub-steppe; cliffs and talus; wetlands and marshes; riparian woodlands; open; mature ponderosa pine forests; alkali ponds; moist pastures; and lakeshores. Some of the species at risk include the Yellow-breasted Chat, Western Screech-owl, White-headed Woodpecker and the Sage Thrasher.

Mammals

The CDC is tracking 18 species of mammals in the south Okanagan while COSEWIC has 7 species listed. Most have small populations and ranges in BC and they have suffered habitat loss. Some have also been over hunted. They primarily inhabit dry grasslands and cliffs. Some examples include: several species of bat and mouse, two species of shrew, Nuttall’s Cottontail, Badger, and California Bighorn Sheep.49

The need to protect a vast array of species within a wide range of ecosystems in the south Okanagan is undeniable. The urgency of this matter is also apparent: the majority of the species noted in this section are at risk as a result of human activity; activity which is rapidly intensifying.

46 Ibid.
47 Ibid.
48 Ibid.
Recovery actions for species at risk are coordinated by Environment Canada for individual species at risk. In the case of the south Okanagan – lower Similkameen, there are several recovery teams in place and strategies underway. However, due to the large number of species at risk, a landscape recovery approach was deemed appropriate and a draft Landscape Recovery Strategy has been prepared, and a Landscape Recovery Implementation Group formed. This initiative will be discussed in more detail in a later section. Comprehensive recovery actions such as a landscape recovery strategy are an essential next step if the biodiversity of this unique region is to be maintained.
3. Settlement Patterns and Overview of Land Use

a. Original Inhabitants

The original inhabitants of the valley were the Interior Salish people of the Syilx dialect. They occupied the south Okanagan for thousands of years prior to the arrival of European settlers. The Syilx culture and existence was intertwined with natural resources and their management. There was an extended system of ownership and resource management, based on a very conscious effort to steward the land for resource management and harvest. Families were charged with the responsibility to steward particular areas and resources within the Syilx territory. The Syilx traditional territory extended to the Kettle River, Isintok Mountain and Sheep Mountain.

Indian Reserves were developed during the early influx of European settlers, the first being surveyed in the 1860’s. The boundaries of what are now the two main reserve areas in the south Okanagan were established in the 1870’s and 1890’s. This resulted in what is now the Penticton Indian Reserves and the Osoyoos (Inkameep) Indian Reserves, although there have been boundary modifications since that time.

The Penticton Band has approximately 19,000 hectares on three reserves. In general terms, the Penticton Indian Reserve runs from Faulder (just north of Summerland) at its north end, to Skaha Lake at the south along the west side of the valley. The most concentrated area of settlement is located immediately west of Penticton along the Okanagan River and Green Mountain Road. Locatee Lands and leases along the river have been developed for commercial, industrial, cultural and recreational uses. Greenwood Industries, a gas station, and the En’owkin Centre are located here. A newer subdivision (West Hills), the administrative offices, and school are located on a terrace above the older development. Other economic activities include forestry, gravel extraction, and ranching. Approximately 600 aboriginal people live on the reserve, and almost 300 members of the Band live off reserve.

The two reserves for the Osoyoos Band are located on the east side of the valley, and include over 13,000 hectares. In very general terms, the reserve areas can be described as being bounded on the north by Gallagher Lake and Osoyoos/Anarchist Mountain in the south. The predominant reserve community is located on the east side of Oliver, where the band office, community hall, police protection, health care, postal service and schools are located. A golf course is located north east of Oliver. Another development node is located north and east of Osoyoos including the Osoyoos Band’s own winery and vineyard, Nk’Mip Desert and Heritage Centre and campground. Also the Band leases land for vineyards. The Osoyoos Band has over 200 people on reserve, and over 50 members living off the reserve. Water is supplied by three reservoirs and two community wells.

The Indian Reserves have large tracts of natural areas, which are not only significant wildlife habitat but also important for livestock grazing, traditional harvesting of plants and animals for food and medicine.

b. European Settlement

The first substantial non-native settlement was Fairview, located on the west side of valley up slope from Oliver, and was a thriving mining town of over 500 inhabitants in the 1890’s. However, Fairview was short-lived and disappeared by the early 1900’s. The predominantly European settlements have developed in the

50 http://www.gospelcom.net/ilm/reserves/bc/
valley floor since that time, and were associated with agriculture, transportation, trade and government business. Ranching, logging and mining have continued in the upper elevations.

Osoyoos was the first town in the valley that still exists today. In response to the establishment of the 49th parallel as the border, a customs house was built in 1861. Other government functions developed there, and in the 1920’s its agricultural industry was developed with the introduction of irrigation. Osoyoos grew slowly, and was incorporated in 1946 as a municipality.

Oliver was established in the 1920’s and incorporated as a municipality in 1945. Its development started when the provincial government purchased land from Thomas Ellis, a pioneer rancher to create the South Okanagan Lands Project. This project, which hinged on irrigation development, was to provide land for returning World War I Veterans. Various agricultural crops have been grown here including tobacco and zucca melons. The Osoyoos and Oliver areas are noted for their orchards, and more recently vineyards and wineries.

Although Okanagan Falls is one of the older communities in the south Okanagan, it was never large enough to be incorporated. In the 1890’s, titled land that had been purchased from Thomas Ellis was subdivided into lots and sold. Soon after, it boasted a sawmill, stageline and post office. However, transportation routes and a constrained land base limited its growth. Road transportation along the east side of Vaseux Lake was restricted by the overhanging rock near the south end, and more westerly routes bypassed Okanagan Falls. Ranching and other agricultural activities are important to this community as is logging. Today it is home to a sizeable sawmill owned by Weyerhaeuser Canada. Also several wineries are located nearby. The community got its name from the now vanished Okanagan “Falls” on the Okanagan River.

The White Lake area also has a rich past in that the Hudson’s Bay Fur Brigade Train from Fort Okanagan to Fort Kamloops passed through the basin from 1811 until around 1849. Between 1895 and 1905 much of the lower elevation lands were pre-empted by early settlers. Ranches, mixed farms and some orchards dominated the landscape. Ranching and conservation are recognized as important values in the Basin today as is the National Research Council’s Dominion Radio Astrophysical Observatory.

Kaleden, another unincorporated community, occupies the western slopes above Skaha Lake. It once boasted a hotel built in 1912, the remains of which stand today, and had a flourishing tree fruit industry. The community has grown considerably being within commuting distance from Penticton and supports an elementary school, community hall, library, post office, general store, fire hall and gas station.

Penticton, the largest municipality in the valley, was the epicentre of Thomas Ellis’ ranching and farming enterprises. In 1865 Ellis settled in what is now Penticton and was involved in the early layout of the townsite in 1892. Penticton became the hub of the south Okanagan, capitalizing on its location to develop commerce and transportation around other activities in the area: ranching, farming and mining. It was incorporated in 1908.

Summerland was incorporated in 1906, and developed largely as a result of the fruit industry. It originally developed with two commercial nodes: what is now referred to as Lower Town on the lakeshore, and West Summerland, which is now thought of as downtown Summerland. Lower Town was largely abandoned as a commercial area due to slides, a fire, and the relocation of the highway to its current upland position.
Naramata, another community not large enough to incorporate, was and still is an important tree fruit growing area developed by John Moore Robinson after 1906. It remains a significant tree fruit and more recently an important grape growing area on the east side of Okanagan Lake. It shares an extensive agricultural area recently known as the Naramata benches with the City of Penticton. The townsite today supports several enterprises including Naramata Centre run by the United Church of Canada, a fruit packing house and a historic hotel.

Urbanization and farming have focused in the valley bottom and benches above. This is true for both Indian people and early European settlers. More recently there has been an influx of retirees and an explosion of vineyards and wineries. Increased urban and agricultural development has resulted in significant loss of ecologically valuable lands in the south Okanagan. A high growth rate and conversion of more of the natural landscape to agriculture and housing is expected to continue.

c. Transportation

Highway 97 and Highway 3 are the current-day expressions of what were early trails across the land. The Syilx people had many trails throughout the area, and additional trail networks were developed as horse and wagon trails by the Europeans.

European fur traders developed trail networks for their use. The Fur Brigade Trail, used between 1822 and 1849, linked Hudson Bay interests in Kamloops and Brewster, Washington, which is located at the confluence of the Okanagan and Columbia Rivers. By 1858, cattle drivers from the Willamette Valley in what is now Oregon State were driving cattle north to the Cariboo gold fields along the old Hudson’s Bay routes including the White Lake Basin trails. The east – west route connecting the south Okanagan to the outside world was the Dewdney Trail, which connected Hope to Fort Steele. In the mid 1800’s the trails were upgraded for wagon use and materials and supplies were transported from the steamboats landing in Penticton to the mines in Fairview, Hedley, Nickel Plate and Camp McKinney. Even by 1908, it was possible to go from Penticton to Kelowna by road, once the wooden bridge was built that crossed the Redwing Marsh immediately north of Penticton. Remnants of these trail networks remain today; Highway 97 covers what was once called the Cariboo Trail.

Waterways were used for extensive transportation by the Syilx, and later by the European Settlers starting in the 1880’s until the end of the 1930’s. Lake and to some extent, river transportation, were critical commercial transportation corridors from the 1880’s until the 1930’s.

The Kettle Valley Railroad (KVR), branching out from Penticton on both sides of Okanagan Lake was built by 1915. A third leg connected Penticton and Osoyoos by 1944. The railroad was completely abandoned by the 1980’s.

The first airport in the valley was located in Oliver in 1933, as part of the east – west string of point-to-point airports built across Canada. Penticton’s airport was built in the 1940’s, during World War II.

The enduring legacy of the transportation on the south Okanagan landscape is predominantly the ground transportation routes. Many of the old wagon roads eventually became what is now our road network, from the main highways to the roads that wind up creek valleys and hillsides. While these were a necessary part of the development of the area, the unplanned nature of the ground transportation routes have contributed to land use and habitat fragmentation.
d. Water Works

Modification of the natural watercourses in the south Okanagan has been underway since the late 1880’s, when several of the oxbows within what is now Penticton were truncated to shorten the travel distance between Okanagan and Skaha Lakes for commercial river traffic. However, the majority of the modifications to the watercourses were for irrigation and flood control purposes, and more recently have incorporated some fisheries needs as well. A total list of modifications to watercourses in the south Okanagan would be too lengthy to list; however there are several notable initiatives.

As part of the South Okanagan Land Project to develop Oliver in the early 1920’s, a 25 mile concrete ditch, known as “The Big Ditch” was built to carry water from the south end of Vaseux Lake to Gallagher Lake, hence along the east side of the valley to a point east of Oliver, and from there across the valley to the west side of Oliver. Eventually, this ditch was extended to carry water to the Osoyoos area. This irrigation project has enabled agriculture in the Oliver and Osoyoos area to thrive. However, severe flooding occurred in the 1920’s and 1940’s.

Modifications to relieve flooding are also noteworthy. Penticton Creek was channelized to alleviate inundation of downtown in the 1940’s. In 1953, a flood control system had been completed on the Okanagan River to manage the often occurring flooding of Osoyoos Lake from the run off being carried in by the Similkameen River, and to also feed into the existing irrigation works. Four dams and seventeen drop structures were built along the Okanagan River. The four dams are located at the outlet of Okanagan Lake beside the Rose Garden in Penticton, Okanagan Falls, McIntyre / Putalo, with the fourth, Zozel, being located in Oroville, Washington.

While the manipulation of the natural watercourses have been key to development of the south Okanagan through both irrigation and flood control, the engineering was carried out in an era were little was known about ecology. On the Canadian side of the border, 37 kilometers of the Okanagan River have been significantly modified by irrigation and flood control dams, channelization, and river flow containment dykes. Only six kilometers of the river’s entire seventy kilometers is intact.

Channelizing the river for flood control purposes has resulted in a loss of approximately 50% of its original length. Fisheries, critical riparian habitat and water quality have been greatly affected. This has resulted in significant loss of critical riparian habitat. Several species at risk rely on the river or its adjacent riparian habitat. The oxbows, in their natural state, provided cleansing of water and nutrient storage, cleansing, fish and riparian habitat and increased human recreation opportunities. Diverting the water into one main channel has left remnant oxbows stagnant ponds, unable to fulfill the river’s natural ecosystem functions.

In 2002 and 2003, the Outdoor Recreation Council of BC designated Okanagan River as British Columbia’s most endangered river. Earthwild International ranked Okanagan River 3rd on the 2003 list of endangered rivers in Canada. Efforts are now underway to naturalize a portion of the river channel and its rating has improved. However, it remains among the top 10 endangered rivers in the province.

51 http://www.obtwg.ca/reg_description.html
52 http://www.obtwg.ca/reports/SOSB_Introduction.pdf
e. Fragmentation of Habitat

The majority of the land used for settlement purposes is covered under the classifications of IR (Indian Reserves) and Private Lands shown in Table 1 below, and includes residential land uses, ranching, intensive agriculture, transportation and commercial / industrial uses. These activities occur at low to mid-elevations in the south Okanagan, as shown in Figure 1. Unfortunately these are the very lands that support the greatest number of species at risk and endangered habitats such as the Red-listed Antelope-brush plant community. Fragmentation and loss of habitat is of great concern to maintaining biodiversity, sensitive ecosystems, ecosystem functioning and species at risk.

A general breakdown of land tenure is as follows:

<table>
<thead>
<tr>
<th>General Ownership</th>
<th>Area (Ha)</th>
<th>Area (%)</th>
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<tbody>
<tr>
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<tr>
<td>Total</td>
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</tr>
</tbody>
</table>

Table 2: Overview of Land Tenure

At higher elevations above the settled areas, the land is largely Crown land, and is managed under a number of different tenures including grazing licences and leases. There is a sizeable tree farm license (TFL 15) managed by Weyerhaeuser Canada. Furthermore, Crown lands in the area have been the subject of a process to create the Okanagan - Shuswap Land and Resource Management Plan (commonly referred to as the Okanagan – Shuswap LRMP), detailed in a later section.

Initiatives have been underway for years to preserve environmental values and critical habitat by the Federal Government, Provincial Government and non-government organizations working with private land holders, as shown in Figure 2.

Federal government lands include those held by the National Research Council at White Lake Observatory (Dominion Radio Astrophysical Observatory), and the Canadian Wildlife Service who have holdings at Vaseux Lake: the Bighorn National Wildlife Area and Vaseux Migratory Bird Sanctuary.

The provincial government provides various forms of protection including Protected Areas, Ecological Reserves, Provincial Parks, Wildlife Management Areas, and Map Reserves. Some of the lands with protected area status in the south Okanagan are Anarchist, Brent Mountain, South Okanagan Grasslands, East Vaseux, and White Lake Grasslands. Ecological Reserves (ER) include Field's Lease ER, Hayne's Lease ER, Mahoney Lake ER, and Trout Creek ER. Provincial Parks in the area include Christie Memorial, Darke Lake, Eneas Lake, Haynes Point, Inkaneep, Kickininee, Okanagan Lake, Okanagan Mountain, Vaseux Lake. In addition, there is the South Okanagan Wildlife Management Area (SOWMA) and two Map Reserves: E12, E13.

Other types of conservation land include purchases or covenants held by conservation organizations. Purchases by The Nature Trust of BC (TNT), Nature Conservancy Canada (NCC), The Land Conservancy of BC (TLC), Ducks Unlimited Canada (DU) and Turtle Island Earth Stewards (TIES) are also reflected in Figure 2.
4. Management of Environment: Roles and Responsibilities

This section provides a brief overview of the array of institutes, agencies and groups which have a range of responsibilities towards managing and regulating different aspects of the environment in the south Okanagan. A recognition and appreciation of the role of each is important while the south Okanagan seeks to work through the issues that affect the environment and impact on the Okanagan lifestyle. This information is integral in developing and delivering the Regional Growth Strategy environmental objectives.

All levels of government are involved, including federal, provincial, local and Band Councils. Additionally, there are various non-governmental organizations, individuals and multi-party initiatives that are making significant contributions to preserving the south Okanagan’s environment and protecting its ecological integrity.

a. Federal

i. Environment Canada

Environment Canada is the most actively involved federal department in the south Okanagan with respect to environmental issues and has responsibilities for wildlife, air quality, climate change and water. Environment Canada is represented in the south Okanagan predominantly through one of its services, the Canadian Wildlife Service (CWS). While provincial wildlife agencies are responsible for many wildlife matters, such as conservation and management of wildlife populations and their habitats, CWS is responsible for:

- protection and management of migratory birds
- protection of endangered species and nationally important wildlife habitat (e.g. species at risk)
- research on nationally important wildlife issues, control of international trade in endangered species, and international treaties

Several programs, legislative tools, funds, and policies, contribute to the delivery of CWS’s responsibilities towards protecting and recovering both species at risk and nationally important wildlife habitat.

Environment Canada Wildlife Programs

The Habitat Conservation section of CWS delivers major elements of the Canadian Wildlife Service (CWS) Habitat Conservation Program, which supports wildlife conservation through a mix of policy and programs for protected areas, sensitive habitats conservation, communications, and environmental impact assessment. The Habitat Conservation Program advances the full range of the Service’s migratory bird and species at risk conservation goals, objectives and responsibilities including research and the science base for conservation actions. Programs include research from various field surveys. The North American Waterfowl Management Plan is a joint Canada / U.S. program designed to protect and enhance wetland habitat throughout North America.

Environment Canada: Main Legislative Tools for Wildlife Management

The *Migratory Birds Convention Act* is the authority that provides Environment Canada with much of its mandate with respect to migratory birds, and provides for the establishment of bird sanctuaries. In the south Okanagan, Vaseux Lake Migratory Bird Sanctuary, comprising 282 hectares, is one of 7 in BC. (It overlaps with a National Wildlife Area, Vaseux – Bighorn, which is 812 hectares.) Within these bird sanctuaries, hunting and other forms of disturbance of birds is prohibited. While Environment Canada is the
agency responsible for Migratory Bird Sanctuaries, the actual properties can be owned federally, provincially, or privately. As part of its responsibility to manage migratory birds, the Canadian Wildlife Service consults with provinces and territories and issues annual migratory game bird hunting regulations.

Migratory bird protection is also guided by international conventions and federal policies such as the 
Convention on Wetlands of International Importance (Ramsar), the Federal Policy on Wetland Conservation, the Biodiversity Strategy and the Rio Convention on Biological Diversity.

Legislative and regulatory support for these activities is given by the Species at Risk Act (SARA), and the Canada Wildlife Act. Additional direction is provided in the Accord for the Protection of Species at Risk, National Strategy for the Protection of Species at Risk. The Habitat Stewardship Program, Endangered Species Recovery Fund, Interdepartmental Recovery Fund provide funding to agencies and or groups to ensure the goals of the department are met.

To protect both wildlife and migratory birds that may be species at risk, and their habitat, the Canada Wildlife Act was passed in 1973, and authorizes the establishment of protected areas known as National Wildlife Areas (NWAs). National Wildlife Areas are created and managed for the purposes of wildlife research, conservation, and interpretation, and are established in relatively undisturbed ecosystems containing nationally significant aquatic and/or terrestrial habitats necessary for animals or plants to survive.. NWAs are managed by Canadian Wildlife Service, using an ecosystem approach, and require the cooperation of public and private institutions.

There are 51 NWAs across Canada. In the Okanagan, a National Wildlife Area, Vaseux – Bighorn, has been created under this act.

The Accord for the Protection of Species at Risk. 16 federal, provincial, and territorial agencies and more than a hundred recovery teams composed of both governmental and non-governmental members worked collaboratively in the development of species at risk and protection of habitat in Canada, including laws and complementary programs. As a result, the Species at Risk Act (SARA) was enacted in 2003 to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and encourage the management of other species to prevent them from becoming at risk. It applies to all federal lands in Canada; all wildlife species listed as being at risk; and their critical habitat. It also establishes the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as an independent body of experts responsible for identifying and establishing species at risk by regulation.

In addition, it complements existing laws and agreements to provide for the legal protection of wildlife species and conservation of biological diversity.

It requires the initiation and facilitation of multi-jurisdictional recovery teams, and for coordinating the development of recovery strategies for species requiring the involvement of more than one jurisdiction. The Minister of the Environment will attempt to enter into agreements with provinces and territories for them to develop recovery strategies for species under their management responsibility.

Currently in the south Okanagan, there are a number of individual species recovery teams such as the White-headed Woodpecker and the Yellow-breasted Chat Recovery teams. However, due to the high number of species at risk in the south Okanagan it was also considered appropriate to consider a multi-species, landscape approach. In this regard, a draft Landscape Recovery Strategy has been prepared. A
Recovery Implementation Group has been established to address issues of species recovery at a landscape level and will address common threats, and the complexity and adjacency of common habitat amongst species.

The intent is that individual species recovery initiatives and recovery implementation measures for sensitive ecosystems such as riparian and Antelope-brush will be addressed in an overall Landscape Recovery Strategy. This Strategy is being done as a collaborative initiative with the South Okanagan-Similkameen Conservation Program (SOSCP) and its partners, including the provincial government (MOE), Okanagan College (OC) and Environment Canada.

SARA also creates prohibitions to protect listed threatened and endangered species and their critical habitat; recognizes that compensation may be needed to ensure fairness following the imposition of the critical habitat prohibitions; will be consistent with Aboriginal and treaty rights; and respect the authority of other federal ministers and provincial governments.

While the Federal Minister of Environment is responsible for the overall administration of SARA, the Act allows for responsibility to be given to either the Minister of Fisheries and Oceans or the Minister of Indian and Northern Affairs. Under the act, the Minister of Environment is responsible for the overall coordination of the federal species at risk strategy, including the implementation of federal activities in support of the Accord for the Protection of Species at Risk in Canada, the administration of the Habitat Stewardship Program for species at risk, and the Interdepartmental Recovery Fund.

Environment Canada Funding Programs

The Habitat Stewardship Program (HSP), Endangered Species Recovery Fund (ESRF), and Interdepartmental Recovery Fund (IRF) are the three main federal funding programs centred on the protection and recovery of species at risk. These initiatives complement other funding by Environment Canada, Fisheries and Oceans Canada, Parks Canada Agency, and many other federal agencies in the recovery of species at risk. 53

The Habitat Stewardship Program (HSP) provides funding for implementing activities that protect or conserve habitats for species designated by COSEWIC as nationally “at risk” (endangered, threatened or of special concern) HSP, and fosters partnerships with organizations interested in the recovery of species at risk. As such, it supports many organizations and individuals in their efforts to meet the requirements of the National Recovery Program and the new species at Risk Act. It was implemented in 2000 for a five-year period.

For the past five years approximately $580,000 annually in HSP funding has been awarded to the south Okanagan for projects focused on helping to protect species and habitat in Canada’s species-at-risk hotspot.

The Endangered Species Recovery Fund (ESRF), a joint initiative of Environment Canada and World Wildlife Fund (Canada), was established in 1988 to support recovery activities for species at risk of extinction. Project proposals from university researchers, conservation groups and others are reviewed once a year by a Scientific Advisory Committee, which makes funding recommendations based on established criteria. The Scientific Advisory Committee is composed of experts who altogether provide

53 http://www.speciesatrisk.gc.ca/default_e.cfm
broad taxonomic and geographic expertise. Since 1988, over $7 Million has been invested by ESRF partners for more than several hundred projects, and 100 different species at risk. In the south Okanagan, projects involving Behr’s Hairstreak, the Pallid Bat, the Lewis Woodpecker, the Northern Pacific Rattlesnake, and the Yellow-breasted chat have been funded.\textsuperscript{54}

Interdepartmental Recovery Fund (IRF) supports federal organizations in their efforts to meet the requirements of the proposed Species At Risk Act by providing funding to federal departments and departmental corporations for implementing recovery activities for species designated by (COSEWIC) as nationally extirpated, endangered or threatened that are on federal lands or under federal jurisdiction. IRF also supports surveys of endangered, threatened and extirpated species on federal lands. This program also fosters partnerships among federal organizations and with other organizations interested in the recovery of species at risk. Since its inception during 2002 / 2003, over 20 species at risk were highlighted in 3 projects in the south Okanagan. These include funding for the Osoyoos Indian Band Conservation Technician, The Sage Thrasher Recovery Project and outreach activities for promoting recovery of three endangered bird species.\textsuperscript{55}

All of the above noted initiatives are active in the south Okanagan due to its high level of species at risk and related critical habitats. Many of CWS’s responsibilities in the south Okanagan are coordinated with the partners of the South Okanagan-Similkameen Conservation Program, detailed in a later section.

Other Environment Canada responsibilities that relate to ecological and environmental issues

In conjunction with its Meteorological Service, air quality and climate change initiatives are being carried out in the Okanagan, including the recent cooperative study released in 2004 on agricultural water use demands and climate change in the Okanagan Basin. This was carried out by Environment Canada and Agriculture and Agri-food Canada, and projects increases in water consumption given the current climate change models available.

Environment Canada is also involved in an interregional Air Quality Initiative in the Okanagan, detailed in a later section.

