

report

Climate Change Adaptation Research
for Forest and Rangeland Ecosystems

Resiliency Implications at the Landscape Level

Honouring the voices of Aboriginal Knowledge Keepers in the South Selkirks Region: Perspectives on climate change

Final Report

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Disclosure Statement

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The views expressed in this final report published by the South Selkirks Climate Change Research Team are that of the author and do not necessarily reflect the opinions of BC Hydro, FFESC, Ktunaxa Nation Council (KNC) and Métis Nation British Columbia (MNBC). The goal of this report is to encourage broad participation in discussion, debate and research of important climate change adaptation issues.

The author was granted permission by MNBC and Nature Conservancy of Canada (NCC) – BC Region and Dr. Howard Harshaw (University of British Columbia – UBC) to utilize the photographs and related images in this final report.

The author recognizes that she is not in a position to influence decision-making and/or planning as it pertains to climate change and natural resource management in the Ktunaxa Nation Member Communities, KNC, Ktunaxa Treaty Council, Ktunaxa Elders' Group nor the MNBC and its Chartered Communities.

Finally, this report was prepared as part of the South Selkirks Climate Change Research Team. This report will not be sold to a third party at any time during or upon completion of the study team's research on climate change adaptation in the South Selkirks Region.

Executive Summary

Indigenous people are inextricably connected to the land and its resources. The sacred knowledge, languages and cultures that bind indigenous people with the land are an important aspect of indigenous science and wellness paradigms as we (as a society) grapple with the complexities and interactions between the changing climate, the landscape and local communities. The question before us is – how is climate change affecting and influencing adaptive capacity from an ecological, social, cultural and economic standpoint? Climate change-effects (e.g., extreme weather events) are altering forest landscapes and are impacting cultures of those who are most dependent on the land and its resources such as indigenous people.

This final report exclusively honoured Aboriginal Knowledge Keepers' voices from the South Selkirks Region based on a qualitative study that was conducted in 2010 as part of the South Selkirks Climate Change Research Project. The study sought to examine the perceptions and viewpoints of Aboriginal Knowledge Keepers from the South Selkirks Region of British Columbia, Canada with regard to human resiliency, climate change adaptation and coping. Aboriginal Knowledge Keepers are individuals (self-identified as being either First Nations or Métis) who are recognized by their communities as having knowledge and understanding of the traditional culture of the community, including spiritual and social practices. They are identified based on their communities' respect for them and peer recognition for their depth and breadth of localized knowledge.

The qualitative study involved reviewing the literature and conducting semi-structured interviews which utilized the Repertory Grid Technique and Echo Approach. Thirteen key informants (N = 13) were interviewed based on purposive and criterion-based sampling. Each key informant was interviewed twice. Results from the study found that key informants are constantly weighing the opportunities and challenges of climate change adaptation strategies in terms of trade-offs in advancing their Aboriginal communities as being self-governed and self-sustaining communities now and in the future. Issues such as the passing away of local Elders, funding and infrastructure limitations and formal recognition of Aboriginal title and rights are counterbalanced by the need to address climate change vulnerabilities in the South Selkirks Region, for example, catastrophic wildfires, water quality and quantity, drought and wildlife habitat changes.

Prioritizing trade-offs with limited funding and infrastructure creates challenges for Aboriginal communities in the South Selkirks Region to effectively continue traditional ways of living, and experiencing the land, language and culture in a sustainable manner. In general, key informants felt that climate change is a natural cycle carried forth by the Creator; however, human activity is accelerating the speed and intensity of climate change in the region. Now more than ever, key informants are recognizing that regular monitoring and utilization of localized knowledge (aka. traditional knowledge) can aid in

clarifying and contextualizing climate change in the South Selkirks Region. Specifically, key informants felt that monitoring changes and utilizing localized knowledge can aid in climate change awareness, education, design and subsequent implementation of adaptation strategies in the region. One-size-fits-all approaches do not recognize the unique aspects of rural Aboriginal communities in the South Selkirks Region. Guided by natural laws, key informants acknowledged the interrelationships between the land in terms of their self-identity and sense of place within the environment. Proposed Aboriginal community-driven Human Resiliency characteristics and climate change adaptation strategies are described in this report and highlight key informants' collective desire to move towards integrative solutions in bringing together indigenous and western ideologies to address climate change adaptive capacity at the landscape level. Other key highlights from this report centered on the identification of five major themes in relation to social and cultural implications for climate change adaptation in the South Selkirks Region:

- **Theme #1: Understanding the Nations.** Key informants described a dilemma as to the tradeoffs that are required to effectively adapt to climate change in relation to other Nation-wide priorities. For example, key informants said that some of the economic diversification activities that are threatening the regional environment also allow their Nations to generate revenue at the individual citizen level to the Nation/region-wide level in order to promote self-sufficiency. Key informants' views of trading off on values and priorities is a reality that many communities and organizations are being faced with as they pursue strategies to achieve balance between sustainability and profitability. Furthermore, the interrelationship and integration between Aboriginal Peoples with the land and its natural resources reinforces that the risk of gradual loss of traditional languages and social and cultural ties to the land creates a domino effect for Aboriginal communities in terms of losing localized knowledge about the land, animals, survival methods, sustenance, sustainability and biodiversity in the region, which are intricate in monitoring and adapting to changing climates in the South Selkirks Region;
- **Theme #2: Climate Change Perspectives.** Key informants are of the view that climate change is a natural change and process; however, human activity (e.g., land development and dependency on fossil fuels) is accelerating the speed and intensity of the change. Major vulnerabilities that key informants felt are intensified by climate change in their Aboriginal communities are encroachment, land development and overpopulation, disrespect for the land and resources, logging, wildfires, seasonal weather changes, water quality and quantity and wildlife changes. Key informants' comments reflected the sentiment that the future of their Aboriginal communities lies in the wisdom of their Elders and Knowledge Keepers, the revitalization and sharing of culture, localized knowledge and language and Youth engagement. Overall, there was a sense that Aboriginal communities in the South Selkirks Region need to better understand climate change and the human dimensions associated with it. Climate change adaptation strategies and initiatives must not simply move Aboriginal people

away from their communities due to climate change-effects in the area thereby distancing citizens from their ancestral linkages to their Nations. Instead, climate change strategies should consider a holistic approach to adaptation that integrates social, cultural, economic and ecological interests in relation to climate change in the Aboriginal communities within the South Selkirks Region;

- **Theme #3: Human Resiliency and Adaptive Capacity.** The findings indicated that Aboriginal communities in the South Selkirks are adapting harvesting patterns and travel routes to mitigate the effects of a changing environment in the region. In response to the hotter and drier summers, key informants say that they do not go out on the land for as long as they used to. They are adjusting their harvesting and hunting schedules and associated routes to maximize their efficiency in harvesting roots and berries and hunting game to maintain sustainable practices taught to them by Elders, Knowledge Keepers and legends. Waiting and integration of traditional knowledge with western science are new found coping strategies for Aboriginal communities in the South Selkirks Region – patiently and respectfully waiting for game to arrive, waiting for the weather to improve, and integrating indigenous and western sciences and technologies to more effectively adapt to changing climates. Key informants felt that who they are as citizens is shaped and influenced by their interconnectedness and interrelationship with the land in which they live. Key informants felt an overwhelming sense of connection and sense of place at the Nation and regional levels which influence their identity as Aboriginal Peoples. Sense of place for key informants represented a profound understanding and connection to cultural and spiritual values that sustain them as individuals, community members and indigenous people. Key informants felt their responsibilities to themselves are extended also to their traditional lands – they felt that it is the foundation that gives direction and purpose to their actions and thoughts as Aboriginal Peoples. Furthermore, key informants noted that the shaping of self-identity ensured recognition for their communities by non-Aboriginal people regarding Aboriginal title and rights on the land and its resources;
- **Theme #4: Regional-Level Decision-Making.** Community meetings, voting by membership on specific issues, committees and working groups, Annual General Meetings and Annual General Assemblies, cultural and language-specific forums, and referendums were all identified as various methods in which Aboriginal communities in the South Selkirks Region engage in regional-level decision-making. As indicated by key informants, other characteristics of Aboriginal-specific regional-level decision-making include engaging in community visioning, growing internal and local capacity in Aboriginal communities in the South Selkirks, facilitating and sharing of local knowledge and resources (if and where appropriate according to cultural protocols) and establishing regional-level goals, objectives and indicators – linking vision with structure and performance measurement. Key informants had an overwhelming sense that they want to

proactively take ownership in what they do on the land and want to be equal with neighbouring or partnering non-Aboriginal organizational entities; and

- **Theme #5: Climate Change Adaptation Strategies.** Key informants identified strategies and initiatives that either currently exist or should be advanced in the future to support their Aboriginal communities in the South Selkirks in adapting to climate change at the regional level. Key strategies centered on renewable energy; Nation-level awareness and education on climate change; enhancement of social networks and dialogue; full participation and engagement in climate change adaptation decision-making by Aboriginal communities in the South Selkirks; recognition and integration of language, cultural and localized knowledge in Nation level climate change processes; utilization of community forests and conservation forestry practices; implementation of ecological restoration; growth or purchase of local foods, products and services; and continuation of Aboriginal community-specific ecological monitoring and climate change adaptation.

Though some or all of these above mentioned themes may not be perceived as directly related to climate change, it is important to realize that climate change and the ability to adapt to its effects at the landscape and regional levels are one of many priorities and needs for Aboriginal communities in the South Selkirks Region. Furthermore, based on the qualitative interviews, these five themes moved beyond climate change adaptation as key informants discussed this topic in a holistic context – cultural, economic, social and spiritual interests.

This study aids in understanding diverse community perspectives and roles in climate change adaptation in the study area; examining the social, cultural and ecological changes that key informants observed and the attributes that they believe make the South Selkirks Region resilient in the face of future climate changes; and informing resource policy makers, planners and program managers on strategies and key factors that can maintain or enhance social and cultural attributes of individuals and/or groups in the face of adversity (i.e., adapting to climate change). Aboriginal paradigms and viewpoints on this subject matter are equal to existing western science approaches in understanding climate change adaptation in the South Selkirks Region. Recognizing and hearing perspectives on climate change from Aboriginal Knowledge Keepers results from this understanding.

Key Words

Aboriginal; climate change; human resiliency; positive psychology; qualitative research; South Selkirks.

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Introduction

“If you talk to the animals they will talk with you and you will know each other. If you do not talk to them you will not know them and what you do not know, you will fear. What one fears, one destroys.” (Chief Dan George, n.d.)



Forest Landscape
Photo courtesy of Métis Nation British Columbia (MNBC)

Coast Salish Chief Dan George (1899 – 1981) respectfully acknowledged that the connection that we (as humans) make with the land and animals is sacred from social, cultural and spiritual perspectives. The decisions that we make today about our communities, our land and our climate will have long-term effects for future generations. Therefore, it is important to understand the connections between humans and the land to identify perceptions and viewpoints that will guide communities in adapting to changing landscapes and climates which surround them now and forever.

From January 2010 to December 2011, the South Selkirks Climate Change Research Project examined climate change at the landscape level in the South Selkirks Region of British Columbia (BC), Canada. This research project was based on the need to use a holistic approach in addressing climate change – an approach that acknowledges and recognizes social, cultural, ecological and economic interests as a benchmark for forest management practices. The project was led by Dr. John Innes (University of British Columbia – UBC) and his multidisciplinary research team. The South Selkirks Climate Change Research Team was comprised of Aboriginal representatives, academia, Government of BC, Nature Conservancy of Canada (BC Region), forest industry representatives and consultants who specialized in natural sciences, social sciences (e.g., economics and psychology) and indigenous science.

As part of the broader research conducted by the South Selkirks Climate Change Research Team, three distinct Resiliency Dimensions were identified to explore and integrate multifaceted questions about climate change adaptation – Ecological Resiliency Dimension, Economic Resiliency Dimension and Human Resiliency Dimension. In order to advance the Human Resiliency Dimension, a mixed methods approach was utilized to examine the social and cultural dimensions of human resiliency in relation to climate change adaptation in the South Selkirks Region. As part of the mixed methods approach, I conducted initial qualitative interviews conducted in Spring 2010 followed by a quantitative-based Public Opinion Survey conducted by my colleague, Dr. Howard Harshaw (UBC), in Summer/Fall 2011.

The study of Aboriginal perspectives on climate change adaptation in the South Selkirks was qualitative and consisted of conducting semi-structured interviews with a purposive sample of Aboriginal Knowledge Keepers (aka. key informants) in the region. Aboriginal Knowledge Keepers are individuals (self-identified as being either First Nations or Métis) who are recognized by their communities as having knowledge and understanding of the traditional culture of the community, including spiritual and social practices. They are identified based on their communities' respect for them and peer recognition for their depth and breadth of localized knowledge. Specifically, I examined human resiliency and coping characteristics of Aboriginal Knowledge Keepers to climate change-related effects in the South Selkirks Region. The purpose of this component of the South Selkirks Climate Change Research Project was to (a) give a voice to diverse Aboriginal Knowledge Keepers' perspectives and roles regarding the topic of climate change, human resiliency and coping; and (b) supplement the South Selkirks Public Opinion Survey. Although there is a considerable amount of research that has been carried out on climate change and its effects on the natural world (e.g., greenhouse gas emissions effects on wildlife), there are still few studies on the effects of climate change on communities, particularly as it relates to Aboriginal communities of First Nations and Métis ancestry.

Through interviews with Aboriginal Knowledge Keepers in the South Selkirks Region, I gathered information about how people use localized knowledge to cope with climate change. Interviews were based on positive psychology, a movement that has shifted psychology's preoccupation with dysfunction to a focus on positive human qualities such as optimism and adaptability (Seligman, 1998; Seligman & Csikszentmihalyi, 2000). Through positive psychology, we (as a society) can better understand how to build on optimal human behaviours to help communities thrive. The application of positive psychology assisted me in identifying characteristics and attitudes that render communities and individuals less vulnerable to climate change effects in the South Selkirks Region.

Based on the findings from the qualitative community-based interviews and complementary results from the South Selkirks Public Opinion Survey, the Ecological Resiliency Dimension and Economic Resiliency Dimension, the research team conducted dialogue sessions and prepared publications and final reports for our strategic partners – academia, industry, Aboriginal communities, Government of BC and non-governmental organizations (NGOs) to facilitate the extension of results. Furthermore, the South Selkirks Climate Change Research Team's collective findings will aid in developing recommendations for operational practices that foster human resiliency in adapting to climate change.

**Note. A glossary of terms is located in Appendix A to aid readers in better understanding key terms from indigenous science, natural resource management and psychology.*

Aims of the Study

As previously mentioned, the purpose of the broader South Selkirks Climate Change Research Project is to utilize a holistic and landscape level approach in addressing climate change adaptation – an approach that respects social, cultural, ecological and economic interests in addressing forest management practices in the South Selkirks Region of the Kootenays in BC, Canada. The emphasis of the research study is to address the following set of priority questions:

- **Ecological Resiliency Dimension.** What climate change adaptation practices would be required to encourage resiliency while maintaining or enhancing conservation values in the South Selkirks study area?
- **Economic Resiliency Dimension.** What forest management practices would be required to encourage resiliency while adapting to climate change?
- **Human Resiliency Dimension.** What climate change adaptation practices would be required to maintain or enhance social and cultural values in the South Selkirks study area? Which of these practices would be acceptable to local residents (and if divergent, how can these be reconciled)?
- **Holistic Policy Framework.** How can these three above mentioned Resiliency Dimensions best be combined in a balanced and equitable approach to regional climate change adaptation?

By analyzing climate change adaptation from multiple Resiliency Dimensions (e.g., human, ecological and economic), the study team is examining the effects of climate change on the relationships between people, forests, water, land, air, plants and animals – thereby honouring the complementing strengths of acknowledging, utilizing and sharing indigenous science and western science approaches in understanding our changing climate.

The Human Resiliency Dimension serves as the integrating mechanism that brings together the social, cultural, economic and ecological values explored in the South Selkirks Climate Change Research Project. As a component of the Human Resiliency Dimension, the qualitative community-based study was intended to give a voice to local Aboriginal Knowledge Keepers on the topic of climate change, human resiliency and adaptation.

Key objectives for the Human Resiliency Dimension are

- collecting local perceptions of human resiliency and adaptive capacity (i.e., strengths and opportunities for coping with climate change from social, cultural, economic and ecological perspectives);
- understanding diverse perspectives and roles of Aboriginal Knowledge Keepers in the South Selkirks; and

- examining the social and environmental changes that participants may have observed and the attributes that they believe make the South Selkirks Region resilient in the face of future climate changes.

The qualitative study was intended to (a) contribute to the broader analyses being carried out by the South Selkirks Climate Change Research Project; (b) understand diverse perspectives and roles in climate change adaptation in the study area; (c) examine the social, cultural and ecological changes (if any) that key informants observed and the attributes that they believe make the South Selkirks Region resilient in the face of future climate changes; and (d) inform resource policy makers, planners and program managers on strategies and key factors that can maintain or enhance social and cultural attributes of individuals and/or groups in the face of adversity (i.e., adapting to climate change). Aboriginal paradigms and viewpoints on this subject matter are equal to existing western science approaches in understanding climate change adaptation in the South Selkirks Region. Recognizing and hearing perspectives on climate change from Aboriginal Knowledge Keepers results from this understanding.

Limitations

As part of the confidentiality agreement between the Aboriginal Knowledge Keepers and me, the names of the communities in which key informants reside and other identifying characteristics of their specific home communities were not mentioned in this final report. Names and related quotes from the interviews were identified in this final report under pseudonyms.

Assumptions

The following assumptions were expected to prevail throughout this study:

1. It is anticipated that the key informants will be honest with their responses;
2. It is anticipated that the key informants will accurately carry out the instructions provided by the researcher;
3. An inductive approach to understanding climate change adaptation, human resiliency, and social and cultural values provides a better means of identifying values, beliefs, feelings and actions of key informants rather than the researcher imposing them through the application of pre-determined conceptual frameworks and constructs from the existing literature;
4. The effectiveness of the mixed-methods research design for the broader Human Resiliency Dimension Study (blending qualitative and quantitative research techniques) rests on the premise that the weakness in a single method will be compensated by the counter-balancing strengths of another research method;
5. A client-centered approach to this study ensures that Aboriginal communities are not only clients benefiting from the deliverables of the study, but also active team members

working on the study and/or serving as research respondents. The participatory approach ensures that the study's aims, objectives and methodologies are developed in collaboration with the Aboriginal communities and clearly reflect their respective interests;

6. Indigenous perspectives of key informants in terms of their experiences and localized knowledge (e.g., traditional knowledge) are of equal weight and complement western science techniques in investigating climate change adaptation in the South Selkirks Region;
7. The opinions and perspectives provided by key informants are their personal and/or professional views and not representative of the views of the governance bodies for their Aboriginal communities. Therefore, key informants' perspectives should not be generalized to other Aboriginal communities in the province, Canada and North America as each community and Nation has distinct social and cultural values and viewpoints relative to their traditional territories; and
8. The Aboriginal Knowledge Keepers interviewed for this study did not distinguish between communities for the purposes of defining a specific territory, study area or geographic area (e.g., South Selkirks Region).

Literature Review

Human resiliency, a term often associated with psychology, has emerged in the natural resource management realm over the past decade. In psychology, human resiliency focuses on the dynamic, responsive capacities for fostering healthy development, interaction and adaptation in the face of a challenge or crisis at the individual and group (or community) levels. At the community level, human resiliency examines citizens or groups (as a whole) in terms of their collective ability to deal with and manage community-based stressors, change or crisis (Caverley, 2005; Joseph & Krishnaswamy, 2010; Ratner & Moser, 2009). According to the *U.S. Endowment for Forestry and Communities November 19, 2009 News* regarding the study on community resiliency and wealth conducted by Shanna Ratner and Dr. Susanne Moser,

a resilient community has the ability to protect, reestablish, and grow community wealth in response to disturbances. The presence of community wealth, "the sum total of the intellectual, individual, social, built, natural and financial assets of a community," is the basis from which communities build resiliency, however it does not assure resilient responses to stressors. (U.S. Endowment for Forestry and Communities, 2009, p.1)

Further to this definition, Joseph and Krishnaswamy (2010) conducted a literature review on community resiliency and identified 15 factors of resiliency that included, but were not limited to, economic diversification; equal distribution between resources (natural, financial, human and social); sound governance; strategic planning and design; and citizen engagement. Human resiliency at the community level is important because it aids in mitigating the effects of difficult

situations from economic downturns, demographic shifts, and social, cultural and political transformations in response to disasters and related changes (e.g., climate change). Environmental, economic and social changes are always occurring; therefore, communities are focusing on developing and implementing strategies and initiatives that enhance adaptive capacities at the local level (A. Krishnaswamy, personal communication, May 6, 2010). The study of community resiliency is part of the broader research field related to the human dimensions of natural resource management.

