The South Okanagan-Similkameen Park Proposal Through a SES Lens

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Abbreviations

BC	Province of British Columbia
CPAWS	Canadian Parks and Wilderness Society
ONA	Okanagan Nations Alliance
ORV	Off-road vehicle
SARA	Species at Risk Act
SES	Social-ecological System
SOS	South Okanagan-Similkameen
SOSNPN	South Okanagan-Similkameen National Park Network
SOSNPR	South Okanagan-Similkameen National Park Reserve

1. Introduction

The proposition to create a new national park protecting the grasslands and forests of the South Okanagan Similkameen (SOS) region has been an issue of ongoing debate over the past twelve years. While the proposal has benefited from strong commitment and investment of resources on the part of Parks Canada, local First Nations, and various other supporters, it has so far been effectively blocked as the result of protest efforts by opponent groups who succeeded in dissuading the Province of British Columbia to proceed. Such groups have expressed concerns associated with the increased restrictions on hunting and the use of off-road-vehicles, as well as the loss of grazing tenures that would accompany park implementation.

Currently, the national park proposal is experiencing a surge of local and political support through the efforts of a number of organized advocacy groups. This paper seeks to contribute to current debates over the SOS park proposal by considering the potential impacts of the proposed park when seen through a social-ecological systems (SES) lens. Rather than reinforcing the oft-discussed dichotomy of social versus environmental benefits, the aim of this paper is to investigate the synergies between social groups and ecological components of the SOS region.

The South Okanagan Similkameen contains a unique and highly threatened ecosystem in Canada, whose protection would be mandated through the proposed national park. The first section of this paper provides a brief history of the park process and key stakeholders throughout. It then looks at the discourse around three stakeholder groups in order to consider social equity in relation to park implementation. This is followed by an overview of the unique ecological features of the South Okanagan Similkameen and the threats facing them. The final section presents scenarios of 1) maintaining the status quo, exploring the ways in which the proposed park area is already experiencing negative social and ecological consequences from drivers of change; and 2) park creation through an integrated SES lens, linking alternative biophysical drivers of change to multiple scales, with an emphasis on grassland restoration. The report concludes that the effective restoration of grasslands through the establishment of a national park could result in increased social and ecological prosperity in the region, with more stakeholders benefiting from park implementation than losing from it.

2. Park Proposal Process & Main Actors

The proposal process for the SOSNPR has been a lengthy one, involving expenditures in the millions of dollars by Parks Canada, and the advocacy efforts of many nonprofit, business, and community groups. The process started in 2002 when Jean Chrétien visited the area was convinced of the need for a park. Accordingly, in 2003 the federal and provincial governments

signed a memorandum of understanding on studying the feasibility of the park, and a steering committee and working group were established; feasibility study work started in 2004.

In 2006, an initial park concept was published by Parks Canada and the first round of consultations was conducted: the proposal was for a 600 sq. km park in three major areas, one of which was discontiguous. This proposal did not garner the support of the Okanagan Nations Alliance (ONA), in part because it included within its boundaries the Snowy Protected Area, a provincially designated protected area that allows hunting. By 2008 Parks Canada had finished a socio-economic assessment of creating a park, which found that significant positive outcomes would likely result over the next several decades, and that residual negative impacts would not be significant in any area after mitigation measures. In 2010 Parks Canada published a new feasibility study and park concept, with two distinct areas (Northern Vaseux Lake and Southern Grassland) totaling 284 sq. km and consisting of approximately equal parts provincial parks, crown land, and private land.

The revised Park Concept focused on the protection of the lower elevation grasslands where species diversity is highest and most at risk. The size of the park was reduced by more than half in order to placate concerns of hunters, Off Road Vehicle Users (ORVers), and First Nations; Snowy Protected Area was not included in the new park proposal. The study included an innovative plan for allowing some grazing activity to continue on the parkland coupled with adaptive management of rangeland, and acquisition of private ranches within the proposed borders of the park on a willing-buyer-willing-seller basis.

Advocacy on both sides ensued. On the anti-park side, signs advocating against the park went up along highways. A group called the Grassland and Park Review Coalition led the opposition, releasing a long list of criticisms, ranging from concerns over exclusion of hunting and ORV access, to increases in wildlife damage to nearby agriculture and negative economic impacts. On the side of proponents, 233 scientists led by Dr. Kai Chan at the University of British Columbia signed a letter in 2011 urging the province to "move forward on an urgent basis" to protect a representative sample of British Columbia's (BC) dry and ecologically diverse Interior plateau. The anti-park efforts successfully created the impression that the vast majority of locals were in opposition to the national park, prompting the BC government to halt the park process in 2012. This despite 2:1 ratios of support:opposition in surveys carried out in 2008 and 2010 (Parks Canada 2010, Western Canada Wilderness Committee, 2010). Parks Canada was obliged to shelve its plans pending a renewal in provincial cooperation (CBC news, 2012).

Concurrently, the ONA, which represents seven member nations in the Syilx language group, was working on its own feasibility study, which was released in 2013. While the ONA had not been a longstanding supporter of the national park plan, their engagement with Parks Canada over several years and their feasibility study process brought them around to support the park's

creation (Richard Carson, personal communication, November 2014; Okanagan Nations Alliance Syilx Working Group, 2012).

In 2014, there was a surge of renewed advocacy in favor of the SOSNPR through several Non Governmental Organizations (NGOs), community groups and business-oriented groups. A petition campaign has been spearheaded by the Canadian Parks and Wilderness Society (CPAWS), and local advocacy has been led through the South Okanagan-Similkameen National Park Network (SOSNPN). The town of Osoyoos led by Mayor Stu Wells sponsored a successful motion at the Union of British Columbia Municipalities supporting the park. In addition, several chambers of commerce and the Thompson Okanagan Tourism Association (representing thousands of businesses) have supported the park's creation. Moreover, a 2015 poll commissioned by the SOSNPN indicates growing support for the park over the last 5 years, with 3:1 ratios of support:opposition (McAllister Opinion Research, 2015).

In November 2014, the Provincial Finance Committee, composed mostly of BC Liberals, and chaired by Penticton MLA Dan Ashton, called on the BC government to resume talks with the federal government and local stakeholders around the creation of the national park, possibly signaling an opening for the province to change its position.

3. A Parks vs. People Narrative in the South Okanagan Similkameen

3.1 Exclusion and Social Equity in Conservation Processes

The potential exclusion of local peoples in the park creation process is an issue worthy of attention. Such exclusion has deep ideological roots in Western thought dating back to the British Romantics and carrying through to modern conservation practices (see Appendix 2). Centuries of violent practices towards local and often Indigenous peoples who inhabit the areas that conservationists propose to turn into parks have been extensively studied. In many park processes throughout history, local peoples have been either excluded or vilified. Preserving biodiversity has been posited as being in opposition to the welfare of local peoples who may depend on the land for cultural, physical, economic, and spiritual well being. As such, it is important to investigate what non-equitable distribution of impacts and benefits may occur and seriously examine claims of negative impacts on specific groups.

Groups opposing the park have effectively constructed a public narrative that has so far succeeded in blocking further progress on its creation. Through our reading of local journalism, this popular narrative is one of environmentalists vs. locals; nature conservation vs. people. In the context of historical exclusion of local and vulnerable groups in the creation of national parks, such a narrative is not implausible. This section analyses the position of three main

stakeholder groups in relation to such a narrative: recreational hunters & ORV users, ranchers, and First Nations. The social equity and political position of these groups are assessed in order to situate them in relation to this historically poignant narrative.

3.2 Stakeholder Narratives: Hunters & ORVers, Ranchers, First Nations

3.2.1 Hunters & ORVers

In accordance with Parks Canada's regulations, recreational hunting will be banned in the new park as will recreational use of ORVs (Parks Canada, 2010). Parks Canada has explicitly treated hunting and ORVing in their socio-economic assessment, concluding that effects on these activities were negative or indeterminate but not significant (Parks Canada, 2010).

The BC government allows hunting based on a species management system, involving license sales and the collection of royalties per animal hunted. Currently, there are roughly 350 licenses issued to active sport hunters in the area per year (BC Parks, 2014). Traditional hunting by First Nations will be allowed in certain areas next to the proposed area of the park after negotiation and a participatory planning process with the ONA. According to BC Parks' website, there are three nearby areas where hunting is allowed: White Lake Grassland Protected Area, the Snowy Protected Area, and the Skaha Bluffs Provincial Park, all located about 20-40 km away from the area of the proposed Okanagan-Similkameen Park.

BC is the one of the last provinces in Canada to implement mandatory registration of ORVs (CBC News, 2014). The registered number of ORVs in BC in 2013 was 19,500, but due to the heretofore lack of mandatory registration, estimates are nearer to 200,000 (BC Government, 2014 a & b; Statistics Canada, 2014a & b). New regulations for registration through the Insurance Corporation of British Columbia starting June 2015 will increase accountability, and make it harder to use ORVs illegally and in ways that are environmentally damaging. Nonetheless, recreation ORV use will not be allowed in the national park.

However, recreational ORV users would be able to continue to use nearby areas, such as the Keremos-Princeton trail that is located next to the proposed area of the park (ATV Riders Resource, 2014).