In its jurisdiction for water management, Environment Canada has responsibility for Boundary Waters Treaty Act, and the International Rivers Improvement Act, which may also impact the activities on the Okanagan River, as both are concerned with international waters. The Okanagan River, part of the Columbia River system, is an international river.

Canadian Environment Assessment Act was developed by Environment Canada to assess environmental impacts. While the drafting of the Act was coordinated by Environment Canada, it is implemented by any federal government department on any activity where the federal government is required to provide a license, permit, certificate or other regulatory authorization; is the proponent; grants financial assistance, or transfers federal land to enable a project. There are four levels of CEAA assessments, depending on how the project is classified according to the regulations of the act. CEAA’s most common applications in the south Okanagan would be on Indian Reserves and permits under the Migratory Birds Convention Act.

\textsuperscript{54} http://www.wwf.ca/NewsAndFacts/Projects/ESRF.asp?lang=EN
\textsuperscript{55} http://www.speciesatrisk.gc.ca/support/irf_fir/projects_e.cfm
The Canadian Environmental Protection Act provides a comprehensive framework that applies to land, air and water, which allows the government to control the use, and prevent the abuse, of toxic substances; this Act is notable for its emphasis on the prevention of environmental harm.  

ii. Fisheries and Oceans Canada

The Minister of Fisheries and Oceans is responsible for the protection and recovery of aquatic species at risk under federal jurisdiction, other than species under the responsibility of the Minister of the Environment found in National Wildlife Areas, and species under the responsibility of Minister of Indian and Northern Affairs found on Indian Reserves. The Minister of Fisheries and Oceans is responsible for implementing the necessary conservation and protection measures under the Species at Risk Act for aquatic species on the legal protection list. Aquatic species to be protected includes fish or marine plant species defined as such under the federal Fisheries Act, and those, which have been, assessed against COSEWIC’s classification criteria.

The Department works closely with the Minister of Environment and to ensure common and consistent approaches within the federal government to protecting species at risk and fish habitat.

Main legislative tools are the Fisheries Act and the Navigable Waters Protection Act.

The Fisheries Act prohibits the disruption or destruction of fish habitat and the discharge of harmful substances into waters containing fish in private and public lands.

Navigable Waters Protection Act safeguards the navigability of waterways, including canals and other bodies of water that have been altered, by requiring approvals for bridges, dams, docks, cable crossings, boathouses, dumping of fill or excavation of materials.

iii. Parks Canada Agency

The Parks Canada Agency, which reports to the Minister of Environment, has the responsibility for national parks, national marine conservation areas and historic sites. It commemorates places that are significant examples of Canada’s cultural and natural heritage through public understanding, appreciation and enjoyment, while ensuring long-term ecological and commemorative integrity.

Currently in the south Okanagan and lower Similkameen, Parks Canada is undertaking a national park reserve feasibility study. As part of a Memorandum of Understanding signed in 2003 between the Government of Canada and the Province of British Columbia, Canada and BC have agreed to work cooperatively to assess the feasibility of establishing a new national park reserve in the south Okanagan. This park reserve proposal could potentially preserve representative features and ecosystems of the Interior Dry Plateau Natural Region of Canada, which is currently unrepresented in Canada’s national parks system.

Should a national park reserve be established, Parks Canada would be responsible for the management and recovery of species found in national parks and lands administered by the Minister, under SARA. The Agency could then also be involved in reviews under Canadian Environmental Assessment Act.

56 http://64.233.179.104/search?q=cache:2wYRsNqJCuEJ:www.acah.org/envir.htm+ecological+reserves+act&hl=en
57 http://64.233.179.104/search?q=cache:2wYRsNqJCuEJ:www.acah.org/envir.htm+ecological+reserves+act&hl=en
Parks Canada Agency operates under the Canada National Parks Act, which provides for the establishment and management of national parks, park reserves, marine sites and historic sites.

**iv. Indian and Northern Affairs Canada**

While the Department of Indian and Northern Affairs is not visibly active in the south Okanagan, its importance here is in setting the framework for the management of Indian Reserves.

The management of reserve lands and powers of band councils are set in the provisions of the Indian Act, while underlying title to Reserve lands and their resources is retained by the federal government as trustee. The majority of decisions made by band councils with respect to land and resources must be approved by the Minister under this regime.

The Indian Act also allows for Certificates of Possession on Reserve Land, which give a right of ownership to Indians on reserve lands. The local term for this type of ownership is Locatee Land.

As a result of this different administrative structure, BC legislation regarding land and resources does not apply on Indian Reserves. Also, certain federal legislation applies differently on reserve lands than it does to non-reserve lands. Most notable in this respect are the Species at Risk Act and the Canadian Environmental Assessment Act.

A recent alternative to management of land and resources on Indian Reserves is the First Nation Land Management Act, passed in 1999, which provides the option for an Indian Band to take over responsibility for management and control of its land and resources directly, after it has developed and ratified a Land Code. The Land Code will work in conjunction with a negotiated Transfer Agreement, which will set out the land and resource management practices of the Indian Band and will also set funding for land management from the federal Government. The Act allows community control over land management, more efficient management of reserve land, and allows the First Nation the direct ability to protect the environment. Canadian courts will recognize First Nation laws created under a Land Code. For example, CEAA provisions may be replaced by a First Nation’s own environmental assessment regime for its reserve lands.

In addition to Land Codes, Self-Government agreements can be negotiated between Indian Bands and INAC. These would be negotiated one-on-one, and the provisions included would depend on the needs, powers and authorities each band would be interested in exercising. Enactment would be by a Self-Government act for the particular First Nation.

Both the Penticton and Osoyoos Indian Reserves in the south Okanagan are currently administered under the Indian Act; however, the potential for more direct control over land and resources may be exercised in the future under the First Nations Land Management Act and Self-Government agreements. A recent example is the Westbank First Nation, which has implemented both of these initiatives in the last couple of years. While it is beyond the scope of the Regional Growth Strategy and this paper to deal with environmental issues and options on Indian Reserves, a basic understanding of the differing administrative structure is worth noting.
b. Provincial

i. Ministry of Environment

The Ministry of Environment is the most actively involved provincial ministry in the south Okanagan with respect to environmental and ecological issue. Relevant divisions of the Ministry are the Environmental Stewardship Division, Environmental Protection Division, the Water Stewardship Division, and less visibly, the Strategic Policy Division. Staff members are located throughout the province in regional offices and are responsible for the on-the-ground delivery of the Ministry’s programs, supported by Victoria headquarters. The Penticton office covers off issues for the southern Interior in conjunction with the Kamloops office.

The Environmental Assessment Office also reports to the Minister of the Environment.

Environmental Stewardship Division is responsible for biodiversity, including wildlife, and fish; parks, protected areas and wildlife recreation management, including hunting, angling, park recreation, and wildlife viewing.

Programs and services focus on working with other ministries, industries, communities and governments to establish standards for the use and protection of species and habitats. Key functions focus on shared stewardship and sustainable economic development and are aimed at maintaining and restoring fish and wildlife species and their habitats.

While wildlife management in Canada is shared by the federal and provincial territorial governments, generally day-to-day wildlife matters in BC are a provincial responsibility. These responsibilities include conservation and management of wildlife populations and habitat, issuing licenses and permits for fishing, game hunting and trapping, guidelines for safe angling and trapping, and outfitting policies.

The Environmental Stewardship Division also stewards protected areas and parks, and provides fish and wildlife recreation services. One key component is this Division’s ability to enable various degrees of protection for environmental and ecological importance. Designations such as Provincial Parks and Ecological Reserves carry the strongest level of protection while Wildlife Management Areas carry less protection and Map Reserves even less. Figure 1 shows the occurrence of these designated areas in the south Okanagan.

The Biodiversity Branch is responsible for biodiversity science, and is thus responsible for the preparation of a biodiversity strategy for British Columbia. This includes specific strategies on living rivers and species at risk. It also manages science-based information and knowledge for aquatic and terrestrial habitats and species, and monitors performance measures on the state of provincial biodiversity.

The Fish and Wildlife Branch manages fishing and hunting activities and allocation of fish and wildlife resources for recreational and commercial use. The Branch manages the provincial fish culture and stocking programs to support recreational fishing and endangered species recovery.

The Parks and Protected Areas Branch manages the province’s protected areas system. The Branch develops protected area management plans, leads conservation programs within all protected areas, and manages the delivery of recreational services and opportunities within protected lands.

The local office of this division is involved in many programs and projects relevant to the south Okanagan such as Species and Habitats at Risk, Species at Risk Recovery efforts, and Frogwatch, and Riparian Areas Regulation.

**Environmental Protection Division**[^59]

Environmental protection includes responsibilities for water, land and air quality including climate change and environmental emergencies; and environmental monitoring and enforcement including the Conservation Officer Service.

Key functions aim at maintaining high environmental standards by regulating and monitoring industrial and community activities to ensure compliance; promoting sustainable environmental practices in communities through partnerships and education on best management practices; and maintaining a system for air and water quality monitoring and reporting.

The **Regional Operations Branch** is involved in an array of activities for environmental protection, including participating in environmental assessment reviews; administering the authorization process associated with discharges to the environment including pesticide- and waste-management plans; permitting, licensing and approvals; undertaking compliance and enforcement activities for the ministry's Environmental Protection Division authorizations and regulations; monitoring air, land and water quality to ensure limits on industrial discharges are met; participating in air shed planning to manage the collective impacts of air pollution from point sources (e.g. industry smokestacks) and non-point sources (e.g. automobiles); participating in establishing BC environmental protection standards, best management practices, guidelines and policies; managing the cleanup of contaminated sites; and responding to toxic spills (environmental emergencies).

The **Water, Air and Climate Change Branch** focuses on the major air and water quality issues facing BC, linking them to the global issues and outlook.[^60]

The **Environmental Management** branch is responsible for the design, development, implementation and evaluation of a wide array of pollution prevention and remediation activities throughout British Columbia to fulfill its goal of preventing pollution at source, and remediating where necessary.[^61]

**Water Stewardship Division**[^62]

Water Stewardship is responsible for licensing water use, as outlined in the **Water Act**. The Division works with many government agencies and stakeholders to ensure best use of water resources.

**Strategic Policy Division**[^63]

Strategic Policy Division is responsible for State of Environment reporting and for Sustainable Communities Initiative, through the **Science, Economics and Analysis Branch**.

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[^62]: [http://www.lwbc.bc.ca/03water/](http://www.lwbc.bc.ca/03water/), March 28, 2006
The Ministry’s regular environment report, *Environmental Trends in British Columbia*, presents key environmental indicators based on the best scientific information available. Environmental Trends in BC was released in 1998, 2000, 2002 and will continue to be released at 5-year intervals. In the interval, the focus is on issuing comprehensive reports on special sectors or regions.

*Sustainable Communities Initiative.* As a first step, this initiative will look at how to develop a cross-government initiative that builds on the various community-oriented initiatives throughout the provincial government, through networking with non-governmental efforts that support sustainable communities, and linking to the numerous programs of others levels of government.

**Environmental Assessment Office**

Reporting to the Minister of Environment, the Environmental Assessment Office coordinates the assessment of the impacts from major development proposals in British Columbia. The assessment process results in recommendations to either grant or refuse an Environmental Assessment certificate.

**Ministry of Environment: Legislative Tools**

The *Wildlife Act* is intended to address the protection and management of wildlife species in B.C. However, in reality it focuses on a relatively small group of designated endangered species, Wildlife Management Areas (WMA), and the management of recreational hunting. The South Okanagan Wildlife Management Area (SOWMA) was created under the provisions of this Act.

The *Wildlife Act* also specifies no disturbance of beaver dams and muskrat dens without approval, except where drainage is threatened.

Bird nests are also protected. The nests of eagle, peregrine falcon, gyrfalcon, osprey, heron and burrowing owl are protected throughout the year; all other birds’ nests are protected when occupied by a bird or egg (i.e., during the spring or early summer in coastal B.C.).

In addition, the Act provides that the dedication of hunting and fishing license fees to the Habitat Conservation Trust Fund (HCTF) can contribute to the acquisition of land for conservation purposes, and for enhancement of habitat, in conjunction with other partners. Contributions to acquisitions in the south Okanagan from HCTF include land in the Okanagan Falls and Vaseux Lake areas. Contributions have been made to numerous enhancement projects, including the landscape level plan for recovery at of species at risk (detailed under SARA), the Puddle Project, stewardship activities, a fish way at Vaseux Lake to enhance rainbow trout spawning, and several projects for enhancement and acquisition of lands along the oxbows north of Osoyoos.

*The Wildlife Amendment Act*

The *Wildlife Act* of British Columbia was amended in May 2004 to enhance the Province’s ability to protect and recover species at risk. This amendment can trace its origins back to 1996 when the federal,

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provincial and territorial governments endorsed the Accord for the Protection of Species at Risk, agreeing to develop laws and programs that would work together to protect species at risk and their habitat throughout the country. The Accord committed the provincial governments to incorporate the intent of the federal Species at Risk Act (SARA).

In British Columbia, the enabling provincial legislation was the *Wildlife Act*, which was updated with the *Wildlife Amendment Act* (2004) to incorporate the intent of species at risk protection. This Act protects individuals (species) on private lands and their residences and critical habitats on Provincial Crown lands.

The amendments enable Cabinet to list as endangered, threatened or extirpated the full range of species that can be similarly listed under the federal *Species at Risk Act*, including plants at risk and invertebrates at risk, which were previously not protected by the *Wildlife Act*. With listing come a series of prohibitions against the killing, trading, trafficking and transport of individuals of that species. Cabinet also has the ability to define and protect the residence of a listed species. Exceptions to prohibitions may be authorized through regulation or by Minister through permit or agreement (including an existing permit or agreement). The provincial listing process and recovery planning remain as policy. Existing tools such as the new *Forest and Range Practices Act* and regulations, *Land Act, Water Act, Parks and Protected Areas Act*, etc., will continue to be used to protect critical habitat for species at risk.

The *Park Act* allows for the establishment and management of provincial parks. In the south Okanagan, provincial parks include Christie Memorial Park, Darke Lake, Eneas Lakes, Haynes Point, Inkaneep, Kickininee, Okanagan Lake, Okanagan Mountain, and Vaseux Lake.

More recently salvage logging has been allowed in places such as around intensive recreation zones (e.g. Manning Park) in response to the pine bark beetle infestation. The revised Park Act (s. 15) states that timber cut must be disposed of in accordance with the Forest Act. Also pursuant to the Parks and Protected Statutes Amendment Act, 2003, the Park Act now allows for resorts or tourism development if, in the opinion of the Minister, the activity and development are consistent with or complementary to the recreational values of the park involved (s. 9.1). Also under this same Amendment Act subsurface rights may be issued for a drilling licence, permit, lease, etc. for the exploration, development and production activities with regard to petroleum and natural gas.

The *Protected Areas of British Columbia Act* allows for a high level of statutory protection. It establishes a number of parks, ecological reserves and places, and was originally intended to strengthen protection of various previously protected areas, including existing class “A” parks and ecological reserves. Protected areas in the south Okanagan include Anarchist, Brent Mountain, Okanagan Falls, South Okanagan Grasslands, Sun Oka Beach, Vaseux and White Lake Grasslands.

The *Ecological Reserve Act* allows for the designation of Ecological reserves, which are established for protecting biodiversity. Ecological Reserves are established to preserve representative examples of BC’s ecosystems; to protect rare and endangered species and their habitat; to preserve unique, rare, or outstanding botanical, zoological or geological phenomena; to perpetuate importance genetic resources; and to preserve opportunities for scientific research and education in the realm of the natural

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68 Ibid
70 [http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm](http://www.env.gov.bc.ca/wld/recoveryplans/rcvry1.htm), March 28, 2006
In the south Okanagan, Ecological Reserves include Field's Lease ER, Hayne's Lease ER, Mahoney Lake ER, and Trout Creek ER.

The **Fish Protection Act** passed in 1997, is designed to increase the protection and management of fisheries by the Provincial Government. The legislation addresses improving water allocation policy and procedures to ensure adequate flows are maintained for fish, improving riparian protection on private land, to strengthen environmental protection by local governments, and for promoting enhanced watershed planning. Provisions have been phased in.

The *Fish Protection Act (FPA)* is designed to protect and restore fish habitat in waters under provincial jurisdiction. The Act prohibits the construction of dams on significant rivers in British Columbia including the Fraser, Nass, Tatshenshini and Thompson Rivers. The FPA authorizes a regional water manager to consider the impact on fish and fish habitat when deciding whether to grant a license or approval under the *Water Act*.

The *FPA* also allows for the designation of sensitive streams and imposes certain restrictions on the granting of *Water Act* licenses that will affect those streams. The *FPA* provides for the granting of streamflow protection licenses, which may be issued to an organization possessing a community-based interest in the stream. These must include a condition requiring the licensee organization to undertake works in relation to fish and fish habitat in the stream.

The *Riparian Areas Regulation* replaces the *Streamside Protection Regulation*, and was enacted under Section 12 of the *Fish Protection Act* in July 2004. It calls on local governments to ensure that proposed activities are subject to a science based assessment conducted by a Qualified Environmental Professional (QEP), and that this be enacted under the extended deadline of March 31, 2006. The intent is to protect riparian areas during residential, commercial and industrial development. When development impacts riparian areas, a developer will be required to hire a Qualified Environmental Professional (QEP) to conduct a riparian area assessment and develop mitigation measures to protect riparian area values, including fish habitat. The Riparian Areas Regulation applies to local governments in certain areas including the three Okanagan regional districts and their respective member municipalities.

The *Fish Protection Act* also provides for enhanced watershed planning in “sensitive stream” watersheds, which should be of assistance to the wetland and riparian ecosystems.

Local governments, through their management of land use and development, have a critical role to play in protecting streams, lakes, wetlands and other fish habitats. The *Fish Protection Act* amends sections in several acts including the *Local Government Act* and the *Water Act* and strengthens environmental protection by local governments. This changing role will be discussed at some length in a later section entitled “Changing Roles and Responsibilities”.

*Environmental Assessment Act (BCEAA)* The purpose of the *B.C. Environmental Assessment Act* is to assess the potential environmental, economic, heritage, health, and social effects arising from a broad range of large scale projects under provincial responsibility. *BCEAA* covers major projects including mines,
waste disposal, energy projects such as power generation plants, pipelines, transmission lines, tourism projects, and transportation related projects (e.g., public highways). Large scale urban developments may also be subject to BCEA review. Project size or ‘threshold’ is an important factor; the BCEAA is intended to address large scale projects with significant potential to affect the environment.

Where both BCEAA and CEAA interests may apply, a joint assessment process can be initiated. Forestry related projects are not generally included as they are addressed by the Forest Practices Code and the Forest and Range Practices Act. The Environmental Assessment Office is located in Victoria.

**ii. Ministry of Agriculture and Lands**

The Ministry’s goals are to enhance economic development and environmental sustainability of the agriculture industry, food sectors and Crown land. Relevant program areas of the Ministry to this discussion include the Resource Management Branch and the Integrated Land Management Bureau. The Agricultural Land Commission also reports to the Minister of Agriculture.

The **Resource Management Branch** is responsible for sustainable resource use, by alleviating crop production constraints and conserving soil and water resources.

The Resource Management Branch is the provincial representative on the BC Agricultural Council, which is responsible for delivering the BC Environmental Farm Plan Program. The BC Agricultural Council, in partnership with BC Ministry of Agriculture and Lands, and Agriculture and Agri-Food Canada launched the BC Environmental Farm Plan Program in 2003, which will complement and enhance the current environmental stewardship practices of producers.75

The partners have been required to complete a basic agri-environmental scan to identify farms and regions requiring corrective action, taking into account the agri-environmental factors that may pose a risk or provide benefits to air, soil, and water quality and biodiversity. A series of regional workshops was held in 2003 to identify regional issues with respect to air, soil, water and biodiversity and beneficial management practices needed to address the issues. To this end, a workshop for the Okanagan region was held in Summerland in February, 2003.77

Following the workshops, a series of reference guides were published in 2005 by the BC Ministry of Agriculture and Lands to assist producers in the preparation of their environmental farm plans. Publications include a Reference Guide which provides an overview of issues that will need to be addressed when farm plans are developed. Other publications deal individually with topics such as drainage, grazing, irrigation, nutrient management, and riparian management.78

Development and implementation of environmental farm plans will help producers to increase their understanding of the environment, assess the potential environmental risks and benefits of their operations, and then identify measures to take action on their findings. An incentive program will also be established to help producers more quickly adopt the environmentally beneficial actions needed to reduce the risks and enhance the benefits identified in the plans.

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75 [http://www.agf.gov.bc.ca/resmgmt/EnviroFarmPlanning/index.htm](http://www.agf.gov.bc.ca/resmgmt/EnviroFarmPlanning/index.htm), March 28, 2006
76 [http://www.agf.gov.bc.ca/resmgmt/EnviroFarmPlanning/RegionalScanSummary.htm](http://www.agf.gov.bc.ca/resmgmt/EnviroFarmPlanning/RegionalScanSummary.htm), March 28, 2006
77 [http://www.bcac.bc.ca/efp_programs.htm](http://www.bcac.bc.ca/efp_programs.htm), March 28, 2006
Federal Financial Support will be provided for environmental sustainability and resource development programs to assist with the implementation of environmental farm plans and to provide information and tools for more effective agricultural land-use planning.79

**Integrated Land Management Bureau (ILMB)** ILMB is the lead provincial agency responsible for sustainable economic development of Crown land water and resources through resource and land management plans consistent with the government’s strategic plan to guide the allocation and pricing of natural resources and related information; Geographic Information Systems, and natural resource use registry. Through the portal of the Natural Resources Opportunity Centre, it manages and authorizes rights to resources and oversees the management of and access to Crown natural resources (tenures, permits, licences, Crown grants, etc).80

ILMB is responsible for the development, completion and implementation of strategic land plans that guide the sustainable economic development of BC’s land and resources.82 This includes the preparation of Land and Resource Management Plans (LRMPs): sub-regional integrated resource plans for use and management of public provincial lands and resources.83 The Okanagan-Shuswap LRMP, developed between 1995 and 2000, with implementation starting in 2001, provides strategic direction for managing Crown lands throughout the plan area.

One of the deliverables identified through the LRMP process was the recognition of several protected areas that fell into two categories: Goal 1 Protected Areas (large areas representing broad ecosystem types) and Goal 2 areas (small areas capturing special features). It was the intent that Goal 1 Protected Areas were to be designated Class "A" provincial parks. A feasibility study for the establishment of a national park in this area is currently underway and this may have some bearing on the final designation of the Goal 1 and 2 areas.

Geographic Information Services is responsible for the development of key GIS tools in use in the south Okanagan, standards for Sensitive Ecosystem Inventory (SEI) Mapping, Predictive Ecosystem Mapping (PEM) and Terrestrial Ecosystem Mapping (TEM).84

ILMB coordinates implementation of the Okanagan-Shuswap LRMP, which includes the south Okanagan valley. ILMB participates on the SOSCP Land Use Team and the Intergovernmental Advisory Committee for the Regional Growth Strategy. ILMB is also represented on an interagency Working Group that advises Parks Canada staff who are leading the study into the feasibility of establishing a national park in the south Okanagan and lower Similkameen.

ILMB encourages clients to review strategic plans to determine if proposed developments and land uses are consistent with plan direction. In some cases ILMB may assist clients by interpreting plan direction.


The Agricultural Land Commission administers the Agricultural Land Reserve under the Agricultural Land Commission Act, and reports to the Ministry of Agriculture and Lands.

Ministry of Agriculture and Land Legislative Tools:

The Farm Practices Protection Act (FPPA) (Right to Farm) came into force in April of 1996. Along with the FPPA, consequential amendments were made at the same time to the Municipal Act (now Local Government Act) and the Land Title Act. The Agricultural Land Commission Act, dating to 1973, also provides important context for the Strengthening Farming Program.

The Land Act enables the province to manage, regulate, or dispose of Crown lands. All lands that are sold, leased, occupied, or granted an easement through the ILMB may be referred to other agencies for review and comment. Foreshore areas and water surfaces are subject to the Land Act. Therefore, many foreshore structures such as wharves, docks, piers, seawalls, etc. require approval by ILMB.

The Water Act regulates the use of surface water and for changes in and about streams. Licenses or approvals are required from the Regional Water Manager, Ministry of Sustainable Resource Management or alternatively the Comptroller of Water Rights. The Water Act provides for regulations to require Notification for many routine works constructed in or around streams. It applies very broadly to manage water found in natural watercourses or sources of water supply such as groundwater, lakes, rivers, creeks, springs, ravines, swamps and gulches for uses including domestic purposes, irrigation purposes or agricultural use. The general purpose of the Water Protection Act ("WPA") is to foster sustainable use of British Columbia's water resources. To that end, the Act contains provisions prohibiting, among other things, the removal of water from British Columbia without a license, and the construction or operation of large scale projects capable of transferring water from one major watershed to another watershed.