Resiliency is not a commonly utilized term in climate change literature. Though a large number of studies have been published on human resiliency and coping (at the individual and group levels), there remains limited research on these topics in relation to climate change adaptation, particularly as it applies to indigenous communities. For example, what types of strategies are utilized by indigenous communities in adapting to climate change effects in their Nations? How does climate change affect and influence social and cultural survival of indigenous communities and their ways of life? The notion of human resiliency applied to climate change adaptation in indigenous communities is worthy of further investigation.

In ecology and natural resource management, the term “resiliency” is often associated with the behaviour of ecological and natural systems in relation to human origin (e.g., pollution, clear cutting) or natural (e.g., fire, insect attack) disturbances (W. Klenner, personal communication, August 11, 2010; T. Stevens, personal communication, August 13, 2010). Furthermore, “resiliency” from an ecological standpoint infers a return to a condition that is somewhat similar to the pre-disturbance condition, or a condition that has key features (e.g., plant species, structures) that strongly resemble the former condition (W. Klenner, personal communication, August 11, 2010). Dr. Walt Klenner, Team Leader for the South Selkirks Ecological Resiliency Dimension and Research Wildlife Habitat Ecologist for the BC Ministry of Forests, Lands and Natural Resource Operations described an image of ecological resiliency that would feature a planned diverse mixture of age and structural conditions that have (a) a well-dispersed environment of unmanaged mature and old forest; (b) a managed land base with treatments that span a range of disturbance severities; (c) redundancy of structural and disturbance conditions to offset the uncertainty associated with natural disturbances; and (d) the incorporation of connectivity issues into varying scales (W. Klenner, personal communication, August 11, 2010). Sara Howard, former South Selkirks Climate Change Team Member and Aquatic Ecologist for the Nature Conservancy of Canada – BC Region outlined other characteristics of ecological resiliency that center on (a) plant communities that are able to re-organize in relation to new climatic regimes because productive populations are widespread and connected; (b) animal populations that are large and productive enough to allow for dispersal and colonization of potential new areas of suitable habitat; (c) genetic diversity that is sufficient to allow adaptation to new habitats as they form; and (d) stream systems that respond well in high flow situations (S. Howard, personal communications, August 12, 2010).

As opposed to human resiliency, some researchers such as Decker, Brown and Siemer (2001) utilize the term human dimensions. Human dimensions focus on how and why humans value natural resources, how humans want resources managed, and how humans affect or are affected

by natural resource management decisions. Research on human dimensions examines human behaviours and how to incorporate that understanding into natural resource management planning and actions. Human dimensions covers concepts and practices that include, but are not limited to, cultural and economic values; individual and social behavior; legal and governance frameworks of management; communication and education; and management decision-making processes. Over time, literature and associated research on resiliency has shifted from community stability (ensuring a constant flow of economic benefits) to community resiliency (focusing on adaptation, transformation and change management) (H. Harshaw, personal communication, May 6, 2010; A. Krishnaswamy, personal communication, May 6, 2010). There is much more to explore in examining human resiliency in relation to climate change adaptation, particularly as it relates to exploring the role localized knowledge plays in shifting attitudes and behaviours about the changing climate in indigenous communities. In this section of the report, I will be integrating various facets of existing literature on climate change, human resiliency and positive psychology (the psychology of positive human functioning and adaptive capacity as individuals and groups) in relation to the South Selkirks Region and the Aboriginal Knowledge Keepers that were engaged in this study.

Human Resiliency and Positive Psychology



Métis Skills & Employment Centre students
Photo courtesy of Métis Nation British Columbia (MNBC)

The qualitative component to the South Selkirks Climate Change Research Study contributed to the existing research in the positive psychology movement. Following in the spirit of the positive psychology movement, the study of human resiliency uses psychology and related disciplines to determine the behaviours of individuals and/or groups (e.g., communities and societies) that render them more or less vulnerable to crises and hardships (i.e., adapting to climate change) (Seligman, 1998; Seligman & Csikszentmihalyi, 2000; Sheldon, Fredrickson, Rathunde, Csikszentmihalyi & Haidt, 2000). Dr. Martin Seligman and his colleagues, Dr. Mihaly Csikszentmihalyi and Dr. Ed Deiner, are champions in the positive psychology movement. Positive psychology involves a shift away from what is wrong with people (e.g., disease, dysfunction, illness) to what is right with people (e.g., strengths and well-being). It focuses on optimizing human performance, behaviours, health and social functioning which are described by terms such as thriving, flourishing or resilience (Seligman, 1998; Seligman & Csikszentmihalyi, 2000; Sheldon et al., 2000). Strength-based attributes at the individual level include, but are not limited to, optimism, hope, perseverance, and insight (Caverley, 2005; Seligman, 1998; Seligman & Csikszentmihalyi, 2000). At the community level, strength-based attributes may include tolerance, responsibility and selflessness as reflected in local institutions, community-driven policies, open-minded leaders and active social networks to facilitate knowledge and information exchange (Ratner & Moser, 2009; Seligman, 1998; Seligman & Csikszentmihalyi, 2000).

Positive psychologists seek to identify, describe and subsequently develop factors that encourage individuals, communities and societies to flourish regardless of the type(s) of hardships, crises and/or changes that they have dealt with over a period of time. This specialized stream of psychology emphasizes the healthy functioning of individuals, societies and communities. Empirical studies in the positive psychology movement shift away from examining pathology to understanding how individuals flourish and/or how communities thrive in the face of difficulty (Sheldon et al., 2000). By studying human resiliency, there is an opportunity for researchers to examine human dimensions and adaptive systems that promote healthy development and functioning at the individual, group and broader community and societal level. The positive psychology movement clearly recognizes that there is much to be learned by studying the positive aspects or strengths of communities or individuals in society.

Human Resiliency and Indigenous Wellness

In this section of the report, general and consistent themes from indigenous wellness and human resiliency literature are described whereby there is recognition that most indigenous cultures have a connection between spirituality, sustenance, community and land which is necessary for the ongoing survival of the culture. However, it is important for readers to realize that not all indigenous societies have earth-based cultures (aka. to have direct sacred connection and interrelationship with the land and earth) just as not all western societies believe in and have direct connection to the same divinity. Positive psychology shares many similarities and characteristics with indigenous wellness whereby human resilience (from an indigenous perspective) centers on balance and harmony between the individual's mind, body, spirit and emotions in relation to the Creator and the environment (Cajete, 1994; Meyers, Witmer & Sweeney, 2000). When the mind, body and soul are disconnected from the Creator and environment, illness (physical, psychological, spiritual, emotional and/or cultural) presents itself at the individual, family, community or societal level. Indigenous wellness perspectives do not view living systems and the universe reductively; instead, all things are viewed as animate and having spirit (Bartlett, Marshall & Marshall, 2007; Cajete, 2000; L. Littlebear, personal communication, May 12, 2009). Therefore, humans are in an existential relationship with all domains of nature with corresponding responsibilities that are interdependent and interrelated. Humans must recognize their roles and responsibilities to assist in maintaining dynamic balances in the natural world through their participation with and renewal of the natural environment. Also, the technologies and related innovations that humans develop should not only be sustainable in nature but also reflect and contribute to balance and renewal within the individual, community, society and natural environment (Cajete, 1994, 1999, 2000; L. Littlebear, personal communication, May 12, 2009).

The Medicine Wheel (aka. Sacred Hoop) is a common visual description and tool that illustrates indigenous wellness. The Medicine Wheel illustrates the interconnectedness and interrelationship of specific dimensions of wellness: physical, spiritual, emotional, psychological, and cultural. The wheel is divided into four quadrants, with each quadrant associated with one of the four sacred directions (e.g., West – physical, North – human spirit, East – emotions, South – psychological). Each direction corresponds to the sacred teachings, meanings, spirits, life forms, elements of power and aspects of wellness (e.g., physical, mental, spiritual, emotional, cultural). The center of the Medicine Wheel is the self in harmony and balance (France, McCormick & Rodriguez, 2004). Figure 1 shows a diagram of a medicine wheel and its sacred directions.

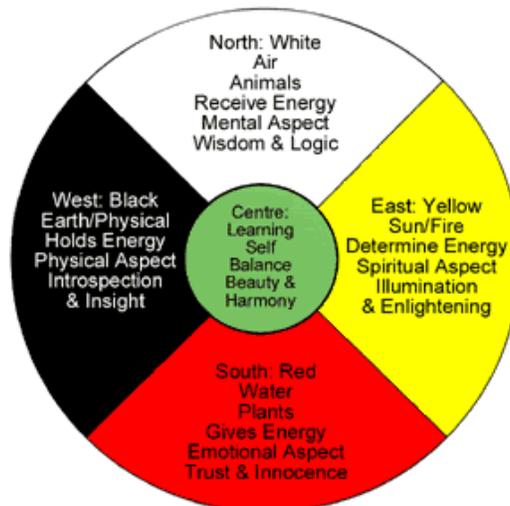


Figure 1. Diagram of an Aboriginal Medicine Wheel (Source: The Integral Medicine Wheel, 2010)

Like the positive psychology movement, indigenous wellness paradigms such as Native American postcolonial psychology involve the restoration of balance and harmony to the body, mind and spirit and to relationships with family, community, society and nature (Duran & Duran, 1995; Duran, 2006; France et al., 2004). According to Duran and Duran (1995) and Duran (2006), the central concept of the Native American postcolonial psychology paradigm is that psychological and life worlds of indigenous cultures are valid in their own right and neither have to be legitimized nor validated by mainstream cultures (i.e., western science paradigms) regarding localized knowledge, experiences and associated science created by indigenous people. Since time immemorial, indigenous people have had to persevere in the face of hardships, crises and changes related to human activity and/or the natural environment which were often highly stressful and traumatic. In response to adversities of human and/or natural origin, indigenous people have developed ways of coping, healing and responding to crises and changes that have enabled them to survive throughout the centuries (Duran & Duran, 1995; Duran, 2006; France et al., 2004).

The human-environment relationship and its healing qualities are addressed in publications by Berkes (1999), Cajete (1999), Deloria (1995), Duran (2006), France (1997), McCormick (1997), Pawu-Kurlpurlurnu, Holme and Box (2008) and Posey (1999) who recognized the connection that humans have with the land in terms of health and well-being. This connection imparts healing mechanisms for individuals, communities and societies (in particular, indigenous communities) to address physical health problems (e.g., coronary heart disease), mental health (e.g., substance abuse and historical trauma), and social and cultural disruptions (e.g., loss of language, localized knowledge and disconnections with one's traditional landscape and Nation through indoctrination of non-indigenous values in the Indian Residential School programs). Indigenous people cannot simply pack up and leave their traditional land as a result of a community and/or environmental crisis or change (i.e., climate change) because this action may negatively impact the physical, psychological and spiritual/cultural dimensions of community

members' sense of self identity and social connections to their Nations which have evolved over generations (Caverley & Scott, 2007).

Climate Change

In general, climate change can be defined as changes in temperature, precipitation, wind patterns and other elements of the earth's climate system over an extended period of time (Jamet & Corfee-Morlot, 2009; Johnston et al., 2010; Seppala, Buck & Katila, 2009; Williamson et al., 2009). Changes in climate are related to natural variability (aka. natural climate cycles) and/or a result of human activity (e.g., production and burning of fossil fuels leading to increased greenhouse gas emissions into the Earth's atmosphere) (Jamet & Corfee-Morlot, 2009; Johnston et al., 2010; Newall & Pitman, 2010; Seppala et al., 2009; Williamson et al., 2009). Climate change-effects manifest themselves in extreme weather events that include, but are not limited to, increased wildland fires, landslides, droughts, floods, insect damage to forest and range lands (e.g., Mountain Pine Beetle – MPB), species extinction, and disruptions to natural ecosystems (Johnston et al., 2010; Konkin & Hopkins, 2009; Seppala et al., 2009; Williamson et al., 2009; Woods, Heppner, Kope, Burleigh & Maclauchlan, 2010). One of the major difficulties in addressing human resiliency in the context of climate change is the uncertainty about how ecosystems that have undergone disturbance (e.g., wildland fires) should respond to changes in basic parameters (e.g., temperature, precipitation) that will allow individuals and communities to thrive during and after these hardships and changes in their natural environment. Therefore, climate change-effects have significant implications on human resiliency in terms of individuals', communities' and societies' ability to flourish in the face of economic (i.e., financial downturns in forestry-dependent communities), social and cultural (disconnection with the land and loss of identity at the Nation level), and public health risks (e.g., spread of infectious diseases, and food and water insecurity which includes reductions in the availability and quality of food and water resources) (Akerlof et al., 2010; Maibach, Nisbel, Baldwin, Akerlof & Diao, 2010).



The effects of the Mountain Pine Beetle (MPB) on a forest landscape - trees turn red after the first year of attack
Photo courtesy of the BC Ministry of Forests, Lands and Natural Resource Operations

Communities are recognizing that they are at the frontlines of climate change, which is accelerating their response to adapt and manage their existing resources and infrastructure. A community's ability to effectively adapt to change centers on human behaviour and choices ranging from citizen behaviour to policy and planning decision-making at the local, provincial/

state and federal governmental levels (Joseph & Krishnaswamy, 2010; Seppala et al., 2009; Ratner & Moser, 2009). Specifically, the capacity to manage the convergence of the ecological, economic, social and cultural effects of climate change serves as a true test for many communities in influencing their degree of human resiliency now and over the coming decades.

In BC, monitoring (aka. regular and systematic measurement) initiatives are being carried out by various organizations (e.g., Aboriginal communities, forest companies, municipal/provincial/federal levels of government and NGOs) with varying degrees of coordination, partnerships and associations to one another. These initiatives are assisting communities in recording how forests and rangeland in the province are being altered as a result of climate change so that researchers and natural resource managers may inform management decisions to effectively adapt to climate change. Monitoring helps to enhance (or at least not negatively affect) resiliency of both the forests and rangeland and the communities that they support (M. Eddington, personal communication, August 10, 2010). Researchers like Margie Eddington (PhD Candidate at UBC) and her UBC/BC Government study team tested methodologies that they have developed for specific monitoring indicators. Key indicators included, but are not limited to, the effects climate change have on the distribution and composition of forest and range ecosystems, the phenologies of wild plants and animals, and fire season length and severity (M. Eddington, personal communication, August 10, 2010). This information gathered through monitoring ecological and physical attributes provides communities with early warning of emerging problems that may require human intervention and/or altered management regimes to maintain resilience, for example, unstable slopes, water temperatures and snow packs (W. Klenner, personal communication, August 11, 2010). Monitoring is especially important in many BC Aboriginal communities as legends and localized knowledge acknowledge the roles of Aboriginal people as caretakers for the creatures and plants on Earth and their responsibility to maintain a healthy balance between themselves and nature (Brown & Brown, 2009; First Peoples' Heritage, Language and Culture Council, 2010).

According to the BC Government's *Climate Change Action Plan*, "over the last 50 – 100 years, BC has lost up to 50 percent of its snow pack, and total annual precipitation has increased by about 20 percent. At the same time, our communities have been experiencing longer summer droughts as weather patterns grow increasingly erratic" (Government of British Columbia, 2008, p.7). In the realm of natural resource management, climate change-effects (e.g., reductions in soil fertility) are influencing forest growth, tree species distribution, ecosystems processes and forestry operations (Galloway McLean et al., 2009; Jamet & Corfee-Morlot, 2009; Johnston et al., 2010). In forest-dependent communities, these changes not only affect ecological systems as indicated above but affect economic, social and cultural systems ranging from employment, income, social well-being to cultural and spiritual connections to the landscape (Galloway McLean et al., 2009; Joseph & Krishnaswamy, 2010). Government of BC initiatives such as Forests for Tomorrow, Trees for Tomorrow and the *BC Bioenergy Strategy* are currently providing province-wide opportunities to assist communities in adapting to climate change while maximizing the overall potential of BC's forests beyond raw logs (e.g., bioenergy, non-timber forest resources and products). High levels of vulnerability coupled with lower adaptive capacity create more risks for forest-dependent communities with Aboriginal communities being more

vulnerable to climate change effects than other communities in Canada (Lemmen, Warren & Lacroix, 2008).

Climate Change – An Indigenous Perspective

“Article 5: Indigenous people have the right to maintain and strengthen their distinct political, legal, economic, social and cultural institutions, while retaining their right to participate fully, if they so choose, in the political, economic, social and cultural life of the state.”
(United Nations Declaration on the Rights of Indigenous Peoples, 2007)

Land, law and governance, language, spirituality, and affiliation/kinship are fundamental cultural elements in growing a sustainable future for many indigenous communities in Canada and worldwide. From an indigenous worldview, there is an “unbreakable and sacred connection between land, air, water, oceans, forests, sea, ice, plants, animals and our human communities as the material and spiritual basis for our existence” (The Anchorage Declaration, 2010, p.1). Therefore, healing of the land by indigenous communities, as traditional stewards of the forests, involves actions such as understanding the principles of stewardship, utilizing localized knowledge (aka. traditional knowledge) of the given Nation that may be shared with others through ceremony and song, and adhering to cultural protocols that keep their societies intact now and forever. For indigenous Youth, learning their Nation’s traditional language, visiting traditional lands and actively participating in experiential learning opportunities with Elders and Knowledge Keepers are ways to heal the land, individuals and communities as a means of improving health and well-being (Caverley, 2009). The cumulative effects of climate change on human resiliency in indigenous communities have the potential of contributing to the loss of social identity and well-being for many people (particularly Youth). Specifically, the social and cultural effects of climate change may lead to the deterioration of historical connections to the Nations and landscapes (e.g., loss of historical information on healing sites, traditional trading routes, rites of passage sites) and access to harvesting sites for sustenance and medicinal purposes (Nuttall, 2005).

Climate change is generally viewed as a significant threat to the social, cultural, health and well-being (human and ecological), local infrastructure, economic viability and general ways of life (livelihoods) for many indigenous communities (Galloway McLean et al., 2009; Ricketts et al., 2010). Indigenous communities often feel direct climate change-effects based on their interrelationship and interconnectedness with the natural environment and its resources (Galloway McLean et al., 2009; Ricketts et al., 2010). Some of the climate change-effects on indigenous communities include, but are not limited to,

- Reduction of freshwater availability and quality for human consumption and fish habitats (e.g., wild salmon);
- Erosion of roads and buildings near coastal shorelines;
- Erosion of landscapes where cultural heritage and spiritual sites (e.g., graveyards, healing sites, traditional trading routes) are situated;

- Change in the location and/or abundance of flora and fauna and their habitats affecting traditional economies and community sustenance;
- Deterioration of community infrastructure (e.g., housing, power);
- Extreme weather events (e.g., wildfires, flooding, drought and landslides);
- Loss of land identified in current or future treaty negotiations; and
- Movement of insects at accelerated rates (e.g., MPB infestation in the interior regions of BC).

Indigenous people are deeply connected (physically, socially, culturally and spiritually) to their Nations and natural environment. They cannot walk away and abandon their communities when hardships, crises and/or changes affect their Nations without placing their Nation's culture and social identity in jeopardy (Caverley & Scott, 2007). Therefore, climate change intensifies the difficulties already faced by indigenous communities such as socio-economic marginalization and loss of traditional lands and resources (Galloway McLean et al., 2009; Ricketts et al., 2010). One of the major vulnerabilities of indigenous communities across the globe is the altering of the quantity and quality of available fresh water and increase and duration of floods and droughts (Galloway McLean et al., 2009; Ricketts et al., 2010). In Canada, access to clean drinking water continues to challenge many Aboriginal communities. For example, in many Canadian Aboriginal communities, it is not uncommon that individual well systems are the primary method of accessing water on reservations which are quite vulnerable to the effects of flooding, drought and landslides (Graham, Edgar & Mitchell, 2009; Graham, Mitchell & Edgar, 2009).

Localized knowledge and practices in indigenous communities play an important role in examining climate change by honouring traditional and experiential knowledge, and social and cultural values gained through observation (aka. monitoring), stories, songs and ceremonies (Galloway McLean et al., 2009; Ricketts et al., 2010; Verschuuren, 2007). The knowledge and practices that indigenous communities have accumulated from time immemorial to cope with past environmental and human disruptions and changes are a powerful resource to aid communities in current climate change adaptation. By using such knowledge to design innovative practices and related infrastructure (e.g., transportation, buildings and water supply), such communities can better adjust to changing weather patterns and conditions that affect the timing of harvesting, hunting and trapping for indigenous community members (G. Merkel, personal communication, August 10, 2010). Localized knowledge serves as a catalyst for community-level adaptation, through the utilization of indigenous people's interpretations, observations and reactions to the effects of climate change. For example, in North America, some indigenous communities are striving to cope with climate change by integrating technologies alongside social, cultural and economic interests for their Nations. The T'Sou-ke Nation in Sooke, BC (on Southern Vancouver Island) is addressing climate change while reconnecting to the land by utilizing solar power as a renewable energy for hot water and electricity production in the Nation. Specifically, T'Sou-ke Nation is enhancing the capacity of their traditional lands as an energy resource for its citizens, replacing fossil fuel-derived energy

(e.g., diesel generation) and limiting greenhouse gas emissions (Kimmett, 2009). It is noted at local, provincial, national and international dialogue sessions such as the Indigenous Peoples' Global Summit on Climate Change that in order to address climate change effectively, indigenous communities require adaptation, technological advancement, and financial and human resources (Galloway McLean et al., 2009). The enhancement of indigenous communities' adaptive capacity to climate change requires integration (or harmonization) with other strategies such as ecosystem stewardship, community protection and economic sustainability. In many circumstances, climate change adaptation technology and related infrastructure requires additional resources (financial and human resources) that many indigenous communities cannot afford. Furthermore, existing climate change funding parameters generally do not accommodate cultural preservation (e.g., language preservation and revitalization) and integrated initiatives (bridging western and indigenous knowledge) for Nations as they endeavour to advance culturally congruent frameworks on climate change strategies and initiatives. These factors create significant barriers for indigenous communities to proactively engage in current climate change initiatives.

