Trout Creek Ecological Reserve

Management Plan

August 2016

BRITISH COLUMBIA | BC Parks

All photos contained within this plan (cover page included) are credited to BC Parks unless otherwise stated.

Trout Creek Ecological Reserve

Management Plan

Approved by:

August 22nd, 2016

_____ _____

John Trewhitt
Regional Director, Kootenay Okanagan
BC Parks

Date

August 19th, 2016

_____ _____

David Ranson
Executive Director, Provincial Services Branch
BC Parks

Date

Acknowledgements

BC Parks is indebted to Ecological Reserve Warden Laurie Rockwell for his years of dedication in monitoring and record collection in Trout Creek Ecological Reserve. Further thanks to ecologist Don Gayton and environmental consultant Alison Peatt for providing additional information on landscape features and characteristics of the ecological reserve. Jeremy Hiebert allowed permission to use several of his professional quality photos of the ecological reserve.

BC Parks also recognizes James Pepper (Natural Resource Department) of the Penticton Indian Band for coordinating the information gathering (i.e., Traditional Ecological Knowledge Initial Enquiry) from band members and elders regarding the important cultural, spiritual and traditional values of the ecological reserve and surrounding land area.

W.T. (Tom) Roos prepared an earlier draft version of this management plan and conducted important background research required for the plan's development.

Vision Statement

The purpose of the vision statement is to identify the future state and management regime that is desired for Trout Creek Ecological Reserve over the next 25 to 50 years. The management vision provides long-term direction for protected area managers, while aiding them in making decisions regarding current issues. It is based on currently prevailing environmental and socio-economic attitudes concerning protected areas. However, the vision statement is also dynamic and conceptual and therefore allows for change due to evolving ideas regarding conservation and evolving ecosystems due to climate changes.

Trout Creek Ecological Reserve is an area of healthy, dynamically functioning semi-arid, open-forest ecological communities. Despite its small size, the ecological reserve provides a safe and nurturing home to a wide diversity of wildlife, especially reptiles and birds. Its vulnerability to non-native plant species has largely been eliminated by effective management, limiting vectors that promote invasive species, and by the regular hands-on assistance of dedicated local nature enthusiasts.

Ongoing fencing protects the ecological reserve from encroachment of livestock and infringement by motorized recreational activities, so natural processes have been able to flourish. Natural and prescribed burning and small-scale vegetation removals (when necessary) have restored and maintained the fire-dependent characteristics of the landscape. The Ecological Reserve Warden and BC Parks staff regularly monitor the ecological reserve, record observations, and facilitate ongoing study and research of this ecologically rich, "living" laboratory of grasslands and open forest.

First Nations, in particular the Penticton Indian Band, have continued interest in the ongoing management of the ecological reserve. Traditional and cultural uses of the ecological reserve have been well documented and serve not only as an important management tool, but reinforce the pre-historical, historical and contemporary connection this ecological reserve has with First Nations.

Table of Contents

Table of Figures

Table of Plates (photos)

1.0 Introduction

1.1 Management Plan Purpose

The purpose of this document is to guide the management of Trout Creek Ecological Reserve. This management plan:

- articulates the key features and values of the ecological reserve;
- identifies the types and levels of management activities;
- establishes the long-term vision and management objectives to be met; and,
- responds to current and predicted future threats and opportunities by defining a set of management strategies.

1.2 Planning Area

Trout Creek Ecological Reserve is 75 hectares in size and is located at the southwest base of Mount Conkle on the western side of the Okanagan Valley, approximately five kilometres from the city centre of Summerland within the Northern Okanagan Basin Ecosection.

The ecological reserve, which ranges in elevation from 540 to 850 metres, is bounded by the steep narrow canyon of Trout Creek to the south and west, beyond which is the Penticton Indian Band's Reserve No. 1. The ecological reserve contains both low elevation intact grasslands and open ponderosa forest then trends to mid-elevation Douglas-fir forest within the Trout Creek drainage.

Undeveloped Crown land is located to the north and east; and to the southeast is the Summerland Golf and Country Club with golf fairways located within close proximity to the ecological reserve's boundary. Access to the ecological reserve is by foot, most readily from the edge of the golf course property.

There are several other ecological reserves within a 100 kilometre radius of Trout Creek Ecological Reserve, but all conserve very different ecological characteristics than what is contained within the Trout Creek Ecological Reserve. Mahoney Lake Ecological Reserve (25 kilometres south) protects a provincially significant alkali lake ecosystem; Campbell Brown (Kalamalka Lake) Ecological Reserve preserves ecosystems that are transitional between Interior Douglas-fir and Ponderosa Pine biogeoclimatic zones as well as rattlesnake habitat; Buck Hills Road Ecological Reserve conserves a small stand of western larch including some large, old-growth specimens; Cougar Canyon Ecological Reserve near Kalamalka Lake conserves representative interior Douglas-fir ecosystems, small lakes and associated wetlands; Browne Lake Ecological Reserve preserves a wet meadow ecosystem and surrounding forests in the Interior Douglas-fir – Montane Spruce transition zone; and Lily Pad Lake Ecological Reserve protects an undisturbed highland lake with unique flora and fauna.

With respect to nearby provincial parks and protected areas, Eneas Lake Park (27 kilometres northwest), Darke Lake Park (21 kilometres northwest), Brent Mountain Protected Area (14 kilometres southwest) and Nickel Plate Park (24 kilometres southwest) are higher elevation forested or alpine sites set aside primarily for backcountry recreation; while Okanagan Lake Park (14 kilometres north), Sun-Oka Park and Kickininee Park (both approximately 5 kilometres east) are primarily beach and swimming destinations.

The general landscape in the area of the ecological reserve was subjected to logging (most likely in the early 1900s) and evidence of past horse logging (e.g., haul roads) and tree falling (stumps) are still visible within the site.

Plate 1: Numerous wildlife trees (snags) with nesting cavities are found within the ecological reserve.

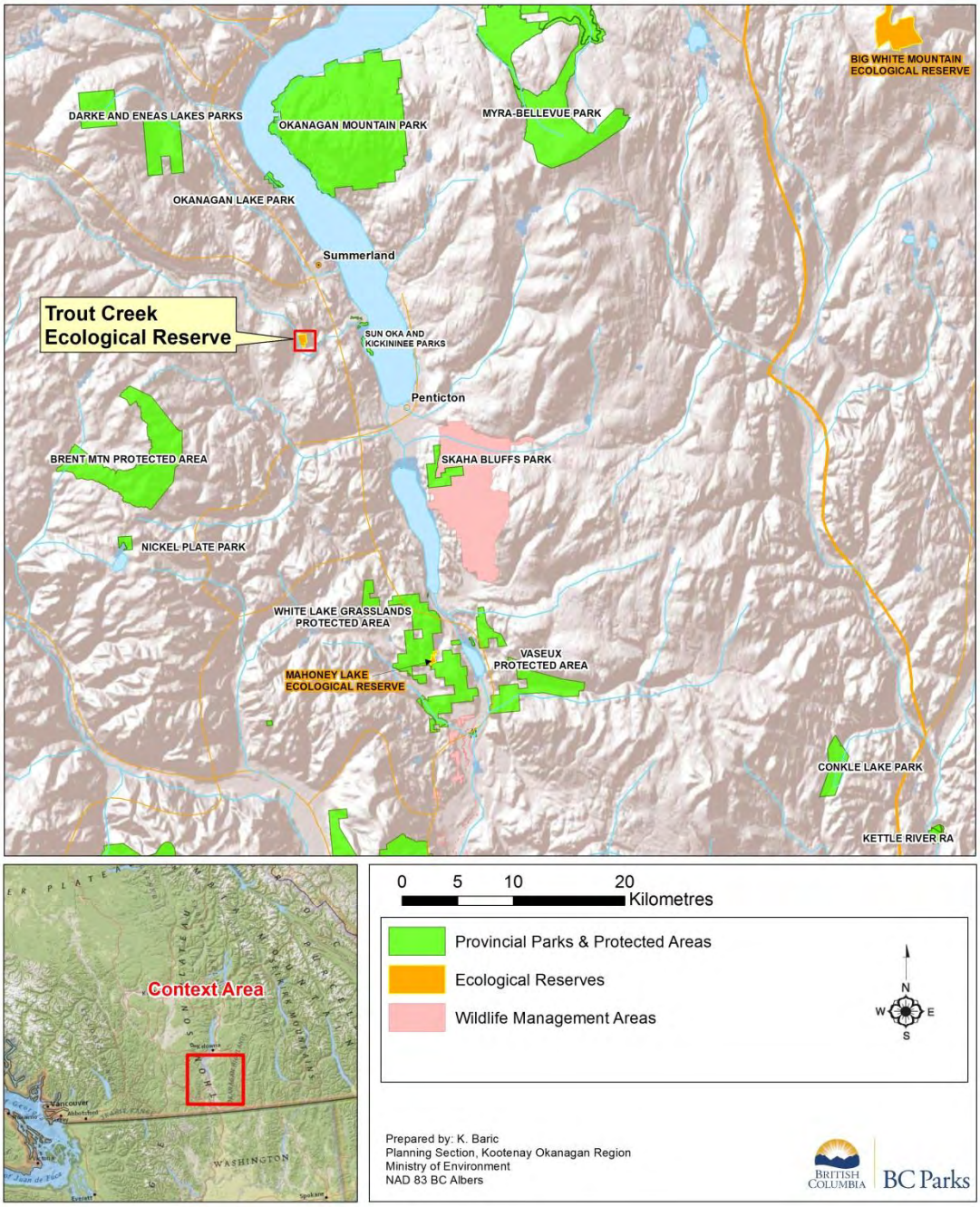

Figure 1: Context Map of Trout Creek Ecological Reserve.