Through the Water Act of British Columbia, the Ministry of Environment (MOE), Water Stewardship Division (WSD) has the responsibility of issuing approvals (for short-term use) and licences for water use, as outlined in the Water Act. The vast majority of water use licences are issued for domestic, irrigation or waterworks purposes. Other purposes include industrial, power, conservation, mining, stockwatering and land improvement.

The Water Protection Act protects British Columbia's water resources by reconfirming the ownership of surface water and groundwater in the Province; maintains existing bulk water removal rights; prohibits bulk removal of British Columbia's water to locations outside the province; and prohibits large-scale diversion between major watersheds of the Province.

The Agricultural Land Commission Act protects farmland from conversion to non-agricultural use. Agricultural Land Reserve (ALR) lands are regulated by the Agricultural Land Commission (ALC). The ALR ensures that farmland is maintained as large parcels for food production. The Local Government Act
contains provisions which affect local governments’ jurisdiction with respect to farm practices in the ALR. The ALR does allow for compatible uses including wildlife habitat and nature reserves.

iii. Ministry of Forests and Range

The Ministry of Forests and Range mandate is to protect, manage and improve the province’s forest and range resources. It does this by ensuring long-term resource sustainability and health, enforcing compliance with the regulations of the Forest and Range Practices Act, monitoring pricing and revenue requirements and other marketing concerns, and manages wild fires.


On May 4, 2004, the Minister of Water, Land and Air Protection signed an Order identifying 39 COSEWIC listed species under the Species at Risk Category for the Forest and Range Practices Act. The order enables the wildlife management provisions (e.g., wildlife habitat areas) of FRPA to be applied.

iv. Ministry of Community Services

The Ministry of Community Services is responsible for Local government; housing/building policy; safety; heritage conservation; immigration, settlement and multiculturalism services.

Regional Districts and municipalities fall under the jurisdiction of the Local Government Act and the Community Charter. Local governments have extensive powers over the use, development, and servicing of private land as well as those provincial Crown lands, which are subject to private tenures under the B.C. Land Act, for example, foreshore and water lot leases for moorage and aquaculture (see Section 4.1). However, these powers have limited application in the Agricultural Land Reserve and no application (except with respect to servicing under special agreements) to areas under federal legislative jurisdiction, such as National Wildlife Areas, Indian Reserves and Department of National Defense lands.

Local governments are comprised of locally elected representatives who have, with the exceptions noted above, autonomous authority to give priority to community interests. In this regard, environmental interests are among a range of diverse and competing priorities such as housing, commercial and industrial development, and transportation. The priority each of these receives is related to a variety of factors—a primary one being community based values—in other words, the importance residents place on these


Local governments have the authority to take on a range of letters patent, such as the regional parks function, invasive weed management and a variety of other environmentally related land use matters. Furthermore, they have the opportunity to engage in the adoption of a considerable range of environmental and ecological practices through their official community plans and zoning bylaws. For example, they can designate Environmentally Sensitive Areas based on ecological mapping and can adopt Development Permit Areas with appropriate standards and practices to help preserve important ecosystems, species at risk and wildlife movement corridors.

However, given the province’s changing role with regard to shared responsibility for the environment, local governments are finding themselves in a position of taking on more of a direct role in terms of the environment and its protection. This is discussed in more detail in the Changing Roles section, below.

**Regional Growth Strategies.** The *Local Government Act* contains provisions for the preparation of regional growth strategies by Regional Districts. A regional growth strategy is a regional vision that commits affected municipalities and regional districts to a course of action to meet common social, economic and environmental objectives. It must also contain population and employment projections. Section 849 of the *Local Government Act* sets out the purposes and goals of a regional growth strategy. One of these goals is to protect environmentally sensitive areas. The strategy is initiated by a regional district and prepared through a broad consultative process specified in the legislation. Prior to enactment, it is referred to all affected local governments for acceptance. Section 850 of the *Act* outlines the content of a regional growth strategy.

A regional growth strategy is not mandatory, but should a regional district decide to prepare one, it must have a planning horizon of at least 20 years. There are two documents at the local government level that ensure implementation of a Regional Growth Strategy: an Implementation Agreement and a Regional Context Statement.

An Implementation Agreement is a partnership agreement between a regional district and its member municipalities and/or other orders of government, their agencies or other bodies. These agreements spell out the details of how certain aspects of a Regional Growth Strategy will be carried out. For example, an agreement may relate to the construction and funding of new or upgraded highways, sewers, regional parks or hospitals.

A Regional Context Statement forms part of a municipality’s Official Community Plan (OCP) and sets out the relationship between the Regional Growth Strategy and the municipality’s OCP. An OCP for electoral areas must be consistent with the Regional Growth Strategy. The statement is prepared by the municipality and referred to the regional district for acceptance.

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b. Interregional Initiatives

i. Water

There is an increasing number of valley-wide initiatives in the areas of water management, economic development, and air quality. These initiatives involve all levels of government, academia, business, and non-government organizations.

The Okanagan Basin Water Board (OBWB) was established to be the implementation vehicle for the 1969-1976 Okanagan Basin Study. This landmark initiative was the most extensive public involvement activity in Canadian history. It brought together the Federal and Provincial Governments to review water quality and quantity issues and to create a framework for future management. The first recommendation of the Study was that the boundaries of the present Regional Districts of North Okanagan, Central Okanagan and Okanagan-Similkameen be redrawn to create a single Okanagan Basin Regional District, to be responsible for those water resource management functions that pertain to the Valley as a whole and in particular the implementation of those recommendations in this report that are Valley-wide in scope, especially waste treatment, the orderly development of shoreline recreation facilities, and floodplain zoning.

This recommendation was not implemented, and instead, the Okanagan Basin Water Board was created to act as the implementation vehicle for the Study. This unique body is constituted by Provincial Statute. It comprises three representatives from each of the 3 regional districts in the Valley. It is the only body in the Okanagan that has valley-wide taxing authority based on assessment. It currently taxes at 10.5 cents per thousand, raising over $2.5 million per annum for grants to sewage facilities and to control Eurasian milfoil, an aquatic weed. The Board can tax to the level of 22 cents per thousand. Funds can be spent on any water initiative agreed to by all three regional districts.

In recent years the Board has undertaken several initiatives to examine and extend its role. To date none has achieved the necessary unanimity to result in action. However, a series of workshops and reports, most notably “Running on Empty”, have recommended a more vigorous effort at water management.

On February 23-25, 2005, the B.C. Branch of the Canadian Water Resources Association (CWRA) held a conference in Kelowna focusing on the Okanagan Basin (“Water - Our Limiting Resource”). The Conference concluded with a plea for the OBWB to take immediate action to expand its mandate and take action on water management. A plenary session at the conclusion of the Conference agreed on the following recommendations:

- a forum should be created for all those with an interest in the future of the Okanagan to develop a common and sustainable vision for Okanagan water, which can be used to guide the development of public policy
- improved demand-side management should be a primary focus of efforts to improve water management in the Okanagan
- public education on water values should become a cornerstone of efforts to promote water conservation
- all water (in stream, groundwater, and lakes) should be managed as a single resource
- water management should ensure the sustainability of aquatic ecosystems

96 Running on Empty: Our Common Future, Okanagan Basin Water Board, Workshop, 2004
- collection of water information needed for decision-making should be a priority
- existing organizations should more effectively coordinate water issues of basin-wide interest
- the existing model for basin-wide governance should be improved

The Conference also made a number of science-orientated recommendations. Several are of particular interest to a growth management strategy:

- the true economic value of water should be reflected by increasing the conservation ethic, and developing financial incentives/disincentives to promote demand management
- sensitive groundwater recharge areas should be protected
- to conserve the ecological integrity of Okanagan Lake it is necessary to identify critical areas for protection, develop a foreshore protection program, clarify responsibilities, and develop an effective enforcement program
- water quality tradeoffs should be included in decision making

The B.C. Branch of the CWRA has recently called for a moratorium on new water licenses in the Okanagan until its recommendations are acted upon.

The work of the OBWB is closely linked to an initiative of the Okanagan Partnership (OP). This is a coalition of business, education and governments promoting sustainable growth and strengthening regional competitiveness. The three regional districts are also partners.

The OP has concluded that coordinated water management is key to the region’s future. Tom Siddon, Water Steward for the OP has written a paper on “Okanagan Water Management”. In it he notes: “The present growth trend is unsustainable unless major changes are made to the way in which we manage and regulate the use of our common and life-sustaining heritage - the waters of the Okanagan. The Paper concludes that climate change, population growth, and the intensification of agriculture will increase stresses on the regional water supply, making droughts more common in the future and the importance of regional water management more critical. Siddon proposes the creation of an Okanagan Water Management Council comprising representatives from each regional district, First Nations and Indian Bands, and water purveyors.

The Regional Districts of Okanagan-Similkameen and Central Okanagan have endorsed the OP proposal in principle and it has recently been reviewed by the Okanagan Basin Water Board. A Water Stewardship Council has been established, representing a wide range of public and agency interests. A Water Grants Program has also been established, providing $300,000 per annum for purveyors to improve water quality and water conservation.

The three regional districts have also cooperated on several economic studies with implications for the environment. The first of these was a partnership with the Federal Department of Western Diversification entitled “Green Sustainable Economic Development in the Okanagan Valley”. The study, completed in 2003, concluded that “the environment is the economy” and sought to encourage economic initiatives that met sustainability criteria. The study was similar to others in Canada undertaken with Federal leadership. The Okanagan Partnership’s cluster analysis followed this pioneer work, building on the concept of sustainable economic development, which takes advantage of the Okanagan’s unique natural assets.
Finally, the Okanagan Basin Water Board is an association of local governments in the Okanagan Valley that operates the milfoil control program and that provides cost sharing of municipal and regional district wastewater treatment facilities.

**ii. Air**

Air quality is a growing concern in the Okanagan. Population growth, topography and weather patterns, land use, and transportation are all issues affecting this quality of life indicator. Recently the three regional districts have signed a memorandum of understanding to cooperate on air quality initiatives. The Central Okanagan Regional District has an extensive program of air quality modeling, air quality indices, and initiatives to reduce smoke. These include a wood stove exchange, a “cash for clunkers” program, an agricultural wood waste chipping program, and stricter outdoor burning bylaws. Funding has recently been announced to carry the agricultural chipping program to the Okanagan-Similkameen. The Ministry of Environment is supportive of this regional approach to air management.

c. Local Government

Both regional districts and municipalities use Official Community Plans (OCPs) to help guide development and provide land use policies and procedures for specific geographic areas. These are augmented through other regulations, most significantly zoning bylaws and subdivision bylaws.

In the area covered by the South Okanagan Regional Growth Strategy area, there are 4 municipalities and the Regional District of Okanagan-Similkameen, all of which are responsible for creating OCPs. The municipalities are the District of Summerland, the City of Penticton, Town of Oliver and Town of Osoyoos. Each of the municipalities has developed an OCP, and in some cases there are sector and neighbourhood area plans. The RDOS has 5 Electoral Areas that fall within the South Okanagan Regional Growth Strategy area and create a total of 6 OCPs within these Electoral Areas.

i. Official Community Plans

“An official community plan is a statement of objectives and policies to guide decisions on planning and land use management, within the area covered by the plan, respecting the purposes of local government.” [Local Government Act s.875 (1)]

An Official Community Plan (OCP) guides community development. It articulates a vision for the future, with policies, objectives and land use designations to support that vision. It does not directly regulate land use and development, but zoning bylaws and development permits must be consistent with the Official Community Plan.

Under the Growth Strategies Act, once a Regional Growth Strategy has been adopted, Official Community Plans in the south Okanagan will have to demonstrate how they will be consistent with the Regional Growth Strategy through a Regional Context Statement. Existing Official Community Plans in the south Okanagan, both within municipalities and the Regional District, will have two years to include a Regional Context Statement in their Official Community Plans. Subsequent to that, future Official Community Plans must be congruent with the Regional Growth Strategy.

An Official Community Plan may identify Environmentally Sensitive Areas as Development Permit Areas and describe what terms and conditions apply to development, including guidelines for conducting environmental impact assessments. (See Ecosystem Mapping section below for a discussion on how environmentally sensitive areas are identified and environmental impact assessments are carried out). An Official Community Plan could contain goals and policy statements that define a local government’s intention to protect and conserve natural areas. Pursuant to those goals and statements, an Official Community Plan can designate these lands as natural or conservation areas.

Sample statements to protect environmentally sensitive areas are provided in the Sensitive Ecosystems Inventory Conservation Manual (McPhee et al. 2000).

- “Promote preservation of sensitive ecosystem areas and their living resources in a natural condition and maintain these areas free of development and human activity to the maximum extent possible. (Ibid)”
- “Manage recreational access into ecosystems to minimize impacts especially during wildlife nesting season.” (Ibid.)

Official Community Plans are an important tool to help bring in policies and procedures to preserve important natural areas. However, Councils and the Regional District Board can change, resulting in changes to the policies within Official Community Plans. When decision-makers are faced with a development project, they will balance a variety of needs, including housing, commercial, parks, transportation, and the environment. Environmental values are given specific priority in some Official Community Plans:

“Because environmental impacts of human action are often irreversible and because Highlands residents place a high value on the quality of the local environment, Goal 1 will be considered the most important goal. Actions to achieve other goals will be taken only if they do not compromise the integrity of the natural environment.” (District of Highlands Official Community Plan 1997).

**ii. Development Permits**

Official Community Plans can establish Development Permit Areas (DPAs), within which lands can be developed only in accordance with specified guidelines. Development Permits can be used for a variety of purposes and to conserve various attributes. For example, where residential development is involved, there is a range of different development permits that are used, including those to accommodate comprehensive development or multi family housing. Likewise for the preservation of natural attributes there are a number of development permit types in place to protect ecological values, control development and to introduce safety measures. Examples include Rural Hillside Development Permit Areas, Sensitive Terrestrial Ecosystem Development Permit Areas, Aquatic Ecosystem Development Permit Areas, and Wildfire Interface Development Permit Areas.

Development cannot occur in Development Permit Areas until a development permit has been obtained. The Sensitive Ecosystems Inventory Conservation Manual (McPhee et al. 2000) describes a variety of ways in which DPA guidelines can be worded to protect environmentally sensitive areas.

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Development Permits can:
• establish special requirements that apply to the development or redevelopment of an area, including the preservation, protection, restoration or enhancement of the natural environment, its ecosystems and biodiversity; and
• require Development Approval Information to be prepared by qualified environmental professionals prior to development approval. This could include an extensive inventory of the site’s natural values and is often in the form of an Environmental Impact Assessment.

Like any tool, Development Permits have their challenges. One is the belief that a Development Permit protects things such as natural features. Although the legislation states that land requiring a Development Permit cannot be altered, subdivided, or built upon without a Development Permit, local governments may grant exemptions. More importantly Development Permits do not prohibit development; rather, they allow it, subject to certain stated guidelines.

Several municipalities and regional districts in the province have identified Environmentally Sensitive Ecosystems Inventory sites or Environmentally Sensitive Areas (ESAs) as Environmentally Sensitive Development Permit Areas (ESPDAs) in their Official Community Plans, and supporting policies and procedures. This ensures these sensitive ecosystems are considered during the development approval process.

One municipality, the District of Langford has three types of Development Permit Area for environmental protection namely):
• Riparian zones;
• Sensitive ecosystems; and
• Areas with potential habitat and biodiversity values.

There are currently several Official Community Plans within the RDOS where Environmentally Sensitive Development Permit Areas have been designated. In addition, there is one sector plan, The Northeast Sector Plan, within the City of Penticton, where Environmentally Sensitive Areas have been established. Furthermore, there are other Official Community Plans currently under review where Environmentally Sensitive Development Permit Areas are being considered.

However, there are still sizeable areas within the south Okanagan without these ecological standards and practices. This could be due to a combination of reasons. In the case of the RDOS, it could be because an OCP has not yet come up for review, or in some places the ecosystem mapping does not yet cover the entire OCP area. For some local governments without Environmentally Sensitive Development Permit Areas, it could be as a result of lack of capacity both in terms of ecological expertise and/or spatial data. Others may not yet appreciate the ecological values and hence the need for Environmentally Sensitive Development Permit Areas.

iii. Zoning Bylaws

Zoning bylaws control four major aspects of settlement: location (by creating distinctive zones); use (what can and cannot occur on land); density (the size and number of buildings that may be constructed); and siting (the location of buildings and other structures, including setbacks). Zoning may be altered (i.e. rezoned) by Council or Regional Board decision, usually at the request of a landowner or developer.

Zoning bylaws can be used to protect natural areas in various ways:

- by including setback provisions that require buildings, parking lots or other uses to remain a certain distance from a specified boundary such as the high water mark or a property boundary. This can be used to protect stream corridors or other natural features from development.
- during re-zoning negotiations, some areas can be developed at higher density in return for the protection of environmentally sensitive areas.
- by establishing “Comprehensive Development Areas” for large or complex sites. This means development on that site will be considered in its entirety, rather than looking at piecemeal development of the property. This allows for more careful site planning for the protection of environmentally sensitive areas.

“Through the use of comprehensive development zones, the City of Burnaby is able to achieve all of its site-specific environmental goals. The City also has a policy that if sensitive areas are within a proposed subdivision, the land is dedicated as a condition of the rezoning.” (Harris 2001)

Public lands may be zoned as parks. Most municipalities have one or more “park” zones in their zoning bylaw, which can be used to protect natural areas. Be aware that some municipal “parks” are focused strictly on developed parks such as playfields and playgrounds. A community plan to protect a natural area should have a “natural park” zone that allows the area to remain in a relatively natural state, perhaps with some trail development. Linear parks are a good option to protect wildlife corridors as well as trails.

“The City of Surrey differentiates between active and passive parks; active parks being playing fields and recreation areas, passive parks being important habitat and environmentally sensitive areas. With an acquisition budget of between $15 and $20 million per year funded through development cost charges and cash-in-lieu of park land dedication, significant tracts of land are acquired.”

Other communities have a range of park types including nature parks complete with interpretive centres.

Very low density zones can be used to protect natural features. If a landowner has a very large lot (e.g. over 4 ha), typically only a small portion of the lot is developed for the homestead, and the remainder stays in a relatively natural condition. Metchosin, Langford and Highlands all use large lots to protect the rural nature of their communities. (The downside of low density development is that it encourages sprawl.)

The District of Highlands uses a greenbelt zone (minimum lot size for subdivision is 12 hectares), as a way of preventing piecemeal rural subdivision until a development plan can be provided that may create very small clustered lots and preserve large, contiguous areas most appropriate for such preservation (K. Key, personal. comm.).

Zoning bylaws regulate how land is developed and used. Innovative zoning provisions can provide significant protection to environmentally sensitive resources. Where appropriate, local governments can establish setback provisions that require buildings, structures, or other uses to remain a certain distance from a specified boundary, such as a property line. Zoning can also define a specified boundary to be a “siting circumstance” such as the high water mark of a water body or other legally definable boundary.

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100 Ibid.
Setback provisions can be used to protect stream corridors or other natural features from development. A siting circumstance could include definition of a distance from a specified tree, however, the tree itself would need protection under development permit, tree cutting bylaw, or landscaping requirements.

Progressive planning measures used as precedent elsewhere that can be implemented locally include the following:

- Ensure that zoning categories allow parcel sizes and dimensions that will enable the establishment of appropriate setbacks and leave areas in the event of future rezoning or subdivision.
- Create density bonusing zones for residential areas adjacent to Environmentally Sensitive Areas to allow developers to apply for an increase in density on part of the property in exchange for the conservation of a specified amenity such as a natural feature on another part of the property. This allows developers to preserve sensitive ecosystems in return for designs that increase density in less sensitive portions of the site.
- Create cluster housing zones for residential areas adjacent to Environmentally Sensitive Areas to allow a tighter grouping of houses or multiple-unit buildings on the most buildable portions of a building site in exchange for retaining a large portion of the land, such as an Environmentally Sensitive Areas, in a natural state.
- Encourage the use of bare land strata subdivisions for residential areas adjacent to Environmentally Sensitive Areas to promote cluster housing with protection of sensitive site areas as common open space.
- Encourage the protection of ecologically sensitive areas to be protected from future development by promoting such tools as conservation covenants in the name of the regional district, municipality, provincial government and/or a land trust or conservancy. This is more easily achievable when there are development permit areas in place protecting ecologically sensitive lands. Also in urban development areas comprehensive development zones can be used for complex sites to enable careful site planning for conservation of sensitive ecosystems.
- Continue to implement the floodplain setbacks and regulations under Section 910 of the Local Government Act, in conjunction with the Riparian Areas Regulation.

iv. Subdivision Approvals

Subdivisions are examined under the Land Title Act by a subdivision approving officer.

Municipal subdivision approving officers are appointed by their respective municipalities and must be a municipal engineer, chief planning officer or others as specified in the Land Title Act. In a regional district, the Lieutenant Governor in Council may, by order, authorize a regional board to appoint a person as approving officer or, if this is not the case, the approving officers are then the Deputy Minister of the Ministry of Transportation and Highways (MOTH) and specified employees of that Ministry. In the case of the Regional District of Okanagan-Similkameen the Approving Officer is a MOTH employee in Kamloops. Subdivision approval provisions require an approving officer to ensure that subdivisions conform to local government bylaws such as zoning and subdivision servicing bylaws.

However, approving officers have substantial independent authority to determine the public interest and specify requirements for subdivisions. The Land Title Act enables the approving officer to use the “protecting the public interest” provisions in the Land Title Act to conserve sensitive and important ecosystems within the subdivision approval process. In this situation, a subdivision approving officer may
refuse to approve a subdivision if s/he considers it to be against the public interest. Case law is extensive with regard to ‘public interests’ that helps define the scope of this authority.

To protect natural areas, the Approving Officer may take measures for sound environmental planning during the subdivision approval process. He or she may:

1) Refuse to approve a subdivision if it is considered “against the public interest” [Land Title Act s.85(3)]. This could include refusing development in an environmentally sensitive area, if sufficient cause can be shown.

2) Seek a dedication or acquisition during subdivision for park or public open space. In subdivisions with 3 or more lots, or where the smallest lot is larger than 2 ha, local government can request that up to 5% of the land be dedicated for park or public open space in accordance with section 941 of the Local Government Act. This could ensure that ecologically valuable land or natural features remain in public ownership. In lieu of park dedication, there is provision for a developer to deposit 5% of the assessed land value in a local government reserve fund for the purposes of acquiring park land.

3) By considering, where appropriate, the use of road and water body access dedication requirements for provision of stream and wildlife corridors.

4) Where acquisition or dedication is not appropriate or possible, seek the registration of a covenant on land title to preserve an environmentally sensitive area. Covenants can be used to require environmental protection measures such as retaining vegetation, keeping sensitive areas free of development and in natural condition, and installing fencing to restrict access. Covenants can be in favour of the local government, a senior government agency, a land trust and/or a conservation organization. Covenants must be monitored and enforced to be effective.

5) Reduce the number of permitted lots and have the subdivision redesigned for natural area protection.

In the District of Saanich, preliminary reviews of all subdivisions, rezoning and development permit applications are conducted for environmental concerns as part of the Environmental and Social Review (ESR) process (A. Pollard, pers. Comm.)

In Langford, fire marshals requested that trees close to a proposed subdivision (adjacent to a park) be cut to reduce the fire hazard. Instead, the subdivision approval required that sprinklers be installed in all homes to reduce the fire hazard – sparing the trees (M. Baldwin, pers. comm.).

In the past, the Ministry of Environment could have the opportunity to review subdivision referrals and develop general or site specific environmental or conservation recommendations to subdivision approving authorities. However, given the Ministry’s changing role, which is described later in this report, this service is no longer provided.

Secondary development approvals may be required after the initial subdivision. For example, a residential subdivision of vacant lots may be approved but still require permits for tree cutting or building within close proximity to a watercourse or lake. Piecemeal, site-by-site approvals may have a cumulative, negative environmental effect that would not have been acceptable if it was identified as a whole during the
conceptual and planning phase of a project. This can be prevented by ensuring that the effects of subsequent development of a property are well thought out at the time of subdivision, and by ensuring that the layout will minimize negative environmental effects.

v. Subdivision Servicing Bylaws

Subdivision servicing bylaws are established under sections 938-946 of the Local Government Act. These bylaws set standards and make requirements for the provision of services, such as access (roads, sidewalks, trails, transit stops), water, sewer, and storm drainage systems. To protect sensitive and other important ecosystems, subdivision servicing bylaws may develop best management practices and guidelines, and incorporate these into engineering, servicing, construction standards and requirements, as well as operational procedures to ensure these are compatible with the preservation, protection, restoration, and enhancement of sensitive and important ecosystems. Important functions include storm water management, stream protection, vegetation management, and erosion and sedimentation control and require that all public works, including road, utility and park construction be conducted in a manner that is consistent with environmental protection of Environmentally Sensitive Areas.

vi. Other Municipal Bylaws of Interest

Other local government bylaws that can be enacted to protect environmentally sensitive areas include:

- Stream and Drainage Bylaws
- Tree Protection Bylaws
- Animal Control Bylaws
- Soil Removal and Deposit Bylaws
- Landscaping Bylaw

vii. Ecological Mapping and Related Environmental Assessments: Important Land Use Decision Making Tools

Environmentally sensitive areas must be systematically identified in order to be protected within land use planning processes. Ecological mapping is used to do this, and in some cases is used further for carrying out environmental assessments. Prior to identifying environmentally sensitive areas for planning purposes, provincially standardized ecosystem mapping must be in place.