In contrast, businesses that offer ORV guided tours in the proposed park areas may be more severely affected. There are at least two companies that offer ORV tours in the area: one in Kelowna, and one in Osoyoos (Osoyoos Boat Rentals ATV Tours, 2014; Okanagan ATV Tours, 2014). The ORV tour business in Osoyoos explicitly mentions in its website that they take visitors to Mt. Kobau which is located inside the territory of the proposed park (Osoyoos Boat Rentals ATV Tours, 2014). Consultation with the handful of recreation businesses that use the proposed park area should be conducted to assess their ability to keep running using alternative areas.

Hunters and recreational ORV users have been positioned in the media as the recreational users in strongest opposition to the park. Yet until recently, empirical data on the extent of their opposition in comparison to the rest of the local population was lacking. A 2015 poll commissioned by the SOSNPN and carried out by McAllister Opinion Research conductedtelephone interviews with 501 persons in the three local ridings. Out of these, 22% reported that they hunt, and 23% reported that they use ATVs or snowmobiles. Of the people self-identified in these groups, 70% and 67% are in favor of the national park, respectively, compared to 69% in favor from the whole sample. This recent polling data, in combination with Parks Canada's engagement with assessing and mitigating negative impacts on these forms of recreation indicate that the highly vocalized "parks vs. local people" narrative does not accurately represent the relationship of the two groups to the actual national park proposal.

3.2.2 Ranchers

Ranchers working in the area of the park have been positioned on both sides of the national park debate. Rancher's livelihood practices cause impacts on more pristine environments. Yet, their presence also functions to protect open "working landscapes" from permanent development of built environments (Brunson and Huntsinger, 2011). The preservation of contiguous open landscape through conservation has been expressed by Ace Elkink, one well-known rancher who owns land in the proposed park area (Osoyoos Times, 2014c). Ace Elkink has already sold some of his land to the Nature Conservancy of Canada, and would be willing to sell more to Park Canada (Osoyoos Times. 2014c). Conversely, the park's opponents, led by Greg Norton under the banner of the Grassland and Park Review Coalition, are opposed to any reduction in grazing tenure (Osoyoos Times, 2014c).

There are twelve ranching tenures in the proposed park area, five of which would be most affected by the proposed park area (Parks Canada, 2010). Currently, Parks Canada's policy for acquiring active ranchland is purchase on a willing-buyer willing-seller basis, with the aim of buying a few of the larger private ranches, and retiring grazing tenures on part of the Crown land (Parks Canada, 2010). In other areas, grazing would continue under an adaptive management framework.

Parks Canada has recognized the importance of preserving the cultural heritage of ranching, and states in the 2010 park feasibility study that it will adopt an "adaptive management framework that supports continued livestock grazing in the park concept area in a manner consistent with ecological objectives and park values". The adaptive management approach (see section 5.4 below) is meant to incorporate input from scientists, First Nations, and the ranching sector on an ongoing basis to form an evolving and flexible set of rules. According to Parks Canada, their engagement with ranchers has shows support for revisions in the park concept, including the decisions to allow grazing in the park, the smaller proposed park area, and the adaptive management approach. A 2015 poll of 501 households in three local ridings had 13% of respondents report that they operate a ranch or farm as a business. Of these, 79% supported the

national park, the highest rate of any other other interest group (McAllister Opinion Research, 2015).

Due to to the small number of ranchers affected, their ongoing engagement with Parks Canada, the high level of support from farmers and ranchers polled, and the expressed support of one prominent rancher within the proposed park, we conclude that this stakeholder group does not fall neatly into a "nature conservation vs. local people" narrative. This group appears to be relatively empowered and has experienced inclusion in both official and media channels.

3.2.3 First Nations

The Okanagan Nations Alliance have not been longstanding supporters of the park (Richard Carson, personal communication, November 2014). Yet several years of engagement with Parks Canada, the park concept revision process, and the preparation of their own feasibility study have culminated in the ONA's tentative support for the park proposal (Okanagan Nations Alliance Syilx Working Group, 2012). Their continued support pends negotiation on co-management with Parks Canada and doesn't imply any compromise for future deals on rights and title; despite these caveats, they expressed willingness to more forward (Okanagan Nations Alliance Syilx Working Group, 2012).

The Syilx people have experienced the devastating results of colonialism and discrimination since the arrival of European settlers on their lands. As recollected by four elders, changes to Syilx communities in the Okanagan have been inextricably bound with the removal of access to natural resources, starting with water, which were first appropriated and then degraded by settlers (Blackstock and McAllister 2004). Elder's memories of the land, flora, fauna and their cultural significance provide critical information to any historical reconstruction of the area. The values and meaning associated with the above are similarly important in order to envision any future restoration (Blackstock and McAllister, 2004).

Parks Canada has engaged extensively with the ONA in order to incorporate their values, knowledge, and history into the national park process (Parks Canada 2010). While the ONA, like many other Indigenous groups have a long history of disenfranchisement by appropriation of natural resources by settlers (including by nature conservation projects, see appendix 2), their current support of the park concept is perhaps a signal of a changing relationship with conservation authorities (Parks Canada in this case). A national park is one way that the ONA sees opportunities to preserve and enhance their material, cultural, and spiritual wellbeing, through co-management with Parks Canada (Okanagan Nations Alliance Syilx Working Group, 2012).

3.2.4 Park Opposition: Equity and Exclusion

From an informal analysis of media articles covering the issue, it would appear that the main group in opposition to the park, represented by Greg Norton under the banner of the Grassland and Park Review Coalition, received fairly consistent media coverage in both local and provincial newspapers. Greg Norton himself was appointed in October 2014 as Agricultural Land Commissioner for the Okanagan Region, which has sparked some claims of conflict of interest (Osoyoos Times, 2014b). The local MLA for the Boundary Similkameen Riding, Linda Larson, also opposes the national park, and has close ties to Mr. Norton, who served until his recent appointment as the president of her riding association. Therefore, it seems that the main group of park opponents have had both media coverage and political representation.

In terms of consultation, Parks Canada has committed to direct engagement with ranchers within and adjacent to the proposed national park area (Parks Canada, 2010). The three polls conducted after the park proposals had a sample size of 777, 405, and 501 respectively (Parks Canada 2010; Western Canada Wilderness Committee, 2010; McAllister Opinion Research 2015), enabling dissenting voices to be adequately represented. Moreover, in Parks Canada's 2008 socio-economic assessment and in its 2010 feasibility study, both hunting, motorized vehicle recreation, and ranching are explicitly addressed, and some mitigation measures are offered. In summary, the three groups that have been popularly conceived as park opponents do not appear to suffer from exclusion or underrepresentation in the process.

More importantly, the best available data from McAllister's 2015 poll indicated that these groups in fact have comparable or higher levels of support for the park compared to the general public and should not be characterized as park opponents in the first place. The role of a small number of politically involved individuals seems to have played a significant role in the construction of a "parks vs local people" narrative, even as general support for the park in the three local ridings has grown over the last five years (McAllister Opinion Research, 2015). The ONA, in contrast, represent nations who have experienced systemic exclusion over centuries, which would plausibly justify a "parks vs. local people" narrative and their opposition to further avenues of formal land appropriation by settlers. However, their feasibility study and engagement with Parks Canada indicate that they see benefits in partnering with Parks Canada towards a national park at this time.

4. Ecology and Ecosystem Degradation in the South Okanagan Similkameen

4.1 Geography and Vegetation

The South Okanagan Similkameen (SOS) is the driest area in Canada, receiving only 317 mm of rain per year in the Osoyoos region (Theberge 2014). This low amount of precipitation places the area in the category of a semi-arid shrub-steppe: moister than most definitions of desert, but

below the precipitation level of most grasslands (Theberge 2014). The uniqueness and high level of threat to this environment and the species it supports in Canada stem from both a priori geographic limitations, and the high proportion of land use conversion resulting from anthropogenic uses. First, the SOS region is the northern tip of a semi-arid plateau ecosystem that extends south into Washington State and Oregon, which is characteristic of the Columbia River basin. Second, the desirability of the hot, dry valley bottoms of the South Okanagan for agriculture and ranching has fragmented and reduced this already limited land base severely. Another unique aspect of the area marked out by Parks Canada and locals is its value as a dark-sky reserve for stargazing and astronomy.

The four main dominant cover types are: bunchgrass-dominated grassland, Interior Douglas Fir forests, Ponderosa Pine woodlands, and Antelope Brush. Together with the degraded grasslands used for cattle grazing and the wide-scale conversion of land to vineyards and orchards, these dominant cover types form the mosaic of habitats that support the increasingly rare and threatened flora of the South Okanagan. For more detailed background on these cover types and some ecological functions they support, see Appendix 1.