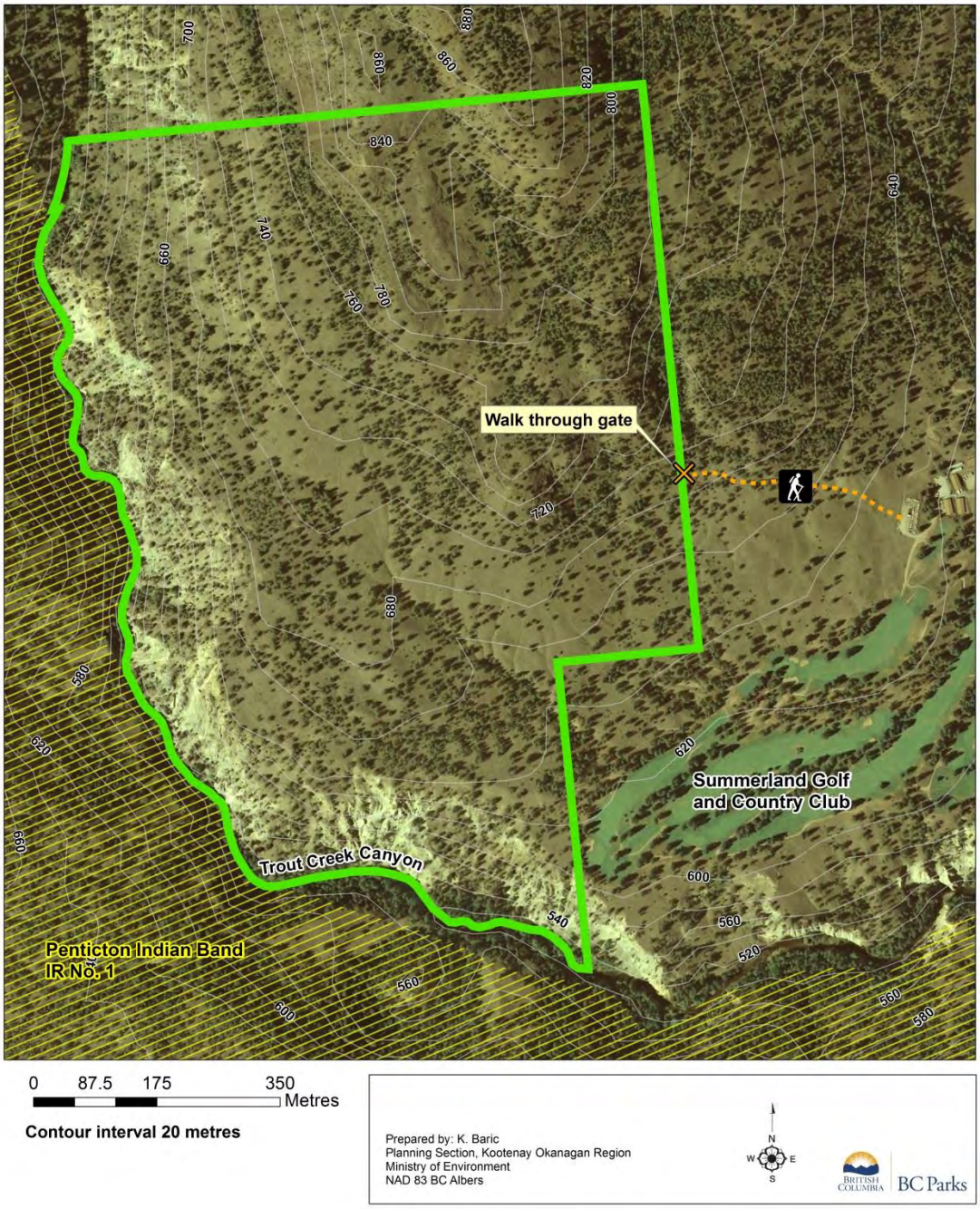

Figure 2: Map of Trout Creek Ecological Reserve.

1.3 Legislative Framework

Trout Creek Ecological Reserve was established on May 4, 1971 by Order in Council 1569/1971. The ecological reserve was one of the first 29 areas set aside under the newly-enacted *Ecological Reserves Act* of 1971. Trout Creek Ecological Reserve is named in Schedule B of the *Protected Areas of British Columbia Act*.

Ecological reserves are areas protected for ecological purposes including areas that: represent examples of natural ecosystems; protect rare or endangered flora and fauna; are suitable for research and education; contain unique examples of botanical, zoological or geological phenomena; or provide opportunities for recovery after human modification. While most ecological reserves are open to the public, they are not established for outdoor recreation purposes and no extractive activities (e.g., logging, mining or hydroelectric development) are allowed.

Plate 2: The deeply incised canyon walls of Trout Creek. Photo by Jeremy Hiebert.

1.4 Adjacent Land Use

To the south and west are lands under the administration of the Penticton Indian Band (Indian Reserve No. 1). This area remains largely undeveloped and roadless due to steep topography, with occasional livestock grazing. The Summerland Golf and Country Club is located to the southeast (on land leased from the District of Summerland). All of the land that encompasses the golf course is designated as Agricultural Land Reserve. A parking area at the terminus of the golf course maintenance road serves as an informal marshalling area for visitors walking into the ecological reserve (see Figure 2). Crown land to the north and northeast of the ecological reserve includes several range tenures.

There are two active range tenures (RAN 076533 and RAN076741) that border the north and northeast boundary of the ecological reserve. A guide outfitter territory (Certificate No. 800754) overlaps the ecological reserve, but no hunting (guided or otherwise) can occur within the ecological reserve. A trapping territory (TR0808T026) borders a small section of the ecological reserve along its northwest boundary.

Plate 3: Looking southeast from the height of land within the ecological reserve. The fairways and greens of the golf course can be clearly observed in the inset photo.

The District of Summerland owns and administers land that forms part of Mount Conkle (i.e., a 108 hectare district park), which is located 2 kilometres to the north of the ecological reserve. Crown land separates the ecological reserve from the district park. A potential concept is to enhance the protection of the Crown land between the district park and the ecological reserve (see Figure 3).