Ecosystem mapping is the stratification of a landscape into map units, according to a combination of ecological features, including climate, physiography, surficial material, bedrock geology, soil, and vegetation. Common scales of ecological mapping are 1:20 000 to 1:50 000, though larger scales such as 1:10 000 or 1:5000 may be used depending on project objectives.

Ecosystem mapping can be used in systematic landscape planning for conservation, urban development, and public uses.

101 HAT Manual
102 Sensitive Ecosystems Inventory.
103 http://srmwww.gov.bc.ca/ecology/item/index.html, Pail 2, 2006
A partial list of ecological mapping approaches is summarized below.

- **Vegetation Resources Inventory** locates and quantifies vegetation resources for forestry purposes.\(^{104}\)

- **Broad Ecosystem Inventory** is a method of classifying and mapping broad ecosystem habitats, and the suitability and capability of the land to support various wildlife species. For the purposes of Broad Ecosystem Inventory, habitat suitability is defined as existing productivity with present vegetation, and habitat capability is defined as potential productivity with optimal vegetation for a species. Broad Ecosystem Inventory is a multidisciplinary approach that can be interpreted for wildlife, range, agriculture, forestry or industrial development.\(^{105}\)

- **Predictive Ecosystem Mapping** is a modeled approach to ecosystem mapping, whereby existing knowledge of ecosystem attributes and relationships are used to predict ecosystem representation in the landscape.\(^{106}\)

- **Terrestrial Ecosystem Mapping** (TEM) is a methodology which requires direct air photo interpretation of ecosystem attributes or characteristics by the mapper. This approach is typically used at a detailed scale where more information is required than would be for Predictive Ecosystem Mapping.\(^{107}\)

- **Sensitive Ecosystem Inventory** (SEI) systematically identifies and maps rare and fragile ecosystems in a given area. SEI mapping can be based on original air photo interpretation for SEI polygons, or as an SEI theme based on Terrestrial Ecosystem Mapping (TEM) polygons.

  The purpose of SEI is to identify rare and fragile terrestrial ecosystems and to encourage land-use decisions that will ensure the continued integrity of these ecosystems. It is intended for use in a variety of land-use planning processes.

In BC, Sensitive Ecosystems Inventories have been completed for East Vancouver Island and Gulf Islands and the Sunshine Coast, and several areas in the Okanagan Valley. These projects are a joint federal/provincial initiative of Environment Canada (Canadian Wildlife Service), the BC Ministry of Environment, the BC Ministry of Agriculture and Land, and the Habitat Conservation Trust Fund. Some SEI projects have also received support and funding from regional districts and local governments.\(^{108}\)

Some SEI projects in BC that are already completed have produced guidelines for the protection of sensitive ecosystems. One example is the Conservation Manual for East Vancouver Island and Gulf Islands\(^{109}\), which identifies fragile and sensitive ecosystems, explains the importance of them in biological, economical, and social terms, and provides tools and guidelines on the protection of them. In the south Okanagan, SEI can help identify survival habitat for provincially significant species and federally-listed species at risk.\(^{110}\)


\(^{107}\) Ibid


Figure 3 is a map of the South Okanagan Regional Growth Strategy area which indicates the types of SEI and TEM ecological mapping currently in place. There are some areas that have no TEM or SEI mapping within the Regional Growth Strategy Area. Also, some existing mapping may need standardization.

Regional and Sub-Regional Applications

The broader uses of ecosystem mapping can be to model, plan and monitor regional scenarios. This can include identifying important ecological areas and general areas for potential urban growth within regional and sub-regional growth strategies, and in Official Community Plans. More specifically, SEI maps and database information have been widely used in the preparation of Official Community Plans, parks and greenways plans, forest stewardship plans, and many other site-specific planning and development purposes.

Generally, ecological mapping at a scale of 1:20 000 is used for delineating areas of ecological concern for Official Community Plans in the south Okanagan. From the mapping, environmentally sensitive areas are identified, and usually translate into a type of development permit area(s) for environmental protection in an Official Community Plan.

The Regional District of Okanagan-Similkameen has adopted Environmentally Sensitive Development Permit Areas (ESDPAs) in some of its Official Community Plans. Environmentally Sensitive Development Permit Areas can help safeguard such things as sensitive ecosystems and survival habitat for provincially significant species and federally listed species at risk.

There are currently three Official Community Plans within the Regional District where environmentally sensitive areas (based on TEM) have been incorporated into Environmentally Sensitive Development Permit Areas. Also there is one sector plan, The Northeast Sector Plan within the City of Penticton, where environmentally sensitive areas have been established based on TEM. The Town of Osoyoos has conducted a SEI and currently is reviewing how this information can be integrated into its new Official Community Plan.

There are a couple of other Official Community Plans currently under review within the Regional Growth Strategy area where Environmentally Sensitive Development Permit Areas are being considered to protect environmentally sensitive areas. Some local governments have not incorporated the ecosystem mapping into their planning processes and have not acknowledged environmentally sensitive areas or Environmentally Sensitive Development Permit Areas.

Ecosystem mapping also may contain, or be used in conjunction with detailed terrain information, which identifies slope steepness and stability. This type of mapping is used to delineate areas where development should be avoided or could only proceed with certain restrictions, subject to detailed geotechnical studies. In the south Okanagan, it can also be used to identify certain habitats.

At the Official Community Plan level, ecosystem mapping can be used as a guide to appropriate land use designations and a flag for further environmental assessment at the zoning and development permit level. Ecosystem mapping can also be used to protect important wildlife corridors and to identify potential regional parkland. It is important for local governments to engage the appropriate environmental planning expertise to evaluate the impacts of proposed land use changes on environmentally sensitive areas. In the

111 http://www.env.gov.bc.ca/sei/, April 2, 2006
Figure 3: Ecosystem Mapping Projects in the south Okanagan
south Okanagan, this could include close liaison with the South Okanagan-Similkameen Conservation Program, applicable government agencies, and local conservation organizations.

Without the availability of standardized ecosystem mapping, threatened ecosystems cannot be readily and consistently identified, and appropriate land-use decisions to protect them cannot be made. The importance of ecosystem mapping as a tool in identifying and protecting important ecological features in our landscape cannot be understated.

**Neighbourhood Applications**

In addition to being identified in Official Community Plans and the resulting Environmentally Sensitive Development Permit Areas, Environmentally Sensitive Areas are now being applied at the neighbourhood planning level.

At a neighbourhood level it is becoming more common place for Environmentally Sensitive Areas to be separated into different levels of ecological sensitivity and significance. A hierarchy of sensitivities within an Environmentally Sensitive Development Permit Area can be defined to identify or rank the relative importance of habitats within the identified area. This can identify core ecological areas, natural features, buffers and corridors for wildlife movement. It can also be used to provide an expectation as to what areas are most suitable for development and identify what intensity of environmental impact assessment would be required if development plans are proposed.

These different sensitivities can appear as varying levels of ESAs, classified as ESA 1, 2 or 3. ESA 1s generally have the most ecological significance while ESA 3s have the least.

For development to be approved by a local government authority in an area that has been flagged as an Environmentally Sensitive Development Permit Area, the proponent will need to hire a Qualified Environmental Professional (QEP) to interpret the ecosystem mapping and to carry out an Environmental Impact Assessment (EIA). The QEP must utilize other available tools such as a specified Terms of Reference appropriate to the study area in order to carry out an impact assessment to better determine ecological values and the potential impacts of the proposed development. The Environmental Impact Assessment should cover ways to avoid, minimize or mitigate any environmental impacts by making objective recommendations on how to protect ecosystems and their functioning. Field verification of the base mapping and other attributes is necessary.

Assuming varying sensitivities have been ranked within an Environmentally Sensitive Development Permit Area, the scope of the assessment might be cursory or specific to one issue, or they might need to be thorough and address a number of issues. The former is being referred to as a Rapid Assessment and the latter a Detailed Assessment. *Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (Ministry of Environment 2005) identifies and describes the approaches used to conduct assessments. The following provides a brief description of the two types of assessments:

**Rapid Ecological Assessment (REA)** serves to document the presence or absence of certain ecological elements and geographic features that might have conservation values. Rapid Ecological Assessments are most often appropriate for small developments (less than 1 ha) which appear to have no potential impacts on natural ecosystems, native species or ecosystem functions.
Typically, Rapid Ecological Assessments are appropriate for ESA 3s. A Rapid Ecological Assessment consists of an overview of the property, typically based on a combination of existing and new data collected at the site. A Rapid Ecological Assessment can be a tool to determine whether a Detailed Environmental Assessment is necessary.

**Detailed Ecological Assessment (DEA)** is done as a result of the findings of Rapid Environmental Assessment, or because the site is designated as an Environmental Sensitive Area 1 or 2. The assessment must fully describe the ecology of the site, and its relationship to the surrounding landscape. Sensitive ecosystems, residences and critical habitats for Species at Risk must be investigated and documented by a thorough review of past data, expert opinion, and thorough inventories by competent individuals. The development plan must clearly demonstrate how the project will avoid, mitigate and compensated where necessary, any potential impacts from the proposed development.

The following table summarizes the approaches for each ESA level (e.g. 1, 2 or 3) within an Environmentally Sensitive Development Permit Area, including an appropriate approach for protecting aquatic environments.

<table>
<thead>
<tr>
<th>ESA Level</th>
<th>Ecological Assessment Intensity</th>
<th>Anticipated Retention Area</th>
<th>Typical Retention Features</th>
<th>Typical Buffer (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Detailed (DEA)</td>
<td>70-100%</td>
<td>Core conservation areas</td>
<td>50-250</td>
</tr>
<tr>
<td>2</td>
<td>Detailed (DEA)</td>
<td>40-80%</td>
<td>Core conservation areas, low intensity public use areas</td>
<td>50-250</td>
</tr>
<tr>
<td>3</td>
<td>Rapid (REA)</td>
<td>10-40%</td>
<td>Ecosystem Features such as wildlife tree patches, rock outcrops, drainages, corridors</td>
<td>10-100</td>
</tr>
<tr>
<td>Aquatic</td>
<td>Detailed (DEA)</td>
<td>70-100% or 30-50% restoration</td>
<td>Lakeshores, water courses, seeps, gullies, kettles</td>
<td>7-30</td>
</tr>
</tbody>
</table>

Table 3: Summarizing ESA Levels and Environmental Assessment Intensities within ESDPAs

d. **Aboriginal Communities**

In the south Okanagan, the Indian Reserves are governed by the Penticton and Osoyoos Indian Bands respectively, under the provisions of the Indian Act. In addition to the bands, there are two organizations that represent the entity of the Okanagan Nation on other matters: The Okanagan Nation Alliance and the En’owkin Centre. All have roles and responsibilities to the environment and ecology, and are involved in various initiatives, both on and off reserve. The Okanagan people have a rich, cultural heritage that incorporates the environment and ecology and are thus very aware of the need to tread lightly.

The Indian Reserves in the south Okanagan have tracts of relatively undisturbed habitat. While this is afforded protection under the Species at Risk Act, economic pressures prevail and the Indian Reserves cannot be seen as the sole resolution for managing habitat for species at risk. And, while the Regional Growth Strategy does not apply to Reserve Lands, environmental and ecological stewardship must be a
joint responsibility to ensure continuity and integrity of the south Okanagan’s endangered ecosystem regardless of jurisdictional boundaries.

This section outlines some current initiatives of each of the native organizations noted above with respect to environment.

i. **Penticton Indian Band**

The Penticton Indian Reserve contains large tracts of relatively undisturbed habitat. The Band has a Physical Development Plan, similar to a land use plan, which is reviewed and upgraded every five years. The Band is applying for funding to create land use zoning that will incorporate environmental and economic management into land use.

There is currently one staff member dedicated largely to natural resource management, and funding is being sought to increase technical staff positions and to provide additional training for additional staff resources, particularly in the areas of GIS, water management, and land management.

A Natural Resource Management Project was recently completed to develop integrated water resource planning, including assigning water resources. The Band will continue to monitor water resource for long term data collection.

Some of the environmental management is traditional, and is not initiated by the Band administration, such as the prescribed burn in the spring of 2005.

The Band has a Traditional Ecological Knowledge group, which advises Chief and Council on traditional ecological knowledge matters and assists on referrals from provincial and regional governments. Members of the Traditional Ecological Knowledge Council from Penticton Indian Band are participating in the Recovery Implementation Group that stems from the species at risk recovery plans being drafted for the south Okanagan.

In joint conservation initiatives that include non-native groups, the Band is represented on the Traditional Ecological Knowledge Team of SOSCP, and would like to be involved in *Species at Risk Act* issues as they pertain to Reserve Lands. The Chief of the Penticton Indian Band sits on the Okanagan Basin Working Group. There is additional representation on cooperative initiatives indirectly through the Okanagan Nation Alliance and the En’owkin Centre.

The Band has been approved for funding for an elementary school. An ambitious curriculum is being developed that incorporates science, traditional knowledge and traditional culture.

ii. **Osoyoos Indian Band**

Osoyoos Indian Band is currently involved in the environment through several avenues largely through the work of its Conservation Technician, developing a pilot project official community plan for certain area on the Reserve, and outreach initiatives. A large amount of intact antelope-brush ecosystem is located on Osoyoos Indian Reserve, an ecosystem that is home to several endangered species. Endangered species found here and forming a large focus of conservation work include the Badger, Peregrine Falcon,

The Conservation Technician position receives funding from various sources including Indian and Northern Affairs Canada and the Interdepartmental Recovery Fund, and works with the Osoyoos Indian Band. This position provides scientific input to the Recovery Action Planning for Species at Risk, assessments, referrals, stewardship (such as range management, managing species at risk), and some input to the Osoyoos Indian Band Corporation. Outreach activities include school programs and programs for youth.

Networking is also a focus, through outside circles of common interest, and access for scientists to species and habitat at risk. With respect to the environment, key areas include developing capacity, networking with the conservation community, inventories, and encouraging a scientific approach to conservation. Within the reserve, the Conservation technician endeavors to provide influence with respect to species diversity, ecological significance and their roles within the environment.

An example of a cooperative initiative that incorporates both outreach and networking between the conservation community and the rattlesnake research program, its focus is to track snakes, and demonstrate snake-friendly development.

As mentioned above, the Band is developing a pilot project Official Community Plan for one specified area on the Reserve, which considers conservation planning. The Species at Risk Act obligates the Band to develop in an ecologically sound manner, as Indian Reserves are federal Crown land. As the Act applies only to federal Crown land, Indian Reserves are bound by its provisions. The Community Plan will apply to a portion of the Reserve as a trial, and hopes to address the dichotomy presented between the encouragement from the federal government to develop band land and resources for economic opportunities, while being obligated and respectful to preserving habitat for species at risk.

At the community level, there are individuals who carry out traditional ecological practices such as controlled burns and harvesting of plants for cultural practices.

The Osoyoos Indian Band is also home to the Nk'Mip Desert and Heritage Centre. Nk'Mip Desert Centre is an eco and cultural tourism venture, and provides outreach and education through its interpretive trails and guides, which explain the desert ecosystem and its relationship to the Syilx culture. The building for the Desert Centre is being planned with a sustainability focus to ensure a reduced footprint on the land.

Osoyoos Indian Band has recently become a partner in SOSCP, and sits on the Regional Growth Strategy Steering Committee

### iii. Okanagan Nation Alliance

**Okanagan Nation Alliance** is a National Tribal Government whose seven member bands are Osoyoos, Penticton, Lower Similkameen, Upper Similkameen, Westbank, Okanagan, and Upper Nicola. On a watershed level, Okanagan Nation Territory includes the Okanagan Basin, the Similkameen Basin, and the Kettle Basin, as well as parts of the Columbia Basin and Thompson Basins.
The ONA Fisheries Department, established in 1995, provides technical fisheries assistance for the Nation and its seven member Bands; acts as a liaison with federal and provincial fisheries agencies and is a founding member of the Canadian Okanagan Basin Technical Working Group. The goal and mandate of the ONAFD is the conservation, protection, restoration, and enhancement of indigenous fisheries (anadromous and resident) and aquatic resources within Okanagan Nation Territory.

The ONAFD initiated the formation of the Canadian Okanagan Basin Technical Working Group (COBTWG) in 1997. COBTWG is a tri-partite governmental working group dealing with technical issues associated with management of salmon and resident fish stocks and their associated habitat requirements in the Canadian portions of the Okanagan River basin. The COBTWG is detailed in its own section within this report.

The ONAFD has been leading the re-introduction of sockeye salmon into Skaha Lake since the mid-1990s. The migration of indigenous sockeye salmon has been terminated by the operation of McIntyre Dam, located on the Okanagan River immediately south of Vaseux Lake. Beginning with a multi-agency workshop in 1996 to identify and discuss the proposed project, the ONAFD completed a 3-year risk assessment to determine the feasibility of returning Okanagan sockeye back into their historic range in Skaha Lake. With approvals provided by the Federal-Provincial Introductions and Transfers Committee under the Federal Fisheries Act, the ONA is now moving forward with implementation planning, and an experimental reintroduction program was initiated in the fall of 2003. On June 1st and 2nd, 2004, 352,500 sockeye fry were released into Skaha Lake, where they will spend one year rearing before making their smolt-outmigration in early 2005. The ONAFD is currently in Year 2 of the Sockeye Reintroduction Program, and implemented another fry release into Skaha Lake in May 2005.

The COBTWG and BC are embarking on a new long term fisheries planning process for the Okanagan and the Similkameen. 2003 and 2004 will be spent setting the stage for "Watershed-based Fish Sustainability Planning" (WFSP). WFSP is a process developed by DFO and provincial agencies to be fish focused and to identify and address watershed priorities by developing comprehensive watershed plans. Although the focus is on fisheries, the process does address the need to include water in planning and obtain support from non-fish interests.

iv. En’owkin Centre

En’owkin Centre is a non-governmental organization for indigenous cultural, educational, ecological and creative arts. En’owkin’s facilities are located off Green Mountain Road on Locatee Land.

The organization is governed by the Okanagan Education Resources Society. The seven bands of the Okanagan Nation Alliance each separately appoint representatives to the board.

Its mandate is to provide educational opportunities for aboriginal people, to develop and implement community programs, restore language and culture: to enhance mental, physical, emotional and spiritual needs of the Okanagan people, by preserving and reinforcing indigenous lands practice and cultural teachings.

112 http://www.syilx.org/naturalresources-fisheries.php
113 Ibid
114 Ibid
115 http://www.syilx.org/naturalresources-reintroduction.php
En’owkin has four objectives:

1) to operate a First Nation post-secondary institution. Its courses practice and implement Indigenous knowledge and systems and have accredited post-secondary standing with other BC post-secondary institutions.

2) To operate an aboriginal education readiness program.

3) To operate programs for Okanagan culture and Okanagan language literacy, archives and educational resources for all people.

4) To operate a program implementing real world experiences of cultural practices related to the land and environment.

En’owkin collaborates with other groups on a variety of cultural, educational and ecological initiatives. It has partnerships with The Land Conservancy of BC, the Centre for Ecoliteracy, University of Victoria, Okanagan University College, the Institute of Indigenous Government, the BC College of Teachers, and Nicola Valley Institute of Technology, and the South Okangan-Similkameen Conservation Program (SOSCP). En’owkin leads the SOSCP Traditional Ecological Knowledge Team.

Initiatives include:
- School programs: En’owkin Centre participates with SOSCP Outreach on the Ecostudies Program. Currently, there is a program being implemented in school districts #67 and #53 (south Okanagan and Similkameen) to highlight the conservation efforts on Locatee Lands and Traditional Ecological Knowledge.
- An Outreach Program for educational programs is being developed for the public on riparian areas on the Locatee Cottonwood area, located along the Okanagan River channel on the Penticton Indian Reserve.

**e. South Okanagan-Similkameen Conservation Program (SOSCP)**

The South Okanagan-Similkameen Conservation Program (SOSCP) is a coordinated conservation partnership of over 35 non-government and government organizations. The purpose of SOSCP is to coordinate conservation efforts to maintain the rich biodiversity of the south Okanagan and lower Similkameen watersheds, including species at risk, while recognizing the area as a viable ecological corridor between the deserts of the south and the grasslands of the north. SOSCP was launched in July 2000.

SOSCP is now in its sixth year of operation. The SOSCP Prospectus and Strategic Plan set out the conservation goal, objectives, and strategies intended to direct a balanced approach to conserving key landscapes, priority habitats, and biodiversity features of the region. More specifically, SOSCP identified conservation targets for 4 broad habitat classes based on available science, expert opinion and Program consensus and published their intent in a prospectus (SOSCP 2000). Aquatic habitats were later added as a 5th broad habitat under the Landscape Recover Strategy, detailed below. The program’s intent is to refine these targets as better information became available and develop annual action plans to achieve them (McKelvey pers. comm., 2005).

SOSCP is the result and successor to previous programs and initiatives. Prior to 1990, individual non-government organizations and government organizations had acquired or set aside lands in the area for their ecological value. This included groups such as The Nature Trust of BC, the Okanagan Similkameen Parks Society, the Canadian Wildlife Service, the Okanagan Region Wildlife Heritage Fund Society and the Ministry of Environment. Others such as the South Okanagan Sportsmen Association, the Okanagan

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116 [www.SOSCP.org](http://www.SOSCP.org)
Similkameen Parks Society, South Okanagan Naturalists Club and Oliver-Osoyoos Naturalists Club have been active in the area for some time.

By 1990 there was an increasing awareness and concern over the rapid loss and fragmentation of habitats in the south Okanagan. As a result, 6 non-government and government (both Provincial and Federal) agencies initiated the south Okanagan Conservation Strategy (SOCS), a 5-year collaborative program that prioritized conservation initiatives. SOCS went on to spearhead many initiatives. Some of the most important of the SOCS initiatives are: the Terrestrial Ecosystem Mapping, the South Okanagan-Lower Similkameen Habitat Atlas for Wildlife at Risk and the South Okanagan-Similkameen Stewardship Program. The Habitat Atlas focuses on 32 species considered by the province at the time to be “at risk” and is a “distillation” of the many years of work in habitat/species inventory and ecosystem mapping. This initiative continued for another two years under the direction of the South Okanagan-Similkameen Implementation Team, but there was no centralized conservation program per se.

Between 1996 and 2001, with no central conservation program, a community-based conservation alliance emerged known as the Okanagan Similkameen Conservation Alliance (OSCA). This group saw the need for more local involvement and community driven initiatives, the most notable of which has become the Meadowlark Festival. This highly successful nature festival has helped heighten the awareness of this endangered ecosystem not only locally, but also afar. OSCA is a partner of SOSCP and leads its Outreach Team.

The structure of SOSCP consists of a Chair, Vice Chair, Executive Committee, Steering Committee, General Manager, and the following 6 technical teams, each with its own goals, strategies, and plans.

Science: Research, inventory, monitoring
Recovery planning
Science reporting

Outreach Community education and awareness
Coordination
Fundraising

Stewardship Landowner contact, Community stewardship
Capacity building
Habitat restoration and demonstration projects
Monitoring and protection (Conservation covenants)

Land Use Planning Planning
Policy and legislation

Traditional Ecological Knowledge (TEK) Recovery of TEK
Application of TEK

Habitat Securement Securement planning
Site assessment
Fundraising
Habitat securement
Property management
Funding for the various projects and for the operation of SOSCP has come through the partners themselves, as well as outside sources. Worthy of note is funding for the past few years through Environment Canada’s Habitat Stewardship Program. Other significant contributions have come from The Nature Trust of BC, Habitat Conservation Trust Fund, The Land Conservancy of BC, The Nature Conservancy of Canada and Ducks Unlimited, as well as in-kind contributions from BC Ministry of Environment and Environment Canada. In addition many other partners and individuals have contributed time and resources to the Program.

SOSCP will continue to foster new partnerships and undertake new initiatives in order to realize its vision: “A healthy environment that sustains the diversity of indigenous plants and animals while enriching people’s lives.” SOSCP is committed to building the SOSCP Conservation Legacy Fund whose goal of $2 million dollars will help sustain program coordination activities. Discussions are underway regarding a cooperative initiative underway involving SOSCP, The Real Estate Foundation of BC and Okanagan University College to set up a sustainability research centre.