4.2 An Area of Species at Risk

The South Okanagan region has 59 provincially endangered animal species according to the BC Ministry of Environment, comprising 30 percent of BC's red-listed wildlife species, and 46 percent of the province's blue-listed species (BC Ministry of Environment, 1998). There are 138 and 147 total species on the red and blue lists, respectively (Stewardship Centre for British Columbia website). BC’s red and blue lists are based on species ranking criteria developed by Nature Conservancy of the United States but implemented for the habitat within the province by the B.C. Conservation Data Centre (BC Ministry of Environment, 1998). While the red and blue lists confer no legal authority, the lists serve as prioritization guidelines for habitat conservation.Federally, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) fills a similar function, generating lists in three categories: Endangered, Threatened, and Special Concern. The South Okanagan is home to 81 species on COESWIC lists. In order to receive legal protection, species must additionally be adopted under the Species at Risk Act (SARA) (Environment Canada, 2014). In the South Okanagan, 65 species are listed under SARA schedule 1 (Stewardship Centre for British Columbia website). The gap between the number of species listed through the BC system and by COSEWIC, and those listed under SARA indicated that there is a substantial backlog of species in need of listing through the only federal process with legal teeth. Even so, it is doubtful whether listing under SARA in fact provides any benefit to endangered species, according to a new study which found that species listed under SARA mostly remained the same or continued to decline despite supposed legal protection measures, due to the lack of identified critical habitat (Favaro et al., 2014).

Whether species are federally listed under SARA or not, the extraordinary biological diversity of the area is not in dispute. Nine out of twenty-eight biodiversity hotspots in BC are located in the South Okanagan (Gayton, 2003). According to the BC ministry of environment, six vertebrate species have been locally extirpated: the Pigmy Short-horned Lizard, White-tailed Jackrabbit, Burrowing Owl, Northern Leopard Frog, Sharp-tailed Grouse, and Sage Grouse. Grizzly bears are also locally absent (BC Ministry of Water, Land and Air Protection, 2002). There are 180 plants, 29 insects (some of which are endemic), and 34 birds that appear on at least one of the three species listing systems discussed above (Stewardship Centre for British Columbia website). Many of the endangered species that make their homes in the dry shrub-steppe of the South Okanagan Similkameen are small and inconspicuous. Charismatic threatened species like bighorn sheep also make their homes nearby, and the region provides overwintering habitat for many species of ungulates, some of which are prized for game, including mule deer and white-tailed deer.

A noteworthy species among those that have become locally extinct is the Burrowing Owl because of its dependence on other declining and threatened species for its nesting habitat. It needs holes made by badgers (which are on the provincial red list) and other burrowing animals that are suffering from the loss of open grasslands. Even though a reintroduction program has been in place for years through the Burrowing Owl Conservation Society of BC, it seems as though the grasslands in the South Okanagan are unable sustain a breeding population of owls. Birds that are successfully bred in captivity and released in the area are banded and often found thriving further south in the US. A captive breeding program, however successful, does not address the root issue of overall ecosystem degradation and habitat loss (Burrowing Owl Conservation Society of BC website).

4.3 Continuing Ecological Degradation

As concisely stated by Iverson (2004) “about one-third of the grasslands area in the Okanagan Basin and Boundary District has been lost to development; the North Okanagan has lost nearly half of its native grasslands. Ongoing population growth will add increasing pressures to remaining grasslands. Most of the losses and adverse effects are to valley-bottom ecosystems, which are the most valuable to biodiversity, the most fragile to disturbances, and the slowest to recover.”

Anthropogenic stressors causing the grassland degradation and reduction in area covered by grassland include: the suppression wildfire, the presence of invasive species (which increase competition over resources such as light, space, & nutrients), overgrazing and degradation of riparian areas by cattle, resource extraction activities, land conversion to cultivation, urban development, and motorized vehicles (Iverson 2004). While we do not treat these comprehensively, fire, overgrazing, and fragmentation are briefly discussed below.

The grassland ecosystems of North America were maintained to some extent through management by First Nations promoting low intensity fires that renewed herbaceous plant growth, and promoted desired habitats for prey animals by preventing encroachment by forests (Blackstock and McAllister, 2004). Long-term fire suppression has caused direct and indirect changes to grassland/woodland environments. Directly, forest encroachment and ingrowth of woody species of shrubs shifts the dominant species away from the native sun-loving bluebunch wheatgrass and rough fescue preferred by ungulates (Gayton, 2003). Indirectly, high-intensity fires occurring due to fuel buildup can sterilize the soil and kill native climax grass communities, creating opportunities for exotic weed invasions (Stevens et al., 2004).

The grasslands of the southern interior were not heavily grazed by bison as were the prairie grasslands, instead supporting smaller populations of ungulates that were under high hunting pressure by both First Nations peoples and top predators (Gayton, 2003). Overgrazed grasslands in the Okanagan in which vegetation is not given sufficient time to recover from cattle are more susceptible to invasion by invasive species, drier, and more nutrient-depleted than native grasslands (Knopp, 2009).

Habitat reduction and fragmentation caused by the land-use changes listed above are of particular concern. Increasing fragmentation of Canada's grassland habitat is a major concern for the sustainability of the grasslands as reduction in connectivity has a negative impact on overall ecosystem health (Roch et al., 2014). Roch et al. (2014) note that "the shrinkage and increased isolation of remnant grassland habitat patches lead to reductions in species richness and biodiversity, the disruption of possibilities of movement, e.g. dispersal and (re-)colonization, the disruption of metapopulation dynamics, and a greater vulnerability and risk of extinction". Development, urbanization, and other activities that involve the partitioning of land by physical barriers, are all contributing to the breaking up of grassland regions and reductions in ecosystem connectivity.

5. Driving Positive Change in the South Okanagan Similkameen

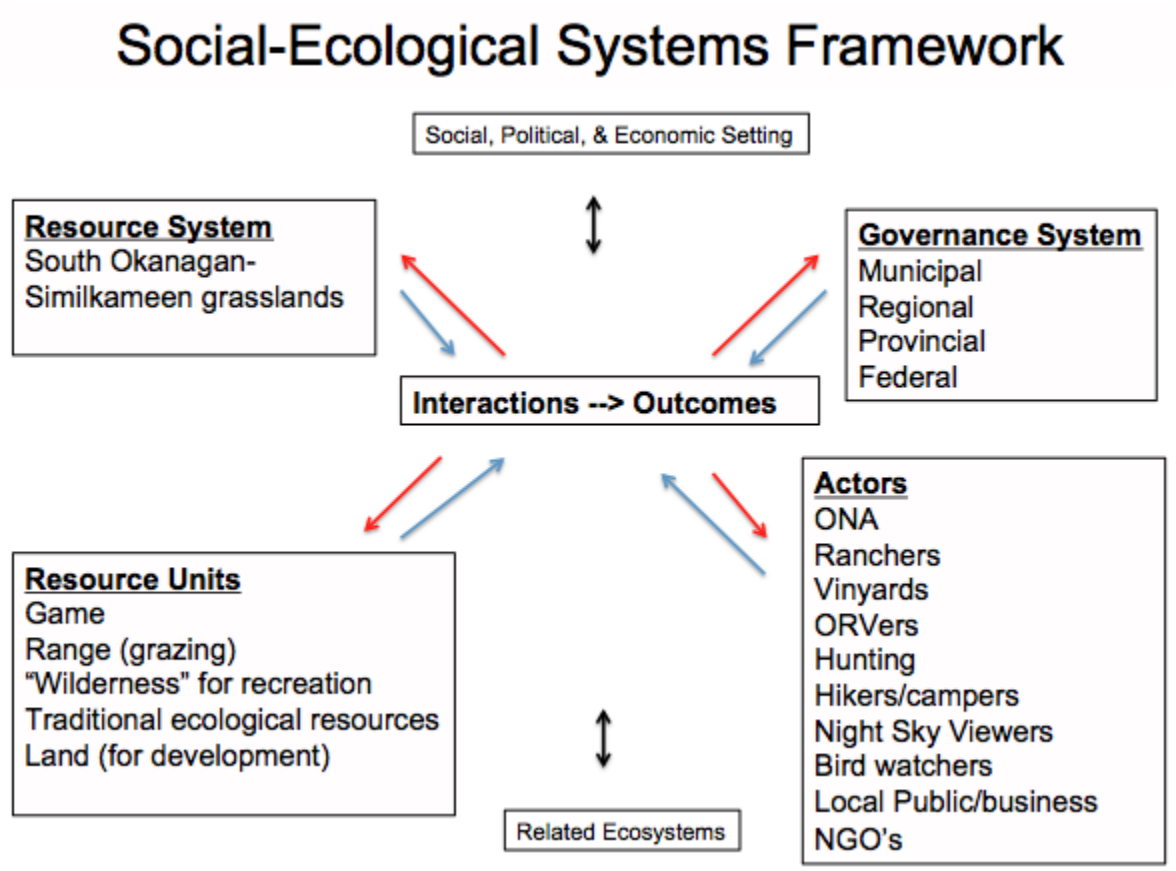
5.1 SOS Region as a Social-Ecological System

In this section, we place various social and ecological components of the proposed park area into an Social Ecological System (SES) framework. The biophysical features of a region are inextricably linked to the ways in which people move through, understand and build social systems within that region. Substantial academic work has been done to characterize the interconnectivity of ecological systems with one or more social systems. While drawing lines between social and ecological components in a geographic region can be arbitrary, addressing only one side or the other is insufficient to achieve desired long term outcomes (Folke et al.,

2005). Viewing the SOS region as a SES allows us to see the types of interactions, processes and outcomes that are occurring at different scales, and broadens the analysis of regional sustainability in terms of scope, objectives, and options for intervention.