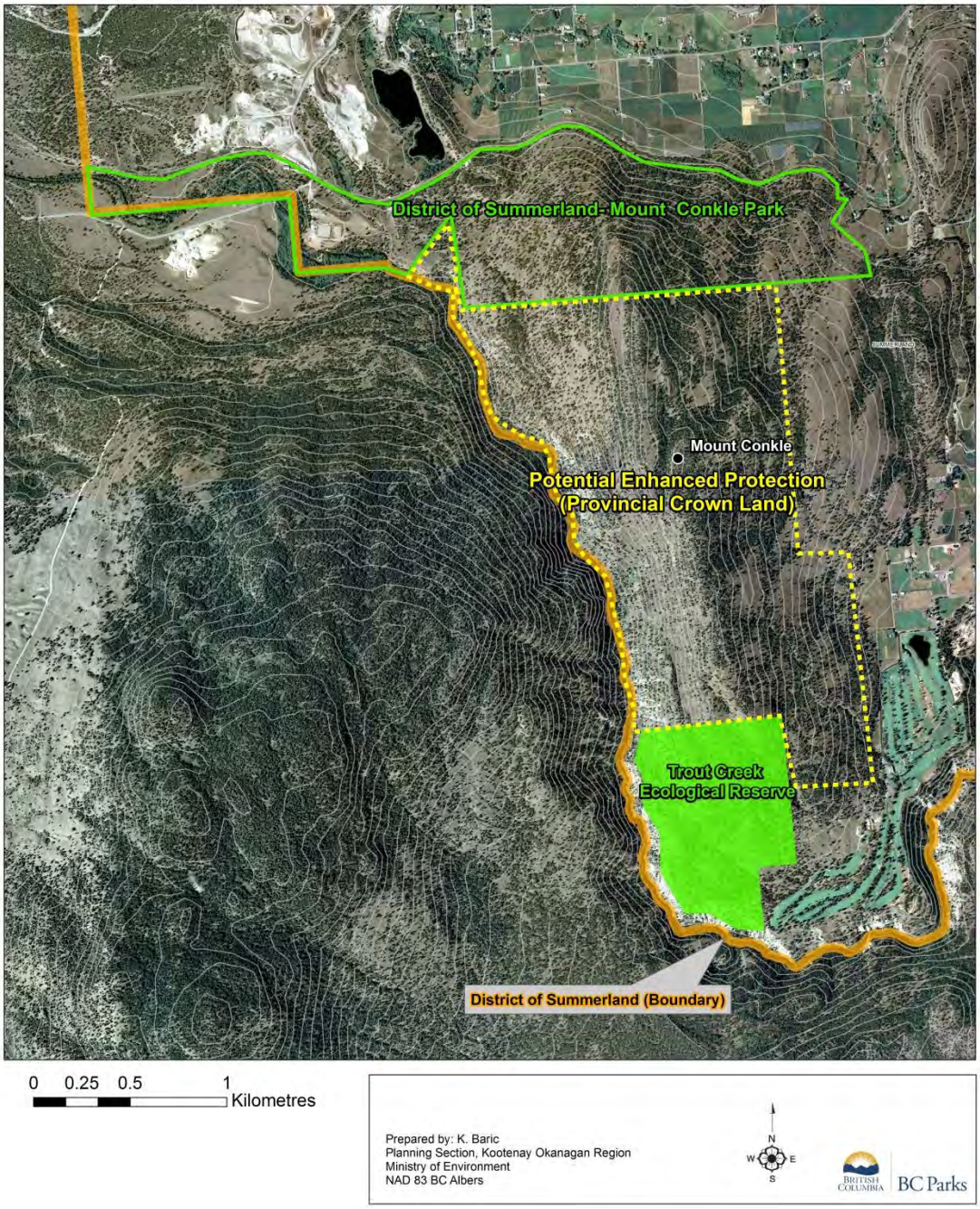

Figure 3: Potential enhanced protection area between Mount Conkle Park and Trout Creek Ecological Reserve.

1.5 Management Commitments/Agreements

This ecological reserve was selected for conservation of representative semi-arid vegetation dominated by ponderosa pine, bunchgrass and Douglas-fir in the southern interior of British Columbia.

1.6 Existing Permits and Authorizations

There are currently no active ecological reserve permits within the ecological reserve; however, in the past there have been several permits issued for research.

A nine hectare portion in the southeast corner of the ecological reserve is designated as Agricultural Land Reserve.

1.7 Management Planning Process

Although Trout Creek Ecological Reserve was established over 40 years ago, it has never had a formal management plan.

A Terms of Reference document was developed in 2011. Background information has also been gathered from communications with the Ecological Reserve Warden, Laurie Rockwell, and an ecologist, Don Gayton, who has studied the ecological reserve extensively. The District of Summerland was contacted and provided useful information on the long-term planning and development vision for the area situated around the adjacent golf course and nearby rural community.

Public engagement in the management plan included a two month online review/comment period. First Nations consultation originally had a 45 day comment period but was lengthened due to considerable interest in the management planning process by the Penticton Indian Band. Revisions based on public/stakeholder/local government feedback as well as First Nations' interest were incorporated into the final management plan.

1.8 Relationship with First Nations

The Province and First Nations governments are working toward a new relationship based on respect, recognition and accommodation of aboriginal rights and interests.

The provincial protected areas system contains cultural and natural values that are significant to First Nations. Some protected areas are important as sources of natural medicines and foods, or as sacred sites.

Trout Creek Ecological Reserve is located within the asserted traditional territories of the Okanagan Nation and the Nlaka'pamux Nation (pronounced *Ing-khla-kap-muh*). The individual First Nation governments associated with Nlaka'pamux Nation that may have an interest in the ecological reserve consist of the Coldwater, Cook's Ferry, Lower Nicola, Nooaitch, Oregon Jack Creek, and Siska Indian bands. The Nicola Tribal

Association and Lytton First Nations (affiliations of the Nlaka'pamux Nation) also have traditional territories that overlap with the ecological reserve.

Within the Okanagan Nation, the traditional territories that encompass the ecological reserve include those of the Penticton, the Lower Similkameen, the Upper Nicola, and the Okanagan Indian bands.

The management plan encourages dialogue between BC Parks and these First Nations to ensure that management of the ecological reserve considers their traditional uses and values. In particular, the Penticton Indian Band has significant interest in the ecological reserve as the site is immediately located next to Penticton Indian Band Reserve No. 1. Penticton Indian Band has communicated directly with BC Parks the following statement concerning management of the ecological reserve:

> *Within the Okanagan (Syilx Nation), every man, woman and child has an interest and responsibility to take care of all lands, waters, plants and animals throughout their territorial boundary. Each Syilx community also has specific place-based responsibilities to take care of the land, waters and all living things. Within the footprint of the ecological reserve, members of the Penticton Indian Band together with neighbouring Syilx communities share a deep responsibility to take care of these lands in the right way; a role that has been passed down and enacted for many hundreds of generations and thousands of years.*

The landscape which includes the ecological reserve has been used for traditional and cultural purposes for thousands of years. The Penticton Indian Band has undertaken a report entitled *Traditional Ecological Knowledge Keeper Initial Enquiry,* an abridged traditional ecological knowledge study of the ecological reserve and surrounding land area. This enquiry assisted greatly in the development of the Trout Creek Ecological Reserve Management Plan.

The management plan will not limit subsequent treaty negotiations. The ecological reserve continues to be available for the exercising of aboriginal rights, including harvesting and hunting (subject to conservation and public safety requirements).

Plate 4: View to the southwest showing the Penticton Indian Band Indian Reserve.

Plate 5: The southern boundary of the ecological reserve is steep cliff terrain composed of granite bedrock. Photo by Jeremy Hiebert.

1.9 Relationship with Communities

Under the District of Summerland Official Community Plan, the Trout Creek canyon area is defined as a 'water course development permit area' and the remainder of the ecological reserve is located within an 'environmentally sensitive development permit area'. These designations trigger provisions to protect environmental values in the event of development as well as protecting (through provisions in the district's by-laws and official community plans) adjacent areas of Trout Creek and other lands along the boundary of the ecological reserve. These strategies provide a stronger mechanism for consideration of environmental values if development nearby is proposed at some future date.

The District of Summerland has indicated the area adjacent to the ecological reserve is not a development priority or a site for an urban growth area for the district (currently zoned 'FG- Forestry/Grazing' and identified in the Official Community Plan as 'Open Space'). The district does not foresee development pressure in the area and is aware of the potential benefits of ecosystem management within the ecological reserve (involving prescribed fire) to lower the threats of wildfire to nearby residential communities. Although it is zoned as Forestry/Grazing, the district is aware that grazing and forestry operations (beyond those for restoration purposes) are not allowed within

the ecological reserve. There may be avenues in the future to have the District of Summerland re-zone the areas under their administration to zoning that is complementary to that of the values of the ecological reserve (e.g., removal of the forestry/grazing zone).

The current Ecological Reserve Warden has taken up a strong stewardship role in maintaining the ecological reserve (fencing repairs, signage replacement, etc.).

In 2011, a photo montage book detailing the unique species and scenic values of the ecological reserve was published by Jeremy Hiebert of Summerland. The book generated considerable interest and acknowledgement of the importance of the ecological reserve.

Plate 6: Naturalist clubs are regular visitors to the ecological reserve. Photo by Jeremy Hiebert.

Plate 7: Don Gayton (Ecologist) and Laurie Rockwell (Ecological Reserve Warden) visiting the ecological reserve in 2011.