As of March, 2005, SOSCP partners were as follows:

BC Conservation Foundation
BC Lake Stewardship Society
BC Ministry of Forests
BC Ministry of Sustainable Resource Management
BC Ministry of Water Land and Air Protection
BC Wildlife Federation
Burrowing Owl Conservation Society
Canadian Parks and Wilderness Society - BC Chapter
Department of Fisheries and Oceans Canada
Ducks Unlimited
En’owkin Centre
Environment Canada - Canadian Wildlife Service
Federation of BC Naturalists (Thompson-Okanagan Region)
Grasslands Conservation Council of BC
Habitat Conservation Trust Fund
Okanagan Similkameen Conservation Alliance
Okanagan Similkameen Parks Society
Osoyoos Desert Society
Osoyoos Lake Water Quality Society
Okanagan Region Wildlife Heritage Fund Society
Osoyoos Business and Community Development Centre
Osoyoos Indian Band
Osoyoos Oxbow Society
Okanagan Region - BC Wildlife Federation
Okanagan College
Pacific Salmon Foundation
Penticton Museum and Archives
Royal BC Museum
South Okanagan Rehabilitation Centre for Owls
A table summarizing Summary of SOSCP Actions Completed or Underway, dating to early 2005, is listed in Appendix B.

f. Landscape Recovery Implementation Group

The Landscape Recovery Implementation Group (LRIG), which is involved with the Landscape Recovery Strategy, is currently taking a landscape approach to species at risk recovery in the south Okanagan. The draft South Okanagan-Similkameen Landscape Recovery Strategy (LRS) was developed by members of the SOSCP Science Team. It is designed as a document to provide scientific advice to SOSCP Partners, implementation people, and funders for conservation and recovery on a more broad landscape basis, rather than a species-by-species basis due to the large number of species and habitats at risk in the region. The south Okanagan-lower Similkameen has one of the highest rankings of biodiversity in Canada, but at the same time has the greatest concentration of species at risk. Agricultural expansion and urban development continue to rise, leading to accelerated loss and fragmentation of habitat and increased threats to species.

Highlights of the LRS:

- Three conservation goals are:
  1) to conserve and restore the full range of habitats representative of the area;
  2) to conserve the full range of biodiversity associated with the area; and,
  3) to maintain healthy ecosystem processes and functions.
- Honours the SOSCP conservation goals of conservation of biodiversity and a viable ecological corridor north and south while “enriching people’s lives” which recognizes the working landscape.
- Provides scientific rationale for SOSCP landscape conservation targets (now five broad habitat classes) and a process to update, refine and integrate new targets based on new information.
- Identifies additional considerations and research needed to achieve, adjust, and evaluate the conservation goals.

Targets of the LRS:

- Conserve a proportion of the historical distribution of 56 habitat types (lumped into five broad classes) which are currently in relatively good condition in the south Okanagan-lower Similkameen, in order to maintain ecosystem functioning. The amount to be conserved has been designated by predictions of species-area relationships, one of the most important tools in conservation biology. These science-based targets have been determined by empirical evidence and other global landscape planning processes (LRS Strategy, 2005).

Both the SOSCP Prospectus and draft Landscape Recovery Strategy referenced Habitat Action Plans, several of which are in now in draft form. The Action Plans contain the most recent, up-to-date information from mapping and species research, and establish priorities to guide implementation of recovery activities. For example, the highest priority has been given to habitat for which there will be set targets to achieve the conservation goals stated in the Landscape Recovery Strategy. These Action Plans could provide
important context-specific management guidelines, and the sustainability indicators could reflect the
direction they provide.

g. **Canadian Okanagan Basin Technical Working Group**

The Canadian Okanagan Basin Technical Working Group is a tri-partite working group dealing with
technical issues associated with management of salmon and resident fish stocks and their associated
habitat requirements in the Canadian portions of the Okanagan River basin. The mandate of the COBTWG
is guided by a Terms of Reference that incorporates ‘principles of operation’ and applies ecosystem
principles as the foundation for activities undertaken by the working group related to enhancement and
restoration of fish stocks and associated habitat in the Okanagan River basin within Canada. Participants
to the COBTWG include Okanagan Nation Alliance, Fisheries and Oceans Canada, and the B.C. Ministry
of Environment.

CCOBTWG also works cooperatively with groups on the American side of the border, for example, the
Public Utility District in Washington State to mitigate losses of juvenile sockeye from downstream migration
on the American side.

The COBTWG has been setting the stage for "Watershed-based Fish Sustainability Planning" (WFSP).
WFSP is a process developed by DFO and provincial agencies to be fish focused and to identify and
address watershed priorities by developing comprehensive watershed plans. Although the focus is on
fisheries, the process does address the need to include water in planning and obtain support from non-fish
interests. Current tasks include compiling relevant reports; assessing the state of the basin for fisheries;
developing an implementation plan for WFSP; and starting community consultations. This initiative also
includes the Fish Water Management Tools Project, a computer model specifically developed for this
project.

**Okanagan River Restoration Initiative – Pilot Project**

Government agencies and non-government organizations have worked cooperatively to produce a plan to
restore portions of the river. Restoration is impractical in many places along the river because of the
amount of development that has taken place. In some other areas the slope of the river is too low to be
beneficial to the salmon and trout. The strategy consists of accessing key riverside properties, and then
moving back existing dykes to allow room for the river to rebuild a meandering channel and fully functional
floodplain. Due to the reduced energy in this river system associated with a regulated flow regime, the plan
calls for some in-stream works to encourage development of these natural features. For more details on the
restoration plan, a copy of the report can be obtained from the Ministry of Environment office in Penticton.

This restoration method has proved successful in many countries and is working well in a short portion of
the Okanagan River that was originally constructed with setback dykes. Nevertheless, the concept of
relocating existing dykes is untried locally and a limited project has been suggested to showcase the
benefits.

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The project is supported by an ad-hoc Project Committee with representatives from:

- Okanagan Nation Alliance
- Fisheries and Oceans Canada
- Ministry of Environment
- The Land Conservancy of BC
- South Okanagan-Similkameen Conservation Program
- Okanagan Region Wildlife Heritage Fund Society

Considerable progress has been made to date on the project. As indicated above, a restoration plan has been developed for this section of river. In addition, the committee has identified the key property access priorities within the zone.

**US Okanagan Sub-Basin Planning**

In 1999 to 2000 the Northwest Power and Conservation Council (NPCC) implemented a program for to complete comprehensive planning on all tributaries to the Columbia River. The initial step was to complete a Sub-basin Summary, which identified the current state of knowledge relating to the sub-basin and to identify limiting factors and gaps in knowledge. Members of the COBTWG commented on sections of the Okanogan/Okanagan Sub-Basin Summary that related to the Canadian portion of the sub-basin.

In collaboration with the Colville Confederated Tribes and the Okanagan Nation Alliance has been providing historic and current technical information and analysis into the development of the Okanogan/Okanagan Sub-basin Plan, which evolved out of the summary. The COBTWG will be given opportunity to review and comment on those sections of the Plan that relate to the Canadian Portion of the Okanagan Basin.

The Okanagan Sub-Basin plan was to be completed in May 2004 and followed by a review by the NPCC Independent Scientific Review Panel. The resulting Sub-Basin plans will be used as a tool to guide and evaluate fish and wildlife mitigation programs, proposals and funding over the next 10-15 years.  

**h. Private Landowners**

Approximately 1/3 of the land base within the RGS area is privately held. Much of this land, plus Indian Reserves in the south Okanagan, occur in the low to mid elevation range, an area considered to be ecologically rich and representative of a diverse array of habitats and species at risk. It appears that where most of the people want to live and work is also the home of many plant and wildlife species. Needless to say, private landowners have an important role to play in preserving and managing the environment by both stewarding the land and by providing securement or acquisition opportunities. In addition to titled land, landowners of Locatee Lands within Indian Reserves are also providing important roles in preserving and managing the environment.

The ranching community is in part responsible for the remaining contiguous tracts of shrub-steppe grasslands and rugged terrain, which allows for functioning ecosystems to still exist on these two priority

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119 http://www.syilx.org/naturalresources-okanaganbasin.php
habitats. Without these ranch production units, the land base may have been subject to conversion to urban uses and ecosystem fragmentation.

However, riparian areas and wetlands have experienced the greatest loss of habitat. In the case of riparian areas this is principally due to the channelization of the Okanagan River. This has resulted in an over 85% loss in riparian areas and the habitat for a number of species, especially a number of the bird species.

The owner of the Locatee Land in the riparian area west of the Penticton Golf Course is currently working with the En’owkin Centre and The Land Conservancy to preserve this area. Not only will it preserve the habitat values, but plans are to create a Cottonwoods Interpretative Site for riparian areas. Offers from developers have been turned down by the Locatee Land owner in favour of conservation.

Private land stewardship and securement are critical to retaining the integrity of the ecosystems. Stewardship initiatives have been in place for the past decade and land securement in specific areas for several years before that. The result of these combined activities has been the preservation of important grasslands, riparian areas, wetlands and rugged terrain, etc. Stewardship goals have been set in the SOSCP Prospectus and good progress is being made in many respects, especially in the area of riparian area restoration. Although projects are underway to address other priority habitats and species such as the Recovery of California Bighorn Sheep, Action for Antelope-brush and White-headed Woodpeckers, the pressures for agricultural and urban development are intense. Both private land stewardship programs and land securement initiatives are not enough to combat the mounting pressures on the landscape.

Other Locatee Lands in the south Okanagan other than those in the Cottonwoods area are of interest to stewardship. However, the differing administrative structure for Reserve Lands provides new challenges to land conservancy. Discussions are underway to develop ways to approach stewardship on Locatee Lands in a manner that is consistent with the management regime for these lands, such as a First Nations land trust.

In recent years, stewardship programs such as the South Okanagan-Similkameen (SOS) Stewardship Program and others involving The Nature Trust, The Land Conservancy, Ducks Unlimited, the Canadian Wildlife Service and others have worked together as members of the SOSCP Stewardship team to raise awareness, foster a stewardship ethic and engage in restoration projects. Funding for such initiatives comes from a variety of sources including Environment Canada’s Habitat Stewardship Program and the Habitat Conservation Trust Fund. Also Stewardship works in conjunction with the other SOSCP teams, in particular the Outreach, Land Use and Securement teams.
i. Changing Roles and Responsibilities Local, Provincial and Federal Governments

The Federal and Provincial Governments have recently changed their roles with respect to management of the environment. With limited resources, much greater emphasis is being placed on interagency and intergovernmental cooperation.

At the Provincial level this has resulted in an initiative to assign responsibility to the agency most appropriate to managing a particular environmental issue, regardless of its jurisdiction. The goal is to share resources to achieve the most benefit at the least cost. Frequently, this means that local governments are seen as the appropriate place to implement environmental policies and initiatives. A greater emphasis is also being placed on funding non-government environmental initiatives, particularly for environmental stewardship and public education.

Finally, property-owners, industry, and the private sector are being asked to take on roles of self-regulation, monitoring, and environmental impact assessment. Senior governments are moving toward an auditing and enforcement role, based on established policy. A recent example of this new approach is the B.C. Lands Trust which has been created by the Provincial Government with an endowment of $8 million dollars. The Trust is guided by a Lands Trust Forum comprising the major conservation organizations in the Province, the Ministry of Environment, the Integrated Land Management Bureau, and the Union of British Columbia Municipalities. The Trust is taking responsibility for ecological planning in the Province and for acquisition of key conservation lands.

This section outlines areas of provincial government core review, amendments and revisions to key pieces of legislation, such as the Riparian Areas Regulation, the Community Charter, Integrated Pest Management Act, Flood Hazard Statutes Amendment Act, Local Government Act, Environmental Management Act, and the increased liabilities of Qualified Environmental Professionals.

Since 2002 the Provincial Government has significantly changed its approach to environmental management. The Ministry of Environment now plays a more limited role in regulating activities affecting the environment. Greater responsibility is now placed on outcome based regulations and on self-evaluation of activities which may cause pollution or environmental degradation. The Ministry’s role is more one of auditing and enforcing violations. Much greater emphasis is now placed on partnerships with the private sector, other levels of government, and non-government interests.

A current example of this changing approach is the Provincial Riparian Areas Regulation (RAR) under the Fish Protection Act. This repeals the Streamside Protection Regulation that established specific standards for the content of local bylaws regulating development in riparian areas. The RAR, by contrast, establishes an “assign-off” by senior government’s requirement on a range of local government development permitting and approval processes, based on a mandatory impact assessment and certification by a Qualified Environmental Professional (QEP). The assessment area is 30 metres from the natural boundary of fish-bearing streams or watercourses. Local governments are not required to evaluate the work of the QEP, but the regulation creates a number of issues, which are the subject of legal review.

The Ministry of Environment has been working with the Union of British Columbia Municipalities (UBCM) on this issue. UBCM had asked for an extension of the March 31, 2005 deadline so implementation issues can be resolved. Case studies in 3 communities, development of a guidebook, training of QEPs, and a
review of local government liabilities, were a few of the issues that prompted the request. The Minister of Environment initially agreed to extend the deadline for the regulation to June 30, 2005 and more recently to March 31, 2006.

Communities which wish to adopt the new approach may do so on March 31, 2006. Some of the reasons for the further delay and granting of extensions include the need for local training and a guidebook, lack of a monitoring and enforcement strategy, and outstanding issues regarding the assessment methodology. In this regard, Regional District of Okanagan-Similkameen and the City of Penticton are two local governments within the Regional Growth Strategy working towards implementing the Riparian Areas Regulation.

Faced with these issues, many local governments have taken the option of declaring themselves in conformity with the existing Streamside Protection Regulation. This view was expressed by a number of South Okanagan local governments at recent meetings with the Ministry.

The UBCM and the provincial government renewed the “Protocol on Sharing Environmental Responsibilities” in September 2001. The document identifies some key issues – Partnership, Funding and Resources and Liability – in the relationship between local government and the province on environmental issues. The Memorandum of Understanding attempts to lay out the meaning of these concepts in greater detail. Outlined below are some excerpts from the agreement:

**Partnership**
- Recognize each others’ strengths and capabilities
- [Ensure] a clear division of responsibilities which leaves the Province and local governments accountable for specific policies and gives them the authority and financial capacity to effectively perform their roles

**Funding and Resources**
- New environmental responsibilities will not be assigned to another party until issues of funding and resources have been discussed among the parties
- With respect to environmental matters where local governments are responsible, they should have adequate authority and independence to fulfill their responsibilities

**Liability Protection**
- Any devolution of authority or responsibility should provide local government with protection from any liability arising from the delivery of Provincial programs or standards when acting in good faith and without negligence

**Bill 14 – Community Charter**

The *Community Charter*, passed by the legislature in May 2003, has also attempted to lay out the framework for future relations between local government and the province. Outlined below are some key concepts in the legislation, which highlight the relationship between local government and the province, under the following heading: *Principles of municipal-provincial relations.*
Section 2(1) of the Community Charter lays out the following points:

- Acknowledge and respect the jurisdiction of each, work towards harmonization of Provincial and municipal enactments, policies and programs, and foster cooperative approaches to matters of mutual interest.

Section 2(2) of the Community Charter outlines the following principles on which a relationship between local government and the province should be based:

- The Provincial government respects municipal authority and municipalities respect Provincial authority;
- The Provincial government must not assign responsibilities to municipalities unless there is provision for resources required to fulfill the responsibilities;
- Consultation is needed on matters of mutual interest, including consultation by the Provincial government on (iii) proposed changes to Provincial programs that will have a significant impact in relation to matters that are within municipal authority.

The intent of the Ministry of Environment in the review of its policies/regulations and new legislation is to focus its efforts on high risk sites where there is the greatest potential for harm to human health and the environment from a discharge. The following concepts highlight the ministry’s future approach to environmental management:

- Decrease reliance on site-specific authorizations (permits);
- Introduction of a risk based authorization approach (three levels of approval: site specific approvals (high risk), code of practice, notification of activity);
- Reliance on qualified professionals to determine risk;
- Partnerships with stakeholders to co-develop the standards;
- New tools for compliance and enforcement.

The Ministry of Environment has undertaken a number of regulatory and policy reviews:

- Product Stewardship Regulation Review
- Wildlife-Humans Conflict Strategy
- Riparian Assessment Regulation Review
- Flood Hazard Management Review
- Pest Management Review
- Advisory Panel on Contaminated Sites

Each of the above policy/regulatory reviews have to some degree reflected the shift in ministry policy to shared stewardship, the increased use of qualified professionals, and the establishment of new standards on which to build a partnership. In some cases these reviews have been used as the basis for new legislation proposed by the ministry. These concepts have subsequently been reflected in the new legislation the ministry has introduced.

**Integrated Pest Management Act**

The legislation:

- Limits the requirement for permits only to those pesticides classified as high risk;
- Eliminates the requirement for ministry approval of pest management plans in favour of a notice and confirmation;
• Requires the person who wants to use pesticides to have a pest management plan prepared, in accordance with the regulations and a declaration that the user will comply with the Act and regulations;
• Requires that information be provided in a pesticide use notice for purposes of pesticide use that will enable the ministry to monitor and inspect pesticide use; and,
• Provides for the enactment of regulations that limit requirements under the Act for permits, certificates and pest management plans to prescribed pesticides – only pesticides classified as high risk will require a permit – and prescribed uses of pesticides.

The new legislation provides a range of new compliance and enforcement tools for the ministry:
• Provides for a category of person known as “qualified monitors” who will perform required professional services for pesticide users and will reduce the monitoring required by government;
• Introduces additional sentencing options for the courts, such as prohibit the person from repeating the offence, direct the person to perform community service, take action to remedy or avoid any harm to the environment etc.;
• Introduces administrative penalties – ticketing offences – for minor violations of the Act; and,
• Increase the level of fines to individuals to up to $200,000 and to corporations up to $400,000 for major violations.

The legislation specifically restricts a municipality or regional district from making bylaws in relation to prescribed pesticide uses in the following areas:
• In the management of pests for purposes of protecting human health and the environment (i.e. use of pesticide for predator control – wolf control programs etc.);
• In the management of non-indigenous pests (i.e. aerial application of pesticides to control the gypsy moth etc.); and,
• On land used for agriculture, forestry, transportation, public utilities and pipelines.

Flood Hazard Statutes Amendment Act

The Act amends four pieces of legislation:
• Dike Maintenance Act
• Drainage, Ditch and Dike Act
• Land Title Act
• Local Government Act

In the case of the Dike Maintenance Act changes give increased authority to the Inspector of Dikes to:
• make orders relative to construction and maintenance of dikes;
• require diking authorities to provide reports, to inspect records, and to audit a dyking authority’s construction and maintenance program; and,
• make regulations that establish standards, operation and maintenance standards in relation to dikes.

The most significant changes under the legislation are to the Land Title Act and the Local Government Act:

• Section 82 – repeals the authority to designate a floodplain, and to set conditions and to require registration of restrictive covenants for development on land that may be subject to flooding.
• Section 86(1) – provides authority for Approving Officers to require an engineering report in respect of, and to require registration of restrictive covenants for, development on land that may be subject to flooding.
• Section 219 (adds new sections) – authorizes the Approving Officer to modify or discharge a restrictive covenant that was formerly required under Section 82 of the Act.

Under the Local Government Act:

Section 910 – removes the authority of the minister to designate floodplains and to set construction requirements for development on a designated floodplain, but requires local government bylaws in respect of these things to have regard for ministry policies and standards.

Environmental Management Act

The legislation repeals the Environment Management Act and the Waste Management Act, replacing both pieces of legislation with new Environmental Management Act.

The following changes have occurred under the new Act:
• Responsibilities under the Environmental Management Act are assigned only to the Director;
• Eliminates the need for a permit for the storage of hazardous waste and requires that it be stored in accordance with the regulations;
• Authorizes the minister to enact codes of practice, so that industry sectors may be exempted from requirements under the Act if they comply with the applicable code of practice;
• Authorizes the minister to require area based management plans in the interests of environmental management;
• Introduces an administrative penalty scheme as an alternative to prosecution;
• Authorizes regulations respecting economic incentives to encourage environmentally responsible behaviour; and,
• Assigns regulation making powers to the minister.

The most significant changes are on the manner in which the Ministry deals with the management of contaminated sites. The legislation:
• Narrows the definition of “contaminated site” so that the presence of any quantity of hazardous waste no longer brings the site within the definition;
• Provides for a category of persons known as “approved professionals” who may perform professional services in respect of contaminated sites;
• Eliminates “conditional certificates of compliance” in relation to contaminated sites;
• Authorizes the director to establish protocols that must be complied with in relation to technical matters associated with contaminated sites;

The intent of the Ministry of Environment in the review of its policies/regulations and new legislation is to focus its efforts on high risk sites where there is the greatest potential for harm to human health and the environment from a discharge. The following concepts highlight the ministry’s future approach to environmental management:
• Decrease reliance on site-specific authorizations (permits);
• Introduction of a risk based authorization approach (three levels of approval: site specific approvals (high risk), code of practice, notification of activity);
• Reliance on qualified professionals to determine risk;
• Partnerships with stakeholders to co-develop the standards;
• New tools for compliance and enforcement.

The new system requires local governments to have additional technical skills or the financial resources to employ experts to assess the engineering reports and other technical information it will be required to review to determine whether ‘dyke standards’ and ‘floodplain guidelines’ are being complied with. In addition, it will need the technical expertise where changes are requested to determine whether or not they are feasible. In the past many local governments have relied on the technical advice from the ministry if it has had to address these types of issues.

In the case of the Environmental Management Act a number of different things have occurred. The majority of the legislation is based primarily on the existing Waste Management Act, which currently sets ‘solid waste and liquid waste management standards’, details how the standards are to be achieved, and requires that local government comply with them. No major changes were made to these sections of the legislation. However, the technical resources in the ministry which local government has previously relied on to assist it in the development of these standards, for example, design of sewage treatment plants and landfill sites, appears to be no longer available. This shift in ministry resources would suggest that local government will need additional financial and technical resources in the future if it is to meet the standards as directed by the province.

Amendments to the Environmental Management Act concerning contaminated sites establish new ‘contaminated site standards’, which local government will be expected to use when making land use decisions related to these sites. The ministry has indicated that it will no longer be providing technical assistance to local government on contaminated sites and has suggested it rely on the reports of ‘qualified professionals’ employed by the land developer when making decisions on these sites. This poses a problem for local government as independent of the standards set by the province it has a ‘duty of care’ when exercising its decision making authority and in the area of contaminated sites it has relied on the ministry for unbiased technical advice. The decision by the ministry that it will no longer provide technical assistance related to contaminated sites would indicate that local government may need additional ‘financial and technical resources’ to administer contaminated sites in the future.

The legislative changes proposed would appear to require local government to take on additional responsibilities in each of the environmental areas identified beyond what it has done in the past. Each of these areas, whether it is the management of pesticides, management of dikes and floodplains, or management of contaminated sites would appear to require greater financial and technical resources on the part of local government. There is a need to ensure that the financial and technical resources local government required to implement these changes are provided.

Liability and Use of Qualified Professionals

The policy shift on the part of the Ministry of Environment to authorize the greater use of ‘qualified professionals’ to monitor pesticides; to manage floodplains, to determine contaminated sites and approve clean-up options, and to undertake riparian assessments and determine development options around streams – has the potential to expand local government liability as a result of the role it is expected to play in the delivery of provincial programs and/or standards. Under the Integrated Pest Management Act the ministry is proposing to limit its responsibility and accountability for pesticide use to only ‘high risk’ pesticides, shifting responsibility for the remaining use of pesticides on to the user. The legislation will
require the sign off of integrated pest management plans by senior executives and require that local
government be responsible for the use of all pesticides under the plan. In addition, the Act will require that
local government employ ‘monitors’ or qualified professionals on a periodic basis to assess the actions
taken under the plan, information that would subsequently be made available to the ministry. Both of these
legislative changes would appear to broaden local government’s general liability exposure and specifically
increase its potential exposure to liability from the use of pesticides.

In the case of the Flood Hazards Statutes Amendment, elimination of ministerial approval under the Land
Title Act has shifted a greater portion of the liability for development in floodplains to local government.
Historically the Minister’s authority to designate floodplains and to require restrictive covenants has
included a clause that limited the liability of the province from loss or damage caused by flood or erosion.
The proposed legislation does not appear to provide local government with the specific ability to provide
restrictive covenants and limit its liability in the same fashion that the provincial government did. The
legislation may have increased local government’s liability exposure in the way it has proposed to transfer
the authority over floodplains to it, as suggested in the following legal opinion, if “a municipality obtains a
flood plain covenant which it does not have statutory authority to obtain or grants a variation which it did not
have the statutory authority to grant, that covenant has no legal effect. The end result is that the
municipality could be liable in both instances if innocent owners sustain loss or damage.”