Ostrom (2008) provides a multi-tier framework for combining social and ecological information to analyze social ecological systems and "diagnose causal patterns and affect outcomes". In SESs, subsystems (such as the resource system, units and users, and the governance systems) are separate interacting elements that produce outcomes at the SES level (Ostrom, 2008). Placing the region of concern within Ostrom's framework (see Figure 1), the Resource System is identified as the South Okanagan Similkameen grasslands, with Resource Units (i.e., wildlife, range, 'wilderness', etc.) being the components of the system that are utilized by Users (various stakeholder groups), who are in turn governed by organizations and rules within the Governance System (from local to national scales). This system is nested within broader social, political and economic settings (shown at the top) and related ecosystems (shown at the bottom) that affect "the patterns of relationships among variables within a region" (Ostrom, 2008). This framework can assist decision-makers in considering trade offs and identifying compromises in the development of conservation actions that benefit ecosystems and human communities (Ban et al., 2013).

Figure 1. South Okanagan Similkameen as a Social-Ecological System



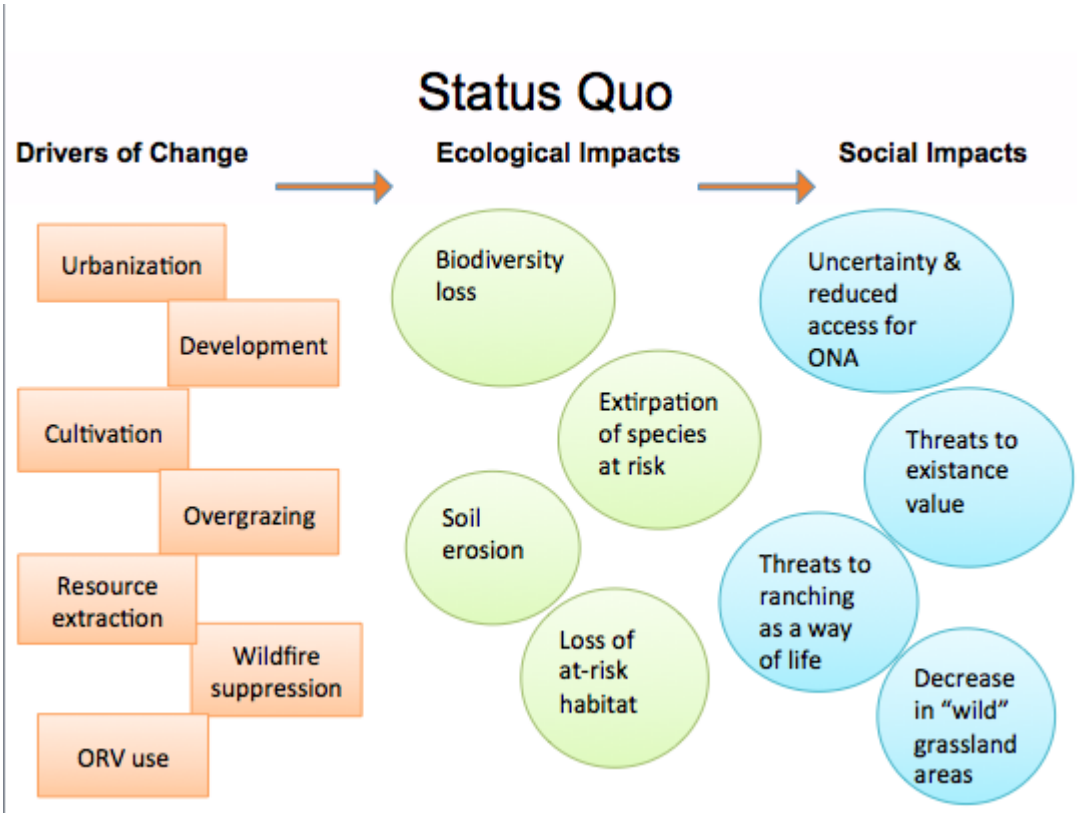
5.2 Inaction Today: Consequences Tomorrow

5.2.1 Drivers of Change

Viewing the region as a social-ecological system provides an opportunity to see how processes of change are underway which suggest that "doing nothing" will not result in the status quo continuing indefinitely. Rather, a lack of effective intervention now will likely mean the continuing degradation of various ecological components of the system and have negative impacts on the social components which value them.

Processes that exert stress (stressors) can push system components beyond thresholds that cause a change in state to one that is less "desired". For the SOS region, several stressors, primarily the result of human actions, are threatening the long-term sustainability of key ecosystem services. While it is not within the scope of this report to comprehensively assess of all the drivers of change in the region, ecological drivers of change are discussed above in section 4.3, and Figure 2 provides examples of a few key social-ecological pressures, interactions and outcomes that are occurring.

Figure 2. Change Processes and Resulting Social-ecological Impacts in the SOS Region



5.2.2 Social Impacts of Grassland Degradation

As a result of stressors such as those shown in Figure 2, the amount of healthy grasslands in the region is decreasing over time. This results in negative impacts on human users of the system who benefit from the ecosystem services it provides. For example, conversion of lands for cultivation, urban development, or resource extraction is results in a reduction of "wilderness" available for outdoor recreation. While grazing is justifiably seen as a threat to healthy grassland ecosystems, some ranchers also feel their lifestyle is threatened by encroaching suburban development. The degradation of grassland ecosystems from overgrazing, alien species invasion, and soil erosion will continue to threaten wildlife that are currently valued by local communities for various intrinsic, recreational, spiritual or economic reasons.

Significantly, a loss of healthy grasslands also means reduced availability of traditional resources for the ONA. In their feasibility assessment of the park, the ONA describe the land and ecosystem health as an indispensable aspect of their cultural, social, spiritual and physical health as a community (Okanagan Nations Alliance Syilx Working Group, 2012). They have expressed deep concern over the current trend of losing access to healthy grassland regions as a result of land-use changes and other stressors described above.

5.3 Changing the Outcome: Scaling Up From Restoration and Protection

5.3.1 Restoration From What, to What?

Theory and practice in restoration ecology have shown that once an alternative stable state (a stable set of unique biotic and abiotic conditions) has been reached, it cannot be reversed by simply stopping the degrading activity or restoring a normal physical disturbance regime (Suding et al.; 2004 & Bakker et al., 1999). If significant degradation has occurred to alter ecological elements such as soil chemistry, the seed bank, or plant community structure, the simple halting of stressors is not necessarily enough to cause a reversal to "native" or desired states (Suding et al., 2004; Bakker et al., 1999). In such cases, specific recovery paths based on understanding of thresholds and biological feedbacks are necessary (Sudig et al., 2004). This may include the active management of invasive species, species reintroductions, and managed disturbance cycles.

A fundamental challenge for any restoration activity is to establish its goals and ethos, acknowledging the limitations of objectivity in establishing "natural" frames of reference to which you want to restore (Klenner et al., 2008). This challenge includes the consideration of the cultural values, memories, and needs of First Nations peoples who have seen the grasslands they depend on change drastically (Blackstock and McAllister, 2004). Returning to a state of "wilderness" may be problematic in several ways. First, the idea of actively restoring an area to a more natural or wild state is itself much debated. Restoration implies an (at least somewhat) interventionist conservation ethos, which has been hotly debated for decades (Russell, 1994;

Marris, 2015). Second, conceptions of what pristine wilderness is may be ahistorical, implicitly dismissing the active role aboriginal peoples played in shaping the ecology of the region. Third, some level of restoration may be unrealistic given the current density and desires of people in the area.

Explicitly stating subjective goals and values for a particular restoration project (for example: primary productivity, biodiversity, culturally important species) is potentially more beneficial than trying to reestablish supposed historical land uses and specific disturbance regimes (Klenner et al., 2008). In all cases, site-specific knowledge is necessary to establish restoration practices that provide specific pathways from degraded states to more productive desired states (Hobbs & Cramer, 2008).

5.3.2 Grassland Restoration in the South Okanagan: Fire, Grazing, and Invasive Species Management

A wealth of umbrella organizations coordinating conservation and restoration exist in the region. These include the South Okanagan Similkameen Conservation Program, the Okanagan Collaborative Conservation Program, and attendant policy frameworks for multi-species landscape conservation (Bezener et al. 2004) and for biodiversity conservation (Okanagan Collaborative Conservation Program and South Okanagan Similkameen Conservation Program, 2014). Though these organizations and documents seek to implement monitoring and reporting, empirical data on restoration projects with actual results, (both in the academic and grey literatures), is quite limited. Restoration activities underway in the SOS are numerous and generally attempt to actively instate desired grassland dynamics through efforts like managing fires, woody plants, invasive species and promoting habitat for endangered species in accordance with SARA (South Okanagan Similkameen Conservation Program, 2013; Bezener et al., 2004). These efforts are often carried out by community groups, and while the above mentioned umbrella organizations work with these groups, scientific design and reporting are not in effect for most.