The Study Area

South Selkirks Region – The Study Area

The South Selkirks Region is situated in the Kootenays (BC, Canada). The municipalities of Nelson, Creston, Salmo, Trail, Castlegar and outlying rural/settlement areas represent western/non-Aboriginal boundaries for this particular region. Figure 2 provides a map of the South Selkirks Region.

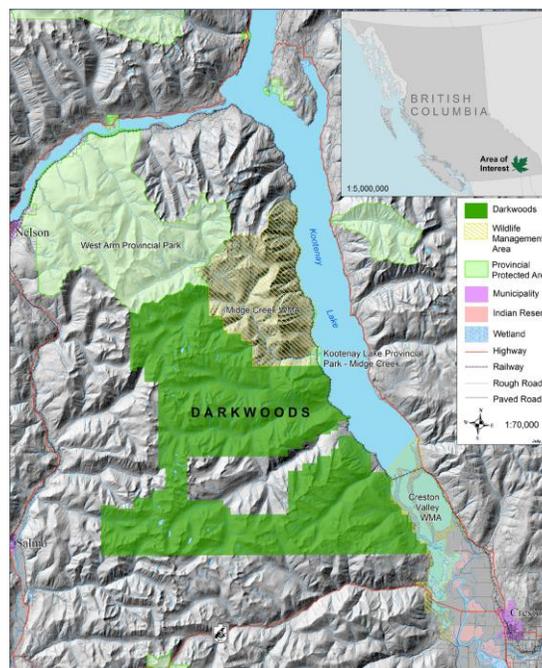


Figure 2. South Selkirks Region as defined by the Nature Conservancy of Canada (NCC) – BC Region (Source: Nature Conservancy of Canada, n.d.)

From geographic and ecological perspectives, the South Selkirks Region is known for its mountainous landscapes (e.g., Valhalla Mountains, Selkirks Mountain), valleys (e.g., Slocan Valley), rivers (e.g., Columbia River) and lakes (e.g., Kootenay Lake) with extensive backcountry for recreation (e.g., hiking and camping) and sustenance (e.g., hunting, fishing) with the wilderness literally in community members' backyards. The ecosystem for this region is in a dry and warm Interior Cedar Hemlock zone (S. Howard, personal communication, August 11, 2010).



Valhalla Provincial Park
Photo Credit: Howard Harshaw

The West Arm Provincial Park, Nature Conservancy of Canada (BC Region) Darkwoods Property and the Creston Valley Wildlife Management Area are located in the South Selkirks Region. Of particular note, the Darkwoods is situated between the municipalities of Nelson, Salmo and Creston (Nature Conservancy of Canada, n.d.). According to the NCC's Darkwoods prospectus, the Darkwoods Property "is approximately 136,000 acres (55,000 hectares) in area. It forms a natural connection between the West Arm Provincial Park, Midge Creek Wildlife Management Area and the Creston Valley Wildlife Management Area" (Nature Conservancy of Canada, n.d., p.8).



Snow capped peaks of Darkwoods as seen across
Kootenay Lake from the Creston Valley Wildlife Management Area
Photo Credit: M.A. Beaucher

The South Selkirks Region contains a diverse array of flora (e.g., Bitterroot, Choke Cherry, Huckleberry, Indian Potato and Yarrow) and fauna (e.g., bank swallows, bison, Columbia spotted frogs, elk, moose, mountain caribou, nighthawks, salmon and white-tailed deer) (Ahearn, 2005).



South Selkirks Mountain Caribou Herd
Photo Credit: Roland Meyer

Key trees in this region are fir, pine, western larch, balsam, spruce, aspen, poplar and birch (Ahearn, 2005). The Kootenay and Columbia Rivers and Arrow Lakes are the major waterways (Ahearn, 2005). To date, the MPB infestation has had minimal impact in this region compared to the devastating effects in northern BC Aboriginal and non-Aboriginal communities (C. Casimer, personal communication, May 5, 2010).



Darkwoods Property
Photo Credit: Pat Field



A waterfall leading into Kokanee Glacier
Provincial Park
Photo Credit: Howard Harshaw

Economic boundaries in the South Selkirks Region represent the proximity of settlement areas to ecological boundaries and Timber Supply Areas (TSAs). Therefore, the southern portion of the Arrow TSA and southern portion of the Kootenay Lake TSA represent forestry-related economic

boundaries of the South Selkirks Region which focus on timber supply and fibre flow (S. Tedder, personal communications, January 29, 2010). The City of Cranbrook is the regional service center for the Kootenays, which includes the Canadian Rockies International Airport and the East Kootenay Regional Hospital. Traditional economies focus on trading, hunting, fishing and trapping, particularly for Aboriginal communities (Ahearn, 2005). Today's current economies in the South Selkirks Region center on light industrial activity (e.g., manufacturing and trade), resource extraction (e.g., forest harvesting, small scale mining and mineral exploration) and agriculture (e.g., farming and agri-tourism) (Kootenays Rockies Tourism, 2010; Visitors' Choice Publications Ltd., 2008).

In recent years, the South Selkirks Region experienced mill closures due to the downturn in the forest sector, which resulted in the transitioning to independent businesses (entrepreneurship) and ecotourism (e.g., mountain biking, lake swimming, fishing, hunting, camping, skiing and boating). There is continued interest by some Aboriginal communities in the South Selkirks Region to actively engage in economic diversification and create opportunities for its citizens to adapt to new employment opportunities in the region (e.g., agroforestry, bioenergy) while ensuring that ecological, social and cultural values are maintained – balancing multiple values on the land. Overall, Aboriginal communities in the South Selkirks Region strive for economic equality alongside non-Aboriginal citizens whereby they can seek ownership and autonomy in their Nation's financial endeavours rather than be dependent on Governments of BC and Canada funding.



Conservation logging on Darkwoods property
Photo Credit: Pat Field

From an indigenous perspective, Aboriginal Knowledge Keepers who participated in the study acknowledged that their Nations do not distinguish between communities for the purposes of defining a specific territory or area (e.g., South Selkirks Region). Aboriginal Peoples are closely interrelated and move between communities thereby having full access to their Nations' traditional territories and respecting their traditional forms of governance (G. Merkel, personal communication, January 29, 2010).

There is a concerted effort by Aboriginal Knowledge Keepers to continue their traditional ways of living on the land and to exercise their Aboriginal rights on the land (e.g., fishing, hunting, trapping). Aboriginal Knowledge Keepers who participated in the interview process described their Nations as being friendly and relatively close knit with family connections and networks very important to them. From a social and cultural perspective, the South Selkirks has traditionally been used by Aboriginal Knowledge Keepers for cultural ceremonies (e.g., celebrations of sacred natural sites and cultural landscapes) as a place to honour ancestors and practice traditional ways of life and spirituality. It is important to continue traditions and to revitalize those practices that may be at risk of disappearing in the Aboriginal Knowledge Keepers' respective Nations. Celebrations can strengthen the spiritual connections between humans and the land. In doing so, celebrations can also create opportunities for Elders and Knowledge Keepers to engage with Youth and help to foster an attitude of respect and stewardship in the younger generation.

Furthermore, many of the Aboriginal communities in the South Selkirks Region are moving forward in establishing specific governance structures to become self-sufficient and engage in self-government initiatives (e.g., Nation re-building through oral history and preservation of traditional languages). Despite these positive steps in advancing their Nations, Aboriginal Knowledge Keepers acknowledged that they are constantly having to deal with racism and stereotypes associated with being Aboriginal, for example, the lack of recognition that Aboriginal Peoples exist in the Kootenays Region and had a presence in the region prior to the 1850s and present day (Ahearn, 2005). These issues create perceived barriers in advancing social and cultural practices in conjunction with ecological initiatives and economic diversification for Aboriginal Peoples in the region.

Methodology

Overview

The Human Resiliency Dimension Team of the South Selkirks Climate Change Research Project applied a mixed-methods approach that utilized a sequential exploratory strategy. Specifically, the team conducted qualitative interviews to inform a quantitative-based public opinion survey. This methodological approach assisted the study team in explaining and interpreting the relationships between human resiliency and adaptation as a means of exploring how community members perceive and respond to climate change from social, cultural, ecological and economic perspectives. Through the mixed-methods approach, the study team had the opportunity to collect diverse types of data as a means of providing a better understanding of human resiliency to climate change. The mixed-methods – sequential exploratory strategy was an appropriate methodology to utilize in the research study for interpreting the relationship between climate change and its effects on community members' degree of human resiliency in the South Selkirks Region.

For the purposes of this report, the results, discussion and conclusion exclusively focused on the findings from the qualitative community-based interviews with Aboriginal Knowledge Keepers from the South Selkirks Region. A separate report focusing on the findings from the South Selkirks quantitative-based public opinion survey is being prepared by my colleague, Dr. Howard Harshaw (UBC), for public release in Winter 2011. In addition to this final report, participatory dialogue sessions were carried out in Fall 2011 along with publications (in academic and popular/non-technical journals) reporting on various aspects of the South Selkirks Climate Change Research Study.

Qualitative researchers emphasize the importance of looking at variables in the natural settings where they are found. Detailed data are gathered typically through open ended questions that provide quotations from the interviewee(s) (Jacob, 1988). This type of research differs from quantitative research which attempts to gather data by objective methods to provide information about relations, comparisons, predictions and attempts to remove the investigator(s) from the investigation (Smith, 1983). The purpose of qualitative research is to understand people's interpretations of a given phenomenon (e.g., climate change) in the form of people's subjective perceptions, values and feelings (or emotions). A holistic focus is sought in qualitative research whereby the researcher(s) develops theories and associated hypotheses from the data that are collected. The primary collection instrument is the human person where the researcher(s) conducts research with the focus on obtaining authentic, rich and profound data on individuals' viewpoints on a phenomenon.

The strength of qualitative research is its production of in-depth and comprehensive information through the use of subjective data to describe the context or natural setting of key variables, thereby providing a broader understanding of a given phenomenon. The major limitation of qualitative research is that its research findings cannot be generalized to other communities (Anderson, 1998). According to Sillitoe (2002a, 2002b), and Snively and Williams (2005), qualitative research and its associated methods (e.g., in-depth interviews) are deemed culturally-

congruent with indigenous ways of knowing and promoting authentic participation with indigenous people. Qualitative research aids researchers and the indigenous communities in developing a deeper understanding of human behaviour, culture and related issues. This study contributed to the existing body of work in the positive psychology movement. Positive psychology is concerned with people's strengths and well-being; it focuses on optimizing human performance, behaviours, health and social functioning (Seligman, 1998; Seligman & Csikszentmihalyi, 2000). This approach is predicated on the idea that there is much to be learned by studying the positive aspects or strengths of individuals in society or in groups (i.e., communities).

Respondents

For the qualitative component of the South Selkirks Climate Change Research Study, I collected and analyzed qualitative data via semi-structured interviews with 13 key informants. This number provided an appropriate range of perspectives and allowed for data saturation (McCracken, 1988). Multiple interviews were used to elicit feedback by key informants on their perceptions of human resiliency and their ability to cope with climate change in the study area. Due to the diverse landscape of the study area, interviewing 13 key informants ensured balanced representation from Aboriginal Knowledge Keepers who actively experience the land and/or engage in natural resource management decision-making in the South Selkirks Region. Pilot testing was conducted for the study to check the overall reliability and validity of the questions being posed to key informants.

Consistent with qualitative research methods, purposive criterion-based sampling was used to recruit key informants for the interviews. A "Request for Participation Letter" was distributed to potential participants via two members of the South Selkirks Human Resiliency Dimension Team (Mr. Mark Carlson - Métis Kootenays Region and Mr. Dan Wigle – St. Mary's Indian Band/Ktunaxa Nation) inviting them to participate in the study. Based on their extensive knowledge and expertise of the South Selkirks Region, Mr. Carlson and Mr. Wigle coordinated the interview sessions and identified key informants with me according to a combination of factors – age, gender, geographic location, level of local community involvement and knowledge of natural resource management and related cultural issues. In addition to the requirement to be 19 years of age or older, the following selection criteria were used to ensure that a cross-section of Aboriginal Knowledge Keepers in the South Selkirks Region were invited to participate in the study:

- Interest in the preservation, revitalization and/or teaching of traditional ecological knowledge and resource management stewardship in their Aboriginal community and/or broader region;
- Knowledge of the given Aboriginal community and/or the broader region's cultural protocols;
- Knowledge and understanding of the given Aboriginal community's history and/or knowledge of the broader region's history;

- Interest in community planning/development and/or climate change issues;
- Recognition as a potential, emerging or current “champion/leader” in the community;
- Willingness to share how to advance Aboriginal holistic resource management approaches to aid in local decision-making;
- Creative and visionary in nature; and/or
- Knowledge of Aboriginal title and rights.

The selection criteria were outlined in the “Request for Participation Letter” (see Appendix C).

Key informants who agreed to participate voluntarily in the research study were asked a series of critical incident-styled questions and open-ended questions regarding climate change and its impact and influence on human resiliency at the individual and regional levels. In the study, key informants were told that they could withdraw at any time without any consequences. See Appendix D for a copy of the general overview and Appendix E for a copy of the informed consent form. In adherence to research ethics protocols, an honorarium was provided to each key informant in recognition of his/her degree and level of knowledge and experience. Travel reimbursement was also provided to key informants who did not reside in Cranbrook, BC and subsequently travelled to the interview location.

Thirteen (13) Aboriginal Knowledge Keepers participated in the study. Key informants were primarily male Aboriginal Knowledge Keepers. The age range of key informants was between 22 – 67 years of age ($M = 52.0$). In general, nine of the thirteen key informants held a high school diploma or higher (e.g., post secondary training). Their length of time residing in the South Selkirks ranged from 12 – 65 years with an average of 33 years that key informants resided in the region. Key informants had between one to four individuals living in their household (including themselves) with an average number of two people in their household (including themselves). The majority of key informants spoke English in their homes. Most key informants were parents and were married or in common-law relationships. The types of employment that key informants engaged in ranged from scientific/technical officer positions, management/ administration to other (e.g., hospitality, transportation, food and beverage or retired). Table 1 outlines a demographic snapshot of the key informants.

Table 1**Overall Demographic Profile of Key Informants**

Characteristics	Key Informants
Male	69%
High School or Above (e.g., post secondary training)	69%
Language Spoken in the Household <ul style="list-style-type: none"> • English 	92%
Married or Common-Law Relationship	54%
Parent (Mother or Father)	92%
Employment Type <ul style="list-style-type: none"> • Scientific/Technical Officer • Management/Administration • Other (e.g., hospitality, transportation, food and beverage, retired) 	38% 31% 31%
Average Age	52
Average Number of Years Residing in South Selkirks	33
Average Number of People in Key Informants' Household (including the respondent)	2

Instrumentation

Thirteen (13) key informants were asked a series of critical incident-styled and open-ended interview questions regarding climate change and its effects on community members' degree of human resiliency in the South Selkirks Region. The purpose of utilizing semi-structured interviewing was not to put key informants' ideas, thoughts and beliefs into preconceived categories (by either the researcher or existing literature) rooted in previous studies and/or theories but to tap into key informants' perceptions and viewpoints. Interviews are useful for

tapping into the story behind key informants' experiences on a given phenomenon. The key informants answered the interview questions in their own words to express their personal perspectives on human resiliency in relation to climate change adaptation in the study area. At no time did I supply and predetermine the phrases or categories that were used by key informants to express themselves. As multiple interviews were conducted, a total of 26 interviews occurred.

A semi-structured interview approach was used, which consisted of a series of questions carefully worded and arranged with the intention of taking key informants through the same sequence and asking the same questions with essentially the same words. In general, questions pertaining to experience/behaviour, opinion/values and emotions (feelings) were the primary categories for the interview questions. For "experience/behaviour" questions, critical incident-styled questions were used as a means of establishing a context for understanding how key informants adapted to climate change. In particular, key informants were asked to describe social and cultural changes (if any) that they observed which make the South Selkirks Region more or less vulnerable to climate change. These questions were aimed at eliciting descriptions of experiences, behaviours, actions and activities that would have been observable had the researcher been present. "Opinion/value" questions were aimed at understanding the cognitive processes and values of the key informants. "Emotion" questions were aimed at understanding the key informants' feelings about their experiences and thoughts. Finally, demographic questions were used as a means of analyzing key informants' discussion points in the study. Therefore, questions concerning age and occupation were posed as a means of interpreting the results from the study.

The main benefits of using a semi-structured interview approach were that key informants could answer the same questions to compare responses on the topics addressed in the interview (Patton, 1990). Semi-structured interviewing techniques permit greater flexibility than structured interviews, but maintain focus through a clearly defined purpose and set of objectives. A limitation of using a semi-structured interview approach was the use of standardized questions, which has the potential of constraining the relevance of questions and answers in the interview session for particular individuals and circumstances (Patton, 1990).

As part of the semi-structured interview design, I utilized the Echo Approach (Bavelas, 1942) and the Repertory Grid technique (Kelly, 1991). Both techniques are inductive and allowed me to examine and describe human resiliency in relation to climate change and adaptation based on experiences that individuals reported during the interviews. The purpose of the Echo-based approach was to assist me in understanding problems and issues that are part of a given group or culture (Brown, 1992; Cunningham, 2001). The Repertory Grid technique allowed me to map out how the key informant viewed the world – how they experienced the world and made sense of that experience (Fransella & Bannister, 1977; Ryle, 1975). These techniques ensured cultural-congruency and full engagement of Aboriginal participants in the study – acknowledging the profound relationship between personal identity and place for Aboriginal Knowledge Keepers in the study area. See Appendices F, G and H for copies of the interview protocols used in the study. An inductive approach was used as it makes no assumptions about how individuals might respond and does not prescribe the type of responses that individuals may have when discussing individual and/or community/regional level events (Creswell, 2003).

For the Echo-based approach, I asked key informants open-ended questions in a series of pairs, for example,

*What are the threats to the environmental well-being of your First Nations Community?
(Probe – describe threats)*

*What are the opportunities for environmental well-being of your First Nations
Community? (Probe – describe opportunities)*

The use of pairs ensures that the researcher is listening to the key informants' positive characteristics and perspectives (aka. "pros") and negative characteristics and perspectives (aka. "cons") about a specific topic. This particular method assumes the participants are the subject matter experts of their own lived experiences and the researchers are the learners (Brown, 1992; Cunningham, 2001). Echo-based questions explore and examine how key informants' values and beliefs are affected in various types of situations by measuring the influences that they associate with values. Overall, the purpose of the Echo-based approach is to assist researchers in understanding issues that are part of a given group or culture. The concept of allowing key informants to define what is being researched and what they value is based on a fundamental assumption that key informants may have significantly different views of the world and different ways of talking about the same things (Brown, 1992; Cunningham, 2001).

The Repertory Grid technique is based on the Personal Construct Theory where, according to Kelly (1991), individuals characterize their world through a series of constructs through which they interpret their world (Brown, 1992; Fransella & Bannister, 1977; Ryle, 1975). This theory of personality enables a researcher to interview an individual in detail. By building a mental map of the key informants' worldview, the interviewer can understand their history and begin to make some predictions about how key informants are likely to behave in a given situation. One of the strengths of this particular technique is that it assists in reducing bias which could be imposed by the interviewer or the process because the interviewer uses only the information the key informants provide. Thus, the interviewer is not imposing any preconceived framework(s) on the key informants' answers (Fransella & Bannister, 1977; Ryle, 1975).

In my research study, the triad and laddering methods from the Repertory Grid approach were used to elicit constructs in the interviews. The triad method questions compared elements presented in groups of three to produce a similarity and a difference. Key informants were asked to say in what way two of the events or individuals they were describing were alike and why these same events or individuals were different from the third (see Appendix I). After using the triad method, laddering was used for each construct. Key informants were asked to rate the characteristics, behaviours and/or attitudes which they had outlined. I used the laddering technique to find out what key informants' personal preferences were of community leaders in the study area. The key laddering question was

Which do you think is a better quality of a community leader, people who are "X" or people who are "Y"?