Amendments to the Environmental Management Act to foster changes in the management of contaminated
sites, illustrate a further shift in liability onto local government. Under the new process local government will
be expected to make its decisions/grant approvals on the basis of reports provided by "qualified/approved
professionals". The fact that local government has issued an approval based on this process has the
potential of exposing it to a broader range of liability, particularly if problems should arise later, such as the
discovery of off-site contamination on adjacent properties or by utilities using rights-of-way under local
government roads. In both cases local government could potentially be held liable for the damage caused
by the contamination and the subsequent clean up costs on the land affected. The new process for
managing contaminated sites also has the potential for increasing local government’s future liability, as it is
proposed that the decision as to the extent of the clean-up required at a site could be based on the type of
land use proposed. For example, if the contamination was not going to be disturbed by the development
proposed at that time it might not have to be cleaned up or the clean up might be very limited in its scope.
This process raises concerns about how these sites will be managed. For example, if the land use in the
area shifts in the future from commercial to residential where the land use could disturb the contamination
and higher clean-up standards are required, who will ultimately be responsible for tracking these sites and
ensuring that they are cleaned up to the new land use requirements? In any event, the process increases
the potential that mistakes may be made and exposes local government to broader liability if it
subsequently approves a development without requiring that additional measures be taken to clean up the
site.

The future administration of contaminated sites is also undergoing review. Currently local governments that
require site profiles to be completed are provided with liability protection for managing this process. There
is a suggestion that the use of site profiles may be eliminated from the process and the subsequent liability
protection provided to local government be removed as well. This would further increase local
government’s liability exposure related to contaminated sites.

The legislative and policy changes discussed above would appear to suggest a broadening of local
government’s liability exposure. The issues identified highlight the need for amendments to the legislation
to provide local government with additional liability protection when making decisions in accordance with
standards established by the province and using the reports of ‘qualified professionals’ as the basis for land use decisions in accordance with provincial direction.

**j. Best Management Practices – shared role between provincial and local governments**

In the past Ministry of Environment played an advisory role whereby development proposals having environmental and / or ecological concerns as well as Official Community Plan (OCP) and Zoning bylaw reviews were referred to the Ministry for comment and input. Although the Ministry had limited resources to devote to this service, local governments, some more, some less, relied on the Ministry to assist with these referrals. For one thing the Ministry took some responsibility to provide the development community, local governments and private landowners with some guidance and terms of reference for undertaking appropriate ecological site evaluations. This is particularly true in the case of the RDOS and some of its member municipalities who have made reference in their bylaws to the Ministry of the Environment taking some level of responsibility for the environment.

However, given the policy and legislative changes mentioned earlier, local government is expected to take on a different role regarding the safeguarding of ecological attributes, among other things. In all fairness to the Ministry, it should be noted that the Ministry at the best of times had limited resources devoted to assisting local government with development referrals and OCP reviews and that not all referrals were given the same level of attention. In fact there were concerns expressed that some development proposals and future land use plans were not dealt with in either a timely or adequate manner (as per communication with the former Ministry of Water, Land and Air Protection). This is likely due to their limited capacity in the first place to perform this service. Nevertheless local government to varying degrees did rely on this service and as mentioned earlier referenced this relationship/role in their bylaws, and this is still the case.

In the case of site level conservation assessments, the Ministry’s new role will focus on strategic initiatives to provide direction, policy and resources. It no longer will be a resource for site development consultation. As mentioned above, the Ministry did provide assistance to local government, the development community and landowners with regard to these site level standards and practices. However with the adoption of this shared responsibility role, the Ministry has prepared draft Environmental Best Management Practices for Urban and Rural Developments. This tool is intended to provide local government with a solid and substantial amount of practical information available for use by local governments, developers, consultants, Qualified Environmental Professionals (QEPS) and the general public to ensure adequate representation of ecological values in the planning and development approval process. This draft document, available on the internet, contains several pdf files dealing with different aspects of environmental planning.

However, with the transfer of these responsibilities it is not clear whether there will be resources devoted to assisting local government in this transition and, for that matter, whether they will be adequate. These issues and others need to be addressed. For example, local government cannot be expected to take on administering and ensuring that detailed terms of reference have been carried out for ecological site evaluations and environmental impact assessments if in fact they do not have other support tools such as Environmental Sensitive Development Permit Areas (ESDPAs) or they have little or no staff expertise to handle such matters.
### Changing Roles and Responsibilities for Aboriginal Communities

While the Regional Growth Strategy and this paper will not be making recommendations with respect to Reserve lands, the common concern for the environment and ecology impacts both native and non-native interests. Having a basic understanding of the aboriginal communities, their roles and how they are changing may have an impact on how environmental and ecological decisions are made in the future in the south Okanagan.

The role of the aboriginal communities in environmental and ecological work will increase in the south Okanagan, due to changing legislation, increased options for the Indian Bands to exercise their powers and authorities, and cooperative ventures amongst conservation interests in the south Okanagan.

The *Species at Risk Act* applies exclusively to federal Crown land, which includes Indian Reserves. Thus, there is an obligation for Indian Bands to be diligent in managing for conservation, while at the same time being aware of the pressures to develop land and resources for economic development.

Indian Bands have new opportunities to exercise powers and authorities, depending on the needs and interests of the Indian Band including the *First Nation Land Management Act*, and the ability to exercise self-government powers.

Additionally, clarification of native rights in Canada and British Columbia continues through legal channels, resulting in decisions such as the landmark Delgamuukw Decision in 1997 and continues with more recent judgements such as the Haida Decision in 2004, which further detailed native rights to land and resources. Legal decisions such as these clarify native rights and titles with respect to land and resources, and reinforce the governments’ responsibilities. Governments are required to consult prior to issuing rights for land and resources to third parties where native rights are asserted, whether or not aboriginal title has been proven.

At the local level, cooperative ventures centered on the environmental integrity of the south Okanagan are increasing despite differing administrative structures between native and non-native land. There are more opportunities to be involved in joint stewardship as all sectors of the south Okanagan community see the value of cooperation, since the connectedness and integrity of ecosystems cross jurisdictional boundaries.
Environmental Issues and Options
For the South Okanagan Regional Growth Strategy

Volume 2: Issues and Policy Framework

References and Appendices

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for the
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1. Environmental Issues

Five broad categories of environmental issues are emerging in the south Okanagan. These are:

1. the impacts of population growth, demographics, and distribution.
2. pressures on the landscape to accommodate competing land uses, including agriculture, recreation, and forestry.
3. changes to natural processes as a result of climate change, drought, deteriorating air quality, pollution, forest ingrowth, and invasive weeds.
4. the central role of water in sustaining environmental health, economy and quality of life.
5. protection of ecological integrity.

    a. Population Growth

Growth in the Okanagan is expected to increase by 2% per annum to over 500,000 people by 2026. For the Okanagan-Similkameen, this means an increase from just over 84,000 today to over 110,000 by 2026. Changing demographics are creating pressure for more housing units to house non-traditional family units. Just as important as growth is the form that growth takes. There is an increasing demand for rural and suburban development. Communities like Penticton and Osoyoos are looking for future development areas outside their traditional cores. All the towns in the region are facing growth pressures, whether for golf courses, subdivisions, commercial centres, industrial parks, or recreation.

    b. Pressures on the Landscape

Lands in the lower elevations of the valley are under intense pressure. Land that is potentially developable is at a premium due to the area’s large lakes, a substantial proportion of land in the Agricultural Land Reserve, and Band lands, although some Band land may be developed in the future. Most of the habitat for species at risk occurs in the valley bottom and adjoining bench lands; for example, riparian areas and associated species such as Yellow-breasted Chats and Western Screech Owl are located here. Competition for this limited land base will only continue to increase as the demand for urban and agricultural development grows, thus intensifying the pressure on important habitat.

The growing economy of the region places further pressure on the environment. Agricultural expansion, especially for vineyards, competes with important habitat, including the critical Antelope-brush plant community. Tourism also encourages more people to explore fragile landscapes. For example, the Skaha bluffs are advertised to rock climbers around the world, but are also important for a number of species including California Bighorn Sheep and White-throated Swifts.

Recreational impacts have also intensified pressures on the landscape base. These include golf course construction, creation of recreational lots and hobby farms, and increased use of all terrain vehicles on Crown lands.

A secondary impact of population growth is the increase in land used for roads and utility corridors. These increase the fragmentation of the landscape and create further barriers to migration of wildlife populations.

Another management issue will be the changing roles and capacities of governments, non-government organizations, and property owners. These are described in a previous section. Without question, an
important issue for both the Regional District and its member municipalities is the changing roles with respect to managing the environment, including funding for added responsibilities.

c. Changes to Natural Processes

Some of the changes that are occurring to natural processes are due to increased population growth locally. Others, such as climate change, are due to population growth and human activities on a global scale. In addition to climate change, we are seeing changes such as drought, deteriorating air quality, pollution, forest ingrowth, and a proliferation of invasive weeds.

Climate change is emerging as a critical management issue in the Okanagan. The trend toward warmer winters and longer, drier summers affects both water supply and habitat. Competition between human uses of water and ecological needs will accelerate. Extreme weather events are likely to increase, leading to public demands for more robust management of the environment, such as greater water storage, tapping of aquifers, improved diking systems, and transfer of water to areas of greater demand.

Global climate change clearly adds a confounding layer to the list of threats to our biotic environment (see Schlesinger et al. 2001 for discussion of effects of climate change and appropriate references, and Cohen, et al., 2004). This may bring great shifts in the ecological norm.

Climate change will also put pressure on critical habitats, and in turn, on endangered species. To survive, species may have to expand their range into areas not previously populated by them. This could create further conflicts with human settlement and fragmentation of the landscape.

Climate change may also make it impossible to recover individual species, but will complicate the resolution of the question of what it is that we are trying to conserve. This problem remains unresolved. This issue is currently the subject of considerable research.

Population growth creates pressure on the land base, and also creates impacts on water supply and quality, and on air quality. Water supplies in the Okanagan are fully committed and purveyors are increasingly looking to groundwater supplies and to Okanagan Lake as a source of additional supply.

Water quality has been a major issue since the 1960's when nutrients from septic systems were identified as a cause of algal blooms on mainstem lakes in the valley. Since that time most communities have installed sewage treatment systems, but rural areas continue to use septic tanks. Solid waste disposal is becoming an issue as local landfills are nearing their capacity.

Population growth is also creating other environmental issues. Air quality in the Okanagan is deteriorating. As more people inhabit the south Okanagan, vehicle emissions increase, having a direct impact on air quality.

Provincially, the Okanagan as a whole is identified as one of three airsheds in the province of air quality concern. Valley topography is a factor, but the main causes of deterioration appear to be outdoor burning, automobile emissions, and dust. The combination of local climate, topography, vehicle usage and outdoor burning put this region at risk of deteriorating air quality in the coming years.

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Several regional characteristics make the Okanagan particularly susceptible to episodes of poor air quality, in particular due to the effects of topography and weather patterns:

- the Okanagan airshed is approximately defined by natural valley boundaries to the east and west, by Enderby to the north and Osoyoos to the south. The Valley lies perpendicular to prevailing winds, resulting in many periods of calm and, as a result, increased stagnation of air.

- during the summer, higher temperatures and increased sunlight can result in greater concentrations of ground-level ozone. In the winter, frequent thermal inversions, which occur when cold air is trapped below a layer of warming air, inhibit the dispersion of pollutants.

Poor air quality poses significant health risks to south Okanagan inhabitants. The young, elderly and people with asthma, bronchitis or heart conditions are particularly at risk, and constitute about 15% of the population. The costs of poor air quality are related to human suffering, health care and quality of life.

In 2004, the Ministry of Environment released a Guide to Airshed Planning in British Columbia, which can be found at [http://wlapwww.gov.bc.ca/air/airquality/pdfs/airshedplan.pdf](http://wlapwww.gov.bc.ca/air/airquality/pdfs/airshedplan.pdf). An airshed planning process has been initiated for the Okanagan-Similkameen region.²

Some management measures have been taken to minimize deterioration of air quality in the south Okanagan, and to better inform inhabitants about periods of low air quality. In 2003, the North Okanagan Regional District, Regional District of Central Okanagan and the Regional District of Okanagan-Similkameen signed a Memorandum of Understanding for the formation of an Okanagan Airshed Coalition that would cooperatively develop initiatives to improve air quality in the Okanagan airshed. As well, the south Okanagan is part of the Okanagan Air Quality Technical Steering Committee (OAQTSC), comprised of staff and technical representatives from municipalities, regional districts, provincial and federal agencies, institutions and industries in the Okanagan Airshed. The OAQTSC provides technical information and research regarding local air quality.³

The Regional District of Okanagan-Similkameen has an air quality board, which is currently implementing a Wood Stove Exchange program, a Burn It Smart program (in conjunction with the Penticton Fire Department) and Let’s Drive Green vehicle emissions testing clinics in Penticton, Oliver and Osoyoos.

Finally, the Okanagan-Similkameen Health Region (OSHR) distributes public education materials, does research into health and costs of poor air quality, and provides self-care instruction for those suffering due to low air quality. The Air Quality Advisory provides residents with important information about air quality on any given day.

The use of pesticides and fertilizers in agriculture, the considerable number of residences in the Okanagan still with septic fields, and livestock that have unrestricted access to bodies of water are all potential sources of water pollution. Pollution is a particular problem for aquatic species as there are numerous routes by which the pollutants can be taken up from the environment (Vitt et al 1990). Both amphibians and fish are exposed to pollutants during sensitive stages of their life cycles (Carey 1995, Ripley et al 1998a,b) and water pollution has been identified as a potential threat to both the Tiger Salamander and the Great Basin Spadefoot Toad.

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All amphibian species go through hormonal and chemical changes that direct the transition through their various life stages. These animals also have permeable skin and spend a portion of their life in an aquatic environment and a portion in a terrestrial environment. For these reasons they are potentially susceptible to a multitude of environmental contaminants and pollutants. Effects of these chemicals include reduction of individual fitness by decreasing the sizes at which larvae metamorphose, immunosuppression, interference with sex determination, and alteration of predator avoidance behaviour (Griffiths & Beebee 1992, Gibbons et al 2000).

Pollution from pesticides may also be a contaminating source of soil after a century of intensive agriculture in the valley bottom. While the use of pesticides is better understood and has been reduced over the past 40 years, the extent of pesticide residues in our agricultural lands and the links to local human health issues have not be adequately studied.

A second long-term threat to some species is the encroachment of forests into grasslands. This is a potential threat to several grassland bird species, the Great Basin Gopher Snake, and California Bighorn Sheep, which, although not COSEWIC listed, are prominent in the conservation concerns of local residents. However, California Bighorns are provincially Blue-listed. Control of the natural fire regime within this region, allowing forest encroachment and infilling, is beginning to have measurable and widespread adverse impacts on grassland bird species (Kranitz & Rohner 2000). In the northern part of their range, listed snake species are suffering from a reduction in their prey base due to forest encroachment into parkland and grassland habitat resulting from a lack of regular fires (Dave Lowe, personal com.; in Nelson, 1992 p. 41).

Changes to natural processes also create threats to ecological integrity, and create some common issues. One of these, invasive species, is discussed below in the section titled “Threats to Ecological Integrity.”

d. The Central Role of Water in Sustaining Environmental Health

One of the most important environmental issues to the general public is the availability of water. Recently, specific areas of the south Okanagan have experienced water shortages. With the growing number of people in the valley and higher consumption by intensive agricultural operations, this issue is of growing concern. Further information can be found in Cohen, et al, 2004, and The State of Fish & Fish Habitat report under the Okanagan section: http://www.obtwg.ca/reports/SOSB_Okanagan.pdf.

While major efforts are underway to determine the water balance regime in the valley and to assess groundwater resources, over-consumption remains a concern. Water pricing, allocation, and conservation will all be critical issues in managing growth. As indicated above, climate change will put further pressure on water supply. Competition between human consumption and ecological needs will intensify. Of particular concern is the preservation of wetlands and riparian areas and the retention of minimum stream flows. Increased water storage, use of aquifers, piping of storm water through urban areas, and filling and diking of land for urban development are all issues which can negatively impact on ecological integrity of endangered habitats.

The Okanagan Basin Water Board has recently formed a Water Stewardship Council. The purpose of the Council is to identify and make recommendations on key water management issues. The Board has also started a grant program to encourage purveyors to implement conservation programs. However, one of the major issues facing all jurisdictions is the fragmentation of authority over the allocation of water and the
separation between land use authority vested in local governments and the water supply responsibilities of irrigation districts.

Water quality remains a major concern in the Okanagan. Much progress has been made in reducing nutrient loading from sewage, but other sources such as urban runoff and logging remain a problem. Accelerated logging for pine beetle and fir bark beetle control and the increase in impervious surfaces from urban development continue to affect water quality. Open access to reservoir lakes and watersheds increases the potential for contamination from human sources, cattle, and wildlife.

e. Protection of Ecological Integrity

Recognizing the historical causes of species extinction and habitat loss is a first step to evaluating future threats to success of conservation initiatives. It is equally important to predict future threats such as those likely to accompany changes in global climate patterns. Threats to the conservation values in the South Okanagan-Similkameen have been documented in various documents including the *Habitat Atlas for Wildlife at Risk: South Okanagan and Lower Similkameen* (BC Ministry of Land, Air and Water, 1998), species recovery plans and the above noted draft *Landscape Recovery Strategy*.

Humans destroy natural habitat to create living space and generate industry (see Cannings et al. 1998 for details of the extent and the mechanisms of this destruction). Lands on which there has been total modification of the natural environment through urbanization and agriculture now cover 15% of the south Okanagan; a figure that would have been close to zero 150 years ago. Riparian areas once covered much of the valley bottoms but now are restricted to a mere 4% of the Okanagan River Valley (Cannings et al. 1998). Such simple measures do not indicate, however, the extent to which the surviving habitat has been modified. About 60% of the antelope-brush community of the grassland/shrub steppe habitat has been destroyed (Schluter et al. 1995), and much of what remains is already degraded by invasion of weedy plants (Scott 1999). Habitat loss has been identified as a major threat to most of the COSEWIC designated animal species in the Similkameen. The causes of environmental degradation tend to be less severe, incremental, and cumulative and differ from the acute causes of habitat loss. Examples of such potentially degrading activities include, but are not limited to the following:

- Anthropogenic alterations to drainage patterns of riparian, lacustrine, and wetland habitats have not only reduced their extent but have greatly reduced their value as habitat for amphibians and fish (Shepherd 1999).
- Grazing damages plants by direct consumption and by trampling, it facilitates the spread of weedy species, compacts soil, damages cryptobiotic crusts, and physically alters the structure of wetlands and riparian habitat (Kauffman & Krueger 1984, Elmore 1992, Woudenberg 1999).
- Activities of recreationists impact the environment in numerous ways from erosion caused by off-road vehicles and horses to disturbance of animals by wildlife enthusiasts.
- Fire suppression can result in modified composition, distribution and age class of forested and grassland habitats.

The projected growth of the human population within the south Okanagan-lower Similkameen means that further loss and degradation is very likely. The draft *Landscape Recovery Strategy* for species at risk in the south Okanagan describes the impact of urban sprawl, agriculture, climate change, and the suppression of fire on the threatened habitats of the region. The Strategy has, among other things, identified the attributes needed to maintain and restore species at risk and their respective habitats within a landscape framework. This strategy, in combination with relevant land use information from local government, could help in avoiding potential habitat losses by planning accordingly to prevent those losses. Protocols for projecting
the spread of human development onto a landscape have been developed for rural Colorado (Theobald 2003) and application of these techniques here might be very beneficial to this area. Other jurisdictions when faced with continued rapid growth have taken very strong measures to curtail growth by putting a cap on development.

Fragmentation of habitat and isolation of habitat patches is a threat independent of simple reduction in total available habitat (Rosenberg & Noon 1997, Beier & Ross 1998, Harrison & Bruna 1999). A greater proportion of a small habitat unit is subject to edge effects compared to a larger one. The gaps between habitat patches typically pose greater threats to species that must move between them. Patches become increasingly isolated as movement corridors are eliminated, preventing migration, reducing effective repopulation following local extinctions, and increasing inbreeding depression (Gilpin & Soule, 1986). The south Okanagan-Similkameen is an important migration corridor but fragmentation may limit northward migration of plant species as global temperatures increase (Honnay et al. 2002). Roads and road construction are increasingly identified as major barriers and sources of mortality. Such fragmentation has been quantified in the antelope-brush communities of the south Okanagan (Redpath 1990).

The BC Ministry of Agriculture and Land designates certain aggressive, introduced, weedy species as “noxious.” There are 21 such species found in the Okanagan-Similkameen. These invasive, non-native plants are degrading natural areas at a rapid and ever-increasing rate. The degradation normally consists of the displacement of native flora, sometimes to the extent that community structure and ecosystem functions are seriously altered (D’Antonia & Vitousek 1992, Cousens & Mortimer, 1995). An example of such an ecosystem function change comes from the spread of cheatgrass (Bromus tectorum) throughout much of western North America where it is known to have increased the frequency and intensity of fires, destroying large sagebrush plants (Klemmendson & Smith 1964), and potentially eliminating nesting habitat for Sage Thrashers. These weed invasions are particularly devastating in grasslands with species like Sulphur cinquefoil (Potentilla recta), Hound’s-tongue (Cynoglossum officinale), Dalmation toadflax (Linaria dalmatica) and Diffuse knapweed (Centaurea diffusa), now dominating many grassland communities.

Weed invasion is the second biggest threat to habitat loss and degradation next to urban development and intensive agriculture (e.g. vineyards). Invasive weeds are insidious and their destructive capacity should not be taken lightly. The recently formed South Okanagan-Similkameen Invasive Plant Society (SOSIPS) will focus on invasive weed education, management and inventory.

The effects of invasive animal species are usually not as extensive as those of plants but there are several instances in the south Okanagan- lower Similkameen where they might pose a significant threat. For example, the brown-headed cowbird is a brood parasite (Lowther 1993) and known to reduce reproductive success of many species (Powell & Steidl 2000, Michaud et al. 2004). A high proportion of nests of warbling vireos (Vireo gilvus) in the SOS are parasitized (Ward & Smith 2000). It is reasonable to suspect that the cowbird may be a significant threat to other species in the area, including some species at risk. Invasive bird species include the European starling, which competes aggressively with cavity nesting species for suitable nesting sites (Koenig 2003). Some introduced fish species will prey on indigenous amphibian species. There is evidence from several parts of the western United States that introduced game fish and bullfrogs (Rana catesbeiana) pose a threat to amphibians, through both predation and competition (Kiesecker & Blaustein 1998, Lawler et al. 1999). Care should be taken, however, in making generalizations about the decline of amphibian populations as the causes are likely to be complex and site specific (Kiesecker et al. 2001, Blaustein & Kiesecker 2002).
2. Framework for Integrating Environmental Policies Into the Regional Growth Strategy

a. Introduction

In adopting Regional Growth Strategies, regional districts have three key tools: the strategy document, regional context statements in Official Community Plans, and implementation agreements. This section lays out a broad framework of strategic directions that the RDOS may choose to follow in addressing environmental issues in the Regional Growth Strategy. The strategic initiatives are not mutually exclusive and each can include different levels of regional district involvement, commitment, and funding. All can be used to support the Provincial Goals laid out in the Growth Strategies legislation:

- avoiding urban sprawl and ensuring that development takes place where adequate facilities exist or can be provided in a timely, economic and efficient manner;
- settlement patterns that minimize the use of automobiles and encourage walking, bicycling and the efficient use of public transit;
- the efficient movement of goods and people while making effective use of transportation and utility corridors;
- protecting environmentally sensitive areas;
- maintaining the integrity of a secure and productive resource base, including the agricultural and forest land reserves;
- economic development that supports the unique character of communities;
- reducing and preventing air, land and water pollution;
- adequate, affordable and appropriate housing;
- adequate inventories of suitable land and resources for future settlement;
- protecting the quality and quantity of ground water and surface water;
- settlement patterns that minimize the risks associated with natural hazards;
- preserving, creating and linking urban and rural open space including parks and recreation areas;
- planning for energy supply and promoting efficient use, conservation and alternative forms of energy; and,
- good stewardship of land, sites and structures with cultural heritage value.

b. Environmental Strategy Options

Overarching Goal: A model region whereby we preserve a healthy environment for fish, wildlife, plants and humans. This includes clean air; sufficient, quality water; functioning ecosystems and the mechanisms in place to ensure these attributes are protected. This can be accomplished by adopting the following principles:

A learning region will stress the importance of establishing clear environmental objectives and measuring progress towards them. Public education on environmental issues will be considered important. Research and experimentation will be encouraged. We will learn from others who have
adopted high environmental standards and practices. At the political level, the views of the public will be considered important and expert technical advice will be sought.

A collaborative region will recognize the importance of partnerships in achieving environmental targets. Integrated approaches involving all stakeholders will be pursued. Government agencies, non-government agencies, landowners, and academia will be engaged in developing and implementing the region’s environmental vision. Consultation with economic and social interests is fundamental to a collaborative approach. For example the business community is considered an important partner.