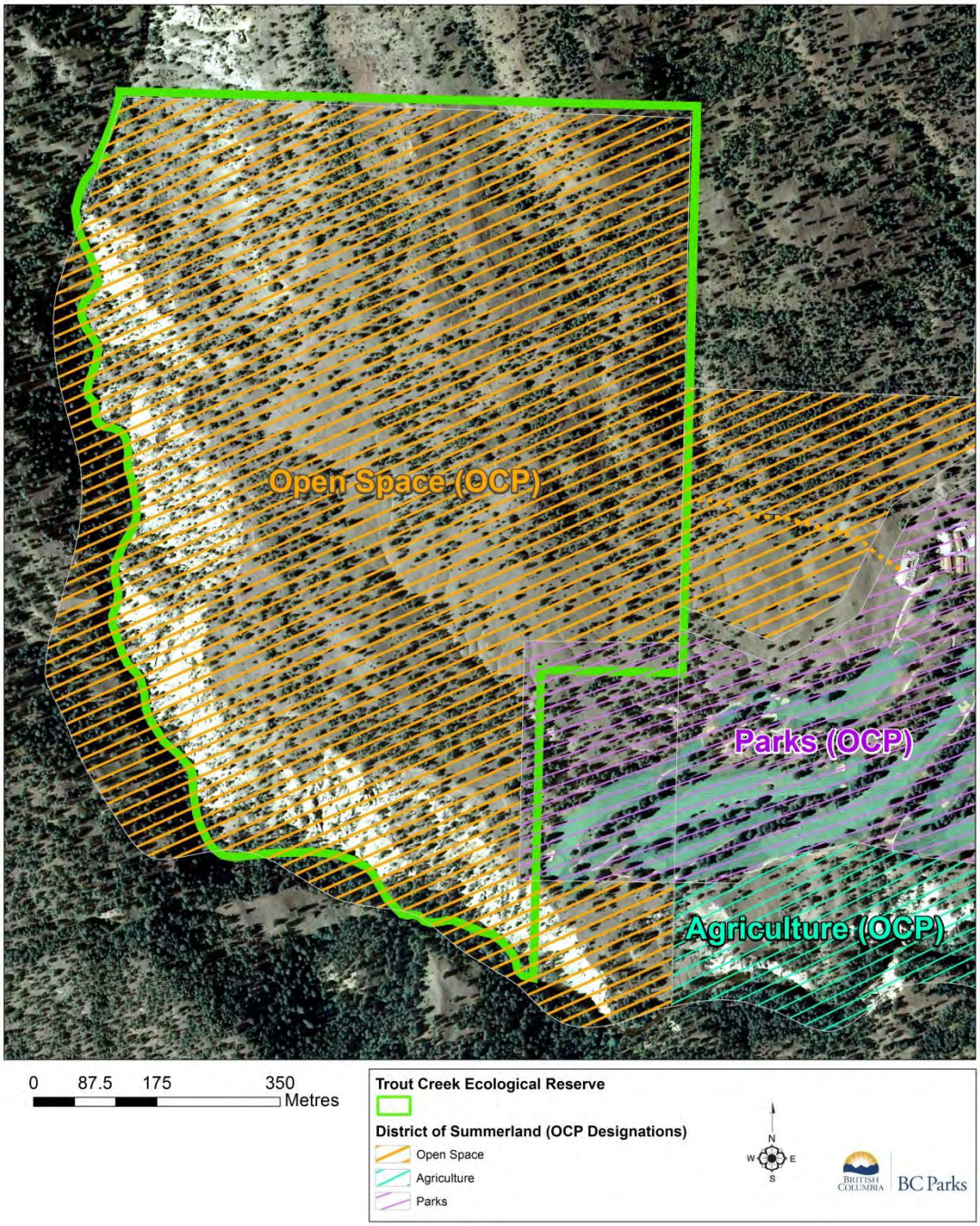

Figure 4: Map of District of Summerland OCP Land Use Designations.

2.0 Values and Roles of the Ecological Reserve

2.1 Significance in the Protected Areas System

When it was established in 1971, Trout Creek Ecological Reserve, while not a large protected area, was unique in protecting a representative sample of an intact grassland plant community. The grassland community located within the ecological reserve is categorized as the biogeoclimatic (BGC) subzone/variant PPxh1 (ponderosa pine very dry hot).

Trout Creek Ecological Reserve is one of fourteen protected areas located within this biogeoclimatic subzone and variant. The recent establishment of the South Okanagan Grasslands, White Lake Grasslands and Vaseux protected areas has greatly increased the total area of this variant under protection in the Okanagan Basin. However, Trout Creek Ecological Reserve does not have range use whereas the above protected areas have range tenures with grazing managed by the ministry responsible for range management. In addition, the ecological reserve remains the only such protected pocket of this ecosystem north of Okanagan Falls. The remainder is located within Indian reserves and private land. Only 10.9% of the total area of the PPxh1variant is protected province-wide.

Despite its diminutive size, the ecological reserve boasts an impressive inventory of species at risk. This is most likely owed to the fact that it has been subject to very little human disruption and no recent (within the past 40 years) domestic livestock grazing pressure.

2.2 Biodiversity and Natural Heritage Values

Vegetation

The ecological reserve is categorized as BGC PPxh1 variant, and at the site level eight different ecological communities are recognized. Of these, three are red listed (Conservation Framework priority is also indicated[1]).

- Bluebunch wheatgrass - arrowleaf balsamroot (grassland; herbaceous): 15 ha. Conservation Framework priority 1.
- Rough fescue – bluebunch wheatgrass (grassland; herbaceous): 12 ha. Conservation Framework priority 2.

[1] The Conservation Framework was established in 2009 and prioritizes species and ecosystems for conservation based on a number of criteria. Priority ranking starts with global and provincial risk status. Priority rank is assigned to a species or ecosystem (1 is the highest priority and 6 is the lowest priority for conservation).

- Black cottonwood - Douglas-fir / common snowberry - red-osier dogwood (riparian; forest): 2 ha (located in the Trout Creek canyon). Conservation Framework priority 1.

Four other recognized communities in the ecological reserve are blue listed. In descending order of area covered, they are:

- Ponderosa pine/bluebunch wheatgrass (woodland; forest): 18.86 ha. Conservation Framework priority 2.

- Ponderosa pine/Red Three-awn (woodland; forest): 11.15 ha. Conservation Framework priority 2.

- Ponderosa pine / bluebunch wheatgrass – Idaho fescue (woodland; forest): 6.94 ha. Conservation Framework priority 2.

- Ponderosa pine / bluebunch wheatgrass – rough fescue (woodland; forest): 2.16 ha. Conservation Framework priority 2.

Plate 8: Balsamroot flowers and bluebunch wheatgrass straddling the ecological reserve's boundary fence. Photo by Laurie Rockwell.

The eighth community is a collection of mosses, lichens and undersized grasses and herbs clinging to rocky outcrops and ridges in the ecological reserve.

A detailed vegetation study of the ecological reserve was conducted in 1973 as part of a Master of Science thesis (Larmour, 1973). This study has been recently updated by Don Gayton and Laurie Rockwell. Further observations have been made as part of a fire history project (Gayton, 2010). A complete list of plant species found in the ecological reserve is included in Appendix 1. In addition to the main tree species (ponderosa pine and Douglas-fir), shrubs present include Saskatoon and rabbit-brush.

Herbaceous species include bluebunch wheatgrass, pinegrass, Idaho fescue, rough fescue, prickly-pear cactus, bitterroot, hoary false yarrow, Columbia goldenweed, scarlet gilia, and prickly phlox; also the red-listed Dalles milk-vetch (Conservation Framework priority 2) and blue-listed narrow-leafed brickellia (Conservation Framework priority 3).

Also present are several invasive species that are provincially-listed noxious weeds, namely knapweed, sulphur cinquefoil, baby's breath and Dalmatian toadflax.

Wildlife

Reptiles are among the most significant wildlife in the ecological reserve. Six of the seven species of snake found in the interior of B.C. have been recorded in the ecological reserve - those being the Great Basin Gopher Snake (blue listed), the Northern Pacific Rattlesnake (blue listed), the North American Racer, the Rubber Boa, the Common Garter Snake, and the Western Terrestrial Garter Snake.

Plate 9: The Great Basin Gopher Snake (left) is commonly mistaken for the Northern Pacific Rattlesnake (right). Photos by Ole Westby.

Gayton (2010) has pointed out that there is a very close correlation between low elevation interior grasslands and overall biodiversity, as well as with relative concentration of species at risk, and concentration (species per hectare) of wildlife. Therefore, as more open-forest-grassland is converted for agriculture or housing developments, Trout Creek Ecological Reserve and other protected areas become increasingly important as refuges for wildlife species.

Mammals known to use the area include American Black Bear, Coyote, Mule Deer and Chipmunk. However, lack of water in the ecological reserve (aside from Trout Creek situated in a steep-walled canyon) limits the variety and abundance of mammals.

Nesting birds include Mourning Dove, Vesper Sparrow, White-breasted and Pygmy Nuthatches, Cassin's Finch, Dusky Grouse, Townsend's Solitaire and the blue-listed Gray Flycatcher. Other avian visitors include Clark's Nutcracker, Golden Eagle, Rock Wren, White-throated Swift and Chipping Sparrow (see Appendix 1 for a complete list of bird species).

Other listed species of management concern that have been recorded in the ecological reserve are:

- Common Nighthawk is federally listed as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and under the federal *Species at Risk Act* (SARA) and provincially a Conservation Framework priority 2.

- Northern Rough Winged, Tree and Violet Green Swallows are provincially yellow-listed species; however, all are a Conservation Framework priority 2 due to declining numbers of these aerial insectivores across the country.

- Olive Sided Flycatcher (blue listed) is federally listed as Threatened by COSEWIC and under SARA and provincially a Conservation Framework priority 2.