Data Collection

Semi-structured interviews were conducted with 13 Aboriginal Knowledge Keepers (aka. “key informants”) in the South Selkirks Region. Key informants are very knowledgeable community members who provided in-depth and comprehensive views of their respective communities and climate change adaptation in the South Selkirks Region. McCracken (1988) recommends a sample of approximately eight to ten long interview respondents to obtain data saturation for concurrent analysis. Multiple interviews were used to elicit feedback by key informants on climate change and its effects on community members’ degree of human resiliency in the South Selkirks Region. Key informants were required to participate up to a maximum of three hours. This represented a two hour in-person interview (initial interview) followed by a one hour telephone interview session (final interview) per key informant. On average, the initial interview sessions were 113 minutes (1 hour and 53 minutes) in duration.

The initial interview was a face-to-face audio-taped interview where key informants were asked a series of critical incident-styled questions and open-ended questions regarding how they have adapted to climate change. The first set of interviews was conducted in the Tobacco Plains Room at St. Eugene Mission Resort in Cranbrook, BC. Cranbrook is the largest urban center in the Kootenays and serves as a central gathering place for Aboriginal Knowledge Keepers in the Region when engaging in various types of dialogue sessions and related Aboriginal community-specific events. Therefore, St. Eugene Mission Resort was an interview environment where key informants were already comfortable, secure and at ease to speak openly about their viewpoints.

The second and final interview was conducted on the telephone. This second interview was for key informants to review the method in which I collected their initial responses to ensure I properly reflected their experiences. On average, the second interview set was 58 minutes in duration. Prior to commencing the interview, I described the informed consent process. Key informants were told at the start of each interview session that their participation was voluntary. Key informants were also told that if at any point during the interview, they elect to withdraw from the study; they may do so without any consequences or any explanation. Also, I announced that their names, initials and other identifying characteristics in their responses would not be connected to their answers and that their identity would remain confidential unless the key informants formally requested (in writing) to be cited or referenced (in general or with a specific quote) in future reports or related publications.

All interviews were conducted by Natasha Caverley (Human Resiliency Dimension Co-Team Leader for the South Selkirks Climate Change Research Study). Please refer to Appendix B for a biographical sketch of Dr. Caverley. I collected data via audio-tape and also took notes during each open-ended interview – this is consistent with standard qualitative procedures. Key informants were asked for their permission to be tape recorded during the interview session. Audio-taping the interview sessions increased the accuracy of the data collection and allowed me to be more attentive to each key informant. Note taking during the interview helped me to facilitate later analysis, including locating important quotations from the tape itself. The dual method allowed me to work back and forth between interview notes and sections of the tape. As previously mentioned in this report, in adherence to the research ethics protocols, an honorarium

was provided to each key informant in recognition of his/her degree and level of knowledge and experience. Travel reimbursement was also provided to key informants who did not reside in Cranbrook, BC and subsequently travelled to the interview location.

Data Analysis Procedures

In order to analyze the interview data, content analysis was utilized. Content analysis allowed me to search for patterns and elicit themes, images and words that key informants used to describe their feelings, thoughts and experiences on climate change adaptation. This involved reviewing the answers of the 13 key informants and grouping their responses into categories as they pertain to human resiliency and climate change adaptation. Content analysis is a process of sorting through the transcribed information from interview sessions in order to develop concepts and/or categories (Creswell, 2003; Tashakkori & Teddlie, 1998, 2003). I reviewed excerpts from the transcribed audio tapes and notes. Copies of the excerpts and notes were divided into key words or phrases that convey an idea or a comment. Each of these words and phrases were attached to a cue card and the cards were coded on the back to identify the key informant. The cue cards were sorted using my own professional judgment about what items describe similar things. Overall, four major steps were carried out. I sorted through the cards, made a record of my decision, repeated the sorting exercise and selected one or two cue cards from each category that represented the key concept. The purpose of sorting and categorizing the responses was to identify common themes and relationships. The themes and sub-themes were organized into the key components: understanding the Nations, climate change perspectives, human resiliency and adaptive capacity, regional-level decision-making and climate change adaptation strategies.

Findings and Discussion

In this section of the report, a summary of key findings supplemented by general discussion of the results are presented. Findings and associated discussion are articulated according to major themes and sub-categories that were identified during the data analysis from interviews with Aboriginal Knowledge Keepers. The major themes that will be discussed in this section are understanding the Nations, climate change perspectives, human resiliency and adaptive capacity, regional-level decision-making and climate change adaptation strategies. Though some or all of these above mentioned themes may not be perceived as directly related to climate change, it is important to realize that climate change and the ability to adapt to its effects at the landscape and regional levels are one of many priorities and needs for Aboriginal communities in the South Selkirks Region. Furthermore, based on the interviews, the themes described in this section moved beyond climate change adaptation as key informants discussed this topic within a holistic context – cultural, economic, social and spiritual interests. In adherence with confidentiality provisions during the research process, pseudonyms are utilized throughout the “Findings and Discussion” section rather than key informants’ actual names.

Theme #1. Understanding the Nations

According to key informants, the following current issues were of significant concern to Aboriginal communities in the South Selkirks Region:

- **Alcohol and Drug Dependency.** There is continued concern about alcohol and drug dependency in some of the Aboriginal communities in the South Selkirks particularly as it relates to Youth drug addiction. Lindsay felt that “the biggest threat to our Nation is drug and alcohol abuse and distribution...I heard that some of our Youth belong to gangs and are going to jail for selling drugs...how do they get into these gangs?” Dylan remarked that “there is still a cycle of dysfunction in the homes leading to drug and alcohol abuse with our Youth.” According to the *Treaty Commission Annual Report 2006*, “Life under the *Indian Act* has meant no life at all. They are the casualties of marginalization and neglect. Many have died too young” (BC Treaty Commission, 2006; p. 13).
- **Passing Away of Elders.** The loss of local Elders who are typically the fluent language speakers and knowledge keepers in Aboriginal communities in the South Selkirks has created significant setbacks in terms of (a) passing on localized knowledge and experiences to the next generation of Aboriginal citizens, particularly Youth; (b) keeping the languages alive in Aboriginal communities in the region; and (c) engaging more Aboriginal citizens to become involved in cultural revitalization – learning the history of the Aboriginal communities in the South Selkirks and applying legends and associated learnings in the region to current ways of life.

As Catherine noted during her interview,

every time an Elder passes away, we lose so much knowledge (language, spiritual knowledge, cultural knowledge). It is like a section of a library closing down when an Elder passes away. With our language already being critically endangered, it is scary to know what the outcome could be if we don't have any more fluent speakers in the Nation or the community. Without our language, we are just like everybody else. Being [Aboriginal] is not just about having the blood, being [Aboriginal] is about knowing your culture, knowing your language, knowing your spirituality...if you don't have cultural values and language that sustain you, you are going to lose your identity. The language and culture are what make you who you are. It perpetuates your survival and is passed along for survival – it keeps you going as a People.

Craig shared similar points of view – “when our Elders pass away, we lose our Traditional Knowledge, culture and language to share with the next generation...we are in an emergency situation in terms of recording and preserving our Métis culture, history and language.” Jake stated that “our language is very much tied to the land, the people are

tied to the language and the land. It doesn't separate itself. When you talk about the land, you have to talk about the language and the people.”

Battiste and Henderson (2000), Brown and Brown (2009), Cajete (1994, 1999), Duran (2006) and First Peoples' Heritage, Language and Culture Council (2010) reinforced these perspectives by highlighting the immediacy of preserving and revitalizing indigenous languages to revive culture, identities, health and pride in indigenous communities. Furthermore, the First Peoples' Heritage, Language and Culture Council (2010) stated that

language loss is part of the loss of whole cultures and knowledge systems. This includes but is not limited to history, stories, spirituality, philosophy, human values, oral and musical traditions, scientific and environmental expertise, medical knowledge, cultural practices, rituals, social and community relations, and artistic skills and traditions. (p.7)

- **Limitations of Provincial and Federal Government Funding.** Key informants highlighted that there are continued funding limitations by the provincial government and federal government, particularly Indian & Northern Affairs Canada (INAC) – now called Aboriginal Affairs and Northern Development Canada (AANDC). Some Aboriginal communities in the South Selkirks experience difficulties accessing funds based on community-driven and identified needs and priorities. Furthermore, key informants also spoke about the lack of financial and human resources for Aboriginal specific services and programs (e.g., health, culture/heritage and natural resources). Amy explained to me that

funding and capacity (human resources) continue to be a challenge for [Aboriginal] resources, programs and services. We would like to have an [Aboriginal] Interpretive Center and connect with the Chamber of Commerce regarding economic development opportunities. Funding is out there, but you need the people who can pull together the program and funding packages on behalf of our region.

Furthermore, key informants noted that many government and industry-related opportunities tend to exclusively focus on engaging First Nations as opposed to working with Aboriginal Peoples (First Nations and Métis) as members of the broader BC Aboriginal population.

Key informants articulated that they have always been living in a recession as their socio-economic status has always been below that of the broader society in BC. Therefore, when people were going through major downsizing and restructuring initiatives (i.e., downturn in BC's forest sector), the recession did not affect Aboriginal communities in the South Selkirks. As Dylan described

[we] are always having to work with and adapt to limited funding and determine how to be creative in dealing with these short falls...we need to establish our own land management frameworks to facilitate our own economic development and not be restricted by INAC rules, regulations and processes...we need to ensure that the monies that they have and access reflect our needs and priorities for program and service delivery in the Nation.

Catherine reiterated similar concerns that “we don’t have our own source of revenue (resources and funding)...we are always penny pinching. It is not an effective way to run an administration and government...the *Indian Act* – it is so limiting and restrictive to our abilities. It is insulting – it is the only piece of legislation in Canada that targets a specific group.”

- **Lack of Formal Recognition of Aboriginal Rights.** Key informants described their struggle to address cultural denial and the suppression of Aboriginal culture – lack of acceptance of one’s cultural and racial identity by some Aboriginal citizens and their families in the Kootenays and by the general population in the region. Further to this struggle, some key informants noted that their region has not received formal recognition to date by the Government of BC regarding their Aboriginal rights (e.g., hunting and harvesting) for sustenance purposes.

Craig noted that “[Aboriginals] are not fully recognized at the provincial level as being a distinct culture...Our current [Aboriginal] leadership is failing us in exposing ourselves to the media, government (politicians and senior government officials), industry and business to better understand who we are and what we do.” Jarrod shared with me that “[Aboriginal] hunting and trapping rights are pretty much non-existent in terms of our privileges. We can only hunt without a license for birds, ducks and geese – that’s pretty much it.” Thomas disclosed to me that

provincial regulations for hunting elk and deer are from September 10 to October 30 which do not align with my Traditional Knowledge of seasonal hunting patterns...I am being forced to hunt during certain months of the year yet my [Aboriginal] knowledge tells me when I should and should not be hunting during certain months of the year...it is leading me to hunt during warmer and hotter times of the year with the risk of meat spoiling and being wasteful...as [Aboriginal] People, it is one of our principles not to be wasteful and to use all aspects of the animal...how can I remove a 600 pound elk out the bush in an hour...it is not ethical. The same goes for berry picking...my [Aboriginal] knowledge tells me that certain times of the year are better than others to pick berries in a sustainable manner and without spoiling...if the weather is hot and dry, you need to pick berries sooner.

Though Aboriginal rights are recognized by the Government of Canada as per section 35 of the *Constitution Act, 1982*, these same rights have not been formally recognized by the Government of BC. As Jarrod and other Aboriginal Knowledge Keepers told me, certain Aboriginal citizens can engage in activities such as duck hunting without a license as a recognized accommodation by the federal government. Until Aboriginal rights are legally acknowledged through the courts, some key informants (particularly of Métis ancestry) foresee a continued lack of political and social awareness of Aboriginal people and culture in the region and province.

In contrast, Aboriginal Knowledge Keepers (of First Nations ancestry) recognized that major court decisions, for example, Delgamuukw, Nisga'a, Gitksan, Wet'suwet'in, Haida, Taku River Tlingit, Musqueam, Heiltsuk, Sto:lo and Tsilhqot'in Nation, have set the legal stage for the Government of BC to better understand First Nations' title and rights through consultation and accommodation frameworks and protocols.

Therefore, it is important to ensure that Aboriginal citizens in the South Selkirks are provided with opportunities to actively and fully participate in decision-making processes with industry and municipal/provincial/federal levels of government regarding climate change adaptation in the region, thereby affirming that Aboriginal Peoples exist and have distinct laws and governance structures in which to develop climate change strategies and approaches.

- **Limited Infrastructure.** Infrastructure such as housing and water systems are visible and daily concerns for Aboriginal communities in the South Selkirks. For example, it is not uncommon that Aboriginal communities in the region have a collection of wells and septic fields as opposed to a main community drinking water and wastewater system. James said “we need to do what is right and demonstrate our activities to the surrounding communities, for example, take care of our water systems as opposed to drilling 100 wells instead have one main water system for the community.” Catherine noted her frustration with limited infrastructure by telling me that

people saw that the roads are horrible (which they are), we want housing, we want a new school, we want a new hall... Indian Affairs doesn't provide funding to these types of things and it is difficult for us to generate our own source of revenue and develop any kind of economy because the *Indian Act* still dictates how that happens, but once we have this designation vote (by way of a referendum), if we get 50% + 1 of those eligible voters who vote in favour for it, then Indian Affairs is out of the picture, we can carry out on our own economic development.

- **Political Discord.** Key informants (of Métis ancestry) acknowledged that current political in-fighting between the MNBC Executive/Board of Directors and MNBC Regions is negatively affecting the prioritizing of Nation needs, issues and objectives that need to be advanced in order to effectively engage and collaborate with other Aboriginal communities, industry and municipal/provincial/federal levels of government. For

example, Amy said that “over the past year, at the MNBC Executive level, there is a lot of negativity and political in-fighting which is causing the Chartered Communities to be at a standstill...the current political tension at the MNBC Executive level has divided the communities and Nation.” Jarrod shared similar concerns commenting that “due to the current political scandals in MNBC, we are losing the community-driven aspects of how we carry out our programs and services for Métis citizens...the MNBC Executive have made monetary and social decisions without consulting MNBC communities and citizens...it is going against all of our Métis Chartered Rights.”

In contrast, there was positive recognition by key informants (of First Nations ancestry) that their current leadership (e.g., Band Chiefs and Councils, Nation Council Representatives) are quite instrumental and strong in terms of shaping the Nation. Of particular note was the positive acknowledgement of the role women have as a driving force in the whole Nation. Dylan outlined that “there is a strong female leadership presence in the Nation.”

Key informants expressed a dilemma as to the tradeoffs that are required to effectively adapt to climate change in relation to other region-wide priorities. For example, key informants expressed a dilemma that some of the economic diversification activities (e.g., forestry, mining) that are threatening the regional environment also allow Aboriginal communities to generate revenue at the individual citizen level to the region-wide level in order to promote self-sufficiency. Key informants’ views of trading off on values and priorities are a reality that many communities and organizations are being faced with as they pursue strategies that endeavour to achieve balance between sustainability and profitability (Ambec & Lanoie, 2008). Jake asked “how do we balance and prioritize our economic needs with our ecological needs?” In addition, limitations in human, financial and infrastructure-related resources in Aboriginal communities in the South Selkirks create significant barriers for Aboriginal citizens to proactively engage in local, regional and province-wide dialogue sessions and initiatives on climate change adaptation. Furthermore, the interrelationship and integration between Aboriginal citizens with the land and its natural resources (e.g., land, water, forests) reinforces that the risk of gradual loss of traditional languages and social and cultural ties to the land creates a domino effect for the South Selkirks in terms of losing localized knowledge about the land, animals, survival methods, sustenance, sustainability and biodiversity which are intricate in monitoring and adapting to changing climates in the region.

Theme #2. Perspectives on Climate Change

General Views

In general, key informants are of the view that climate change is a natural change and process; however, human activity (e.g., land development and dependency on fossil fuels) is accelerating the speed and intensity of the change. For example, Dylan said that “we all need to be more proactive. Everybody on the planet needs to be trying to reduce our impacts on the climate and accelerating these changes.” Howard reinforced that sentiment, stating that “I worry about climate change because I want something for my grandchildren to see...humans have rapidly

accelerated climate change – we are the cause...if you challenge nature, she will always win,” while Steven felt that “climate changes can lead to big wars, fights, disputes...people will start fighting over water and land. There will be a loss of animal and plant diversity for our grandchildren to see and experience...this leads to historical loss of culture.”

Also, key informants felt that the mountainous landscape of the Kootenays (including the South Selkirks) served as a protective layer for the region thereby shielding Aboriginal communities from dramatic climate change effects in this area as compared to northern BC communities (e.g., the effects of the MPB epidemic on BC’s northern communities and the melting of the polar ice caps in the Arctic). For example, Tammy told me that the South Selkirks Region is less vulnerable to climate change “because of our mountains and rivers...I think that our geographic location will make our community less susceptible to climate change...it is because of our natural landscapes so there is no immediate danger for losing what we already have.” Thomas felt that there will be minimal impact of the MPB in the South Selkirks Region: “for the most part, we have mixed and diverse forests...we tend not to have homogenous forests like in the Chilcotin area...therefore, I don’t feel that the MPB will have the same impact on our forests as it has in northern BC.”

In terms of sources about climate change, a number of key informants expressed skepticism, difficulty and frustration in separating the “facts” from the propaganda in the scientific community, corporate/business community and government (municipal, provincial and federal levels of government). Michael stated “who is telling [us] the truth? What are you to believe?” Howard emphasized his mistrust of the information that is presently available on climate change by suggesting that “BC, Canada and industry do not truly want to adapt to climate change but would rather focus on immediate economic gains by letting the ice melt, so they can drill for oil in the north.” Jarrod commented on the extreme perspectives that are presented on the topic of climate change and global warming: “it is all propaganda...you have the government and political perspectives versus the scientific perspectives versus the layman perspectives...it ranges from completely greening our society to a ‘who cares’ attitude.” According to Newell and Pitman (2010), if “the public read or hear opinions from climate change skeptics about 50% of the time, then this could lead to a bias of the perception of the balance of evidence in the minds of the public.” (p. 1006). The concept of differential losses and gains states that loss creates “psychological pain” and therefore has more strength in conversation and debate than focusing on the potential gains of a given activity or initiative. From a psychological perspective, people generally pay more attention to avoiding losses in life rather than seeking gains (Newell & Pitman, 2010).

Furthermore, key informants had a sense that policy and planning decision-makers were viewing and subsequently implementing policy, legislation, programs and services through “an urban-specific lens” which is not compatible with rural and remote communities (in particular, Aboriginal communities) and their needs. For example, Catherine shared with me during her interview that “in my [Aboriginal community], wood is typically utilized for heat. Citizens in the [Aboriginal community] cannot afford \$600.00 monthly hydro bills in the winter, so they use wood. By using wood for heat it is helpful when people go to collect firewood on the reserve land - it is helping to open the traditional grasslands in our territory because it was not forested, it

was all open range.” Jake said that “it is easy for urban dwellers to say what is or isn’t efficient when they do not have to see the flooding of thousands of acres of land (for dams) or the digging up of the earth for natural gas. All they know is that when they turn on the heat in their urban settings, they get warm – that’s it. This is a similar situation with food production – where are we getting our food from and what’s more efficient?”

Key informants struggled with the double-edged sword of climate change and the role of human activity and the critical need to engage in regional economic development. For example, Jack shared his dilemma with me:

As a Nation, we have to balance our cultural values in terms of engaging in current and future economic development opportunities while being first and foremost stewards of the land. What do we take part in when we are the stewards of the land? We need to take part in this bigger economy but at what expense? How do we balance our economic values and our environmental values in order for us to survive as a Nation? Are we not just building upon our traditional economies of resource extraction and trading by exploring such opportunities (forestry, mining) right now? It is part of our makeup, it is part of our DNA to engage in resource extraction and trading. The concern for us is the scale at which resource extraction and trading are occurring – it is going against one of our core values which are – “take what you need.” As part of our legends, one of the mythical creatures is taking more than what is needed and the animals see this happening – a hunting party is formed to kill this creature. The creature is going against natural law and balance of nature by consuming more than what it needed...we do this as human beings...we need to be recognized as an economic contributor so that we have a seat at the table to influence decision-making on environmental well-being in the Nation and broader region.

Tammy felt the same way as Jack, stating that “the things that threaten the environment are also a necessity for the community for monetary and employment purposes like mining and logging...but without those resource activities, people would not be able to work and we need jobs.”