A smart growth region will support efficient land, containment of sprawl and preservation of important community values such as environmentally sensitive areas and farmland. Suitable areas for future growth will be identified and strategies implemented to direct growth to them. It will generally follow the principles of Smart Growth BC:

- Encouraging mixed-use zones
- Promoting compact and walkable neighbourhoods and towns
- Concentrating new growth into existing areas
- Enhancing the range of housing options (more affordable, appropriate, accessible)
- Linking new development to public transit and other transportation options
- Using Demand Management techniques that reduce the amount of a service or resource used, rather than simply increasing its supply
- Integrating storm water management with stream corridor and riparian area protection strategies
- Reducing the overall amount of impervious surfaces, while maximizing the use of public open spaces as rain-water catchment areas
- Preserving and linking greenways, open spaces, farmland, and environmentally sensitive areas
- Ensuring effective citizen participation in development decisions

A conserving region will emphasize the reduction of demands on limited resources, especially land, water, and energy. However, it will also seek to conserve financial resources so they can be expended in areas of greater need. Appropriate pricing strategies, incentives, and development charges will be explored.

A protecting region will use its regulatory authority to ensure environmental assets are not adversely affected by human activity. Plans will be prepared to manage liquid and solid waste, air emissions, and natural hazards. Considerable emphasis will be placed on identifying and protecting environmentally sensitive areas.

1. **A Learning Region**

GOALS

1. establish clear environmental objectives for land, water and air
2. create benchmarks for achieving objectives
3. put in place a monitoring framework
4. value and support involvement by the public in setting environmental objectives and in evaluating progress in meeting them
5. seek to find the best scientific advice
6. incorporate environmental policies into land use decisions, economic development strategies, and social policies
7. value public education on environmental issues
8. value experimentation and learning

STRATEGIC INITIATIVES

1. Prepare a State of the Environment Report for the region and update on a regular basis
2. Develop a community mapping program and incorporate results in the RGS
3. Establish a standing Environmental Advisory Committee to advise on development and implementation of the Regional Growth Strategy and related environmental matters
4. Support and expand the current public education program (e.g., EcoStudies) on issues such as habitat conservation, smart growth, transportation demand management, water conservation, and air quality
5. support the formation of an Environmental Innovations Fund to encourage experiments in managing environmental issues

ii. A Collaborative Region

GOALS

1. harness the authority, resources, energy, and ideas of all interests to achieve mutual goals
2. recognize the value of traditional knowledge from first nations, landowners, and resource users; recognize historical places and the role history has played in shaping the south Okanagan
3. recognize and incorporate the ideas and values of youth in the Regional Growth Strategy
4. build partnerships with non-government agencies to achieve environmental objectives
5. utilize the skills of the Penticton Campus of OC and UBC Okanagan
6. support valley-wide approaches to air and water management issues

STRATEGIC INITIATIVES

1. Work to create a Sustainability Research Centre at UBC Okanagan
2. Develop, in partnership with other Regional Districts, First Nations, and Senior Governments, a valley-wide airshed management strategy
3. Support the Okanagan Basin Water Board in developing and implementing new water management programs, including the formation of an Okanagan Water Stewardship Council
4. Work with the Okanagan Partnership Regional Planning Flagship to achieve valley-wide consensus on future settlement and conservation areas as well as policies and programs to implement that consensus.
iii. A Smart Growth Region

GOALS

1. encourage compact, mixed-use development
2. discourage sprawl into rural areas
3. reduce dependency on the automobile
4. support habitat sensitive development, where appropriate. This includes preservation of environmentally sensitive areas, connectivity of ecosystems and wildlife movement corridors
5. reduce the demand for infrastructure, water, and energy
6. avoid environmental hazards
7. encourage sustainable economic development

STRATEGIC INITIATIVES

1. Develop a Regional Town Centre Strategy to encourage mixed use, pedestrian-oriented development in urban centres
2. Establish a Regional Settlement Plan identifying Urban Containment Boundaries around communities, suitable areas for future urban growth, resource lands (e.g. agricultural lands), conservation lands, and rural areas to which infrastructure will not be extended
3. Utilize the principles of the draft Landscape Recovery Strategy and other relevant documents as the framework for ensuring ecological integrity
4. Formulate alternative development standards to reduce the ecological footprint of new development
5. Develop regional and valley-wide water conservation policies and encourage purveyors and local governments to implement them
6. Prepare a Regional Agricultural Plan to support the agricultural economy and reduce urban impacts on agricultural land
7. Create a Regional Transportation Plan to support transit, cycling, and walking as alternatives to the automobile

iv. A Conserving, Caring Region

GOALS

1. maintain ten percent of urban settlement land for parks and conservation
2. support the conservation of critical habitats in urban and rural areas
3. promote conservation of watersheds, wetlands and riparian areas
4. develop a clear policy position on the future use of protected areas and lands proposed for park status for inclusion in the final Regional Growth Strategy
5. support environmental stewardship on private lands
6. support the conservation of water, air quality, and energy

STRATEGIC INITIATIVES

1. Establish a Memorandum of Understanding with BC Ministry of Environment and Environment Canada on the various local government roles in implementing appropriate environmental
standards and practices in support of such things as preservation of sensitive ecosystems, wildlife movement corridors and species at risk recovery plans in the region. These changing roles and responsibilities increase local governments’ capacity to undertake environmental standards and practices, which is limited without adequate resources. Therefore, other levels of government need to provide additional resources, authority and expertise to assist local government in carrying out these responsibilities.

2. Utilize Map Quest and similar scenario building approaches to create consensus on future growth models for the region and encourage the other valley regional districts to participate in a valley-wide model.

3. Continue to develop user-friendly ecological mapping platforms to convey information on ecological values to local governments, other agencies, landowners, and the public.

4. Develop a map of regionally significant conservation areas and corridors for inclusion in Official Community Plans.

5. Prepare a Regional Riparian Areas Management Policy and encourage local governments and Crown agencies to adopt it.

6. Encourage local governments to establish Development Permit areas for Environmentally Sensitive Areas (ESAs) and to apply best management practices to such development permits.

7. Prepare a Regional Energy Conservation Strategy (including green buildings policies and life cycle accounting for public projects).

8. Bring Natural Area Protection Tax Exemption Program (NAPTEP) to the Region (currently in place on one of the Gulf Islands).

v. A Protecting Region

GOALS

1. protect the environment from harmful waste discharges
2. maintain potable drinking water
3. protect people from natural hazards

STRATEGIC INITIATIVES

1. Develop a Regional Flood Management Policy
2. Prepare a Regional Natural Hazards Map identifying high risk areas for flooding, landslips, and wildfire and include in future Official Community Plans
3. Work with Federal and Provincial agencies to identify aquifers and establish policies for their protection
4. Develop a Regional Wildfire Strategy in cooperation with Provincial agencies, fire departments, and local governments and incorporate actions in a Regional Emergency Plan
3. Conclusion

This report has been prepared for the Environmental Advisory Committee to the RDOS Regional Growth Management Steering Committee. Its goal is to assist the Environmental Advisory Committee in developing environmental policies for the Regional Growth Strategy. The authors anticipate that, over the next year, these policies will be further refined, with the ultimate goal of supporting environmental sustainability in the south Okanagan.

The report has demonstrated the uniqueness of environmental attributes in the south Okanagan, as well as the region's sensitivity to threats such as habitat destruction and degradation, pollution, introduced species and climate change. The authors have outlined the existing environmental management regime, and have made recommendations as to how the Regional Growth Strategy might guide development in ways that promote ecosystem health and function. Finally, a multi-faceted strategy has been presented to this end, promoting a Learning, Collaborative, Smart Growth, Conserving and Protecting region culminating in a Model region.
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APPENDIX A: Plan Review

**Goal:** to consider environmental content of high-level plans, regional growth strategies in southern BC; to provide summaries, excerpts to inform development of South Okanagan Regional Conservation Strategy

A. Overview (Key Findings)

**Purpose of Regional Growth Strategy: General**

- Means of providing coordination on planning issues that cross municipal boundaries
- Coordinating planning among LGs and provincial government, other agencies on which LGs depend for project/program resources
- Guides to development over 20 year period (at minimum)
- Addressing housing; transportation; regional district services; parks and natural areas; and economic development
- Including population/employment projections; list of actions to meet projected needs
- Building consensus within region on future policies/development

**Recurring Themes in Environmental Protection: From RGSs Reviewed**

1. **Vision**
   - Protection of natural attributes (green spaces, water resources)
   - Recognition of interconnectedness of regions (collaboration with adjacent regions essential, development respecting neighbouring communities, basin-wide approach)

2. **Policy**
   - Environmental review of development
   - Direct urban development away from environmentally sensitive areas
   - Identify, conserve, protect diversity of environmentally sensitive areas
   - Create system of interconnected areas (nodes and corridors)
   - Good, up-to-date, accessible information on sensitive areas

B. Regional Growth Strategies

EXPLANATORY GUIDE TO GROWTH STRATEGIES ACT

(http://www.mcaws.gov.bc.ca/lgd/irpd/growth/PUBLICATIONS/expguide/gsaqui2.html)

- GSA (1995)(s. 25 LG Act): practical framework for coordinated planning/action for LGs in BC
  - Establishes rules for 3 key planning tools: regional growth strategies (RGS), regional context statements (RCS) and implementation agreements (IA)

1. **RGS:** regional vision committing LGs and regional districts to course of action to meet common social, economic, environmental objectives
   - Initiated, adopted by RD, referred to affected LGs for acceptance
2. **RCS**: part of OCP establishing relationship between RGS and municipal plan  
   a. Prepared by municipality, referred to RD for acceptance

3. **IA**: partnership between LG, RD, other agencies establishing how aspects of RGS will be carried out

- **Growth strategies as (purpose):**
  - Means of providing coordination on planning issues that cross municipal boundaries
  - Coordinating planning among LGs and provincial government, other agencies on which LGs depend for project/program resources
  - Guides to development over 20 year period (at minimum)
  - Addressing housing; transportation; regional district services; parks and natural areas; and economic development
  - Including population/employment projections; list of actions to meet projected needs
  - Building consensus within region on future policies/development

- **Objective of RGS:** [section 849(1)] to "promote human settlement that is socially, economically and environmentally healthy and that makes efficient use of public facilities and services, land and other resources"

- **Provincial goals** (related to environmental protection) [section 849(2)] – note: 11 of the 14 goals directly related to env. protection (clear indication of dependence of all else on environmental health)
  - Avoiding urban sprawl and ensuring that development takes place where adequate facilities exist or can be provided in a timely, economic and efficient manner;
  - Settlement patterns that minimize the use of automobiles and encourage walking, bicycling and the efficient use of public transit;
  - Protecting environmentally sensitive areas;
  - Maintaining the integrity of a secure and productive resource base, including the agricultural and forest land reserves;
  - Reducing and preventing air, land and water pollution;
  - Adequate inventories of suitable land and resources for future settlement;
  - Protecting the quality and quantity of ground water and surface water;
  - Settlement patterns that minimize the risks associated with natural hazards;
  - Preserving, creating and linking urban and rural open space including parks and recreation areas;
  - Planning for energy supply and promoting efficient use, conservation and alternative forms of energy; and,
  - Good stewardship of land, sites and structures with cultural heritage value.

- **GSA** provides flexibility for creation of **sub-RGSs**

- **Is not** a community plan done at larger scale – provides framework for individual community plans in region

- **Steps to creation of RGS:** needs identification, boundary determination, scope, goals, process (public consultation), information, implementation

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1. **GROWTH STRATEGY FOR THE REGIONAL DISTRICT OF THE CENTRAL OKANAGAN**
   ([http://www.cord.bc.ca/docs/bylaws/Planning%20Bylaws/GMS%20Bylaw-public%20format.pdf](http://www.cord.bc.ca/docs/bylaws/Planning%20Bylaws/GMS%20Bylaw-public%20format.pdf))

- **Purpose** of RGS: indicate a vision of a desired future for region
  - Provide general framework to guide pattern of development/investment decisions within RD
  - To enhance communication, coordination, collaboration among government agencies
  - To provide monitoring and evaluation systems to ensure that future decisions move communities towards high quality of life
• **Organizations/agencies contributing expertise**: Irrigation Districts, School District, Health Region of Ok-Similkameen, First Nations, BC Transportation Finance Authority, Agricultural Land Commission

• **Completed in 3 phases**:  
  - Strategy (agreement on regional vision, regional goals, growth management objectives, growth management policies)  
  - Regional Context Statements (how OCPs reflect/implement RGS)  
  - Action Plan Development Plan and Implementation (guiding principles on key issue areas, desired growth scenario, detailed ongoing actions/strategies required to support growth scenario)

• **Vision Statement** (1st element): "The Central Okanagan is a region that protects and respects its natural attributes. The region’s green spaces and water resources are managed to ensure their long term health and sustainability."  
  - (last element): "Is part of a larger region and ecosystem. Our development and growth management decisions respect our neighbouring Okanagan communities. Valley-wide cooperation is supported to sustain the health of our water, air and lands."

• **General growth management policies** (elements):  
  - "Require an environmental review of developments deemed to impact the ability of the land, watershed and other natural resources to accommodate the proposed development."
  - "Urban development is to be directed away from hazardous areas, sensitive environmental areas, resource extraction areas, and farmlands, to reduce land use conflicts and development encroachments."

**[CENTRAL OKANAGAN REGIONAL GROWTH STRATEGY MONITORING PROCESS 2001](http://www.cord.bc.ca/docs/planning/prgrs_rpt.pdf)**

- **Indicators** related to conservation/environmental protection:  
  - Percentage of land managed for conservation (in parks, through DPAs/covenants/easements retaining land as open space, through stewardship measures protecting individual features/providing special management)  
  - Water: domestic water consumption, water quality ratings, number of groundwater and water allocation plans  
  - Natural resources: rural resource land base  
  - Community and regional park

- **Implementation** of RGS: primarily through land use and servicing decisions of member municipalities

2. **THOMPSON-NICOLA REGIONAL DISTRICT REGIONAL GROWTH STRATEGY**

- **Environmental Protection** ("protect and enhance the environment through the adoption and cooperative use of stewardship principles")  
  - Conserve and protect the region's natural resources, amenities and attributes for the benefit of existing and future generations  
  - Protect and enhance the quality and quantity of the water of the region's lakes, rivers, streams and ground water sources  
  - Encourage the development and adoption of policies that contribute to the reduction or prevention of air pollution
- Develop measures to identify, conserve and protect environmentally sensitive areas
- Recognize and respect development constraints imposed by environmental factors. Avoid development within sensitive or hazardous areas or undertake adequate precautions or mitigative measures where development is unavoidable.
- Review the Lake Study Policy to ensure that it is consistent with the RGS and that it addresses
  - Updated Lake Classification and Management Guidelines
  - Evolving nature of resort industry
  - Increasing demand for lakeshore residential opportunities
  - Visual quality and natural attributes
  - Servicing and design standards
  - Coordination with provincial agencies

3. REGIONAL DISTRICT OF NANAIMO REGIONAL GROWTH STRATEGY
(http://www.rdn.bc.ca/cms/wpattachments/wpID436atID413.pdf)

- **Vision statement** includes: “high standards of environmental protection – that serves habitat, enhances ecological diversity, and maintains air and water quality”
- **Goal 4**: “to protect the environment and minimize ecological damage related to growth and development”
- **Policies**
  - Collaboration to protect open space that “reflects the region’s landscape character and ecological integrity, and forms a system of interconnected areas and natural corridors capable of sustaining native plant and animal communities”
  - Collaboration to “gain a greater understanding of regionally significant ESAs and the natural biodiversity of the region” including conducting field checking/updating of ESA information, data entry/tech updates, making databases available/affordable
  - Consideration ecological character of land base in land and resource use decisions – require environmental review for projects potentially harmful to ESAs
  - Protection streams/streamside areas in accordance with provincial/federal legislation
  - Protection supply/quality of surface water resource/aquatic habitat – integrated stormwater management projects
  - Take measures to identify/protect groundwater resources
  - Pursue solid waste management program (“Zero Waste” approach – eventual elimination of need for solid waste disposal)
  - Diversity in transportation options to maintain good air quality
  - Regional district/LG coordination in environmental protection/management
4. REGIONAL DISTRICT OF COMOX-STRATHCONA STRATEGIC PLANNING
(http://www.rdcs.bc.ca/RDboard/StrategicPlan/2001_Strategic_Planning.pdf)

- Growth Management Strategy to be in place this year
- **Strategic Priority: Environment**
  - “To achieve a consensus view of what sustainable development is and define sustainable for ourselves, including air quality
  - To continue the inventorying of ESAs as a resource to the growth management strategy, local planning processes, and sectoral planning
    - To encourage development that reflects the data contained in the ESA Atlas
  - To develop liquid waste management plans for all parts of the Regional District
  - To inform ourselves about, and participate in initiatives for watershed and groundwater management plan/policies to ensure the quality of drinking water throughout the region.”

5. ISLANDS TRUST REGIONAL CONSERVATION PLANNING (done by Islands Trust's Land Trust: Islands Trust Fund) (http://www.islandstrustfund.bc.ca/howtoprotectlands/conservationplanning.htm)

- Vision of Islands Trust Fund: to create a legacy of special places, that will protect at least 25% of the remaining Coastal Douglas-fir and Coastal Western hemlock ecosystems with a view to ensuring that they continue to thrive in future generations (see the Islands Trust Fund 5 Year Plan)
- IT’s 3 steps to creating Regional Conservation Plan:
  - Foundation: establishing firm basis of accurate, complete, scientifically defensible ecosystems information – via. ecosystem mapping
  - Analysis of ecosystem mapping
  - Creation of Plan – “We will use the plan to work in partnership with other conservancies, government agencies, and local landowners to establish measurable goals and a work plan to protect the identified priority areas.”

C. Other Strategies/Initiatives of Interest

1. A STRATEGY TO ACHIEVE GREEN SUSTAINABLE ECONOMIC DEVELOPMENT IN THE OKANAGAN AND SIMILKAMEEN VALLEYS
(http://www.rdos.bc.ca/pdf/cao/gsed/GSED_Final_Strategy.pdf)

- Role GSED project: “to identify ways that the three regional districts can collaborate to achieve development that protects the environment and conserves land, air and water, and protects livability”
- Economy as nested within Society, and both within Environment
- “4 Gs” to attaining green, sustainable economic development
  - Growing – encouraging success/growth existing green enterprises in OSV
  - Greening – aiding enterprises to understand/apply sustainability concepts in decisions/operation
  - Guarding – retaining successful green businesses
  - Getting – seeking relocation green businesses from other regions
Importance of inter-regional (ie. basin-wide) collaboration on sustainable development

Note: good background on growth history, “context” of Ok./Similkameen Valleys (demographic info, population pyramids, etc.)

Quality of environment strong contributor to quality of life in region (according to resident surveys) – important “lifestyle opportunities”

Water issues: appropriate pricing, use of water for golf courses/domestic/agricultural uses, agriculture-urban conflicts over water supplies/prices, water quality (eutrophication, metals/nutrients in urban/ag runoff), climate change, human use vs water use for survival of fish (note: irrigation consumes more water than all other uses combined)

Environment linked to social/economic welfare:

“We have in the past been concerned about the impacts of economic growth upon the environment. We are now forced to concern ourselves with the impacts of ecological stress—degradation of soils, water regimes, atmosphere, and forests—upon our economic prospects. We have in the more recent past been forced to face up to a sharp increase in economic interdependence among nations. We are now forced to accustom ourselves to an accelerating ecological interdependence among nations. Ecology and economy are becoming ever more interwoven…”

World Commission on Environment and Development. Our Common Future 1987: 5

2. HABITAT ATLAS FOR WILDLIFE AT RISK
(http://wlapwww.gov.bc.ca/sir/fwh/wld/atlas/conservation/conserv_index.html)

Conservation Strategies

- Identify wildlife habitat
- Preserve corridors (to ensure functional biodiversity)
  - Link core reserves – create buffers linking parks and protected areas (provincial parks, Nature Trust properties, wildlife areas)
  - Buffers to afford lower level protection (via local government zoning bylaws, provincial special management zones, volunteer landowner and stewardship covenants)
  - Landscape linkages on east and west sides of valley
  - Maintain elevational landscape connections from low-elevation grasslands/lakes/wetlands → forests, rugged terrain, subalpine areas
  - Okanagan as critical connection between grasslands of intermontane areas/Great Basin to south and Thompson Valley/Cariboo Chilcotin grasslands to north

Community planning (integrate wildlife concerns into CP)

- Division of lower elevation land into Crown land, private land, Indian Reserve – requires coordination
- Key players: local governments, First Nations, regional districts
- Key tools for conservation: regulatory bylaws, OCPs (planning/development controls) and park designation
- Wildlife and habitat conservation planning should be incorporated into land use planning
- OCPs may include "policies of the local government relating to the preservation, protection, restoration, and enhancement of the natural
environment, its ecosystems and biological diversity [Section 878(1)]."
(Municipal Act)

- Municipal Act: tax relief to owners protecting riparian areas adjacent to streams, marshes, lakes or not developing due to wildlife concerns
- OCPs: set environmental policies that all subsequent bylaws must conform to (land designated park/greenway buffer, erosion control, stormwater management)
- Rural Land Use Bylaws: combine broad goals/policy statements (OCPs) with more specific zoning bylaws
- LGs: can purchase covenants/obtain long-term leases from land owners to ensure protection
  - Acquire park land through direct purchase (using DCCs), land trades, donations, dedication through subdivision plans, or expropriation
  - DPAs – EIA required (should delineate potential impacts, mitigation measures, compensation for residual effects)

- Development planning
  - Encourage early consideration of habitat impacts/mitigation

- Stewardship
  - Encouraging private landowner protection
  - South Okanagan-Similkameen Stewardship Program (SOS Stewardship)
  - Important role for Land Trusts, NGOs

- Tools for conservation
  - Identify core areas to protect; increase parks and protected areas
  - Use land use planning and zoning to enhance and preserve corridors, and buffer areas around core protected areas
  - Integrate wildlife habitat concerns into community planning processes
  - Encourage land stewardship to maintain and enhance wildlife habitat on private land and Indian Reserves
  - Increase public awareness of wildlife species at risk and their habitat needs

3. HABITAT ACQUISITION TRUST MANUAL (http://www.hat.bc.ca/projects/HATManual.pdf)

- Danger: “death by 1,000 cuts” – incremental development has severe impact over long-term
- Overview:
  - State of natural areas
  - Benefits of protecting natural areas
  - Tools available to LGs, developers, NGOs, landowners
- Synergy of habitat protection/good community planning – natural spaces make nice places to live
- Increasing rarity of natural areas
- **Greatest cause species decline** – loss/fragmentation habitat areas (urban/agricultural development, forestry, road building, recreational use of lands)
  - Invasive, non-native species a concern (remove food sources, habitat for native species)
  - Use/accumulation pesticides, chemicals on land/water
- What percent of s Ok sensitive ecosystems are protected (park/ecological reserve)?
- Note **benefits of protecting natural areas in communities**
- Good for economy, livability, biodiversity, health
- Must consider not just costs of protection, but costs of not protecting
- **Benefits**: ecosystem services *free*, economic benefits, increased property values (adjacency: 15-20% increase in property values near greenways), reduced costs for developers/community (clustering of homes to protect green spaces), expedient public approval processes for developers (public support generally higher where environment taken into consideration, media interest in green development), lower costs/more benefits for homeowners (reduced heating/AC costs), tourism opportunities, community benefits (quality of life: viewscapes, recreation, health), research/medicine, wildlife/biodiversity

**Tools for protection**
- Must:
  - Know what to protect, and why (sensitive ecosystems inventories, maps denote priority areas)
  - Plan for protection (regional, LG policies/plans)
    - CRD Green/Blue Spaces Strategy: identifies 4 core elements – green/blue space core areas, greenways/corridors that link core areas, renewable resource working landscapes (agricultural and managed forest lands), valuable remnant ecosystems (sensitive areas not included in core areas)
  - Know what tools are available (regulatory, incentives, acquisition, landowner stewardship)


- **Includes**: overview of aquatic/terrestrial ecosystems; description environmental management programs, roles, responsibilities
  - **Growth history/projections**
  - **Inventory of natural features** (topography, drainage patterns, description natural habitats, rare species lists), human settlement features (current/anticipated future settlement patterns, access routes), environmental protection management tools (major regional/provincial parks, flood protection measures, pollution permitting, environmental control)
    - To incl (above and beyond existing elements in template): topography, slope (>30%), drainage patterns, groundwater flows, sources pollution, threats specific to each ecosystem/at risk species (development pressure, clearing, invasive species, etc.)
    - Key sources info.: Okanagan-Shuswap LRMP, Conservation Data Centre ("Tracking Lists" rare/vulnerable species/plant communities) COSEWIC
    - To note: scenic views translate into rich tourist economy
    - Identify: provincial, regional, major municipal parks; resource management zones (LRMP)
    - See: biogeoclimatic zones transect (excellent visual) – p. 17
  - **Settlement patterns**: largely based on topography, allocation water supplies, design criteria public roads
    - Settlement management
      - Development bylaws by LGs: OCPs, zoning bylaws, subdivision bylaws, DPAs, building bylaws, etc.
      - Settlement activities subject to referral/approval by provincial agencies: construction within floodplain setback, septic disposal field approvals, works in and about a stream, pollution/pesticide permits, hazardous waste disposal, activities on crown lands, lakes
• Environmental protection measures: wastewater collection/treatment systems, flood control works, landfills, water treatment facilities
  ▪ Regulation through “nuisance” regulation/bylaws
  ▪ Establishment building setbacks
  ▪ Acquisition/management of parks for conservation/recreation
  ▪ Designation of uplands areas “Community Watershed”
  ▪ DPAs: areas generally protected include streams (year-round flow), large lake shorelines, selected groves of trees, selected rock cliffs/bluffs/canyons, selected marshes/wetlands, selected grasslands, areas >30% slope

• Roles and responsibilities (agencies involved in environmental protection) – p. 43-45
  • Federal legislation: Species at Risk Act (2001)
  • Municipal/Regional roles: Local Government Act
  • First Nations/Local Government role
  • NGO role: general discussion followed by listing of organizations (no detail re: specific activities)

• accomplishments over 20 years: overview “Environmental Protection Accomplishments” (conservation, environmental programs, enabling legislation/new regulatory frameworks, site reclamation/restoration, local government accomplishments)

• Levels funding for protection activities

• Emerging issues of regional concern – within 5 distinct categories (issues & actions)

  1. Water resources and air quality
  2. Diversity of the region
  3. Sustainability and pressures of population growth
  4. Natural hazards
  5. Managing aesthetics

• Goals and actions (what to protect, how to improve management, how to improve investment/development decisions)
  • Recommendations for specific actions toward environmental protection during period of sustained growth
  • Identification lead agencies, performance targets developed through ongoing dialogue with community stakeholders, public agencies
  • General recommendations:
    ▪ Protection/respect for natural attributes
    ▪ Respect for neighbouring communities
    ▪ Decisions respect carrying capacity of land/water
    ▪ Promotion development that sustains/enhances natural environment
    ▪ Protection scenic qualities of region, significant features, open space

• Table of Implementation Activities, Lead Agencies, Anticipated Timing – see next page
Potentially useful sources

Plan of Action Table taken from Regional District of Central Okanagan, Environmental Discussion Paper, 2002.