- Lark Sparrow (red listed) was recorded in 1977 (breeding status unknown); however, this species has not been recorded within the ecological reserve since 1990. It is a grassland/shrub-steppe species, which suggests more suitable habitat conditions occurred at that time as tree cover has since increased. Lark Sparrow is a Conservation Framework priority 2.

- Lewis's Woodpecker (red listed) has been confirmed within the ecological reserve and approximately half of the ecological reserve is identified as critical habitat under SARA. Lewis's Woodpecker is a Conservation Framework Priority 2.

Plate 10: Gray Flycatcher. Photo by Laure Neish.

To date, there has been no inventory or study of invertebrates existing within the ecological reserve, but it is suspected that the area provides suitable habitat for a range of invertebrate species, many of which are considered at risk.

2.3 Cultural Values

Traditional Ecological Knowledge (TEK) experts from the Penticton Indian Band have identified that the Nsyilxcen place pame for the Trout Creek Ecological Reserve is "kəɬ qʷap" meaning "the place where land sinks every so often". Within the vicinity of the

ecological reserve the Nsyilxcen place name is “liq’sxn”, which translates to “the place where a meteorite hit, which marks a significant event where the people were scared and worried”.

Trout Creek Ecological Reserve and the surrounding land area is coveted by the Penticton Indian Band for its abundance in the variety of spiritual and ceremonial practices as well as a source for medicinal and food purposes. The area has been used historically and pre-historically for customary activities, cultural stories, as a land marker and training grounds (for youth and coming of age practices), major range lands, and as a significant harvesting area (e.g., roots, berries, and animals).

The ecological reserve is located immediately adjacent to the 19,277 hectare Penticton Indian Band Reserve No. 1. Trout Creek canyon acts as a difficult terrain barrier separating the ecological reserve from the adjacent Indian reserve, but foot access is possible across the canyon at certain locations. The adjacent Indian Reserve points to the importance of the general landscape and overall connection of the pre-historical to present day use of the ecological reserve by First Nations. Subsistence harvesting of flora and fauna does occur within the ecological reserve by First Nations. Supplemental information on the traditional and cultural values of the ecological reserve will be added to the management direction of the ecological reserve as it comes available.

Although there are no recorded archaeological sites within the ecological reserve, there are two recorded sites situated near the ecological reserve’s eastern boundary (i.e., DjQw-7 and DjQw-12). It is highly likely that if archaeological assessments were conducted within the ecological reserve further sites would be revealed.

Since European immigration and settlement in the region, there is indication of past livestock grazing and logging; probably using horses given the narrow imprints on the remnants of old haul-roads within the ecological reserve (Gayton, 2010).

2.4 Recreation Values

The ecological reserve provides opportunities for hiking, wildlife viewing and nature photography, primarily to residents of Summerland and surrounding communities, as well as naturalists groups. The ecological reserve is not well publicized, which keeps use numbers low; however, as the nearby residential population expands, it is predicted visitation will increase.

Boundary signage along the periphery of the ecological reserve is well maintained and livestock fencing (originally erected in 1977) provides increased protection from illegal activities (e.g., off road vehicles).

A short trail leads from an impromptu parking area on the golf course property to the eastern boundary of the ecological reserve. Don Gayton facilitated the construction of a walk through gate at the terminus of the trail at the ecological reserve boundary.

Plate 11: A walk-through gate is located along the eastern boundary of the ecological reserve.

Plate 12: An informal parking area exists at the terminus of the maintenance road for the golf course.

2.5 Research and Education

Trout Creek Ecological Reserve has been the subject of study for a Master of Science thesis (Larmour, 1973), a fire history project (Gayton, 2010), and many years of observations and reports by two successive and very dedicated volunteer ecological reserve wardens. A forest litter and decomposition study took place within the ecological reserve (along with an

additional 27 sites across British Columbia) from 1992 - 1997 and its findings were illustrated in a discussion paper published in 2004 (Prescott, C.E., L.L. Blevins, and C. Staley. 2004)

As the nearest public and protected land of its ecological type to a major urban centre (i.e., Penticton), the ecological reserve serves as an excellent outdoor classroom for school groups.

Plate 13: A Park Ranger installs a long-term ecological monitoring plot in the ecological reserve.

2.6 Climate Change

It is now generally recognized by the scientific community that increasing atmospheric "greenhouse gases" are causing long-term shifts in climate patterns worldwide. In the southern interior of British Columbia, the trend is toward warmer, drier summers and more precipitation in winters (primarily as rain, rather than snow). The exact effects of such climate change on any ecosystem are impossible to predict with a high degree of confidence; and this holds true for the PPxh1 variant in which the ecological reserve is located. More extreme weather events will most likely occur over the landscape.

It is possible, given that this biogeoclimatic zone is already so fundamentally the product of a hot, dry climate, that this particular area is less likely than most in the province to be significantly altered by predicted climate changes. However, it is postulated that grassland extent in the province will increase (more frequent droughts will favour grasses over trees), and that these 'new' grasslands will be predominantly early seral stage[2] and susceptible to invasive, non-native weed species taking hold. Localized climate change effects are predicted to create varied responses by species. The combination of such climate trends along with long-standing policies of wildfire

[2] An early seral stage is commonly known as a pioneer plant community- the first to grow on a site. Early seral stages are highly productive but require large inputs of nutrients and also tend to lose nutrients. Biomass increases, but there is low productivity and fluctuations in biomass are common. These seral stages are dominated by "weedy" species which reproduce quickly, but often die young. Most of their energy goes into reproduction. There are relatively few species in early seral stages.

suppression and resultant significant forest in-growth (see Figure 4) will likely increase the likelihood of a catastrophic fire event, which could create ground conditions for further invasions of non-native plant species.

Plate 14: Past fire history is visible in many areas of the ecological reserve (e.g., standing trees, fallen snags, and fire broken/scarred rock).

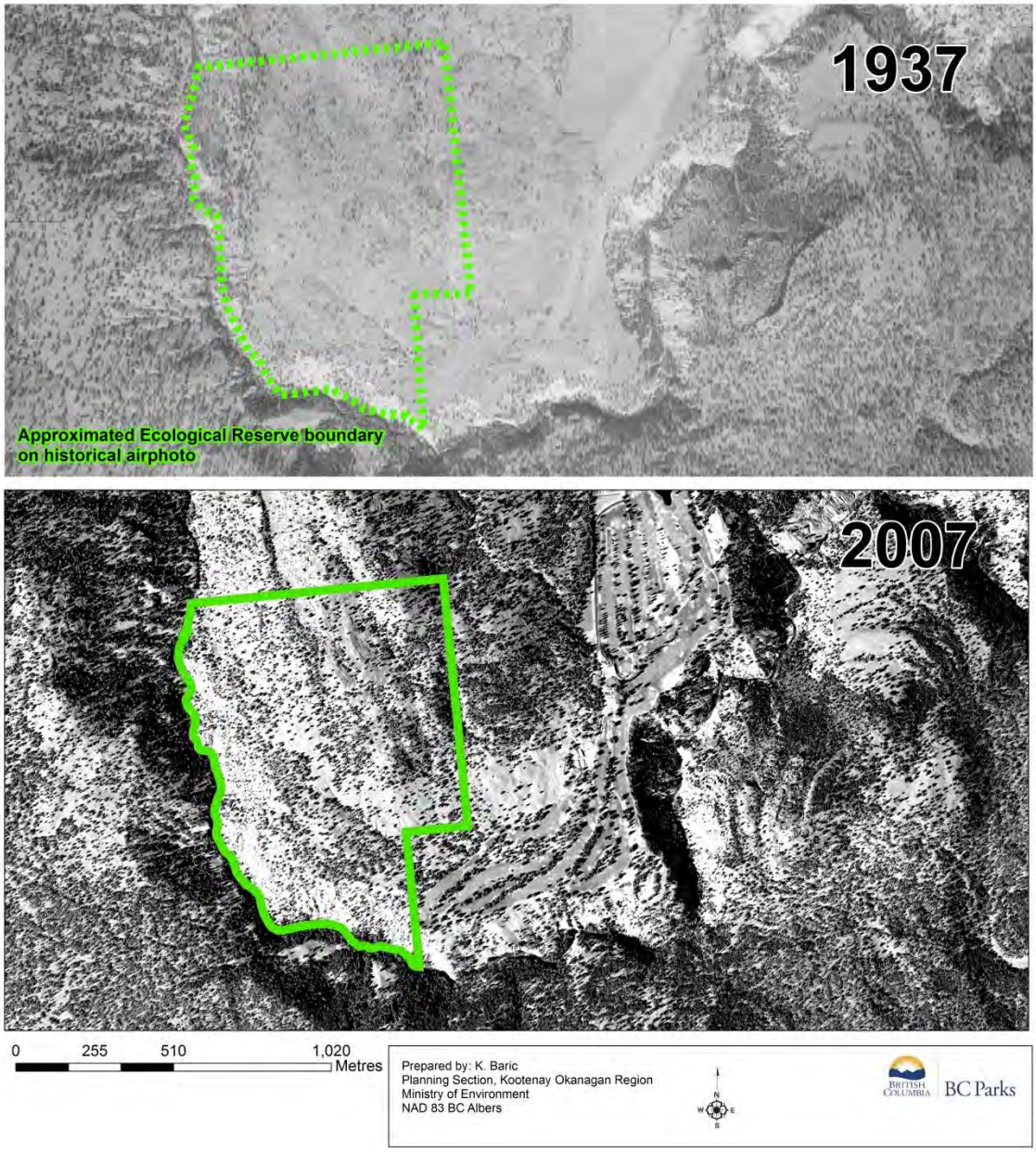

Figure 5: Aerial photo context illustrating forest in-growth over a 70 year period in the area of the ecological reserve.