Addressing the effects of climate change in the South Selkirks, key informants said that it is through localized knowledge (passed down by Elders and Knowledge Keepers to Youth), spirituality, indigenous sciences, practices, experiences and relationships with the traditional lands, territories, water, forests and other natural resources that Aboriginal communities in the region can have an instrumental role in adapting to climate change. Michael said that “Mother Nature will take care of herself.” Key informants’ comments reflected the sentiment that the future of Aboriginal communities in the South Selkirks lies in the wisdom of local Elders and Knowledge Keepers, the revitalization and sharing of culture, localized knowledge and language and Youth engagement. Overall, there was a sense that Aboriginal communities in the region need to better understand climate change and the human dimensions associated with it, specifically, “[we] need to understand how to make the best of the situation [changing climate and environment] and [we] need to understand patterns, cycles of change within our environment and climate” as Howard stated. Climate change adaptation strategies and initiatives must not

simply move Aboriginal people away from their communities due to climate change-effects in the area thereby distancing citizens from their ancestral linkages (e.g., family, language and cultural practices) to their Aboriginal communities. Instead, climate change strategies should consider a holistic approach to adaptation that integrates social, cultural, economic and ecological interests in relation to climate change in the region.

Vulnerabilities on the South Selkirks Landscape

The South Selkirks is significant to Aboriginal communities in the region for a number of reasons. This region has been traditionally used for fishing, hunting and gathering foods. According to Craig, “Elders used to say that the South Selkirks is rich in biological diversity where [Aboriginal People] harvest plants for sustenance and medicinal purposes. Also, this region has and continues to serve as one of the sites for cultural celebrations and community gatherings, a place for spiritual reflection and honoring ancestors.”

Key informants highlighted the following set of vulnerabilities that they feel are intensified by climate change in Aboriginal communities in the South Selkirks:

- **Encroachment, Land Development and Overpopulation.** Key informants expressed increased concern that over the past 10 years the South Selkirks Region, a relatively private and quiet aspect of the Kootenays Region, is becoming more crowded and developed. There was a perception by key informants that increased land development and human activity in neighbouring municipalities (e.g., Cranbrook, Creston, Nelson, and Trail) is threatening access to Aboriginal harvesting areas. These activities, in turn, are cutting off natural corridors for animals and access to water which is affecting the connectivity in the region making Aboriginal communities in the region vulnerable to climate change effects (e.g., wildfires, droughts). Dylan was troubled about encroachment and land development, telling me that

it is really disturbing to see how many referrals our communities get each day. We are seeing how bits of the territory are getting chewed up. Our people feel helpless about what is happening. Then there are major developments that you fight against or fight to minimize impacts...the cumulative effects of all of these developments threaten the ability to access things like food, social and ceremonial connections to the land and resources.

In terms of development in the South Selkirks Region, Craig commented that “there is a mania to build in the region and it is reducing our land base...the local municipalities keep wanting to develop, develop, develop...they want more land-based tax for their municipalities. It is impacting wildlife and now, the wildlife is starting to come into the urban centers.” Steven’s concerns centered on overpopulation in the South Selkirks Region –

There seems to be a population explosion in the South Selkirks and surrounding areas. The more people in the region, leads to more resources being used, more

housing and impacts to forested land. Overpopulation impacts the natural land base making room for development where trees are getting cut down at a faster rate...it is creating a large human footprint on the land...it is not uncommon now a days that the land is being taken out of the Agricultural Land Reserve in the region for subdivisions and related developments. This cuts off natural corridors, impacts local wetlands, disrupts river beds in order for property owners to have better water views...it impacts the temperature of the water and fish swimming in the rivers.

- **Disrespect for the Land and Resources.** There is increased tourism and recreation in the South Selkirks backcountry by dirt bikes and all terrain vehicles (ATVs). Key informants found that the increased traffic is disturbing the natural flora and fauna in the region. The viewpoint that humans are “at the top of the food chain” and superior over all others (e.g., plants and animals) rather than part of a circular and holistic system or network of natural co-existence created angst with key informants who felt that this hierarchical viewpoint of human superiority goes against their social, cultural and spiritual beliefs as Aboriginal Peoples in the South Selkirks. Instead, key informants’ worldviews collectively centered on sharing the land and resources with the animals and plants.

There were concerns expressed by key informants that individuals who visit the South Selkirks Region do so without respect for the land. Key informants noted that Aboriginal citizens in the region are concerned that there is a gradual loss of respect for the land, traditional values and associated survival practices. These values and practices are not being passed down anymore, and are at risk of being lost forever. Damage done by off road vehicles (e.g., dirt bikes and ATVs) is destroying ecologically sensitive areas and cultural/spiritual sites. Key informants worried that traditional medicines and foods are becoming increasingly difficult to locate in the South Selkirks.

Ahearn (2005) wrote that “[a]t one time, fish, waterfowl and fur bearing animals flourished. It is estimated that before dams were built on those waters, there were some 11 to 16.5 million salmon in the Columbia River alone” (p. 46). The former BC Ministry of Forests & Range recognized negative effects of off road vehicles in the province and consequently amended the *Forest & Range Practices Act* in 2007, ruling that people causing damage that adversely affects an ecosystem or riding off road vehicles in an irresponsible manner in alpine terrains or range lands can face a fine of up to \$100,000.00 (MacLeod, 2010).

- **Logging.** There is general concern over clear cutting in the region which is leading to higher runoffs, thereby impacting local drinking water systems. Specifically, hydrological impacts due to clear cutting and road building to access logging sites disrupt local lakes, streams, rivers, watersheds and water quality for fish habitats (e.g., wild salmon stocks) and human consumption. For example, Steven shared with me that “we need to work our land properly. For our Nation, there is over 17,000 acres of forested land caused by encroachment that needs to be logged. We can use selective logging which would assist

in animals thriving on the land...it opens up the forest. We can replant native plant seeds to sustain the natural ecosystems in our community and people can access trails to engage in physical activity like bike riding and walking.” In contrast, Michael felt that opportunities already existed from logging in the region in terms of accessing hunting grounds – “logging has opened up the land, now there is an increased number of elk and moose which is good for us hunters. Logging has enhanced the lands for elk and moose...[Aboriginal] citizens want to have good hunting grounds as this activity sustains us as a People.”

- **Wildfires.** Wildland and interface fires are becoming more frequent and intense each year. Key informants believed that the provincial government’s fire suppression for the past 75 – 100 years coupled with climate change are escalating the frequency and intensity of wildland and interface fires in the region. As a result, key informants who on average had resided in the region for 33 years have witnessed that the South Selkirks Region’s ecosystems are being altered by forest encroachment and in growth due to fire suppression. Aboriginal communities in the South Selkirks were originally situated on open grasslands. Over time, forest encroachment has reduced native grasses and wildlife and created a fuel load around these communities. Dylan stated that

I am concerned especially with catastrophic wildfires. The ecosystems are majorly altered by forest encroachment and in growth due to fire suppression. It is a big problem in terms of the open grasslands that we once had...it has reduced native grasses, native plants and wildlife. It has also created a major fuel load around communities in our Nation. Fires cause a lot of damage (e.g., property, lives and environment); the fuel loads create such hot fires that it sterilizes soil.”

Lindsay also said that “parts of the territory have never been cleaned and cleared...it is overgrown...if there was ever a fire around here, it would be disastrous.”

- **Seasonal Weather Changes.** Key informants observed that the winters in the region are getting shorter and milder over time leading to less snow on the mountains. There was an overall sense by key informants that the region is becoming desert like with summers getting increasingly hotter and drier. Furthermore, changing weather patterns in the region (e.g., hotter and drier summers and milder winters) created uncertainties surrounding the health and availability of various roots (e.g., wild camas, Indian potato and wild carrot) and salmon that were once harvested in this area. Craig described the changing climate in the region as follows:

The snowfall in the 1960s, 1970s and 1980s were common at the 20 foot level. Now, snowfall in the region’s mountains is at 8 to 10 foot levels. I have also seen a drastic reduction in our water levels for August, September and October each year. The reduction in our water levels affects our Peoples who rely on the waterways for food. Our annual hunts are reduced by a month and a half in the fall because of the extreme heat we experience in the fall hunting season. We use

to set up our hunting camp in early September and now we set up in mid-October. Because of the heat, we have to adjust our fall harvest so that we can run the game we harvest into town to refrigerate so that the game does not spoil. Climate change affects the way we hunt and has increased the costs of hunting. However, as a resilient People, we are quick to adapt and continue to thrive.

Thomas commented on his observations of seasonal weather pattern changes over the past 20 years

I have been monitoring the fluctuations in seasonal weather conditions in the region, there are more drier periods throughout the calendar year...the wildfires are getting bigger in the summer...we are experiencing drier winters and there is a bigger range and set of extremes in temperature from huge snow packs one year to no snow packs the following year...it is only getting drier later in the year compared to 15 – 20 years ago.

The Columbia Basin Trust (CBT) reinforces key informants' observations on climate change effects through its research analyses and community dialogue sessions on vulnerabilities whereby the changes observed in the Columbia Basin center on warmer winters, drier summers, lower summer stream flows, loss of glaciers, rising snowlines and more extreme weather events (e.g., wildfires and landslides) (G. Merkel, personal communication, August 10, 2010). Therefore, some of the concerns facing Aboriginal communities in the South Selkirks include the change in species and availability of traditional food sources and perceived reductions in seasonal weather predictions, thereby, affecting food security and water quality for these communities.

- **Water Quality and Quantity.** Key informants identified that the proximity of sewage, pulp mills and other resource companies (e.g., mines) coupled with hydrological changes in lakes, rivers and streams in the South Selkirks Region (e.g., lower summer stream flows, loss of glaciers and rising snowlines) due to climate change are affecting primary water systems for sustenance (e.g., drinking water and fisheries) and economies (e.g., tourism and trade). Furthermore, long term effects of flooding in the region may give rise to effects of climate change on culture and traditional ways of life for Aboriginal communities in the South Selkirks. These effects can range from community protection (aka. public safety) to health (e.g., mold issues for housing and related buildings, financial hardships, and mental health – trauma experienced during and after extreme weather events and limited access to clean, drinking water).

Craig noted that “warmer temperatures threaten the water supply of our communities who depend on water from the seasonal melting of mountain ice and snow...as I monitor the water in the region, I see that the local creeks are still dry and there are low snow packs from the mountains...this will impact the water supply for consumption by animals, fish and people.” In addition to risks related to water accessibility and quality, risks of land loss and resource changes create further cultural, environmental and financial challenges for our communities.” Catherine expressed worry about the Kootenay River:

I worry about the people eating fish coming out of this river. I worry about people just swimming in it. I worry about the quality of the water...the river runs past a former mine...it probably has years of pollutants in it. The mine is closed now but there are times when this mine was hit hard by the Ministry of Environment for the activities it was doing...with this river running by us, I am concerned about what it is doing to the quality of our water because we are all on a well system...there is also a pulp mill that is still active and dumps effluent into the Kootenay River. The mill says that there is no effect but if you ever canoe down the Kootenay River as soon as you hit that outflow at the pulp mill, the water goes from being crystal clear to a murky brown colour. It is the effluent. They (pulp mill representatives) say there are no health impacts, they say the water is “neutral” – but people don’t like swimming in there...Also low water supply creates an impediment to range activities. It would cost additional money to bring water into the community for advancing our rangeland activities.

Jake echoed similar concerns about access to water in the region – “all of our waterways in our Nation are completely privately owned. We can only survive as humans with water. Historically, we have always been connected to water – water is paramount. Our Nation has limited access to this precious resource (water).”

- **Wildlife Changes.** Key informants noted an influx of wildlife in residential areas. They found that milder winters led to certain animal populations skyrocketing in size (e.g., deer, elk, coyotes, cougars). Due to influx and seasonal weather changes, seasonal harvesting and hunting and trapping patterns for Aboriginal citizens have had to be adjusted to accommodate cycle changes arising from climate change.

Michael said that “traditional or localized knowledge can greatly assist our communities in adapting to climate change through the design of innovative harvesting practices that can better adjust to changing weather patterns and conditions which affect the timing of harvesting, hunting and trapping for our People.” Catherine has noticed that milder winters are leading to certain animal populations skyrocketing – “I have noticed an increase in wildlife (predator/prey). There is a significant increase in herds of deer (never seen this before in 20 years). Now you see 20 deer together and hundreds of more elk. That has created a real increase in predator animals (e.g., cougars). In the past, colder/harsher winters and more snow packs assisted in regulating the populations of deer and elk in the region.” While Michael said that “the region we hunt shrinks every year which is another problem for our hunters. Because people and governments are allowing excessive development, the game have less area in which to live. Now we are seeing animals coming into the cities during the winter creating a problem for the human population and the game animals...the herd should only be as big as it is able to survive the winter.”

Howard did not feel that climate change was the root cause for an increased population of elk, deer and cougars in the region – “They (deer and elk) are afraid to return to their regular feeding and breeding grounds because there are people out there – humans are

entering their grounds and upsetting their feeding and breeding processes – so they are trying to find other locations to eat and have their young.”

As noted in the above mentioned set of identified vulnerabilities, key informants recognized that the ecological and cultural integrity of the South Selkirks Region is threatened by climate change accelerated by human influences in the form of encroachment, development and paradigm differences in viewing humans in relation to their natural surroundings.

Theme #3. Human Resiliency and Adaptive Capacity

Human resilience refers to the ability of a natural and/or human system to flourish and adapt to situations or environments with minimal negative effects during and after the change, hardship or crisis. In psychology, resilience emphasizes the individual or groups' ability to effectively utilize positive attributes and capabilities more than weaknesses or pathologies. As a means of demonstrating human resilience in response to climate change, adaptive capacity is required. Adaptive capacity is the ability of a system or community to adjust to climate change effects ranging from mitigating damages to coping with its effects in the immediate future or in the long term.

Key informants' perspectives on human resiliency centered on social, cultural, economic, psychological and spiritual factors. In general, key informants described human resiliency as the acceptance of change through the ability to connect to the land, have wisdom and persevere in a positive manner despite the given hardship, change or crisis. Key informants' definition of resiliency was earth-based and holistic in nature – linking land with healthy development and interaction as individuals and as a society. As previously noted in the “Literature Review” section of this report, western science-based human resiliency definitions centered on individual and group responses to social and community challenges and crises which may or may not be associated with connections to the land and environment (Caverley, 2005; Joseph & Krishnaswamy, 2010; Ratner & Moser, 2009). Furthermore, key informants found that they learned to cope by taking personal responsibility for their actions on the land (aka. internal locus of control), talking about their individual or community-based hardships with family and friends, utilizing humour and laughter, and being proactive in their decision-making at the individual and community-levels. Tammy explained that “Aboriginal People (First Nations and Métis) are very accepting of change – look at all of the things that we have had to adapt to and we continue to survive (e.g., from pre-contact, contact by Europeans, residential schools to present day)...we have always been resilient”, while Howard reinforced that human resiliency focused on “honouring and remembering the past and accepting what lies in front of us for the future – be able to think front and back – what happened before and what can happen in the future.” Jake asserted that

Aboriginal people have had to adapt from day one. They have had to adapt like the rest of humanity. This has been a natural part of being Aboriginal over time. Aboriginal People don't want to stay in the past (with the old ways of doing things), they want to acknowledge the importance of the past and the ancestors before them (learn from the

past), but they want to move forward – take what we know of the past and bring it to the future.

From an Aboriginal perspective, Howard described that a “good [Aboriginal] person” in terms of behavioural and cultural attributes was an Aboriginal citizen that “had no shame (looked at you with straight eyes), was respectful and truthful, accepted change, remembered their mistakes (so they do not happen again in life), turned something into good, carried out good deeds for others and communities; and was clean (there were no hidden agendas).” Lindsay, who is a survivor of the Indian Residential School experience, persevered and made a conscious effort to retain and practice her traditional ways:

I would come here [residential school] for 10 months of the year and then I would go home and my parents continued living the way they have always lived – my mom tanning her hides and my dad going to work on the farms. My grandparents would come down and pick us up and take us out to the mountains to pick huckleberries. Sometimes my parents would come and the men would go out hunting because there were no deer and elk on the reserve. Sometimes we would spend a week up in the mountains with our grandparents. When we were younger, it would just be us kids out there experiencing the land.

Craig believed that Kootenays Aboriginal citizens “take care of the land and the land will take care of you which means taking pride in being [Aboriginal], and learn from the ancestors and generations before you to sustain all living beings in the future.”

The human resiliency behavioural characteristics and attributes (e.g., willingness to adapt) noted by key informants provide insights into the adaptive capacity of Aboriginal communities in the South Selkirks. The findings indicated that Aboriginal communities and its peoples in the region are adapting harvesting patterns and travel routes to mitigate the effects of a changing environment in the South Selkirks. In response to the hotter and drier summers, key informants say that they do not go out on the land for as long as they used to. They are adjusting their harvesting and hunting schedules and associated routes to maximize their efficiency in harvesting roots, berries and hunting game to maintain sustainable practices taught to them by Elders, Knowledge Keepers and legends. Waiting and integration of traditional knowledge with western science are new found coping strategies for Aboriginal communities in the South Selkirks – patiently and respectfully waiting for game to arrive, waiting for the weather to improve, and integrating indigenous and western sciences and technologies to more effectively adapt to changing climates.

Indigenous Paradigms: Identity, Sense of Place and Localized Knowledge

Key informants felt that who they are as citizens is shaped and influenced by their interconnectedness and interrelationship with the land in which they live. They also felt an overwhelming sense of connection and sense of place at the Nation and regional levels which influence their identity as Aboriginal community members. Sense of place for key informants represented a profound understanding and connection to cultural and spiritual values that sustain

them as individuals and as Aboriginal Peoples. Key informants felt their responsibilities to themselves are extended also to their traditional lands – they felt that it is the foundation that gives direction and purpose to their actions and thoughts as Aboriginal Peoples. Furthermore, key informants noted that the shaping of self-identity ensured recognition for Aboriginal communities in the region by non-Aboriginal people regarding Aboriginal title and rights on the land and its resources.

Key informants described that the fundamental methods that are utilized to shape cultural identity and sense of place for Aboriginal communities in the South Selkirks were traditional knowledge. As Lindsay said “the Nation is our identity – includes our values, language and traditions, without them, you are not [Aboriginal].” Lindsay went on to share a story with me about the importance of cultural identity:

I was talking to a lady this afternoon who was a schoolmate of mine. She told me that she is a successful product of the residential school because when she left the residential school, she told me that she went into mainstream society. Now, she doesn't have the language, doesn't have the knowledge of our legends or traditions...so my schoolmate said to me that I have lost my way but was a success according to what the government wanted. I felt so sorry for her because she had no connection and nobody at home – our Nation.

Catherine reinforced cultural connections and sense of place – “the parcel of land that I currently live on is where my great-grandfather, grandmother, grandfather, and mother lived...if we do not have a place to go in the future, we know where we can return to – this is our land and these are our connections.”

Galloway McLean et al. (2009), Ricketts et al. (2010) and Verschuuren (2007) acknowledged that traditional knowledge reflects a sacred connection with the environment, its seasonal cycles and indicators of flora and fauna regeneration. Key informants said that, in general, traditional knowledge was passed on to the next generation through (a) listening to Elders, fluent language speakers and/or Knowledge Keepers in their Aboriginal communities; and (b) experiential learning which included travelling throughout the Aboriginal communities in the South Selkirks and participating in cultural activities (e.g., singing, speaking the traditional languages, hunting, trapping, fishing, gathering, praying, engaging in spiritual ceremonies, visiting natural sacred sites). Guiding principles and values for Aboriginal communities in the South Selkirks extended to the sacred interrelationship and interconnectedness that the Aboriginal communities in the region have with the Creator.

Key informants (of First Nations ancestry) identified the following set of cultural and spiritual values as guiding principles that influence their decision-making and strengthen who they are as Aboriginal citizens:

- Ensure the land, air and water are clean and healthy;
- Ensure access to, and protection of, traditional goods and medicines;

- Balance the economic use of the land with cultural and spiritual values;
- Ensure long term sustainability and ecological integrity take precedence;
- Follow natural law – taking only what you need, not what you want;
- Move freely through the territory;
- Exercise your Aboriginal rights to derive benefits from the lands and resources without compromising them for the next generation;
- Preserve our heritage while developing new connections with the land and one another;
- Manage the lands and resources through healthy working relationships with ourselves and others based on understanding, respect and equality;
- Take care of the land and the land will take care of you; and
- You cannot manage the land, the land manages you.

Steven expanded on the above mentioned First Nations values by sharing these comments with me:

Everyone in the community no matter the age was brought up to respect and honour all the plants and animals of the land. When an animal was killed, no part was wasted or thrown away, even such things as the bladder and stomach were used. If anything was taken from the land, a type of offering was made to give thanks for providing nourishment for their bodies and their families. There was no concern for overharvesting as they took only what they needed and nothing more. It was a very harmonious relationship between the [Aboriginal Nation] and the lands and beyond.

Catherine said that

our Creation Story gives us quite the connection to our land. It describes how the territory was created back in the animal world when no humans were present. They chased the water monster until he either tripped or fell – that is when lakes and mountains were created in the region. When the water monster was killed, its blood was spread and that is when the people were created (when we were created as [Aboriginal] People). Some of the regional formations and landscapes are where the water monster's ribs are. Our Creation Story is the equivalent to the Catholic Holy Bible and the journey of Jesus Christ. Up until recently, the Creation Story was not written down, it was told orally. We don't have the family units like we did before so we have to audio record or videotape and write down our story so it is there and cannot be lost and can be shared with as many people as possible for our People and our neighbours. We need to tell people who we are and our history, they have chosen to live on our territory and they need to understand that

there is such a rich history to this land – it is our history, our language, our land. These values are a part of who they are; the principle of “taking what you need, not what you want” is part of the natural law. Natural law dictates everything - how you conduct yourself on the land, it dictates how you need to share everything around you with all living things, and dictates how you watch the animals and how they conduct themselves.