Active restoration management actions with a higher level of reporting have been undertaken by the province in the nearby provincial White Lake Grassland Protected Area. This effort ultimately endeavor to reintroduce low-intensity fires into the management of the grassland in order to promote succession of local species (Millar, 2007). Reintroducing fires is challenging, because of the buildup of fuel, the proximity to human habitation, the desire to maintain snags and dead wood for habitat, and sometimes, the presence of invasive species whose growth is encouraged by fire (Millar, 2007). In order to balance human needs and advance a desired ecosystem state, actions like removing sick and young trees prior to burning, mechanical thinning, monitoring of invasive plants, and re-seeding of grass have been undertaken by the provincial park system in several provincially managed grassland ecosystems within protected areas and parks (Millar, 2007; Stevens et al., 2004). While these are comprehensively listed by

Stevens et al. (2004), there is a paucity of information available on the progress and success of such restoration activities.

Indeed, restoring grasslands and shrub-steppe invaded by non-native species is not trivial: in a 2009 study, Knopp showed that physical removal of knapweed actually encourages knapweed seedling growth, but was more effective in annual-grass dominated areas. The most large-scale grassland restoration experiment we could find was sponsored by the Osoyoos Desert Society, and began in 1998. It was meant to test several interventionist and non-interventionist restoration methods in a controlled experimental design of 300 plots on 27 hectares (Scudder, 2000). Yet, to our knowledge, seventeen years after its start, only the first year of results have been reported thus far (Atwood, 2000).

An aspect of returning a degraded grassland to a "normal" disturbance regime would entail decreasing the intensity of grazing to levels that mimic the levels of native ungulates. There is intense debate about whether well-managed grazing that moves cattle from place to place frequently can help in restoration of grasslands while providing meat production or if cattle are an overall detriment to grassland ecosystems (Savory, 1980; Briske et al., 2011). In the Okanagan, the Nature Trust of BC has begun grassland restoration projects on two ranches involving "holistic" grazing practices (Canadian Geographic 2005), though no results from this trial are publicly available. A different study looking at the seed banks of native and invasive plants in variously grazed patches of antelope brush in the Okanagan showed that the most heavily grazed areas with bare soil had the largest seed banks of the invasive knapweed, while cheatgrass (another invasive) had uniformly high seed banks regardless of grazing. They also found significant seed banks of certain native plants which are adapted to disturbance and have seeds that persist in the soil, suggesting that further reseeding of such species would be beneficial (Clements et al., 2007).

The experiments and studies done specifically in the SOS region relating to fire, invasive species and grazing form a rudimentary and incomplete picture of the disturbed grassland dynamics in the region. While studies of grassland ecosystems elsewhere are theoretically relevant, the intricacies of grasslands in the SOS with their specific compliment of invasive species, nutrient levels, and woodland conditions necessitate individual restoration plans at each site, and possibly more experimentation than is currently evident from the peer-reviewed and grey literatures. While existing umbrella conservation organizations aspire to provide continuity in monitoring, the quality of data currently available from well-documented studies is lacking. A National Park would provide resources to expand, document, and better coordinate these activities with provincial authorities in nearby protected areas of the SOS.

5.3.3 Scaling Up From Grassland Restoration

According to Holling's (2001) foundational work in Social Ecological Systems theory, ecological and social systems are characterized as many dynamic (or adaptive) cycles that are nested together, and influence each other. The connection between different systems occurs through processes that can reach between larger and smaller scales of cycles, or between types of cycles. We apply this idea and propose that the positive impacts on the health of grasslands at specific ecosystem scales can create a momentum of positive impacts to other scales or types of dynamic cycles in the larger system. Two hypothetical examples of this process are shown in Figure 3. In the cartoon graphic we have illustrated two restoration processes (blue arrows) that re-establish desired cycles at the ecological scale. The thin black arrows show how these restored systems could reach socio-cultural cycles, creating positive positive feedbacks outside of their immediate cycle of origin. One example is the active restoration of plant communities through management of woody plants, invasive species, etc, resulting in a desired grassland burn and succession cycle and higher plant biodiversity. The second example is of species reintroductions involving two interacting threatened species, the badger and the burrowing owl, resulting in higher vertebrate biodiversity.

In both cases, grasslands with improved ecosystem integrity (both plant and animal) reach upwards to cycles in the social realm, impacting humans who value the landscape for recreational, spiritual, or cultural reasons. This experience of benefiting from the health of the system in turn reaches from those people who directly benefit from ecosystem services, to a culture of stewardship that extends out into the wider community. From this point, community values that stem from a culture of stewardship, support political decision making which then returns to the ecological cycles to further support the health of the ecosystem.

The positive social impacts of effective grassland protection and restoration could be diverse, with benefits filtering out to various local stakeholder groups. For the ONA, protection means a greater sense of certainty around future access to traditional resources. In their feasibility study, they describe the potential benefits, saying:

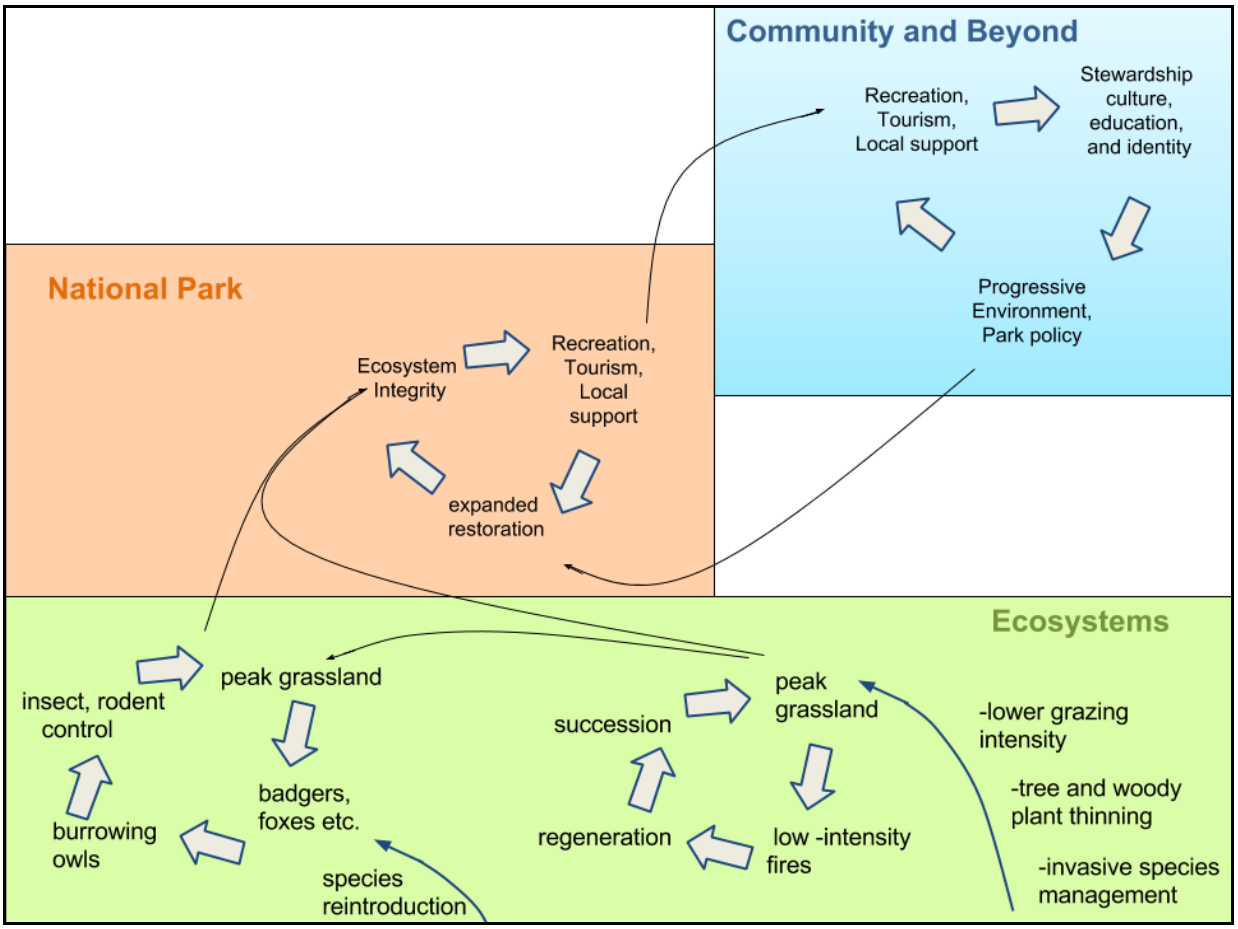
> "In an NPR scenario, Syilx cultural strengthening will be possible from increased access to a healthy environment, protection of culturally significant sacred spiritual sites and funding of cultural research. Increasing and popularizing the use of Nsyilxcen place names and employment opportunities that apply Syilx cultural knowledge will help to strengthen Syilx culture." (Okanagan Nations Alliance Syilx Working Group, 2012)

Park implementation creates opportunities for the preservation of ranching culture, something many ranchers feel is currently threatened by the fast rate of land conversion to more economically profitable uses (Parks Canada, 2010). It is also expected to increase the appeal of the SOS area as a tourism destination, bolstering the economy through attracting investment into existing tourism infrastructure, such as B&Bs, vineyards, and outdoor recreation companies. It

would also serve to diversify the local economy by bringing new ecologically focused experience opportunities into the tourism marketing mix.