3.0 Management Direction

3.1 Management Objectives and Strategies

Open Forest Ecosystems

Research conducted by Don Gayton has illustrated that the landscape encompassing the ecological reserve is a fire-maintained ecosystem, perhaps averaging a low-intensity fire event every 25 - 30 years. Two intervals of landscape-scale fires have influenced the ecological reserve's landscape, one in 1845 and the other in 1933. There was a smaller spot fire in the mid-1970s (Gayton 2010).

Because of the ecological reserve's proximity to a populated area, and general provincial policies of active fire suppression, natural fire disturbance patterns have been altered in the ecological reserve and surrounding area. The ecological reserve is currently within the 'natural range of variability' based on stem density of Natural Disturbance Type 4 (frequent stand maintaining fires) for open forests using restoration guidelines for NDT4 systems. However, recent review of air photos has determined an increasing trend in tree density in the ecological reserve, and the time since the last fire is just outside the range of variability for the known fire regime (Gayton 2013). The concern with the current trend, if continued, is the loss of biodiversity values, and the potential for catastrophic wildfire due to excessive loading of fuels.

The risk with a management approach that does not include prescribed fire or mechanical vegetation removal is that the important ecological values present in the ecological reserve such as wildlife trees-snags, mature growth forest, and organic soil could be removed entirely or severely degraded by a high intensity wildfire. Alternatively, in the absence of wildfire or mechanical treatment, increasing tree densification may result in the loss of species that depend on grasslands and open forest environments.

Using prescribed fire as a maintenance activity to retain ecosystem values of the ecological reserve is preferable to restoration activities that require more intrusive methods (e.g., tree removal). Managing for values within the ecological reserve should focus on using a range of ecosystem parameters to determine management activities, and the triggers for those activities. However, pre-burn thinning and fuel modification can be a very useful adjunct to prescribed burns. Furthermore, rather than manage for a single point in time or an 'average' (e.g., fire every 18 years), the emphasis should be placed on managing within the context of the range of known variation using the best available information.

Several non-native, invasive plant species have been identified in the ecological reserve for many years. While not currently spreading very fast, optimum ecosystem functioning

requires invasive species to be kept in check, if not eliminated. Dalmation toadflax is of current management concern; however, biological control which started in the mid-1980s has been very effective at keeping the population of this weed species in check. Mechanical treatment (e.g., hand pulling) by the Ecological Reserve Warden has been targeting such species as sulfur cinquefoil.

Management Objective	Management Strategies
Support open forest ecosystem resilience, maintenance and restoration.	• Implement management actions that support open forest and grassland characteristics, and the range of variation within them, to manage the ecological reserve. These characteristics include, but are not limited to, climate change, fire regime, tree density, tree age class distribution, soils, species composition, beetle infestations, invasive plants, and species at risk. • Complete a study on trends in forest age-class distribution and tree density. • Explore research/modelling opportunities with academic institutions that assess climate change scenarios, risks and impacts to guide ecosystem management work within the ecological reserve. • Collaborate with other agencies administering adjacent natural areas (e.g., Penticton Indian Band, District of Summerland, and the ministry responsible for forests and range) to extend these ecosystem management efforts across the broader landscape. • Encourage the District of Summerland to rezone (via district by-laws) the area within and surrounding the ecological reserve as protection/preservation instead of forestry/grazing in an effort to harmonize future land uses and to ensure that future land uses are complementary to the ecological reserve's values. • Utilize community outreach to engage and inform the public about the advantages of ecosystem-based management (e.g., wild land urban interface fire). • Maintain existing sites for Long Term Ecological Monitoring (LTEM) plots within the ecological reserve. • Develop a fire management plan for the ecological reserve; with emphasis on ensuring high value open

	forest ecosystem characteristics are not adversely affected by future suppression activities.
Reduce, suppress or eliminate non-native plant species.	• Continue to document and inventory occurrences of knapweed, sulphur cinquefoil, Dalmatian toadflax, baby's breath and any other invasive species into the provincial Alien Invasive Plant Program Application (IAPP). • Control invasive plants by release of biological control agents, mechanical removal, or targeted chemical treatments. Treatment options may be dependent on adjacent land values and perceptions (e.g., biological control versus chemical control). • Liaise with adjacent land managers to coordinate efforts to remove and prevent further spread of non-native species. • Incorporate invasive plant management into restoration planning to reduce establishment and spread of invasive plants.

Species at Risk

The ecological reserve contains several flora and fauna species at risk and has potential for others. Recent species occurrence records are anecdotal observations based on field reports submitted by the ecological reserve wardens over the past several decades, while the most comprehensive studies/inventories date back to the early 1970s. Several gaps exist in species at risk inventories, and many of the older inventories have not been revisited to confirm species occurrence/location. Reptile and invertebrate surveys and inventories are lacking, as is an assessment for species at risk which occur in the riparian areas of the ecological reserve (as most of the past surveys and monitoring have been focused on the upland portion).

Because of its proximity to Summerland, there is occasional recreation use within the ecological reserve. Visitor use has the potential to disrupt and degrade species at risk values and habitat (e.g., smoking on trails leading to wildfire, off-trail use, dogs off leash).

Management Objective	Management Strategies
Improve information on species at risk, their occurrence and	• Encourage researchers (e.g., graduate students from local post-secondary institutions) and provincial/federal government research branches to

habitat needs.	set up ongoing studies within the ecological reserve. • Encourage the mentorship and administrative support of the current Ecological Reserve Warden. • Create signage (at known points of public entry) that encourages visitors to record their observations and submit them to BC Parks (via the Wildlife Species Inventory website). • Maintain up to date information in the Conservation Risk Assessment (CRA) database for the ecological reserve. • Ensure ongoing monitoring both in upland and riparian portions of the ecological reserve as a response to changing climatic patterns.

Adjacent Land Use and Impacts

The ecological reserve borders provincial Crown land, Penticton Indian Band Reserve No. 1 and a popular golf course. A large tract of Crown land that lies between the ecological reserve and Mount Conkle Park (District of Summerland) contains values (e.g., habitat connectivity) that are complementary to the ecological reserve and could potentially be a suitable candidate for future park protection (provincial or municipal).

Management Objectives	Management Strategies
Increase BC Parks' awareness of activities peripheral to the ecological reserve.	• Liaise with adjacent property/land use managers as to proposed or current activities that may affect the integrity of the ecological reserve. • Regularly inspect fences and repair promptly as required. • Consider placing a *Land Act* Notation of Interest on the Crown lands that are located between Mount Conkle Park (District of Summerland) and the ecological reserve. • Ensure maintenance and operation funding (e.g., fence repair and upkeep) for the ecological reserve and its volunteers/stewardship groups. • Promote wildland/urban interface fire outreach.

Recreational Use

The ecological reserve is open to foot access only and current use of the ecological reserve for low impact recreational activities is curtailed by limited knowledge by the general public about its existence. Most use of the ecological reserve is by members of the local community who use it for day hiking and naturalists clubs that are familiar with its unique values. A primary access trail to the ecological reserve begins on the golf course property (see Figure 2 and Plate 11). A walk-through passage is located on the eastern fence line of the ecological reserve; however, the main access trail becomes undefined within the ecological reserve. The golf course operators do not restrict access to the ecological reserve.

As the residential community expands there may be additional recreational pressure placed on the ecological reserve, which may result in *ad hoc* trail development and other non-conforming uses (e.g., off road vehicles, mountain biking, and dogs off leash).

Management Objectives	Management Strategies
Monitor and minimize the impact of human visitation in the ecological reserve.	• Maintain signs identifying the ecological reserve along the boundary fence. • Continue to work with the golf course owners to ensure that public access is permitted but that visitors to the ecological reserve are aware of the risks involved by traversing the golf course and utilize specific routes/parking areas. • Consider installation of a discreet foot traffic counter at the walk-through gate to monitor use trends. • Consider adding more informative/interpretive signage if visitation increases and as funding allows. • Continue to allow foot access only and limited to existing routes only. Do not allow for off-road vehicles or mountain bikes. • Continue to prohibit dogs off leash.