Some key informants noted the words of a local First Nations Elder who reflected that “when you put a price tag on something, you destroy it. They put a price tag on the trees and they were destroyed. Look at the fish now. You will destroy that resource and yourself...things that the Creator gave us aren’t suppose to have a price tag on it. It was meant to sustain us now and in the future...you can have money but can you eat money?”

For key informants of Métis ancestry, spiritual and cultural values centered on

- Respecting Elders for their wisdom and age;
- Ensuring mutual respect and maintaining balance and harmony with all living things – natural co-existence;
- Embracing family as a social support network to share, listen and cope during changes, hardships and crises while fostering encouragement, reassurance and validation; and
- Preserving and revitalizing traditional knowledge as a means of forming one’s self-identity and ensuring survival on the land.

Key informants of Métis ancestry spoke about their multiracial identity embracing both their First Nations ancestry and European ancestry. For example, Thomas remarked that “being Métis to me means accepting my different lifestyles and being OK with being of mixed race...as I am blending my different values and cultures from my First Nations mother and European father.” Craig acknowledged that “Métis have served as integrators in terms of bringing together and facilitating relationship building between First Nations and Europeans throughout the transformation of Canada in general and in the development of the West...Métis ‘walked in two camps’ by getting ahead and dealing with government...that is where the Métis stepped in to negotiate. We [Métis] have our spot in history.” At present, the Métis Kootenays Region is working with the BC Métis Assembly of Natural Resources (BCMANR) to develop Métis harvesting policies and procedures. In addition, they are engaging in research studies with researchers such as Dr. Mike Evans (formerly from UBC) to record and preserve Aboriginal culture, language, dances and Elder interviews on DVDs and CDs.

It is crucial that Aboriginal cultural values are protected and conserved because they are important to Aboriginal Peoples in the South Selkirks to perpetuate healthy cultural identity now and forever. The cultural values, sense of place and localized knowledge are all facets of self-identity for the Aboriginal Peoples in the region. As Howard acknowledged, “it is part of the survival of the people...if you do not have those cultural values that sustain you, you are going to lose your identity. The language and culture are what make you who you are and perpetuates

your survival and keeps our People going.” Key informants identified that their Aboriginal communities in the South Selkirks are diligently working on preserving the language and culture by (a) documenting the traditional alphabet; (b) interviewing Elders, fluent language speakers and Knowledge Keepers via video and audio recordings; (c) conducting traditional use studies; and (d) writing down the oral history of the Aboriginal communities in the region (e.g., historical texts, legend books and botanical documentation).

Ahearn (2005), Bartlett et al. (2007), Battiste and Henderson (2000), Brown and Brown (2009), Cajete (1994, 2000), Duran and Duran (1995, 2006), and France et al. (2004) have noted in the literature that indigenous people are generally taught to respect all life forms knowing that each is connected in an interdependent way to all other life forms. It is through local knowledge and practice that indigenous people are able to adapt to change over the centuries. Through the passing down of traditional knowledge from Elders and Knowledge Keepers to the next generation, indigenous people are able to develop a sense of belonging to their communities and the land. It is through living and respecting Aboriginal-specific spiritual and cultural values that indigenous people sustain their culture. In relation to climate change, if indigenous people were to be forcibly moved away from their traditional lands and values due to climate change-related effects, there is a perceived risk of disconnection from their Aboriginal origins and from natural surroundings thereby leading to disrespect for the land and erosion of the traditional languages and associated cultural and spiritual practices. Language and culture are intrinsically linked to heritage and land; therefore, if indigenous people became separated from their ancestral ties to the land, then their identity as Aboriginal citizens in the South Selkirks is also eroded. Therefore, the act of belonging provides a sense of place – a platform from which to grow and contribute at the individual, family, community and the regional levels. The spiritual and cultural values of the Aboriginal Peoples in the South Selkirks (e.g., living in harmony with nature, ensuring clean air and water) serve as existing human resiliency characteristics in ensuring that the region is flourishing and adapting to changes, hardships and crises that face them over time.

Human Resiliency Characteristics

In terms of operationalizing and measuring human resiliency based on the above mentioned spiritual and cultural values of Aboriginal communities in the South Selkirks, key informants identified the following set of characteristics and associated directional flows which would demonstrate human resiliency in the region:

Social Characteristics of Human Resiliency

Education	Governance	Housing and Infrastructure	Social Services	Youth Engagement	Relationship Building
Increase in the number of citizens receiving living allowance cheques for	Increased engagement in municipal, BC, Canada and industry decision-making	Improved housing conditions and increased number of homes in the Aboriginal community	Increase in the number of Aboriginal children (in care) being placed with	More Youth engaged in Aboriginal activities, events, programs and/or services	Improved relationships with Kootenay School Boards, BC, Canada and neighbouring

Education	Governance	Housing and Infrastructure	Social Services	Youth Engagement	Relationship Building
<p>post-secondary education</p> <p>Increase in the number of Aboriginal students attending Aboriginal-operated daycares and schools</p> <p>Increase in the number of Aboriginal teachers in Kootenay School Districts</p> <p>Increase in the number of Aboriginal adults from the South Selkirks going back to school to obtain their Grade 12 equivalency</p>	<p>(from the beginning of the process to implementation)</p> <p>Continuation of citizen-driven decision-making and community engagement in Aboriginal-community specific issues (e.g., strategic planning, economic development and land use planning)</p> <p>Active political leaders serving as champions on behalf of the Aboriginal community</p>	<p>Improved water systems and related infrastructure</p>	<p>Aboriginal citizens</p>	<p>Increase in the number of activities for young people (e.g., sports and recreation and cultural celebrations)</p>	<p>municipalities</p>

Many Aboriginal citizens are stepping up to become part of citizen-driven processes for revitalizing and rebuilding Aboriginal communities in the South Selkirks. Key informants were favourable towards their Aboriginal communities utilizing planning processes that actively engage citizens. Furthermore, key informants wanted to see enhancements to education, housing and social services to recognize that the development of knowledge, skills and abilities of Aboriginal citizens (in particular, Youth) can aid in diversifying opportunities for community members and fostering creativity in order to proactively participate in decision-making on critical issues (e.g., climate change) facing the region. Lindsay told me how people have asked her “how can somebody lead when they haven’t been there? All these parents stress to their children that you have to complete Grade 12 but they don’t challenge them to go any further than Grade 12 because they have never pursued studies past high school.” The social elements of human resiliency are knowledge, skills, abilities and interactions with others (in and around Aboriginal communities in the South Selkirks) and are necessary in enhancing group (e.g., Aboriginal communities) adaptive capacity to respond to crises, hardships and change in the environment.

Psychological Characteristics of Human Resiliency

Personal Style	Coping Strategies	Social Support Networks
Ability to adapt to change	Communal coping – connecting with others (family, friends and community)	Talking and seeking guidance from friends and family members
Optimistic		
Internal locus of control	Use of humour and laughter	
Strong sense of hope	Acceptance of responsibility	
Reflective on the meaning of life – having spiritual connection to the land	Proactive problem solving	
Strives for personal growth and development as an individual		

Key informants felt that certain behaviours contributed to human resiliency from a psychological perspective. As Howard noted “we need to take responsibility for our actions...take ownership for everything that you do. We need to reach out to others that we trust for social support (e.g., family, friends, mental health professionals) to share our stories and experiences and reflect on previous experiences so we do not repeat the same mistakes as before.” In terms of leadership characteristics, key informants identified that community leaders need to (a) demonstrate reasoning – they get to know the real facts of the crisis or change; (b) gather facts; (c) hold in-person meetings; (d) be vocal; (e) be comfortable with new situations and adapting to change, (f) be rational, (g) be intelligent; and (h) be level-headed. Individuals that were identified by key informants as local Aboriginal champions were Bob Adams (Métis), Chief Cheryl Casimer (First Nations), Gerry Legare (Métis) and Sophie Pierre (First Nations).

How community members perceive and handle changes, crises and hardships can determine whether or not they can adapt to the given situation in a healthy manner. The above mentioned were representative of both individual and community level behavioural characteristics. Behavioural characteristics at the individual and community levels provide a lens for how the change, hardship or crisis is perceived and handled by the individual or group (e.g., community). Overall, the identified characteristics appeared to represent protective factors such as tolerance, perseverance and a willingness to accept one’s personal role in decision-making as it pertains to climate change adaptation. These behavioural characteristics lend themselves to encouraging engagement in community and region-wide initiatives and foster a sense of belonging and personal sense of ownership in making a positive contribution to adapting to changing climate patterns in the South Selkirks.

According to Masten (2001), personality characteristics and associated behaviours that individuals and groups use to interpret, evaluate and react to stressful situations can influence how people will ultimately handle particular events. Coutu (2002), Gebhardt, van der Doef and Paul (2001), Kobasa, Maddi and Kahn (1982) and Maluccio (2002) have all noted in their works

on human resiliency and personal style that resilient individuals are more energetic, open to new experiences, optimistic, have a sense of commitment to the importance of what one is doing, an internal locus of control and a sense of life challenge. Coping strategies depend on a variety of factors including personality, experience, training and the environment, such as the degree of control the individual has over the situation. Key informants' coping strategies centered on social support, use of humour, internal locus of control and proactive problem solving. Amy said that "social support in the Kootenays [Aboriginal] communities involves reaching out to family and friends by sitting, listening, helping and freely giving your time to others." Kobasa et al. (1982) and Gebhardt et al. (2001) argued that individuals and groups with an internal locus of control tend to suffer from fewer stress symptoms as they are more likely to define stressors as controllable and take proactive steps to cope with them. House, Umberson and Landis (1988), Kulik and Mahler (1989) and Pierce, Sarason and Sarason (1996) found that social relationships with others can buffer the effects of hardships and crises by assisting individuals and groups in coping with stressful events and reducing both physiological and psychological symptoms of stress.

Cultural and Spiritual Characteristics of Human Resiliency

Language	Cultural Integration	Title and Rights	Spiritual Celebration
Increase in the number of fluent language speakers in the Aboriginal community	<p>Increased presence of Elders' Groups in Kootenays School Districts</p> <p>Further integration of Aboriginal culture in elementary and high school curriculum</p>	<p>Move towards self-government and becoming self-sufficient as an Aboriginal community (e.g., creation of Aboriginal specific legislation, policies and related governance structures)</p> <p>Recognition of Métis Kootenays Region as a distinct Aboriginal Nation in BC with associated rights</p> <p>Signing of a First Nations Treaty</p>	Honoring citizens who have passed on (e.g., memorial dinners and gatherings)

The roles language and cultural integration play in the transmission of localized knowledge (e.g., traditional knowledge) cannot be minimized. Unfortunately, the number of people who actively speak their respective traditional language has declined over the decades. In order for climate change adaptation initiatives and activities to be fully integrated into Aboriginal communities in the South Selkirks, the traditional languages must be an essential part of climate change planning, program design and implementation. By working to revitalize traditional languages, Aboriginal communities in the region will create important linkages between climate change, adaptive capacity and culture. Key informants noted that in order to adapt to climate change in

the South Selkirks, traditional knowledge and the guidance of community Elders and Knowledge Keepers will be required. It is the Elders and Knowledge Keepers who are the critical sources of traditional knowledge, oral history, language and cultural protocol in these communities. The Elders and Knowledge Keepers’ collective guidance is vital in developing a sustainable future for the Aboriginal communities in the South Selkirks and in mitigating the effects of a changing climate. In the area of self-government, Catherine said that

by being in the treaty process, opportunities have come our way that we wouldn’t have had...as a Nation, we can focus on developing our capacity, reconnecting with our traditional governance structure...we recognize that the governance structure under the *Indian Act* is not our process and not reflective of who we are...we are working at the community and Nation levels determining what would be the best governance structures and processes for us to have for self-government...we need to preserve our language and culture in the modern world since it was stolen from us in Residential School.

Economic Characteristics of Human Resiliency

Economic Development	Employment
<p>Increase in the number of citizens holding government contracts for community service and business activities (e.g., volunteer firefighting)</p> <p>Increase in the number of Aboriginal Peoples working for the Aboriginal community</p> <p>Increase in the number of economic development opportunities (particularly businesses that demonstrate “green” management and have small carbon footprints)</p>	<p>Lower unemployment rate</p> <p>Decrease in the number of citizens on social assistance/welfare</p>

Key informants highlighted that direct access to diversified economic development opportunities should strengthen Aboriginal communities’ ability to enhance employment and actively grow relationships with industry, municipal/provincial/federal levels of government and small businesses to promote productive and sustainable business relationships which, in turn, would promote Nation re-building, self-sufficiency and self-governance endeavours. By capitalizing on business opportunities that are sustainable (aka. “green management” and small carbon footprints), key informants acknowledged that Aboriginal communities in the South Selkirks can advance their cultural and spiritual values of maintaining balance between financial benefits and respect for the environment. Catherine mentioned that “when you are entering into business deals, you have to think about what kind of footprint you are leaving behind.” Jake emphasized the value of economic resiliency:

I hope that there is more of an attitude of economic development. I think that there are some people in the community that are now realizing that economic development is not a bad thing...that capitalism is not a bad thing. For the longest time, that whole idea of economic development has been opposed in the Nation. People now understand that we are part of the whole capitalistic wheel...we are part of that machine since we are

consumers. We need to acknowledge that we need to take part in it. I know that I am starting to see a change in attitude around economic development. However, there are still some people in our Nation who think that we shouldn't be part of the capitalism system at all – even though, they still drive a car, watch TV and consume products from mainstream society.

Through sustainable and green-based economic diversification opportunities, key informants perceived that business, industry and municipal/provincial/federal levels of government are realizing that working with Aboriginal Peoples makes business and government-related processes and transactions easier. In turn, these relationships aid in creating more opportunities for local Aboriginal Peoples in the South Selkirks Region to improve investment opportunities for their communities while ensuring that ecological, social and cultural values are maintained.

Theme #4. Regional-Level Decision-Making

Key informants were asked to describe how decisions were made in Aboriginal communities in the South Selkirks. A number of key informants said that strong citizenship driven processes which utilize consensus building and group problem solving are advantageous for their communities. Community meetings, voting by membership on specific issues, committees and working groups, Annual General Meetings and Annual General Assemblies, cultural and language-specific forums, and referendums were all identified as various methods in which Aboriginal citizens engage in regional-level decision-making. As indicated by key informants, other characteristics of regional-level decision-making include engaging in community visioning, growing internal and local capacity in their communities, facilitating and sharing of local knowledge and resources (if and where appropriate according to cultural protocols); and establishing regional-level goals, objectives and indicators – linking vision with structure and performance measurement. Catherine outlined the value of strategic planning for her community:

We have recently come together to develop a strategic plan. This exercise has seen our community come together and work on a vision and how to make this vision a reality in the future...strategic planning allows us to leave a legacy for future generations. We are working together so when our young people move forward, they do not have to go through similar struggles that we did. I know that our ancestors faced far more adversities than we can imagine; we don't want to lose what they have done for us. Instead, we need to build on our ancestors' experiences to make a better future...we just finished talking about our strengths and weaknesses for our community...our strengths as a community far outweighed our weaknesses – this is a good thing.

Howard reflected on a time when “we use to meet every Sunday as a community to gather and pray. After service, men in the community would gather in a circle and light their pipes and cigarettes to discuss community issues – tending to their crops and dealing with family issues.”

Despite the current political tension at the MNBC Executive, key informants like Amy and Jarrod positively acknowledged the value of the governance models that are currently in place for the Métis – “the Métis governance models are more community focused than ever before”

said Amy, while Jarrod remarked “it is encouraging that we can vote on decisions that are directly impacting our Nation.” In addition, a number of key informants found that the MNBC (as a whole) was beginning to engage in more dialogue with industry (e.g., forestry companies) to provide expertise on monitoring and land management planning. As Michael stated “this dialogue session process with industry is another positive step for the Métis in BC as a means of ensuring that the Métis’ voice is present and well represented at the decision-making table on natural resource management issues in the province.” Like Michael, Thomas was pleased with the engagement of the Métis in referral processes – “this [referral process] is a big step for economic development for the Métis...it can lead to employment opportunities and we can fully participate in referral committees.”

Key informants had an overwhelming sense that they want to proactively take ownership in what they do on the land and want to be equal with neighbouring or partnering non-Aboriginal organizational entities. Craig noted that “there is a solid working relationship between the [Aboriginal communities in the South Selkirks Region] regarding Aboriginal decision-making in the region.” The current governance initiatives underway with Aboriginal communities in the region and engagement in economic development are creating structures, certainty and independence for diversified revenue streams to be designed and implemented for direct benefit to Aboriginal communities in the South Selkirks. In relation to adaptive capacity, these initiatives are of particular importance in prioritizing Aboriginal citizens’ needs and associated projects related to climate change decision-making processes and activities, including rights to Aboriginal lands, territories, environment and natural resources in accordance with the *United Nations Declaration on the Rights of Indigenous Peoples*. The decision-making and citizen engagement methods such as forums, referendums and Annual General Assemblies serve as important tools for educating citizens about climate change and developing adaptation strategies that are citizenship driven and culturally congruent to Aboriginal communities in the region.

Theme #5. Climate Change Adaptation – Local Initiatives and Strategies

After reflecting on climate change themes ranging from trade-offs, vulnerabilities to human resiliency, adaptive capacity and regional-level decision-making, key informants identified strategies and initiatives that either currently exist or should be advanced in the future to support Aboriginal communities in the South Selkirks in adapting to climate change at the regional-level.

- **Renewable Energy.** Key informants were in favour of a transition from fossil fuels (if and where feasible) to renewable and ecologically-friendly energy economies, sources and systems (e.g., bioenergy, solar, water and geothermal) that are owned and controlled by Aboriginal communities in the South Selkirks to achieve energy security and sovereignty. Lindsay expressed interest in the use of solar energy in the South Selkirks region as a way of adapting to climate change – “use of solar energy would help us keep energy costs down...it would cost about \$6,000.00 to transform a home into a solar energy heated home...we would need funding for the technology, but we do get a lot of sunshine around here to use.” Catherine also commented that

when we build subdivisions in the future, we are doing research right now on how to make it greener. What other sources of energy can we use? How do we work with the solar energy? Do we use hay (straw) bale houses? Do we use traditional materials? We want to make sure that the houses in our communities last a very long time and do not leave a big carbon footprint.

Key informants also felt that by fixing roads, citizens can purchase smaller and more fuel efficient vehicles; for example, one key informant said that

right now a lot people drive trucks, we have no choice. We have people who own cars but they don't last. We have poor roads – they are still dirt roads, some are even just trails. Sometimes you are driving through lakes when the snow melts just to get to the pavement. If and when we are at a point that we can fix our roads, people could start looking into getting smaller vehicles (e.g., Smart Cars and Hybrids) and have our own economy so people can make these kinds of upgrades. Unfortunately, right now, people are driving older cars that are gas guzzlers but simply cannot afford getting upgrades or purchasing new and more fuel efficient cars.

Some key informants described the potential of bioenergy in terms of restoring grasslands and ecosystems while reducing the threat of fire and generating revenue. The utilization of bioenergy from wood fibre can aid in enhancing economic resiliency in the region while reducing fuel loads surrounding local communities and regenerating native grasslands through selective logging and prescribed burning practices. Bioenergy initiatives would involve creating biofuels made from community waste products such as agricultural, forest, municipal and food processing waste. Jake focused on the economic benefits of bioenergy sharing with me that “waste management for energy plants or alternative energy solutions can advance green business opportunities for our Nation...it is a real economic development possibility and climate change adaptation strategy.” Newell and Pitman (2010) describe the differential impact of losses and gains. In applying these concepts to energy initiatives for Aboriginal communities in the South Selkirks, it will be important for community champions to present these opportunities by “focus[ing] on the potential to avoid large losses (e.g., high fuel or heating bills) than the corresponding gains (e.g., savings occurred over time by installing solar hot water)” (Newell & Pitman, 2010, p.1008).

- **Regional-Level Awareness and Education on Climate Change.** Public awareness and education on climate change was viewed by key informants as a community-based experience in which citizens learn about this complex topic through experiential learning and dialogue at the community and regional levels. As Jarrod noted, “the more education about climate change adaptation, the better...it will help us make informed decisions for our Nations.” Thomas felt that

there needs to be increased dialogue with our Youth about climate change adaptation...we need to integrate climate change adaptation into the school system and work with local community groups. There is a “green belt” in the

South Selkirks – it is an environmental activist region so there are various opportunities for our community members and Youth to be proactive and engage in adaptation activities like recycling and other green initiatives in the community...citizens need to understand that caring for nature is part of their responsibility...it leads to preservation.