### Plan of Action Table

<table>
<thead>
<tr>
<th>Implementation Activities</th>
<th>Lead Agencies</th>
<th>Anticipated Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan for development by knowing what to protect:</td>
<td>Regional District and Ministry of Sustainable Resource Management</td>
<td>Long term (following aquifer &amp; sensitive ecosystem mapping &amp; management plans)</td>
</tr>
<tr>
<td>Establish “settlement expansion” management plans with BC Assets and Lands</td>
<td>Individually municipalities, electoral areas, first nation communities, and Ministry of Sustainable Resource Management</td>
<td>Short term</td>
</tr>
<tr>
<td>Build partnerships to undertake regional inventories (for community planning purposes)</td>
<td>Individual municipalities, electoral areas, first nation communities, and Ministry of Sustainable Resource Management</td>
<td>Short term</td>
</tr>
<tr>
<td>Use best management (urban development):</td>
<td>Individual municipalities, electoral areas, and first nation communities</td>
<td>Mid term</td>
</tr>
<tr>
<td>Develop guidelines for managing Sensitive Ecosystems</td>
<td>Individual municipalities, electoral areas, and first nation communities</td>
<td>Mid term (following efforts underway in South Okanagan Similkameen Conservation Strategy and federal initiatives)</td>
</tr>
<tr>
<td>Apply Best Management Practices and Development Guidelines referenced in Stewardship Series</td>
<td>Individual municipalities, electoral areas, and first nation communities</td>
<td>Short term</td>
</tr>
<tr>
<td>Develop and adopt best management practices for vulnerable aquifers and recharge areas (in consultation with water purveyors and using provincial and federal guidelines as a base)</td>
<td>Individual municipalities, electoral areas, and first nation communities assisted by Ministry of Water, Land, and Air Protection</td>
<td>Mid term (following publication of mapping for Central Okanagan region)</td>
</tr>
<tr>
<td>Monitor compliance post development</td>
<td>Individual municipalities, electoral areas, provincial agencies, and first nation communities</td>
<td>Short term</td>
</tr>
<tr>
<td>Development of Town Centres implementation strategies</td>
<td>Individual municipalities, electoral areas, and first nation communities assisted by public sector investment and funding agencies</td>
<td>Short term</td>
</tr>
<tr>
<td>Use best management (resource development):</td>
<td>Regional District and Ministry of Sustainable Resource Management</td>
<td>Ongoing (through LRMP implementation)</td>
</tr>
<tr>
<td>Apply best management practices to resource development</td>
<td>Regional District and Ministry of Sustainable Resource Management</td>
<td>Ongoing (through LRMP implementation)</td>
</tr>
<tr>
<td>Protect an intact and functional crown land base</td>
<td>Ministry of Sustainable Resource Management</td>
<td>Ongoing (through LRMP implementation)</td>
</tr>
<tr>
<td>Reference existing and future resource development in environmental impact assessments</td>
<td>All development approving agencies</td>
<td>Short term</td>
</tr>
<tr>
<td>Manage native habitat &amp; species:</td>
<td>All development approving agencies</td>
<td>Short term</td>
</tr>
<tr>
<td>Amend landscape regulations to encourage use of native plants</td>
<td>Municipalities, electoral areas, provincial agencies, and first nation communities</td>
<td>Short term</td>
</tr>
<tr>
<td>Reduce application of pesticides and herbicides</td>
<td>All development approving and public works agencies</td>
<td>Mid term</td>
</tr>
<tr>
<td>Apply best management practices to construction process, especially re erosion control and ground cover</td>
<td>All development approving and public works agencies</td>
<td>Mid term</td>
</tr>
<tr>
<td>Incorporate environmental with social &amp; economic:</td>
<td>Regional District and Ministry of Sustainable Resource Management</td>
<td>Mid term</td>
</tr>
<tr>
<td>Encourage watershed and landscape unit planning</td>
<td>Regional District and Ministry of Sustainable Resource Management</td>
<td>Mid term</td>
</tr>
<tr>
<td>Work toward regional consistency in environmental impact assessments</td>
<td>Regional District and Ministry of Sustainable Resource Management</td>
<td>Short term</td>
</tr>
<tr>
<td>Enhance level of communication and referral between resource and community agencies</td>
<td>All public works agencies</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Work to ensure that capital investments in environmental infrastructure are linked to development priorities</td>
<td>All public works agencies</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Leverage conservation with capital investments in environmental infrastructure</td>
<td>All public works agencies</td>
<td>Mid term</td>
</tr>
</tbody>
</table>

1 Lead agencies are those that are anticipated to lead in the initiation of activity, based on current functions as of October 2001.
Calvin Sandborn\(^1\) states that “At the local government level, planning for green infrastructure means that before we plan anything, we need to identify and protect:

- waterbodies, watersheds and groundwater recharge areas
- floodplains, riparian zones and wetlands
- critical habitat for significant species and for support for biodiversity
- ecologically special areas, such as rare grassland and forest types
- terrain such as steep slopes, deserts and alpine regions that cannot sustain certain land use activities without serious damage
- recreation areas
- natural lands with the potential to provide linkages between other green spaces.”

- **Note:** And all of these areas have to be identified **before** development decisions are undertaken.
- **Programs of note:**
  - District of Highlands: OCP indicates environmental protection as **main goal**, to override all other goals of OCP
  - Municipality of Saanich: has in-house Environmental and Social Review Process for all subdivisions/rezoning, has had urban containment boundary in place since 1964
    - Have produced Environmentally Sensitive Areas Atlas
    - Have “Green/Blue Spaces” report outlining options for environmental protection
    - Have adopted Naturescape BC principles
  - Most municipalities in CRD have identified some sensitive areas as DPAs
  - Note: in many municipalities in CRD, habitat protection can only occur if it is shown to be in developer’s best interest
  - District of North Van: comprehensive Environmental Protection and Preservation Bylaw (EPPB) – permitting process in bylaw provides consistent approach to handling of specified environmental issues
  - Port Moody: has identified all environmentally sensitive areas, inventoried them and developed management recommendations specific to these areas
  - Township of Langley: Watershed Management Planning Program – roles of developers, stewardship groups and various agencies all documented/agreed upon in plan
  - Campbell River: Environmental Strategy
  - Colwood: Greenways Plan (addresses natural landscapes, wildlife corridors)
  - North Saanich: Environmental Advisory Commission – provides input, recommendations on projects referred to them by council
  - Central Saanich: Resource Atlas for municipality – maps out geology, aquifers, ecosystems, soil and slope information (info to be used in development of DPAs)
  - Burrard Inlet Environmental Management Plan
  - Burnaby: has identified “Green Zones” (conservation areas) in OCP; have Environmental Review Committee that reviews all proposed developments near waterways
  - RD Comox-Strathcona: Sensitive Habitat Atlas, incorporated into OCPs – this info forms baseline against which development applications reviewed
  - Highlands: incorporated SEI polygons into OCP – sensitive areas designated as DPAs

(http://srmwww.gov.bc.ca/sei/van_gulf/doc/SEICMfinal.pdf)

- Excellent overview of tools – won’t go into detail, but good reference
- Conservation tools: Local Governments
  - Planning
  - OCPs
  - Development Permits (incl. suggested guidelines for all sensitive ecosystems)
  - Zoning
  - Subdivision Approvals
  - Subdivision Servicing Bylaws
  - Stream and Drainage Policies/Bylaws
  - Tree and Landscaping Policies/Bylaws
  - Soils Bylaws
  - Animal Control Bylaws
  - Partnerships
- Conservation Tools: Landowners/Citizens
  - Stewardship Organizations/Land Trusts/Advocacy Groups
  - Conservation Covenants
  - Land Donations (tax advantages)
- Conservation Tools: Senior Government
  - Legislation (overview)

D. Mapping Initiatives

- **Sensitive Ecosystems Inventories:** East Coast Vancouver Island/Gulf Islands; Bowen-Gambier; Sunshine Coast; Central Okanagan; Bella Vista - Goose Lake Range http://srmwww.gov.bc.ca/sei/
- **Comox-Strathcona:** Sensitive Habitat Atlas http://www.shim.bc.ca/atlases/Comxdoc.htm
- **Fraser Valley Regional District:** Habitat Atlas http://www2.fvrd.bc.ca/growth/RGS_Concepts/Habitat_Atlas/habitat_atlas.html
- **Nanaimo:** Environmentally Sensitive Areas Atlas
- **Squamish:** Fish Sensitive Habitat Atlas http://www.shim.bc.ca/atlases/squadoc.htm
- **Saanich:** Environmentally Significant Areas Inventory and Atlas http://www.gov.saanich.bc.ca/resident/community/enviro/esa.html
- **BC Grasslands Atlas** http://www.shim.bc.ca/atlases/grassland/grassland_public.htm
- **Conservation Data Centre** http://srmwww.gov.bc.ca/cdc/
**APPENDIX B: Summary of SOSCP Actions Completed or Underway**

<table>
<thead>
<tr>
<th>PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Okanagan Ecosystem Recovery: A scientific assessment</td>
</tr>
<tr>
<td>South Okanagan – Similkameen Habitat Atlas</td>
</tr>
<tr>
<td>Complementarity Analysis and Mapping</td>
</tr>
<tr>
<td>South Okanagan River Restoration ‘Proof of Concept’ Project.</td>
</tr>
<tr>
<td>Vaseux Lake Riparian Restoration Project</td>
</tr>
<tr>
<td>White Lake Basin Recovery Project</td>
</tr>
<tr>
<td>Antelopebrush Recovery Working Group</td>
</tr>
<tr>
<td>Species At Risk Inventory Projects</td>
</tr>
<tr>
<td>Species At Risk Monitoring Projects</td>
</tr>
</tbody>
</table>

**PROJECT ACTIONS COMPLETED OR UNDERWAY**

- Independent assessment of the “state of the valley,” and of the needs, issues and species priorities for a South Okanagan-Similkameen Ecosystem Recovery Strategy.

- Determine distribution and status of species populations and recovery habitats: map species distributions (1:20,000 Terrestrial Ecosystem Mapping);
  - Identify threats, biologically limiting factors, recovery habitat requirements and required ecological interconnections and processes;
  - Identify ecological and socio-economic considerations involved in recovery;
  - Determine recovery potential, rationale and scale of required recovery action.

- Additional TEM and SEI mapping currently underway in rural Osoyoos of 7,000 ha of higher elevation areas to complete mapping required for preparation of the Official Community Plan.

- Identify priority areas to be secured and/or managed for the recovery of multiple species at risk.

- Planning and implementation of in-stream, wetland and riparian restoration project.

- Planning and implementation of in-stream, wetland and riparian restoration project.

- Planning and implementation of landscape-level conservation/recovery effort.

- Setting specific objectives and development of action plan and strategy for the conservation of antelope-brush habitat.

- Inventory for species at Risk on federal, provincial and private lands; primarily for birds, amphibians, snakes and Behr’s Hairstreak.

- Monitoring of at-risk species populations in the SOSCP area; in particular Yellow-breasted Chat.

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| **Species At Risk Research** | Research by a range of university researchers (OUC, UBC, SFU) and government biologists on species at risk.  
Population demography and habitat research for at-risk species populations in the SOSCP area (for example yellow-breasted chat, white-headed woodpecker, sage thrasher, Behr’s hairstreak, mormonmetalmark, pallid bat, tiger salamander).  
Other research on various species. |
| **Okanagan Ecoregion Assessment** | A complementarity based approach to conservation of species at risk and habitat representation undertaken by TNC and NCC using species.  
One of a continent-wide series of such ecosystem assessments. |

**OUTREACH**

| **SOSCP Coordination** | Support the development and delivery of SOSCP presentations, meetings and reports.  
Development new partnerships with local governments, and regional, local and national organizations  
SOSCP website and communications.  
Support in development and delivery of outreach displays, education programs, training workshops, information sessions and public events, including the annual Meadowlark Festival. |
<p>| <strong>Walk-in Outreach Centre</strong> | Walk-in environmental resource centre in Penticton. |
| <strong>Ecommunity Project</strong> | With the City of Penticton, the RDOS, En’Owkin Centre and SOSCP, developing a ecoliteracy project to use the digital medium to highlight environmental awareness and species at risk in the community |
| <strong>Meadowlark Festival</strong> | Annual nature and conservation festival. |
| <strong>Species at Risk Communications Plans</strong> | Assist working groups and teams to develop and deliver communication plans for species at risk. |
| <strong>Species at Risk Outreach on Osoyoos Indian Band Lands Project</strong> | Species at risk outreach for First Nations. |</p>
<table>
<thead>
<tr>
<th>PROJECT</th>
<th>ACTIONS COMPLETED OR UNDERWAY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEWARDSHIP</strong></td>
<td></td>
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</tbody>
</table>
| Landowner Contact and Stewardship Projects:  
  - Caring for the Green Zone workshop  
  - Caring for Cottonwoods Project  
  - Antelope-brush Stewardship Project  
  - Riparian Rewards Project  
  - Ponderosa Pine Partners Project  
  - Understanding Snakes Project  
  - California Bighorn Sheep Habitat Stewardship Project  
  - Lake Okanagan Foreshore Protection Project  
  - Badgers & Burrowing Owls Project  
  - South Okanagan – Similkameen Loosestrife Control Project  
  - The “Puddle” Project | Development of a Landowner Contact database.  
Completion of conservation covenants and eco-gifts from private landowners.  
Landowner and volunteer-initiated stewardship events.  
Stewardship on private lands. |
| Riparian Planting on the Okanagan River and Water Management Dykes Project | Planted native riparian vegetation on First Nations lands. |
| Weed Management Project | Treatment and removal of seven invasive weed species. |
| Okanagan Tree Encroachment Project | Prescribed burning and thinning to restore ponderosa pine-savannah habitat. |
| Conservation Partners (Agricultural) Program | Developing stewardship agreements with agricultural producers to protect, enhance, and/or restore natural habitats on their lands. |
| Conservation Technician for the Osoyoos Indian Band | Technical advise to recovery planning and implementation, inventory and monitoring, outreach on Osoyoos Band Lands |
| Introductory Bird Survey Training Programs and First Nations Bird Mentoring Programs | Build capacity of local community members, particularly First Nations, to recognize, inventory and monitor at-risk bird species. |
| Riparian Fencing Project | Installation of riparian fencing to exclude livestock on private lands.  
Development of a range plan for livestock rotation.  
Stewardship and fence maintenance agreements signed with private landowners. |
| **ECOLOGICALLY SUSTAINABLE LAND USE** | |
| Regional District of Okanagan-Similkameen Technical Environmental Advisory Committee | Established committee to make land use recommendations in response to local and regional development proposals and growth strategies. |
| Land management tool analysis | Conduct inventory and gap analysis of land management tools. |
| Penticton and area Visioning Project | Involve community in developing a long-term vision for ecologically sustainable urban population growth and development. |
| City of Penticton Official Community Plan review | Review and make recommendations on local urban growth strategy. |
| South Okanagan – Similkameen Habitat Atlas | Update Habitat Atlas for Species At Risk where required for local government planning and zoning. |
| Antelope-brush Risk Assessment | Improved science-based mapping and ranking of Antelope-brush sites for land use planning. |
| Provide input to implementation of Okanagan-Shuswap Land and Resource Management Plan | Review and make recommendations for implementation of multi-stakeholder regional resource development and conservation plan. |
| TRADITIONAL KNOWLEDGE | ECOLOGICAL KNOWLEDGE |
| En'Owkin Centre Locatee (Cottonwoods) Project | Gathered TEK to serve as a basis for decision-making for species at risk conservation of First Nations lands. Developed management plans for three areas within First Nations lands. Native cottonwood habitat restoration. |
| TEK Councils | Maintain local TEK councils in each of 3 band communities. |
| TEK Keepers Training Workshops | Develop and deliver TEK keepers training workshops for youth. |
| HABITAT SECUREMENT | |
| Securement Prioritization and Planning | Develop securement priority list. Assess ecological and socio-economic property values. |
| Securement | Negotiate property acquisitions (donations and purchases) with landowners. Negotiate covenants/ easements on private lands. Raise funds for property purchases and other habitat securement activities. Secure sites for conservation through execution of covenants/easements, acceptance of donation or acquisition through final purchase. |
| Property Management | Manage/administer secured properties. Assist with development of Site Conservation Plans. Oversee implementation of Site Conservation Plans. |
## Appendix C: Table Listing Species at Risk, both Federal and Provincial, in south Okanagan

<table>
<thead>
<tr>
<th>English Name</th>
<th>Scientific Name</th>
<th>BC Status</th>
<th>COSEWIC Status</th>
<th>SARA Schedule Number</th>
<th>Habitat Type</th>
<th>Biogeoclimatic Subzone*</th>
<th>Identified Wildlife List</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANIMALS</strong></td>
<td></td>
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<tr>
<td><strong>- VERTEBRATES</strong></td>
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<tr>
<td><strong>- Fish</strong></td>
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</tr>
<tr>
<td>Chiselmouth</td>
<td>Acrocheilus alutaceus</td>
<td>Blue</td>
<td>NAR</td>
<td></td>
<td>Lakes and Rivers</td>
<td>BG;IDF;PP</td>
<td></td>
</tr>
<tr>
<td>Mountain Sucker</td>
<td>Catostomus platyrhynchos</td>
<td>Blue</td>
<td>NAR</td>
<td></td>
<td>Rivers</td>
<td>BG;IDF;PP</td>
<td></td>
</tr>
<tr>
<td>Columbia Mottled Sculpin</td>
<td>Cottus hubbsi</td>
<td>Blue</td>
<td>SC</td>
<td>1</td>
<td>Rivers</td>
<td>BG;IDF;PP</td>
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<tr>
<td>Umatilla Dace</td>
<td>Rhinichthys utamilla</td>
<td>Red</td>
<td>SC</td>
<td>3</td>
<td>Rivers</td>
<td>BG;IDF</td>
<td></td>
</tr>
<tr>
<td>Chinook Salmon (Okanagan pop.)</td>
<td>Oncorhynchus tshawytscha</td>
<td>E</td>
<td>Lakes and Rivers</td>
<td>BG</td>
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<tr>
<td><strong>- Amphibians</strong></td>
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<tr>
<td>Tiger Salamander</td>
<td>Ambystoma tigrinum</td>
<td>Red</td>
<td>E</td>
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<td>Ponds, Wetlands and Uplands</td>
<td>BG;IDF;PP</td>
<td>Y</td>
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<tr>
<td>Great Basin Spadefoot</td>
<td>Spea intermontana</td>
<td>Blue</td>
<td>T</td>
<td>1</td>
<td>Ponds, Wetlands and Uplands</td>
<td>BG;IDF;MS;PP</td>
<td>Y</td>
</tr>
<tr>
<td>Western Toad</td>
<td>Bufo boreus</td>
<td>Yellow</td>
<td>SC</td>
<td>1</td>
<td>Ponds and Creeks</td>
<td>BG;IDF;MS;PP</td>
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<tr>
<td>Northern Leopard Frog</td>
<td>Rana pipiens</td>
<td>Red</td>
<td>E</td>
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<td>Lakes and Wetlands</td>
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<tr>
<td><strong>- Reptiles</strong></td>
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</tr>
<tr>
<td>Painted Turtle</td>
<td>Chrysemys picta</td>
<td>Blue</td>
<td>Lakes, Ponds and adjacent Uplands</td>
<td>BG;IDF;PP</td>
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<td>Hypsiglena torquata</td>
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<td>Gopher Snake, deserticola ssp</td>
<td>Pituophis catenifer deserticola</td>
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<td>1</td>
<td>Arid Uplands and Riparian</td>
<td>BG;PP</td>
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<tr>
<td><strong>- Birds</strong></td>
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<td>Western Grebe</td>
<td>Aechmophorus occidentalis</td>
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<td>Lakes and Wetlands</td>
<td>IDF</td>
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*Subzone codes: BG - Boreal, IDF - Interior Deciduous Forest, PP - Pacifi
**Notes:**

- NAR - Not at Risk
- SC - Special Concern
- T - Threatened
- Y - Yes
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Color</th>
<th>Range</th>
<th>Habitat</th>
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<td>SC</td>
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<td><em>Botaurus lentiginosus</em></td>
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<td><em>Buteo swainsoni</em></td>
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<td>Rugged Uplands and Lakes</td>
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<td>Stylurus olivaceus</td>
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| - Bivalves           |                                          |       |               |       |
| California Floater   | Anodonta californiensis                 | Blue  | Lacustrine, Riverine | BG; IDF; PP |
| Winged Floater       | Anodonta nuttalliana                    | Blue  | Lacustrine, Riverine | BG; IDF; PP |
| Western Ridged Mussel | Gonidea angulata                      | Red, SC | 1 Lacustrine, Riverine | BG; IDF; PP |

| - Gastropods          |                                          |       |               |       |
| Pale Jumping-slug     | Hemphillia camelus                      | Blue  | Terrestrial   | IDF; PP |
| Umbilicate Sprite     | Promenetus umbilicatellus               | Blue  | Riverine      | BG; IDF; PP |
| Abbreviated Pondsnail | Stagnicola apicina                     | Blue  | Lacustrine, Riverine | BG; IDF; PP |
| Silky Vallonia        | Vallonia cyclophorella                 | Blue  | Terrestrial   | BG; IDF; PP |
| Black Gloss           | Zonitoides nitidus                      | Blue  | Palustrine    | IDF; PP |
| Attenuate Fossaria    | Fossaria truncatula                    | Blue  | Lacustrine, Riverine | IDF; PP |

<p>| PLANTS                |                                          |       |               |       |
| cut-leaved water-parsnip | Berula erecta                           | Red   | Lacustrine, Palustrine | BGxh; IDFxh |
| Brandegee's lomatium  | Lomatium brandegeei                    | Blue  | Terrestrial   | IDFxh |
| nine-leaved desert-parsley | Lomatium trifernatum ssp. platycarpum | Red   | Terrestrial   | BGxh; IDFxh; PPxh |
| western mugwort       | Artemisia ludoviciana var. incompta    | Blue  | Palustrine, Terrestrial | IDFmw |
| short-rayed aster     | Aster frondosus                        | Red   | Lacustrine    | BGxh |
| tall beggarticks      | Bidens vulgata                         | Red   | Lacustrine, Palustrine | BGxh |
| narrow-leaved brickellia | Brickellia oblongifolia ssp. oblongifolia | Red   | Terrestrial   | BGxh; IDFxh; PPxh |</p>
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<th>Growth Habit</th>
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<td>Coreopsis tinctoria var. atkinsoniana</td>
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<td>Erigeron poliospermus var. poliospermus</td>
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<td>small-headed tarweed</td>
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<td>Holboell's rockcress</td>
<td>Arabis holboellii var. pinetorum</td>
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