Cultural Heritage

Although there are no known archaeological sites within the ecological reserve there are two recorded sites within close proximity to the ecological reserve's boundary. It is highly probable that cultural heritage features associated with First Nations use are contained within the ecological reserve. Future fire management strategies and ecosystem restoration could negatively affect currently unknown cultural heritage/archaeological values (e.g., culturally modified trees).

The ecological reserve's southerly border is shared with the Penticton Indian Band Reserve No. 1, and as such presents opportunities to collaborate with First Nations on achieving complementary land use objectives.

The Penticton Indian Band has a strong cultural and traditional connection to the ecological reserve. A current project (*Okanagan/Syilx Traditional Ecological Knowledge Keeper Initial Enquiry*) being undertaken by the Penticton Indian Band involves an abridged traditional ecological knowledge study that will greatly assist future management of the ecological reserve. The enquiry has identified several areas of interest/issues which the Penticton Indian Band views as important to the ongoing management of the ecological reserve (e.g., absence of wildfire, water quality-connectivity, water diversions, and ground water replenishment, boundary obstructions, unauthorized dumping, fencing as a barrier to migration and biodiversity corridors, off-road vehicle use/noise pollution, hunting outside of the ecological reserve, and invasive plant management).

Management Objectives	Management Strategies
Protect cultural heritage values existing within the ecological reserve and work collaboratively with First Nations in management of the ecological reserve.	• Perform historical and ethnographic research (e.g., archaeological investigation/assessments). • Identify threats to cultural heritage values and implement protective measures that ensure sensitive sites are not impaired by land use activities (e.g., ecosystem restoration, prescribed fire management). • Liaise with the Penticton Indian Band, and any other First Nations band/association which expresses interest, on the management of the ecological reserve. • With respect to the adjacent Indian reserve, provide avenues of communication with the Penticton Indian Band and BC Parks so that activities over the landscape do not negatively affect each other's interests. • Continue to source funding mechanisms and explore opportunities to facilitate research that builds upon traditional ecological knowledge, and the cultural and spiritual values relevant to the ecological reserve.

4.0 Plan Implementation

4.1 Implementation Plan

BC Parks will seek project-specific funding and partners to implement high priority strategies. Specific projects will be evaluated for their priority in relation to the overall protected areas system. Many of the initiatives contemplated are not funded as part of core BC Parks activities so jointly seeking funds or outside partners will be a key aspect of the management plan implementation.

4.2 High Priority Strategies

- Implement management actions that support open forest and grassland characteristics, and the range of variation within them, to manage the ecological reserve. These characteristics include, but are not limited to, fire regime, tree density, tree age class distribution, soils, species composition, beetle infestations, invasive plants, and species at risk.
- Complete a study on trends in forest age-class distribution and tree density.
- Explore research/modelling opportunities with academic institutions that assess climate change scenarios, risks and impacts to guide ecosystem management work within the ecological reserve.
- Encourage the District of Summerland to rezone (via district by-laws) the area within and surrounding the ecological reserve as protection/preservation instead of forestry/grazing in an effort to harmonize future land uses and to ensure that future land uses are complementary to the ecological reserve's values.
- Consider placing a *Land Act* Notation of Interest on the Crown lands that are located between Mount Conkle Park (District of Summerland) and the ecological reserve.
- Control invasive plants by release of biological control agents, mechanical removal, or targeted chemical treatments.
- Encourage researchers (e.g., graduate students from local post-secondary institutions) and the provincial/federal government research branches to set up ongoing studies within the ecological reserve.
- Develop a fire management plan for the ecological reserve; with emphasis on ensuring high value open forest ecosystem characteristics are not adversely affected by future suppression activities should they occur.
- Continue to source funding mechanisms and explore opportunities to facilitate research that builds upon traditional ecological knowledge, and the cultural and spiritual values relevant to the ecological reserve.

4.3 Plan Assessment

In order to ensure that the management direction for Trout Creek Ecological Reserve remains relevant and effective, BC Parks staff will ensure that the management plan is assessed by BC Parks staff on a regular basis (i.e., at least every 5 years). Minor administrative updates may be identified and completed at any time (e.g., update protected area details where needed), and will be documented according to BC Parks guidelines. If an internal assessment reveals that the management plan requires updating or substantial new management direction is needed, a formal review by BC Parks may be initiated to determine whether the plan requires an amendment or if a new plan is required.

5.0 References

Alcock, Wade. 2006. Invasive Plant Inventory in Parks and Protected Areas of the Okanagan Region. Ministry of Environment (Environmental Stewardship Division).

Gayton, Don. 2010. Trout Creek Ecological Reserve Fire History Project (A Report for the Okanagan-Shuswap Ecological Restoration Committee. Forrex.

Gayton, Don. 2013. Preliminary Forest Cover Assessment Trout Creek Ecological Reserve. Forrex.

Eneas, Chad. Penticton Indian Band – Request for Okanagan (Syilx) Traditional Ecological Knowledge Keeper (TEK) Initial Enquiry. 2016.

Halstead, H.C. Trout Creek Pilot Study (Ground Water Support). 1972. Province of BC. 1972.

Heibert, Jeremy. 2011. Trout Creek Ecological Reserve (Photos by Jeremy Hiebert).

Larmour, S.D. 1973. A Vegetation Description of Two Ecological Reserves in the Interior of BC. Department of Botany. University of Regina.

Ministry of Environment. Conservation Risk Assessment for Trout Creek Ecological Reserve. 1999.

Sirk, G. and L. Bayliss. 1977. Ecological Reserve No. 7 Trout Creek: Report on the fencing of the reserve and weather, flora and fauna observations. Ecological Reserves Unit, Province of BC.

6.0 Appendix 1

The following is a list of plant species found in Trout Creek Ecological Reserve. It combines the work of Larmour (1973), Conservation Risk Assessment data, and observations/records from ecological reserve wardens.

Scientific name	Common name
Acer glabrum	Douglas maple
Achillea millefolium	yarrow
Achnatherum occidentale	stiff needlegrass
Agoseris glauca	short-beaked agoseris
Amelanchier alnifolia	saskatoon
Antennaria corymbosa	flat-top pussytoes
Antennaria dimorpha	low pussytoes
Antennaria parviflora	Nuttall's pussytoes
Antennaria rosea	rosy pussytoes
Antennaria umbrinella	umber pussytoes
Apocynum androsaemifolium	spreading dogbane
Aristida longiseta	red threeawn
Arnica sororia	twin arnica
Artemisia campestris	northern wormwood
Artemisia dracunculus	tarragon
Artemisia frigida	prairie sagewort
Artemisia tridentata	big sagebrush
Asclepias speciosa	showy milkweed
Asparagus officinalis	garden asparagus
Astragalus collinus	hillside milkvetch
Astragalus miser	timber milkvetch
Astragalus purshii	wollypod milkvetch
Astragalus sclerocarpus	Dalles milkvetch
Balsamorhiza sagittata	arrowleaf balsamroot
Boechera retrofracta	dangling suncress
Boletus edulis	king bolete
Brickellia oblongifolia	narrow-leaved brickellia
Bromus tectorum	cheatgrass
Calamagrostis rubescens	pinegrass
Calochortus macrocarpus	sagebrush mariposa lily
Capsella bursa-pastoris	shepherd's purse
Castilleja thompsonii	Thompson's paintbrush
Ceanothus sanguineus	redstem ceanothus
Centaurea diffusa	diffuse knapweed

Chaenactis douglasii	hoary false yarrow
Chenopodium fremontii	Fremont's goosefoot
Chenopodium leptophyllum	narrow-leaved goosefoot
Cirsium undulatum	wavy-leaved thistle
Cladonia fimbriata	powdered trumpet
Cladonia pyxidata	pebbled pixie-cup
Clematis ligusticifolia	white clematis
Comandra umbellata v. pallida	pale comandra
Coscinodon calyptratus	steppe mouse-moss
Crepis atrabarba	slender hawksbeard
Dactylis glomerata	orchardgrass
Delphinum nuttallianum	upland larkspur
Descurainia pinnata	western tansy mustard
Eleagnus commutata	silverberry, wolf willow
Elymus cinereus	basin wildrye
Epilobium angustifolium	fireweed
Epilobium brachycarpum	tall annual willowherb
Ericameria nauseosa	common rabbit-brush
Erigeron divergens	diffuse fleabane
Erigeron filifolius	threadleaf fleabane
Erigeron pumilus	shaggy fleabane
Eriogonum heracleoides	parsnip-flowered buckwheat
Eriogonum niveum	snow buckwheat
Festuca campestris	rough fescue
Festuca idahoensis	Idaho fescue
Festuca saximontana	Rocky Mountain fescue
Gaillardia aristata	brown-eyed Susan
Geum triflorum	old man's whiskers
Grimmia affinis	No common name
Gypsophila paniculata	baby's breath
Hesperostipa comata	needle-and-thread grass
Heterotheca villosa	Golden-aster
Heuchera cylindrica	round-leaved alumroot
Ipomopsis aggregata	scarlet gilia
Juniperus scopulorum	Rocky Mountain juniper
Koeleria macrantha	junegrass
Lactuca serriola	prickly lettuce
Lappula occidentalis	flatspine stickseed
Lepidium campestre	field pepper-grass
Lepidium densiflorum	prairie pepper-grass
Lesquerella douglasii	Columbia bladderpod
Letharia vulpina	timber wolf