Experiential learning and related initiatives focused on holding climate change camps for Aboriginal citizens (particularly Youth) to re-connect to the land to hunt, trap, gather and fish alongside Elders and Knowledge Keepers. Other initiatives centered on integrating recycling programs in Aboriginal communities within the South Selkirks; conducting energy assessments and installing energy efficient light bulbs in homes and buildings; encouraging people to bring their own cutlery (e.g., mugs, plates, knives and forks) rather than utilizing Styrofoam at community gatherings; and setting up and maintaining community gardens and composts to minimize the amount of garbage that is hauled weekly to the local landfills. James said that “we need to get back into our culture...language lessons for the kids, intermingling of Youth and Elders, setting up Teepee Camps along significant trails and getting our people back out on the land...see what is happening to the land and resources in order to adapt to change.” Howard felt that “we need to teach people more about the natural laws (e.g., stewardship, sustainability, respect for the land, caring for the land). Youth need to be educated in this area because they are being influenced by big game hunting and trophy hunting instead of hunting for sustenance purposes.” Amy suggested to me that

climate change games and challenges in the [region] that are age-specific would be a good way to build relationships with other communities in the region and connect with others...you could have a recycle and clean up the neighbourhood challenge with different communities or don't drive for a week challenge or composting and community garden games or a walking challenge...climate change adaptation activities that everyone can participate in and celebrate.

Alternate reality gaming is currently being explored by Aboriginal communities in the South Selkirks where culture and language are being integrated into modern digital technology such as learning language(s) and songs on iPods, and playing SIMS (an interactive on-line video game) on Aboriginal lands where players return to their traditional lands and learn about their culture. Aboriginal communities in the region are endeavouring to bridge indigenous and western practices as a learning tool for Youth. Specifically, one Nation in the South Selkirks is currently in discussions with a California-based computer programming firm to design traditional language programs for use on game systems such as Nintendo to aid in cultural and language revitalization in the Nation. The proposed computer games will integrate traditional language to make language studies more fun while preserving the language over time. As Jake said,

the media is the message...by choosing to use the media (e.g., computer, on-line video games), our Nation becomes part of the message (the culture). By being involved in accessing these forms of technology, we are doing our part in

becoming more resilient, ensuring the survival of our distinct People...knowledge of our geographic area, our unique language and culture while changing with the times.

However, it is worth noting that despite the potential of integrating language with video games, key informants like Steven expressed caution in overly relying on modern technology –

We have to be careful that we are not creating a sedentary lifestyle for our Youth with iPods, X-Boxes, TV and other video games. If people particularly our Youth aren't on the land, it is difficult to educate them about the importance of the land from a holistic perspective and taking responsibility for caring for the land – particularly if they do not believe in their spirituality...those are things that you can't necessary learn through technology.

The indigenous philosophy behind these activities focused on respecting the land and its resources. If citizens learn more about natural laws and Aboriginal values and principles of sustainability and caring for the land as stewards, greater responsibility and respect will emerge from within individual citizens to heal the land, thereby deescalating the speed and intensity in which climate change is occurring in the South Selkirks Region.

- **Enhancement of Social Networks and Dialogue.** Key informants described that a diverse array of communication methods are utilized to connect with other citizens, administration and politicians. Key communication methods are the utilization of Aboriginal community websites (e.g., MNBC – www.mnbc.ca); social networking sites (e.g., Facebook), face-to-face dialogue sessions and community gatherings (e.g., Annual General Assemblies, cultural celebrations and ceremonies); and periodicals (e.g., MNBC's *Whispering Winds Magazine*). James outlined that “we use technology like web meetings for us to link up by computer and have web cameras to interact with one another to discuss issues.” Lindsay commented on the benefits of broadband internet to engage citizens on issues such as climate change: “we can access Facebook and connect with friends and interact with them...it is a new sense of social connection with other Nation members.” Howard, on the other hand, stated that “we need to return to having community meetings...we need to return to being ‘all as one’ and return to our sense of community connections – more healing needs to occur to make this a reality.” All of the above mentioned communications methods can aid in heightening awareness and understanding of climate change and associated adaptation strategies in Aboriginal communities in the South Selkirks Region.

Key informants recognized the current work of the Columbia Basin Trust (CBT) which has carried out research and dialogue sessions on climate change in the Columbia Basin. CBT was seen as a trustworthy organization that is actively engaging Aboriginal People in the region to develop plans and provide a rural lens on potential climate change effects in the Columbia Basin. In addition, these methods can aid Aboriginal communities in the region in their advocacy work in growing local and regional support for climate change-

related public policy consultation and accommodation. Initiatives that respond to climate change effects in the region with a rural community context can enhance well-being as the Aboriginal Peoples in the South Selkirks Region.

- **Full Participation and Engagement in Climate Change Adaptation Decision-Making by Aboriginal Communities in the South Selkirks.** Key informants would like to see the Aboriginal communities in the South Selkirks proactively and fully participate in climate change adaptation decision-making in the region and broader Kootenays area. A mechanism for full participation in climate change adaptation decision-making by Aboriginal Peoples is access to adequate and direct multi-year funding to engage in all aspects of climate change processes, including adaptation, mitigation, monitoring and transfer of appropriate technologies and related infrastructure to foster regional-level self-sufficiency, capacity growing and learning – particularly as it relates to engaging Youth in the above mentioned climate change processes. James stated that “we need to have a say on land, water and logging practices...carefully harvesting, managing water issues, managing sensitive areas (for plants/berries), taking care of archaeological sites.” Jake posed a question about engagement with various levels of municipal, provincial and federal governments in relation to climate change adaptation – “which part of the circle of life do they sit in or do they see themselves above the circle of life and web of life? Is their thinking circular or linear – where do policy makers sit?” Overall, key informants like Jarrod and Thomas want to see climate change and other green initiatives “on the local, regional, provincial and national level agendas as a key priority for citizens.” Craig wanted to see “[Aboriginal Peoples] have a higher profile in order to be at the decision-making table for promoting [Aboriginal] interests regarding climate change adaptation.” In particular, key informants are very interested in the Darkwoods Property (owned by the NCC – BC Region) and are curious about what is happening with the property, what are the next steps and how Aboriginal communities in the South Selkirks will be engaged in climate change adaptation activities that occur on this property located in the region.
- **Recognition and Integration of Language, Culture and Localized Knowledge in Regional Climate Change Processes.** As mentioned throughout this report, key informants’ perspectives supported by existing literature recognized the value of localized knowledge (aka. traditional knowledge) and practices to monitor and develop strategies to adapt to climate change. According to key informants, one of the greatest challenges in advancing climate change initiatives in Aboriginal communities in the South Selkirks is that much of the localized knowledge that remains in their communities is held by a small number of people (typically local Elders) and is in jeopardy of being lost forever.

Because of the deterioration of localized knowledge in Aboriginal communities in the South Selkirks due to colonization and assimilation initiatives, there was an inability to foster the sharing of sacred knowledge with younger generations. Therefore, it is important to seek out opportunities for the expression of localized knowledge to adapt to changes in society and the environment (e.g., climate change). Consequently, one of the goals for current and future climate change adaptation initiatives in Aboriginal

communities in the region should continue to focus on the protection of traditional languages to provide opportunities for reviving these languages, localized knowledge and culture through the sharing of wisdom between Elders, Knowledge Keepers and Youth. This is important because as James stated “it is the Youth who will carry forward the knowledge and values of climate change projects for future generations.” For climate change adaptation to meaningfully occur in Aboriginal communities in the South Selkirks, these communities have to fully engage with their younger citizens (e.g., Youth – 30 years of age and younger).

Key informants encouraged their Aboriginal communities to share information and knowledge with others while ensuring the protection and respect of intellectual property rights at the local, national and international levels pertaining to their localized knowledge, innovations, and practices. These include sharing knowledge and use of land, water, forest management, food plants, animals and medicines (if and where appropriate according to cultural protocols and intellectual property rights) to develop climate change adaptation and mitigation strategies that will strengthen their communities in the South Selkirks.

As previously mentioned in the “Regional-Level Awareness and Education on Climate Change” strategy, having Youth engaged in climate change initiatives is intended to promote positive behavioural shaping in the form of taking personal responsibility (internal locus of control) in caring for the land, water, language and culture of Aboriginal communities in the South Selkirks.

- **Utilization of Community Forests and Conservation Forestry Practices.** Key informants, in particular First Nations Knowledge Keepers, imparted that community forests and conservation forestry, as strategic decision-making approaches, can maintain and restore the structural and functional diversity of forests and resources being affected by climate change in the region. Specifically, community forest models utilize citizen engagement in the operation and management of local forests based on multiple values – economic, social, cultural and ecological interests. Conservation forestry is another management approach that is based on multiple values (e.g., ecological, social, cultural) that extend beyond pure economic and fibre supply interests. Both of these management approaches were seen as community-driven and supportive of Nation-level self-sufficiency and recognition of Aboriginal title and rights. Community forests and conservation forestry management practices were viewed by key informants as effective strategies in (a) reestablishing traditional connections to local lands and resources, and (b) being culturally respectful in the recognition of Aboriginal communities in the South Selkirks as the stewards of the land. On November 20, 2009, the Government of British Columbia (2009) announced that the Ktunaxa Nation signed a 25 year agreement with the former BC Ministry of Forests & Range to aid in employment (e.g., hiring local forestry contractors), economic diversification (e.g., timber harvesting up to 5,790 m³/year) and ecosystem stewardship (e.g., silviculture) in a community forest spanning 20,000 hectares in the Elk Valley. The community forest is managed by Nupqu Development Corporation (a Ktunaxa owned and operated forestry and natural resource management business

venture). Key informants said that Aboriginal communities in the South Selkirks are very interested in being actively involved in the conservation forestry, monitoring and related climate change initiatives on the NCC's Darkwoods Property in the region.

- **Implementation of Ecological Restoration.** Key informants asserted that ecological restoration has the potential to renew and support biological diversity and the overall ecological integrity of the South Selkirks Region as the climate changes. James noted that “annual traditional burning can replenish native berries and plants...without fire, everything gets ingrown with lots of grasses and animals cannot walk through it...and instead of hunting and gathering in one spot all the time, rotational harvesting can be used to prevent overharvesting in an area.” Lindsay further described that “thinning, pruning and clearing undergrowth near and around homes is beneficial for cleaning up the land and fire protection.” Lindsay went on to mentioned that “we [our Nation] are talking with BC Hydro to get the salmon back up the Columbia River...Hydro is talking about their ways to get the salmon to return...perhaps our ways can be considered as well in bringing the salmon back.”

Habitat areas in this region that have been damaged or destroyed due to climate change effects (e.g., droughts and wildfires) can be restored so that they can once again function as they had in the past. The most important elements of ecological restoration include (a) a concern for the quality of the ecosystems that Aboriginal communities in the South Selkirks seek to restore; and (b) working together to create stronger relationships on the South Selkirks landscape. The process of working with each other towards stewardship and restoration goals can help to strengthen the relationships between people and places which are of particular importance for Aboriginal communities in the region. A recurring theme in the strategies described thus far is that restoration activities must include the localized knowledge of Elders and Knowledge Keepers and the full engagement of Youth, thereby bringing respect and traditions back to the South Selkirks Region which is community-driven, experiential and visual.

- **Grow or Purchase Local Foods, Products and Services.** Another strategy that key informants felt was necessary in adapting to climate change was the need to protect local food security in the region by growing one's own vegetables and raising one's own foods (e.g., chickens) in order to support local Aboriginal businesses in becoming more self-sufficient. In addition, local food security protection decreases one's reliance on foods grown and services provided outside the region, province and country. Catherine said “we need to be more self-sufficient...we have land here to create community gardens; there are not a lot of things that we really rely on in town that we couldn't simply carry out right here in our community.” Tammy shared with me that “we need to rely on our Aboriginal communities more instead of outside of the community by purchasing local produce and supporting our local economy.”

Key informants maintained that food affects cultural and spiritual health. When non-traditional foods were introduced to Aboriginal communities in the South Selkirks, key informants noted the significant increase in illnesses such as heart disease, cancer, Type

II diabetes and obesity which were not prevalent prior to colonization. There are sacred relationships between food and Aboriginal well-being. Furthermore, key informants were keen to support local, Aboriginal-based businesses which they felt was a sign of supporting local citizens' needs and priorities in economic diversification. Again, as noted in the above mentioned strategies, the philosophy of working with the land and harvesting only what you need and not what you want is instilling respect for land and its resources while fostering self-respect in Aboriginal citizens in the region.

- **Continuation of Aboriginal-Specific Ecological Monitoring and Climate Change Adaptation Research.** According to key informants, continued community and Aboriginal-specific ecological monitoring and research on climate change adaptation were viewed as positive climate change strategies. In particular, key informants believed that further field research in Aboriginal communities in the South Selkirks will assist them in identifying local social and cultural values and practices that can be integrated with existing western technologies and strategies for addressing climate change in the region. Craig felt that “we need to engage in more partnership opportunities with universities for research and analysis to engage [Aboriginal] participation and ensure that ‘green’ programs and services are being provided to [Aboriginal Peoples].” Dylan said that localized knowledge (aka. traditional knowledge) is a key to addressing climate change issues in the region:

It is all about monitoring based on thousands of years of observation and paying attention to the natural world and patterns in the environment. In natural resource management, there is more of an emphasis on quantitative data than qualitative data... TEK integrates qualitative information to natural resource management by helping us identify information about the natural world and relating it and correlating it to climate patterns.

By better understanding the interrelationships between climate change and culture, there is a potential for contributing innovative strategies to enhance existing climate change adaptation initiatives, monitoring, and policy decision-making. In the area of monitoring, key informants felt that many of their Aboriginal citizens were “natural observers” as they have been watching and recording seasonal weather patterns and collecting inventories on various flora and fauna in the region for decades. As Steven stated,

we understand the land based on our experiences over significant periods of time being on the land – we naturally monitor and adapt and observe patterns and shifts with flora and fauna in our Nation... monitoring is based on our experiences on the land year after year. We can see the changes, whether they are good or bad. We watch the lands, animals and birds. We used to have people watch and count the animals and monitor for balance. They would report back if there were not enough or too many specific animals; for example, they would recommend that we take out the three year old deer in order to even out the populations. If the berries are depleted in a specific area, it would be noted and we would move on to another area... all the while we are guided by our natural laws as we monitor and

observe our natural surroundings. We need more information about climate change adaptation...we need to watch and record what is happening to have a better awareness for hunting, fishing and berry picking...we need to stay informed about the changing climate at the community level and Nation level.

Craig said that “by understanding and monitoring seasonal migration patterns of animals and fish, we can coincide our hunting for deer in the winter and fish in the summer in a sustainable manner.”

Subject to available funding, BCMANR engages in mountain caribou research in the Selkirks Mountain, species at risk mapping and Métis Traditional Knowledge interviews with Métis knowledge holders. Métis Traditional Knowledge (in terms of localized knowledge) can greatly assist Métis communities in adapting to climate change through the design of innovative harvesting practices that can better adjust to changing weather patterns and conditions which effect the timing of harvesting, hunting and trapping for Métis People.

The common thread throughout the above mentioned climate change strategies was the realization by key informants that effective adaptation strategies will require behaviour shaping at the individual and group levels (e.g., community, regional level) in terms of taking personal responsibility for one’s actions and taking ownership for everything that you do on the land and how you utilize the environment’s natural resources. Without taking personal responsibility, key informants realized that it will prove challenging to garner respect for the environment and flourish while the climate continues to change in the South Selkirks Region.

Conclusions and Recommendations

The qualitative study on Aboriginal perspectives on climate change in the South Selkirks Region sheds light on interconnectedness of land, resources and people, reinforcing that climate change adaptation strategies have to extend beyond ecological interests to also include social, cultural and economic needs. From a psychological perspective, the report acknowledged that the health of traditional lands and its resources affects the health and well-being of Aboriginal citizens in terms of cultural identity with their Aboriginal communities in the South Selkirks. For community leaders and policy and planning decision-makers, this report recognized that human resiliency is a fundamental pillar in growing adaptive capacity at the local and regional levels. In this particular study, Aboriginal Knowledge Keepers were forthcoming in sharing their perspectives on human resiliency, coping and climate change adaptation. They indicated that climate change policies, strategies, and initiatives should require cultural paradigms to be respectfully integrated into climate change decision-making to promote sustainability of Aboriginal communities in the region over time. Failing to do so will only perpetuate conflicts, disputes and related cross-cultural misunderstandings in collectively addressing the complex issue of climate change and its effects on natural and human systems in the region.

In terms of recommendations, policy and planning decision-makers at the local, regional and provincial levels should endeavour to

- (a) develop a consistent set of human resiliency measures or indicators (e.g., measures on language, laws, governance, lands, community health and well-being and economic diversification) for climate change adaptation to effectively monitor human systems and sustainability as the climate changes in the region;
- (b) integrate cultural values into clearly defined climate change adaptation objectives – including resources (human and financial) for Elder and Youth engagement, language preservation and cultural revitalization;
- (c) work with Aboriginal communities to engage Knowledge Keepers as local observers for climate change and related ecological monitoring initiatives and aid in prioritizing monitoring needs in the region;
- (d) broaden the understanding and research on climate change to include localized knowledge (aka. traditional knowledge) and indigenous science alongside and equal to western science to expand the depth and breadth of adaptive capacity; and localized decision-making and adaptation strategies to maximize community engagement and access to traditional knowledge to ensure that cultural values and practices inform decision-making in the region;
- (e) expand the climate change knowledge base and distribution of information through proactive and full engagement of Aboriginal people in climate change adaptation decision-making from research analysis to the design and implementation of adaptation strategies;
- (f) utilize existing communication methods in Aboriginal communities in the South Selkirks to grow capacity, knowledge and understanding about climate change, which includes framing information and customizing messages, concepts and diagrams based on Aboriginal communities in the region; and
- (g) develop equitable partnerships and collaborations within Aboriginal communities in the South Selkirks and with strategic partners (e.g., municipal/provincial/federal governments, industry and academia) as a lever to share resources (financial and human resources and infrastructure) in collectively addressing climate change effects in the region.

In Fall 2011, the South Selkirks Climate Change Research Team advanced extension opportunities to support South Selkirks communities in better understanding climate change. These opportunities were intended to enhance existing tools for climate change research and planning for use by natural resource management specialists and community leaders. Such enhancements included developing a culturally-congruent participatory research module for the FORREX Social Science Curriculum and facilitating climate change dialogue sessions in the

South Selkirks Region to increase collaboration, networking, information sharing and engagement of Aboriginal and non-Aboriginal community members in developing integrated climate change adaptation strategies.

As Catherine Pulsifer (Canadian author and artist) articulated “if you resist change, you will face challenges on a daily basis. If you consciously refocus your attitude to see the benefits of change, your outlook becomes positive and life becomes easier” (Catherine Pulsifer, n.d.). By focusing on strengths and positive attributes, individuals and groups (e.g., Aboriginal communities in the South Selkirks Region) have the ability to shape their behaviours, attitudes and perceptions in order to effectively adapt and cope with hardships, crises and changes in their natural environment now and in the future. Through its multidisciplinary work, the South Selkirks Climate Change Research Team is making a concerted effort to bring together climate science, indigenous science and social science to aid in analyzing, interpreting and extending our research results to provide policy and planning decision-makers with integrated insights on the complex issue of climate change at the landscape level.



A Tug Boat Towing a Log Boom Barge on Slokan Lake
Photo Credit: Howard Harshaw

References

- Ahearn, J. (2005). *Indigenous Peoples of the West Kootenays: A resource guide for students and teachers*. Nelson, BC: School District #8 (Kootenay Lake).
- Akerlof, K., DeBono, R., Berry, P., Leiserowitz, A., Roser-Renouf, C., Clarke, K.L., Rogaeva, A., Nisbet, M.C., Weathers, M.R., & Maibach, E.W. (2010). Public perceptions of climate change as a human health risk: Surveys of the United States, Canada and Malta. *International Journal of Environmental Research & Public Health*, 7(6). 2559-2606.
- Ambec, S., & Lanoie, P. (2008). Does it pay to be green? A systematic overview. *Academy of Management Perspectives*, 22. 45-62.
- Anchorage Declaration (April 24, 2010). Anchorage, AL: Indigenous Peoples' Global Summit on Climate Change.
- Anderson, G. (1998). *Fundamentals of educational research* (2nd ed.). Philadelphia, PA: Falmer Press.
- Bartlett, C.M., Marshall, M., & Marshall, A. (2007). *Integrative science: Enabling concepts within a journey guided by trees holding hands and two-eyed seeing*. Two-Eyed Seeing Knowledge Sharing Series, Manuscript No.1, Institute for Integrative Science & Health (www.integrativescience.ca). Sydney, NS: Cape Breton University.
- Battiste, M., & Henderson, J.Y. (2000). *Protecting indigenous knowledge & heritage: A global challenge*. Saskatoon, SK: Purich Publishing.
- Bavelas, A. (1942). A method for investigating individual and group ideology. *Sociometry*, 5. 371-377.
- BC Treaty Commission (2007). *Treaty commission annual report 2006*. Vancouver, BC: BC Treaty Commission
- Berkes, F. (1999). *Sacred ecology: Traditional ecological knowledge and resource management*. London, UK: Taylor & Francis.
- Brown, S. (1992). Cognitive mapping and repertory grids for qualitative survey research: Some comparative observations. *Journal of Management Studies*, 29(3). 287-307.
- Brown, F., & Brown, Y.K. (2009). *Staying the course, staying alive – Coastal First Nations fundamental truths: Biodiversity, stewardship and sustainability*. Victoria, BC: Biodiversity BC.