Protected areas have also been shown to benefit surrounding ecosystems via "spillover effects", which are when the area around a protected zone profits from increased ecosystem productivity that can occur within the protected area. Often, this includes increased wildlife populations, which in the case of SOS region would benefit the hunting activities that are permitted to continue in adjacent regions.

Figure 3. Connecting Grassland Restoration to Multiple Ecosystem and Social Cycles



5.4 Improved Resilience and Adaptive Capacity in the Area

In SES theory, **resilience** is considered to be the extent to which a system can absorb various natural and human-induced impacts without either degrading overtime or "flipping" into less desirable states[1] (Folke et. al, 2005). Folke et al. (2005) describes resilience as the ability of a system to deal with disturbances and reorganize in such a way that it essentially retains its

1 Considered "desirable" in terms of desired ecosystem services

identity through function, structure, and feedbacks. Yet, resilience can mean different things to different people: where one party may see a system which benefits themselves as resilient, another may regard that stability as a trap in an undesirable state. For this reason, specificity around context and perspective is necessary when using the term.

The concept of resilience can help us to understand the ways that certain activities might impact the ecological and social sustainability of the SOS region. On the ecological side, pressures like land use change, overgrazing and fire suppression are slowly eroding the ability of grassland ecosystems to absorb each disturbance and reorganize to produce the same desired ecosystem services (i.e. habitat for wildlife, wilderness for recreating etc.). On the social side, the resilience of human communities is an equally important consideration for assessing sustainability. The resilience of communities within the SOS region is challenged in a number of ways, including through a lack of economic diversity, uncertainty of future grassland availability, and decline in access to traditional resources for local First Nations.

The **adaptive capacity** of a system is the capacity of actors in the system to manage and influence resilience (Engle, 2011). The interactions of humans and ecosystems are undergoing dynamic processes of change at different scales. Rather than simply managing for optimal use and static control of individual resources (or ecosystem services), policies and practices of resource management should be coordinated and treated like the testing of hypotheses. Adaptive governance uses the concept of adaptive capacity in institutional/political frameworks designed to change with changing relationships between society and ecosystems, thereby functioning as a source of social resilience (Folke et al., 2005).

Successful adaptive approaches for ecosystem management under uncertainty contain several key elements: They bring in and build different knowledge forms and understanding of ecological dynamics at play, monitor and respond to ecological feedbacks, and support adaptive governance structure and management practices (Olsson et al., 2004). Parks Canada has committed to implementing an adaptive governance framework for the proposed park that would allow for the types of flexible and responsive resource management practices that are crucial to supporting adaptive capacity. This will include:

- Utilizing the traditional ecological knowledge of the ONA to work towards maintaining the “ecological and cultural integrity of the area for future generations” (Parks Canada, 2010)
- Working with the ranching community to monitor and manage continued livestock grazing in a manner that supports the continuation of ranching culture without undermining ecological objectives
- Connecting an existing network of provincial and federal protected areas, allowing for increased connectivity of ecosystems and better coordinated land-use planning and resource management

Monitoring is a vital prerequisite for effective grassland conservation (Roch et al., 2014). The paucity of peer reviewed and grey literature directly about grassland status and restoration in the South Okanagan and Columbia Basin underlines the urgent need to better understand ongoing ecosystem trends to assess where to most effectively place resources now and in the future. With coordinated management efforts, park implementation provides an increased ability to "observe and interpret essential processes and variables in ecosystem dynamics to develop the social capacity to respond to environmental feedback and change" (Folke et al., 2005).

6. Conclusion and Recommendations

As a social-ecological system built of interactions and interdependencies between human actors, wildlife, and grasslands, the SOS region demands thoughtful stewardship if it is to survive into the future as a thriving landscape. Currently, the region faces several key threats to the health of its grasslands. In particular, land use changes and overgrazing are resulting in ecosystem degradation through fragmentation, invasion of alien species, soil erosion, and suppression of natural disturbance regimes. The implementation of the SOSNPR would not only allow for the mitigation of such impacts, but in doing so would also provide benefits to the ecosystem and surrounding community. While the financial costs of park implementation would be borne by the federal government, the existence of a national park would bring important economic opportunities to the region, through direct jobs and increased tourism activity (Parks Canada, 2010).

The views of individuals opposing the SOSNPR have been heard consistently throughout this process. While ostensibly, the voices of hunting and ORVing stakeholders have come out the loudest, particularly in local newspaper articles and copious anti-park signage along highways, recent new data provides evidence that these groups are no less supportive of the park than the general public (McAllister Opinion Research, 2015). The impression that these recreational groups, and even a majority of the larger community shared the same concerns as a few vocal opponents over park implementation to some extent captured the public imagination, particularly following the BC government's decision to put a stop to the park process. But with the recent polling results showing increasing levels of support for a national park in the three local ridings, and with the accumulation of business and municipal support, this impression is not only false, it is also increasingly fragile.

The stakeholder group that is most likely to be considered vulnerable to the implementation of a park, the ONA, has agreed to work with Parks Canada and shown support for creating the SOSNPR. Beyond the various benefits discussed above, this is also an opportunity for Parks

Canada to strengthen relationships with local First Nations through thoughtful and effective co-management.

Without effective protection and restoration efforts, the ecological impacts of landscape changes will mean the degradation of a rare and valued grasslands ecosystem. As well, the social sustainability of the area is deeply interconnected to the integrity of the grassland ecosystem, with human users relying on ecosystem services for social, cultural, spiritual and economic well being. The region is home to a number of endangered species and a national park in the SOS has much to offer in terms of the legal protection entitled to them under SARA.

With park implementation, greater resources and stakeholder coordination are available to monitor ecological feedbacks, integrate different knowledge forms and implement adaptive management practices that can test, assess, and revise interventions to be the most effective. As a result, park implementation is a strong opportunity for community-based collaborative approaches where ecological conservation objectives can be pursued alongside socio-cultural and economic ones. While existing umbrella organizations like the South Okanagan Similkameen Conservation Program have excellent (and very similar) goals and strategic frameworks, they don't have the level of resources that would be made available from the federal government upon the creation of the a national park.

While the creation of the SOSNPR has faced effective opposition from a small but vocal group, this report suggests that the potential costs of park creation (such as decreased hunting and ORVing areas) are far outweighed by the many social-ecological benefits that accompany a thriving grassland ecosystem. This report thus concludes that the costs of creating the SOSNPR should be considered negligible when compared to the potential social-ecological benefits to the region and recommends that:

- Parks Canada, The Province of British Columbia, and the Okanagan Nations Alliance return to the SOSNPR process for speedy park implementation.
- Parks Canada consult with hunting outfitters and ATV businesses that rely on the area in question, and possibly offer monetary compensation for the loss of such licenses.
- Parks Canada contributes to knowledge of grassland restoration by coordinating existing efforts for restoration in the SOS and developing and publishing restoration plans and experiments to be carried out in the new park.
- Grassland and species-centered restoration efforts be included and emphasized in the visitor experience, to strengthen the multiscale connections between ecosystems and people.

References

ATV Riders Resource website. (2014). Keremos to Princeton trail. Retrieved December 04, 2014 from: http://www.quadcorral.com/placestoride/directory/Canada/British_Columbia/Southcentral_BC_-_Okanagan_Area/Keremeos_to_Princeton_Trail/Keremeos_to_Princeton_Trail.html

Ban, N.C., Mills M., Tam, T., Hicks, C. C., Klain, S., Stoeckl, N., Bottrill, M. C., Levine, J., Pressey, R. L., Satterfield, T., & Chan, K. M. A. (2013). A social–ecological approach to conservation planning: embedding social considerations. *Frontiers in Ecology and the Environment* 11(4): 194–202.

BC Government. (2014a). Off Road Vehicle Management Framework - Ministry of Forests, Lands and Natural Resource Operations. Retrieved November 19, 2014 from: http://www.for.gov.bc.ca/mof/orv/

BC Government. (2014b). ORV legislation will keep B.C.'s backcountry safe. Retrieved November 19, 2014 from: http://www2.news.gov.bc.ca/news_releases_2013-2017/2014FLNR0016-000217.htm

BC Government, Ministry of Forests, Lands and Natural Resource Operations. (2014). Fish, Wildlife and Habitat Management. Retrieved December 04, 2014 from: http://www.env.gov.bc.ca/fw/wildlife/hunting/regulations/

BC Government, Ministry of Environment, Okanagan Region. (1998). Habitat Atlas for Wildlife at Risk. Retrieved from: http://www.env.gov.bc.ca/okanagan/esd/atlas/atrisk.html

BC Government, Ministry of Environment, Lands and Parks. (1995). Antelope Brush Ecosystems. Retrieved from: http://www.env.gov.bc.ca/wld/documents/antelope.pdf

BC Government, Ministry of Forests, Lands and Natural Resources. Chapter 10: Interior Douglas Fir Zone. Authors: G.D. Hope, W.R. Mitchell, D.A. Lloyd, W.R. Erickson, W.L. Harper, and B.M.Wikeem. Retrieved from: http://www.for.gov.bc.ca/hfd/pubs/docs/srs/Srs06/chap10.pdf

BC Government, Ministry of Forests, Lands and Natural Resources b. Chapter 9: Ponderosa Pine Zone. retrieved from http://www.for.gov.bc.ca/hfd/pubs/docs/srs/srs06/chap9.pdf

BC Government, Ministry of Water, Land and Air Protection. (2002). Grizzly Bears in British Columbia: Ecology, Conservation, and Management. Retrieved from: http://www.env.gov.bc.ca/wld/documents/grzzlybear.pdf

BC Government, Ministry of Environment. (2014). South Okanagan Grasslands Protected Area - BC Parks. Retrieved December 04, 2014 from: http://www.env.gov.bc.ca/bcparks/explore/parkpgs/s_ok_grassland/

BC Government, Ministry of Environment. (2014). Visiting - BC Parks - Province of British Columbia. Retrieved December 04, 2014 from: http://www.env.gov.bc.ca/bcparks/explore/map.html

Bezener, A., Dunn, M., Richardson, H., Dyer, O., Hawes, R., & Hayes, T. (2004, March). South Okanagan-Similkameen conservation program: a multi-partnered, multi-species, multi-scale approach to conservation of species at risk. In *Proceedings of the species at risk 2004 pathways to recovery conference* (p. 3)

Blackstock, M. D., & McAllister, R. (2004). First Nations perspectives on the grasslands of the Interior of British Columbia. *Journal of Ecological Anthropology*, *8*(1), 24-46.