Lewisia rediviva	bitterroot
Linanthus pungens	prickly phlox
Linaria genistifolia	Dalmatian toadflax
Lithophragma parviflorum	small-flowered woodland star
Lithospermum ruderale	lemonweed
Lomatium dissectum	fern-leaved desert-parsely
Lomatium geyeri	Geyer's desert-parsley
Lomatium macrocarpum	large fruited desert parsley
Mahonia aquifolium	tall Oregon grape
Medicago sativa	alfalfa
Microseris nutans	nodding microseris
Opuntia fragilis	brittle prickly pear cactus
Peltigera canina	dog pelt
Penstemon fruticosus	shrubby penstemon
Phacelia hastata	silverleaf phacelia
Phacelia linearis	threadleaf phacelia
Philadelphus lewisii	mock-orange
Pinus ponderosa	ponderosa pine
Plantago patagonica	woolly plantain
Poa bulbosa	bulbous bluegrass
Poa compressa	Canada bluegrass
Poa pratensis	Kentucky bluegrass
Poa secunda	Sandberg's bluegrass
Polygonum douglasii	Douglas' knotweed
Potentilla recta	Sulphur cinquefoil
Pseudotsuga menziesii	Douglas-fir
Pseudoregneria spicata	bluebunch wheatgrass
Pyrocomma carthamoides	Columbia goldenweed
Pyrola asarifolia	pink wintergreen
Ranunculus glaberrimus	sagebrush buttercup
Rhinanthus minor	Yellow rattle
Rhytidiadelphus triquetris	electrified cat's tail moss
Ribes cereum	waxy currant
Rosa woodsii	prairie rose
Selaginella densa	compact selaginella
Selaginella wallacei	Wallace's selaginella
Silene antirrhina	sleepy catchfly
Silene douglasii	Douglas' campion
Sporobolus cryptandrus	sand dropseed
Stephanomeria tenuifolia	narrow-leaved stephanomeria
Symphoricarpus albus	common snowberry
Taraxacum officinale	common dandelion
Tortula ruralis	sidewalk moss

Tragopogon dubius	yellow salsify
Verbascum thapsus	mullein
Vulpia octoflora	six weeks fescue
Woodsia scopulina	mountain cliff fern
Zigadenus venenosus	meadow deathcamas

The following is a list of non-native weed species found in Trout Creek Ecological Reserve. An asterisk (*) indicates that the plant is invasive/noxious

Alyssum desertorum	desert alyssum
Asparagus officinalis	garden asparagus
Bromus tectorum	Cheatgrass*
Capsella bursa-pastoris	shepherd's purse
Centaurea diffusa	diffuse knapweed*
Dactylis glomerata	orchardgrass
Gypsophila paniculata	baby's breath*
Lactuca serriola	prickly lettuce
Lepidium campestre	field pepper-grass
Linaria genistifolia	Dalmatian toadflax*
Medicago sativa	alfalfa
Poa bulbosa	bulbous bluegrass*
Poa compressa	Canada bluegrass
Poa pratensis	Kentucky bluegrass
Potentilla recta	Sulphur cinquefoil*
Taraxacum officinale	common dandelion
Tragopogon dubius	yellow salsify
Dactylis glomerata	orchardgrass
Gypsophila paniculata	baby's breath*
Lepidium campestre	field pepper-grass
Medicago sativa	alfalfa
Potentilla recta	Sulphur cinquefoil*
Verbascum thapsus	mullein

The following is a list of animals (vertebrates) found in Trout Creek Ecological Reserve. Common names are followed by scientific names.

Mammals

Coyote *Canis latrans*
Chipmunk *Neotamias minimus*
Mule Deer *Odocoileus hemionus*
American Black Bear *Ursus americanus*

Birds

American Crow *Corvus brachyrhynchos*
American Goldfinch *Carduelis tristis*
American Kestrel *Falco sparverius*
American Pipit *Anthus rubescens*
American Robin *Turdus migratorius*
Bald Eagle *Haliaeetus leucocephalus*
Black-billed Magpie *Pica hudsonia*
Black-capped Chickadee *Poecile atricapillus*
Brewer`s Blackbird *Euphagus cyanocephalus*
Brown Creeper *Certhia americana*
Brown-headed Cowbird *Molothrus ater*
Bullock`s Oriole *Icterus bullockii*
California Quail *Callipepla californica*
Calliope Hummingbird *Selasphorus calliope*
Cassin`s Finch *Haemorhous cassinii*
Cassin's Vireo *Vireo cassinii*
Cedar Waxwing *Bombycilla cedrorum*
Chipping Sparrow *Spizella passerina*
Chukar *Alectoris chukar*
Clarke's Nutcracker *Nucifraga columbiana*
Common Nighthawk *Chordeiles minor*
Common Poorwill *Phalaenoptilus nuttallii*
Common Raven *Corvus corax*
Cooper's Hawk *Accipiter cooperii*
Dark-eyed Junco *Junco hyemalis*
Dusky Flycatcher *Empidonax oberholseri*
Dusky Grouse *Dendragapus obscurus*
Eastern Kingbird *Tyrannus tyrannus*
European Starling *Sturnus vulgaris*
Evening Grosbeak *Coccothraustes vespertinus*
Golden Eagle *Aquila chrysaetos*
Golden-crowned Kinglet *Regulus satrapa*
Gray Flycatcher *Empidonax wrightii*
Gray-crowned Rosy Finch *Leucosticte tephrocotis*
Hairy Woodpecker*Picoides villosus*
Horned Lark *Eremophila alpestris*
House Finch *Haemorhous mexicanus*
House Wren *Troglodytes aedon*
Lewis's Woodpecker *Melanerpes lewis*
Merlin *Falco columbarius*
Mountain Bluebird *Sialia currucoides*

Mountain Chickadee *Poecile gambeli*
Mourning Dove *Zenaida macroura*
Northern Flicker *Colaptes auratus*
Northern Goshawk *Accipiter gentilis*
Northern Harrier *Circus cyaneus*
Northern Pygmy Owl *Glaucidium gnoma*
Northern Rough-winged Swallow *Stelgidopteryx serripennis*
Olive-sided Flycatcher *Contopus cooperi*
Osprey *Pandion haliaetus*
Pacific Wren *Troglodytes pacificus*
Pileated Woodpecker *Dryocopus pileatus*
Pine Grosbeak *Pinicola enucleator*
Pine Siskin *Spinus pinus*
Pygmy Nuthatch *Sitta pygmaea*
Red Crossbill *Loxia curvirostra*
Red-breasted Nuthatch *Sitta canadensis*
Red-naped Sapsucker *Sphyrapicus nuchalis*
Red-tailed Hawk *Buteo jamaicensis*
Rock Wren *Salpinctes obsoletus*
Ruby-crowned Kinglet *Regulus calendula*
Ruffed Grouse *Bonasa umbellus*
Rufous Hummingbird *Selasphorus rufus*
Sharp-shinned Hawk *Accipiter striatus*
Spotted Towhee *Pipilo maculatus*
Steller's Jay *Cyanocitta stelleri*
Swainson's Hawk *Buteo swainsoni*
Swainson's Thrush *Catharus ustulatus*
Townsend's Solitaire *Myadestes townsendi*
Townsend's Warbler *Setophaga townsendi*
Tree Swallow *Tachycineta bicolor*
Varied Thrush *Ixoreus naevius*
Vaux's Swift *Chaetura vauxi*
Vesper Sparrow *Pooecetes gramineus*
Violet-green Swallow *Tachycineta thalassina*
Western Bluebird *Sialia mexicana*
Western Meadowlark *Sturnella neglecta*
Western Tanager *Piranga ludoviciana*
Western Wood Peewee *Contopus sordidulus*
White-breasted Nuthatch *Sitta carolinensis*
White-throated Swift *Aeronautes saxatalis*
Yellow-rumped Warbler *Setophaga coronata*

Reptiles

Northern Rubber Boa *Charina bottae*
North American Racer *Coluber constrictor*
Western Rattlesnake *Crotalus oreganus*
Gopher Snake *Pituophis catenifer deserticola*
Western Terrestrial Garter Snake *Thamnophis elegans*
Common Garter Snake *Thamnophis sirtalis*