Bodin, Ö., & Tengö, M. (2012). Disentangling intangible social–ecological systems. *Global Environmental Change*, *22*(2), 430–439. doi:10.1016/j.gloenvcha.2012.01.005

Briske, D. D., Sayre, N. F., Huntsinger, L., Fernandez-Gimenez, M., Budd, B., & Derner, J. D. (2011). Origin, persistence, and resolution of the rotational grazing debate: integrating human dimensions into rangeland research. *Rangeland Ecology & Management*, *64*(4), 325-334.

Brondizio, E. S., Ostrom, E., & Young, O. R. (2009). Connectivity and the Governance of Multilevel Social-Ecological Systems: The Role of Social Capital. *Annual Review of Environment and Resources*, *34*(1), 253–278. doi:10.1146/annurev.environ.020708.100707

Brosius, J. P. & Russell, D. (2003). Conservation from above: Imposing transboundary conservation. *Journal of Sustainable Forestry 17* (1-2), 39-65. Retrieved from: http://dx.doi.org/10.1300/J091v17n01_04

Burrowing Owl Conservation Society of BC website. Retrieved on November 20th 2014 from: http://burrowingowlbc.org/

Canadian Geographic. (2005). A Tale of Two Grasslands: The Slow Road to Restoration in British Columbia and Kenya. Retrieved from: http://www.canadiangeographic.ca/Magazine/jf05/indepth/international.asp

CBC News. (2014). Off-road vehicle registration launched for B.C. - British Columbia - CBC News. Retrieved November 19, 2014 from: http://www.cbc.ca/news/canada/british-columbia/off-road-vehicle-registration-launched-for-b-c-1.2837632C

CBC News. (2012). Parks Canada walks away from national parks plan. Retrieved December 04, 2014 from: http://www.cbc.ca/news/canada/british-columbia/parks-canada-walks-away-from-national-park-plan-1.1286212

Chapin, M. (2004). A challenge to conservationists. Worldwatch Institute. Retrieved from: http://www.worldwatch.org/system/files/EP176A.pdf

Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social Vulnerability to Environmental Hazards n, *84*(2). *Social Science Quarterly*, 84(1): 242-261.

Crandell, G. (1993). Nature Pictoralized: "The View" in Landscape History. Baltimore, MD: John Hopkins University Press.

Dowie, M. (2005). Conservation refugees. *Orion Magazine.* Retrieved from: http://www.oriononline.org/pages/om/05-6om/Dowie.html

Engle, N. L. (2011). Adaptive capacity and its assessment. *Global Environmental Change*, *21*(2), 647–656. doi:10.1016/j.gloenvcha.2011.01.019

Environment Canada. (2014). Species at Risk Act. Retrieved from: http://www.ec.gc.ca/alef-ewe/default.asp?lang=en&n=ED2FFC37-1

Favaro, B., Claar, D. C., Fox, C. H., Freshwater, C., Holden, J. J., & Roberts, A. (2014). Trends in Extinction Risk for Imperiled Species in Canada. PloS ONE, *9*(11), e113118.

Folke, C., Hahn, T., Olsson, P., & Norberg, J. (2005). Adaptive Governance of Social-Ecological Systems. *Annual Review of Environment and Resources*, *30*(1), 441–473.

Grasslands Conservation Council of British Columbia. (2005). Mitigating the Fragmentation and Development of BC's Grasslands: Problem analysis and strategic plan. Retrieved from: http://www.bcgrasslands.org/stewardship-a-planning/problem-analysis-and-strategic-plan

Gayton, D.V. (2003). British Columbia grasslands: Monitoring vegetation change. FORREX–Forest Research Extension Partnership, Kamloops, B.C. FORREX Series 7

Guided Outfitters Association of BC. (2014). Okanagan Outfitters. Retrieved December 04, 2014 from: http://www.goabc.org/outfitters/98/okanagan-outfitters.aspx

Hobbs, R. J., & Cramer, V. A. (2008). Restoration ecology: interventionist approaches for restoring and maintaining ecosystem function in the face of rapid environmental change. *Annual Review of Environment and Resources*, *33*, 39-61.

Holling, C. S. (2001). Understanding the complexity of economic, ecological, and social systems. *Ecosystems*, *4*(5), 390-405.

Iverson, K., & Ministry of Water, Land, and air Protection. (2004). Grasslands of the Southern Interior, 1–6.

Knopp, A. (2009). First step restoration techniques in invaded grassland in southern British Columbia. Dissertation. University of British Columbia. Retrieved from: https://circle.ubc.ca/handle/2429/13708?show=full

Marris, Emma. (2015, May). Handle With Care. *Orion Magazine.* Retrieved May 2nd 2015 from: https://orionmagazine.org/article/handle-with-care/

McAllister Opinion Research. (2015). Local Community Support for a National Park in the SOuth Okanagan Similkameen 2015. Retrieved May 10th 2015 from: https://sosnationalpark.files.wordpress.com/2015/04/poll-briefing-note-final-2015-study.pdf

Millar, J. (2007, Oct.) Presentation at Workshop on Ecological Restoration Best Practices in Protected Natural Areas, Waterton, Alberta.

Nash, Roderick. (1983). *Wilderness and the American Mind*. New Haven, CN: Yale University Press.

Neumann, R. P. (1998). Imposing Wilderness: Struggles Over Livelihood and Nature Preservation in Africa. Retrieved from: http://books.google.com/booksid=McyIX9AGlV4C&source=gbs_navlinks_s

Neumann, R. P. (2001). Disciplining peasants in Tanzania: From state violence to self-surveillance in wildlife conservation. In N. L. Peluso & M. Watt's *Violent Environments*, 305-327. Ithaca, NY: Cornell University Press.

Okanagan ATV Tours website. (2014). Retrieved December 04, 2014 from: http://www.okanaganatvtours.com/index.html

Okanagan Collaborative Conservation Program and South Okanagan Similkameen Conservation Program. (2014). A Biodiversity Conservation Strategy for the Okanagan Region. Retrieved from: http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=42389

Olsson, P., Folke, C., & Berkes, F. (2004). Adaptive Comanagement for Building Resilience in Social-Ecological Systems. *Environmental Management*, *34*(1), 75–90. doi:10.1007/s00267-003-0101-7

Osoyoos boat rentals ATV Tours website. (2014). ATV Tours. Retrieved December 04, 2014 from: http://www.osoyoosatvtoursandwatersports.com/#!osoyoos-boat-rentals/c209u

Osoyoos Times. (2014a). Town takes quest for national park to B.C. Municipal conference. (2014, September 24, No author). Retrieved from: www.osoyoostimes.com/town- takes-quest-national-park-b-c-municipal-conference/

Osoyoos Times. (2014b). Greg Norton Rejects Conflict of Interest Claims. (2014, October 22, No author). Retrieved from: http://www.osoyoostimes.com/greg-norton-rejects-conflict-interest-claim/

Osoyoos Times. (2014c). Veteran rancher voices his support for South Okanagan national park. (2014, April 16th, No author). Retrieved from: http://www.osoyoostimes.com/veteran-rancher-voices-his-support-for-south-okanagan-national-park/

Okanagan Nations Alliance Sylx Working Group. (2012). Building a Sylx Vision for Protection: Final Report Assessing Feasibility of a Syilx/Parks Canada Protected Area: Findings and Guiding Concepts. Retrieved from: http://www.soscp.org/wp-content/uploads/2013/02/Assessing-Feasibility-Syilx-Final-Report.pdf

Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science*, *325*(5939), 419–422.

Parks Canada. (2010). Proposed National Park Reserve for the South Okanagan - Lower Similkameen: Feasibility Assessment. Retrieved from: http://cpawsbc.org/upload/South_Okanagan-Similkameen_National_Park_Feasibility_Study.pdf

Roch, L., & Jaeger, J. A. G. (2014). Monitoring an ecosystem at risk: What is the degree of grassland fragmentation in the Canadian Prairies? *Environmental Monitoring and Assessment*, *186*(4), 2505–2534. doi:10.1007/s10661-013-3557-9

Russell, C. L. (1994). A sense of place: Conservation's common ground. *Trumpeter*, *11*(1).

Savory, A., & Parsons, S. D. (1980). The Savory grazing method. *Rangelands*, 234-237.

Scudder, G. G. E. (2000). Osoyoos Desert Society: Experimental studies on ecological restoration of the shrub-steppe habitat. Internal Report.

South Okanagan Similkameen Conservation Program. (2013). SOSCP Annual Report 2012-2013. Internal Publication. Retrieved from: http://www.soscp.org/wp-content/uploads/2011/01/2013-Annual-Report.pdf

Statistics Canada. (2014a). Motor vehicle registrations, by province and territory (Yukon, Northwest Territories, Nunavut). Retrieved from http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/trade14d-eng.htm

Statistics Canada. (2014b). Population by year, by province and territory (Number). Retrieved from http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo02a-eng.htm

Stevens, V., Millar, J., Gall, M., Gawalko, L. (2004, March). Restoration of Fire-maintained Ecosystems at Risk: British Columbia Parks and Protected Areas. Proceedings of the Species at Risk 2004 Pathways to Recovery Conference, Victoria, BC.

Stewardship Centre for British Columbia website. Species at Risk, a primer for British Columbia. Retrieved from: http://www.speciesatriskbc.ca/advancedsearch?q=advancedsearch&district=OSRD&format=long

Suding, K. N., Gross, K. L., & Houseman, G. R. (2004). Alternative states and positive feedbacks in restoration ecology. *Trends in Ecology & Evolution*, *19*(1), 46-53.

Theberge, John B., (2014). Osoyoos Desert Society Website. Retrieved from: http://desert.org/index.php/our-desert/17-resources/34-what-s-in-a-name.html

Western Canada Wilderness Committee. (2010). Local Support for a National Park in the Southern Okanagan-Similkameen Public Opinion Study. Retrieved from: https://www.wildernesscommittee.org/sites/all/files/McAllister%20-%20Okanagan_Similkameen%20Poll%20-%20JUNE%202010_DISTRIBUTION.pdf

Appendix 1: Main Ecotypes in the South Okanagan Similkameen

Grasslands: Bunchgrasses (as opposed to the sod-forming grasses of prairies) dominate in this arid climate at the lowest elevations. The soil is covered by a crust of lichens and mosses that is quite delicate. Healthy patches are dominated by bluebunch wheatgrass and rough fescue, while overgrazed areas are characterized by higher numbers of invasive grass species like Bromus tectorum (cheatgrass) and Centaurea spp. (knapweeds). Native grass species are preferred by both wild and domesticated grazers (Gayton, 2003), and grassland dominated by them have higher nutrient levels and better moisture retention (Knopp, 2009).

Interior Douglas Fir forests: These forests occupy mid elevations, forming open to closed stands that are sometimes mixed with lodgepole pine and ponderosa pine at lower elevations. A combination of historical fires and topographic conditions have enabled grassland communities to be common in the understory of the stands. Due to their wide variation in overstory and understory vegetation, the forests provide many niche spaces, and a desirable overwintering habitat for many ungulates, who travel long distances to overwinter in the zone, including the endangered bighorn sheep (BC Ministry of Forests, Lands and Natural Resources a.).

Ponderosa Pine woodlands: The Ponderosa Pine woodland is considered the peak woodland community, occurring as a thin band in the bottoms and/or on lower sidewalls of the very dry southern interior plateau valleys. It's an open woodland/parkland with a grassy herbaceous understory. Like the Douglas Fir forests, the short, largely snow-free winters in the zone attract many animals during the winter months, including ungulates like Mule Deer, White-tailed Deer, Bighorn Sheep, and Rocky Mountain Elk. Its tree canopy and varied understory provides an abundance of seeds and insects for a variety of birds and small mammals (BC Ministry of Forests, Lands and Natural Resources b.).

Antelope Brush: Antelope brush is a yellow-flowering seed plant in the rose family that forms the dominant ground cover of a small and rare community in the South Okanagan. Antelope brushlands were not extensive at the time of European colonization, and currently only 40% are left with 9% of them relatively undisturbed. The remainder have been converted to vineyards, orchards, and urban landscapes, or have been invaded by alien species of cheatgrasses and knapweeds. Antelope brush provides habitat to rare species including the Pallid Bat and three endemic species of scorpions. Some of the most integral remaining patches are included in the Northern portion of the SOSNPR concept, near Vaseaux Lake. (BC Ministry of Environment, Lands and Parks).

Appendix 2: Western Concepts of Parks and Nature Conservation

Ideas of what nature should look like are rooted in the context of sublime and picturesque nature from British Romantics, which carried on to American Romantics, and forward to modern conservation ideological framework (Nash, 1983). These picturesque ideals of nature are based upon a constructed British countryside, and were exported to the "new world" (Crandell, 1993). The sublime, as imagined in the travelogues of the 18th century determined the way that colonialists thought about the terrifying, hostile nature in North America and Africa. Both of these images were central in informing modern ideas of what nature should look like, and thus central to the ideological framework of conservation (Neumann, 1998).

In the conservation framework as it developed over roughly the last century and a half has often conflated landscapes that were being managed through indigenous management practices with "natural" landscapes. This conflation lead to the undermining of indigenous presence on the land (Poirier & Ostergren, 2002). The sentiment that Nature is a place devoid of humans became official policy in America in the 1964 Wilderness Act, which defines wilderness as a place "where man himself is a visitor who does not remain." This sentiment is often echoed in modern conservation groups (Dowie, 2005).

Alternatively, in the early days of conservation in North America, local indigenous peoples were seen as an affront to the sensibilities of tourists to conservation areas (Poirier and Ostergren, 2002). Essentially, in the practice of conservation local peoples are often denied the legitimacy of their existence or are vilified. Another method of vilification is the claim that indigenous management practices are harming the land or decreasing biodiversity.

The science of biodiversity and social welfare are posited as being in opposition, rather than two aims which can be simultaneously achieved (Chapin, 2004). In essence, the belief is that either biodiversity must be sacrificed for the social welfare of indigenous peoples or vice versa. While conservationists used to see a common aim between themselves and indigenous peoples, this has changed in recent years. While there used to be more discussion around a natural alliance between conservationists and indigenous peoples due to their common aim of preserving land in the face of "development," this has all but disappeared in recent years. There has been a change in priorities which focus upon the importance of science rather than the social realities of stakeholders (Chapin, 2004). This is in large part due to the increasing concern with environmental degradation, and the amount of work and capital that it takes to produce a thorough and meaningful consultation relationship with local indigenous peoples (Brossius and Russell, 2003).

This phenomenon of exclusion of local, typically indigenous, people is most apparent in Africa where there is an estimated fourteen million conservation refugees (Dowie, 2005). Conservation refugees are people who lived in a particular area and depended on the land for subsistence, and

were subsequently removed from the land for the purposes of conservation of biodiversity. Many locations in Africa with conservation areas have adopted a "shoot on sight" policy concerning poachers in nations in which poaching is not punishable by death (Neumann, 2004). This has led to the deaths of local peoples who rely upon the land for subsistence.

The issue of conservation refugees has become so serious that in 2004 200 delegates at a meeting of the International Forum on Indigenous Mapping signed a declaration that states that the "activities of conservation organizations now represent the single biggest threat to the integrity of indigenous lands" (Dowie, 2005). Africa, which has an enormous amount of parks and reserves, has the highest global indigenous eviction rates, but only 10% of biodiversity lies within protected areas (Dowie, 2005). The discrepancy between actual conservation success and the disenfranchisement of millions of people begs the question of whether or not human lives are going to be valued as less than the goal of conserving biodiversity.

Part of the issue of exclusion of local peoples in the decision making process for forming a conservation area stems from difficulties in consultation. The community-based conservation paradigm has faded recently not because of the local people failing to attempt to engage in the process or make themselves heard. The reason that people continue to be disenfranchised by conservation efforts is a failing on the part of conservationists who do not pay close enough attention to extralocal forces, intralocal community variation, and power imbalances that affect access to and control over resources (Brosius and Russell, 2003). There are people within communities who may lack the political clout to have their voices heard. Their lack of power might also result in limited accesses to natural and political resources. The variation within communities that has not always been properly observed (intralocal) is often the result of too quick a survey of local communities (Brosius and Russell, 2003). This is not to say that community-based conservation has not had any successes, but that they are limited and often encounter difficulties in creating a meaningful dialogue in the local communities.

The case of conservation refugees in Africa and the ideology brought to modern-day conservation is relevant to the case of the South Okanagan because the park has encountered serious conflict with local peoples. Moreover, the park is located in an area that is home to four First Nations, who fit into the category of those typically vulnerable to exclusion in conservation processes. In any case in which a park is proposed it is absolutely imperative that the concerns of local people are seriously weighed in the decision. In this case specifically, because of the opposition encountered, it is important that there is an assessment carried out to address whether or not the local opposition is vulnerable to conservation in a comparable way to those millions of conservation refugees in Africa, and the untold numbers who suffer a similar plight here in Canada.