- Cajete, G. (1999). *Igniting the sparkle: An indigenous science education model*. Skyand, NC: Kivaki Press.
- Cajete, G. (1994). *Look to the mountain: An ecological of indigenous education*. Rio Rancho, NM: Kivaki Press.
- Cajete, G. (2000). *Native science: Natural laws of interdependence*. Sante Fe, New Mexico: Clear Light Publishers.
- Catherine Pulsifer (n.d.). [Quote]. Retrieved on August 1, 2010 from <http://www.inspirationalquotes4u.com/pulsiferquotes/index.html>
- Caverley N. (2009). An indigenous perspective on economic sustainability in mountain pine beetle impacted communities. *BC Journal of Ecosystems and Management*, 10(2). 140-147.
- Caverley, N. (2005). Civil service resiliency & coping. *International Journal of Public Sector Management*, 18(5). 401-413.
- Caverley, N. & Scott, R. (September 2007). Mountain pine beetle: Socio-economic strategies for First Nations. *Native Journal*, 16(9). 36, 39.
- Chief Dan George (n.d.). [Quote]. Retrieved September 20, 2010 from <http://www.legendsofamerica.com/na-quotes.html>
- Coutu, D.L. (May 2002). How resilience works. *Harvard Business Review*. 46-55.
- Creswell, J.W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.
- Cunningham, J.B. (2001). *Researching organizational values & beliefs: The echo approach*. Westport, CT: Quorum Books.
- Decker, D.J., Brown, T.L., & Siemer, W.F. (2001). Evolution of people – wildlife relations. In Eds. D.J. Decker, T.L. Brown and W.F. Siemer (Eds.), *Human dimensions of wildlife management in North America*. Bethesda, MD: The Wildlife Society.
- Deloria, V. (1995). *Red earth, white lies: Native Americans and the Myth of scientific fact*. New York, NY: Scribner.
- Duran, E. (2006). *Healing the soul wound: Counseling with American Indians and other Native Peoples*. New York, NY: Teachers College Press.
- Duran, R., & Duran, B. (1995). *Native American postcolonial psychology*. Albany, NY: State University of New York Press.

- First Peoples' Heritage, Language and Culture Council (2010). *Report on the status of BC First Nations language*. Brentwood Bay, BC: First Peoples' Heritage, Language and Culture Council.
- France, M.H. (1997). First Nations: Helping and learning the Aboriginal community. *Guidance & Counselling*, 12(2). 3-8.
- France, M.H., McCormick, R., & Rodriguez, M.C. (2004). Chapter 20: The "red road": Culture, spirituality and the sacred hoop. In M.H. France, M.C. Rodriguez & G.G. Hett (Eds.), *Diversity, culture and counselling: A Canadian perspective*. Calgary, Alberta: Detselig Enterprises.
- Fransella, F., & Bannister, D. (1977). *A manual for repertory grid technique*. San Diego, CA: Academic Press.
- Galloway McLean, K., Ramos-Castillo, A., Gross, T., Johnston, S., Vierros, M., & Noa, R. (2009). *Report of the Indigenous Peoples' global summit on climate change: 20-24 April 2009, Anchorage, Alaska*. Darwin, Australia: United Nations University – Traditional Knowledge Initiative.
- Gebhardt, W.A., van der Doef, M.P., & Paul, L.B. (2001). The revised health hardiness inventory (RHHI-24) psychometric properties and relationship with self-reported health and health behaviour in two Dutch samples. *Health Education Research*, 16(5). 579-592.
- Government of British Columbia (2008). *Climate action plan*. Victoria, BC: Government of British Columbia.
- Government of British Columbia (2009). *Long term community forestry supports Ktunaxa success – News release*. Victoria, BC: Government of British Columbia.
- Graham, J., Edgar, L., & Mitchell, L. (2009). *Summary report of the impact assessment of the proposed federal legislative framework for drinking water and wastewater in First Nations communities*. Ottawa, ON: Institute On Governance.
- Graham, J., Mitchell, L., & Edgar, L. (2009). *Engagement sessions on the development of a proposed federal legislative framework for drinking water and wastewater in First Nations communities: Summary report*. Ottawa, ON: Institute On Governance.
- House, J., Umberson, D., & Landis, K.R. (1988). Structures and processes of social support. *Annual Review of Sociology*, 14. 293-318.
- Integral Medicine Wheel (2010). Retrieved on October 17, 2010 from <http://i154.photobucket.com/albums/s262/caracutro/MedicineWheelChart.gif>

- Jamet, S., & Corfee-Morlot, J. (2009). *Assessing the impacts of climate change: A literature review*. OECD Economics Department Working Papers, No. 691. Paris, France: Organisation for Economic Cooperation and Development.
- Johnston, M., Williamson, T., Munson, A., Ogden, A., Moroni, M., Parsons, R., Price, D., & Stadt, J. (2010). *Climate change and forest management in Canada: Impacts, adaptive capacity and adaptation options. A state of knowledge report*. Edmonton, AB: Sustainable Forest Management Network.
- Joseph, C., & Krishnaswamy, A. (2010). Factors of resiliency for forest communities in transition in British Columbia. *BC Journal of Ecosystems and Management*, 10(3). 127-144.
- Kelly, G.A. (1991). *The psychology of personal constructs volume one – A theory of personality*. London: Routledge.
- Kimmet, C. (July 24, 2009). *First Nation takes lead on solar power*. Retrieved on September 10, 2010 from <http://thetyee.ca/News/2009/07/24/FirstNationSolarPower/>
- Kobasa, S.C., Maddi, S.R., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology*, 42(1). 168-177.
- Konkin, D., & Hopkins, K. (2009). Learning to deal with climate change and catastrophic forest disturbances. *Unasylva*, 60(231). 17-23.
- Kootenays Rockies Tourism (2010). *Kootenays Rockies travel guide 2010*. Kimberley, BC: Kootenays Rockies Tourism.
- Kulik, J.A., & Mahler, H.I.M. (1989). Social support and recover from survey. *Health Psychology*, 8. 221-238.
- Lemmen, P.S., Warren, F.J., & Lacroix, J. (2008). Synthesis. In P.S. Lemmen, F.J. Warren, J. Lacroix & E. Bush (Eds.), *From impacts to adaptation: Canada in a changing climate 2007*. Ottawa, ON: Government of Canada.
- MacLeod, A. (May 4, 2010). Three year old ATV regulations surprise to minister responsible. Retrieved on May 5, 2010 from www.thetyee.ca/Blogs/TheHook/BC-Politics/2010/05/04/MudBogged/print.html
- Maibach, E.W., Nisbel, M.C., Baldwin, P., Akerlof, K. & Diao, G. (2010). Reframing climate change as a public health issue: An exploratory study of public reactions. *BioMed Central Public Health*, 10(299). 1-11.
- Maluccio, A.N. (2002). Resilience: A many-splendored construct? *American Journal of Orthopsychiatry*, 72(4). 596-599.

- Masten, A.S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, 56(3). 227-238.
- McCormick, R. (1997). An integration of healing wisdom: The vision quest ceremony from an attachment theory perspective. *Guidance & Counselling*, 12(2). 18-21.
- McCracken, G. (1988). *The long interview*. Newbury Park, CA: Sage.
- Nature Conservancy of Canada (n.d.). *Darkwoods prospectus*. Victoria, BC: Nature Conservancy of Canada BC Office.
- Newall, B.R., & Pitman, A.J. (2010). The psychology of global warming. *Bulletin of American Meteorological Society*, 91(8). 1003-1014.
- Nuttall, M. (2005). Hunting, herding, fishing and gathering: Indigenous Peoples and renewable resource use in the Arctic. *Arctic Climate Impact Assessment: Scientific Report*. New York, NY: Cambridge University Press.
- Patton, M.Q. (1990). *Qualitative evaluation methods*. Beverly Hills, CA: Sage Publications.
- Pawu-Kurlpurlurnu, W.J., Holmes, M. and Box, L. (2008). *Ngurra-kurlu: A way of working with Warlpiri People*, DKCRC Report 41. Desert Knowledge CRC, Alice Springs, NT.
- Pierce, G.R., Sarason, B.R., & Sarason, I.G. (1996). *Handbook of social support and the family*. New York, NY: Plenum Press.
- Posey, D. (1999). Safeguarding traditional resource rights of Indigenous People. In Virginia Nazarea (Ed.), *Ethnoecology: Situated knowledge/located lives*. Tucson, AZ: Arizona Press.
- Ratner, S., & Moser, S. (2009). *Community resilience and wealth: The challenges and opportunities for rural communities in a rapidly changing world*. Greenville, SC: U.S. Endowment for Forestry and Communities.
- Ricketts, T.H., Soares-Filho, B., da Fonseca, G.A.B., Nepstad, D., Pfaff, A., Peterson, A., Anderson, A., Bouchers, D., Cattaneo, A., Conte, M., Creighton, K., Linden, L., Marettis, C., Moutinho, P., Ullman, R., & Victurine, R. (2010). Indigenous lands, protected areas, and slowing climate change. *PLoS Biology*, 8(3). 1-4.
- Ryle, A. (1975). *Frames and cages: The repertory grid approach to human understanding*. London: Sussex University Press.
- Seligman, M.E.P. (1998). Building human strength: Psychology's forgotten mission. *American Psychological Association Monitor*, 29(1).

- Seligman, M.E.P., & Csikszentmihalyi, M. (2000). Positive psychology: An Introduction. *American Psychologist*, 55(1). 5-14.
- Sheldon, K., Frederickson, B., Rathunde, K., Csikszentmihalyi, & Haidt, J. (2000). *Positive psychology manifesto*. Retrieved on September 21, 2010 from <http://www.positivepsychology.org/akumalmanifesto.htm>
- Sillitoe, P. (2002a). Chapter 1: Participant observation to participatory development: Making anthropology work. In P. Sillitoe, A. Bicker & J. Pottier (Eds.), *Participating in development: Approaches to indigenous knowledge*. New York, NY: Routledge.
- Sillitoe, P. (2002b). Chapter 6: Globalizing indigenous knowledge. In P. Sillitoe, A. Bicker & J. Pottier (Eds.), *Participating in development: Approaches to indigenous knowledge*. New York, NY: Routledge.
- Snively, G. & Williams, L. (2005). The Aboriginal knowledge and science education research project. In W.M. Roth (Ed.), *CONNECTIONS '05*. 233-250.
- Seppala, R., Buck, A., & Katila, P. (2009). *Adaptation of forests and people to climate change: A global assessment report – IUFRO World Series Volume 22*. Helsinki, FIN: International Union of Forest Research Organizations.
- Smith, J.K. (1983). Quantitative versus qualitative research. An attempt to clarify the issue. *Educational Researcher*, 12(3). 6-13.
- Tashakkori, A., & Teddlie, C. (2003). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage Publications.
- Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches*. Thousand Oaks, CA: Sage Publications.
- United Nations Declaration of the Rights of Indigenous Peoples (2007). Retrieved on August 10, 2010 from <http://www.un.org/esa/socdev/unpfii/en/declaration.html>
- U.S. Endowment for Forestry and Communities (2009). *Resilience report highlights challenges and opportunities for rural communities*. Greenville, SC: U.S. Endowment for Forestry and Communities.
- Verschuuren, B. (2007). *Believing is seeing: Integrating cultural and spiritual values in conservation management*. Gland, Switzerland: Foundation for Sustainable Development.
- Visitors' Choice Publications (2008). *Visitors' choice Creston and the east shore of Kootenay Lake*. Vancouver, BC: Visitors' Choice Publications.

Williamson, T.B., Colombo, S.J., Duinker, P.N., Gray, P.A., Hennessey, R.J., Houle, D., Johnston, M.H., Ogden, A.E., & Spittlehouse, D.L. (2009). *Climate change and Canada's forests: From impacts to adaptation*. Edmonton, AB: Sustainable Forest Management Network, Natural Resources Canada, Canadian Forest Service, and Northern Forestry Centre.

Woods, A.J., Heppner, D., Kope, H.H., Burleigh, J., & Maclauchlan, L. (2010). Forest health and climate change: A BC perspective. *The Forestry Chronicle*, 86(4). 412-422.

Appendix A: Glossary of Terms

Aboriginal Knowledge Keeper. Any person or persons recognized by the Aboriginal community as having knowledge and understanding of the traditional culture of the community, including spiritual and social practices. Knowledge Keepers are identified based on the community's respect for them and peer recognition for their depth and breadth of localized knowledge.

Aboriginal Peoples. The indigenous people of Canada. The *Constitution Act, 1982 – Section 35* recognizes three groups of Aboriginal People – Indians (commonly referred to as First Nations), Métis and Inuit. Each group has distinct histories, languages, and social, cultural and spiritual beliefs. For the purposes of this final report, unless a specific First Nations or Métis Peoples and/or their communities are referenced in sections of this document, the term “Aboriginal” was utilized to reference indigenous communities in BC and Canada.

Aboriginal Rights. Practices, traditions and customs integral to the distinctive culture of the Aboriginal group claiming the right that existed prior to contact with the Europeans. Aboriginal rights are fact and site specific. Specifically, Section 35 rights are existing Aboriginal rights, including Aboriginal title and treaty rights as per the *Constitution Act, 1982 – Section 35*.

Aboriginal Title. An Aboriginal right to the exclusive use and occupation of land.

Adaptation. This term relates to any activities and measures that reduce negative effects of climate change (aka. vulnerabilities) in natural and/or human systems.

Adaptive Capacity. The ability of a system or community to adjust to climate change effects ranging from mitigating damages to coping with its effects in the immediate future or in the long term.

BC Bioenergy Strategy. A BC Government strategy (focusing on BC rural communities) that centers on creating fuels made from common waste products such as agricultural, forest, municipal and food processing waste.

Capacity Growing. The process of developing knowledge, skills and abilities to empower communities to participate in any or all aspects of decision-making in their communities, regions, provinces/states and country.

Community Forest. A forest that is community-operated and managed and focuses on enhancing economic, social, cultural and ecological interests for citizens and the broader environment in the area.

Conservation-Based Forestry. This type of forestry management approach maintains and restores the structural and functional diversity of forests and surrounding resources based on multiple ecological and socio-cultural values rather than an exclusive focus on fibre and timber.

Coping. Strategies, thoughts and actions that individuals and/or groups demonstrate when they are responding to a hardship, crisis or change affecting their health and well-being.

Creston Valley Wildlife Management Area. Established in 1968, this is the first management area in BC. The management area is an approximately 17,000 acres wetland habitat which serves as a natural wildlife sanctuary for waterfowl (e.g., swans, geese, herons).

Cultural Values. Guiding principles, ideals, aspirations and beliefs that serve as a foundation in how Aboriginal Peoples (as individuals and as a group) carry out work in their Nations. Cultural values manifest themselves in local traditions, institutions and protocols that are major pillars that define the given Aboriginal society.

Differential Impact of Losses and Gains. According to Newell and Pitman (2010), loss creates “psychological pain” and therefore has more strength in conversation and debate than focusing on the potential gains of a given activity or initiative. From a psychological perspective, people generally pay more attention to avoiding losses in life rather than seeking gains.

Ecosystem. A system of living organisms interacting with their physical environment.

Ecosystem Stewardship. Planning and management decision making that is culturally relevant to Aboriginal People, reflects their unique connection with land and resources and is congruent with their inherent responsibility to care for the land, water, air, people, animals and fish in a manner consistent with their spiritual beliefs and values.

Elder. Any person or persons recognized by the Aboriginal community as having knowledge and understanding of the traditional culture of the community, including spiritual and social practices. Knowledge and wisdom, coupled with the recognition and respect of the people of the Nation, are key characteristics of an Elder.

Extreme Weather Event. A weather event that is rare in relation to the average number of weather events over a certain period of time.

Food Security. The ability to have access to safe, culturally acceptable, affordable and nutritious food based on the guiding values of sustainability, self-reliance and social justice.

Forest. A vegetation type dominated by trees.

Forests for Tomorrow. A four year BC Government initiative that focuses on the reforestation Program design and implementation to improve future timber supplies and other forest values in the province.

Framing. A psychological term to describe how information is presented to convey a particular message or to produce a desired response.

Habitat. The particular environment where an organism or species tends to live; a more locally defined portion of the broader natural environment.

Historical Trauma. Cumulative and collective trauma experienced over a lifetime and across generations as a result of acts of nature (e.g., oil spills affecting land and people) and acts of cruelty towards others (e.g., oppression, Residential School Experience, racism, genocide) that lead to dysfunctional coping strategies (e.g., substance abuse, domestic violence), which negatively impact the health and well-being of the individuals, communities and societies that experienced the given trauma(s).

Indigenous Peoples. Ethnic and cultural groups who are the original inhabitants of a given region based on the earliest known historical records and their descendents.

Indigenous Science and Wellness. Ancient processes by which Indigenous people continue to build their experiential knowledge and healing of the natural environment in relation to the larger social and human context (e.g., communities and their well-being). Additionally, a practical application of theories of knowledge about the nature of the world in relation to human activity.

Legend. A story or collection of stories based on experience and generations of living a culture on traditional lands from time immemorial. Legends are viewed as teaching tools and knowledge sharing opportunities that center on morality and social understanding of the given Nation.

Localized Knowledge. Local and culturally-specific bodies of knowledge that indigenous people gained through generations of social, physical and spiritual understanding of the world around them, traditional lands and associated practical experience. For example, Traditional Ecological Knowledge (TEK) and Métis Traditional Knowledge (MTK) are unique bodies of knowledge for specific Aboriginal cultures, locations or societies.

Meaningful Consultation. The duty to consult requires a genuine effort to address legitimate concerns and interests that relate to the impacts of potential Crown conduct on Section 35 rights. For consultation to be meaningful, there must be a genuine willingness and ability to adjust the conduct, if appropriate.

Memorandum of Understanding. A formal agreement between two or more parties indicating a common understanding of key activities and processes.

Mitigation. Strategies, policies and practices that aid in the reduction of greenhouse gas emissions into the Earth's atmosphere.

Monitoring. Repeated observations over time of selected objects and values in a given ecosystem in order to determine the state of that particular system.

Nupqu Development Corporation. A Ktunaxa Nation owned and operated business venture focusing on forestry and natural resource management. This corporation was formally called Ktunaxa Kinbasket Development Corporation and provides services in forestry (e.g., silviculture, forest planning and wildfire protection) and environmental management (e.g., conservation restoration and ecological monitoring).

Performance Measures. Indicators or metrics used to gauge program performance.

Resilience. The ability of a natural and/or human system to flourish and adapt to situations or environments with minimal negative effects during and after the change, hardship or crisis. In psychology, resilience emphasizes the individual or groups' ability to effectively utilize positive attributes and capabilities more than weaknesses or pathologies.

Resources. Resources include water, plants, people, and animals; all living things including the two-legged, four-legged and winged animals and beings.

Silviculture. The development and care of forests.

Timber Supply Area. According to the *Forest Act*, an area of Crown land designated by the BC Minister of Forests, Lands and Natural Resource Operations and managed based on specific objectives, which includes timber production.

Trees for Tomorrow. A BC Government program that involves the planting of trees in local communities (e.g., parks, schools and other public spaces) throughout the province to promote the benefits of urban forests.

Vulnerability. The negative effects of climate change and the degree to which human and/or natural systems are unable to cope with the impacts.

Western Science. A system of knowledge that relies on certain laws that are established to understand phenomena in the world around us. The process of the scientific method begins with an observation followed by a prediction or hypothesis which is then tested. Depending on the test results, the hypothesis can become a scientific theory or “truth” about the world.

Appendix B: About the Author

Natasha Caverley holds a B.A. (With Distinction) in Psychology, M.Ed in Counselling Psychology and Ph.D in Organizational Studies from the University of Victoria. Natasha is a Certified Canadian Counsellor (C.C.C) through the Canadian Counselling & Psychotherapy Association. Dr. Caverley specializes in group dynamics, psychology, community and cross-cultural research.

Since 1998, Natasha has held research and policy analyst as well as organizational development positions in Aboriginal, non-Aboriginal and public service organizations specializing in community facilitation and troubleshooting, management and organizational behaviour, including policy development, instrument design and analysis, and strategic planning. Notable positions that Natasha has held include Vice-President – Turtle Island Consulting Services Inc.; Research Scientist – Human Resources Research Organization in Alexandria, Virginia; Benefits Analyst and Human Resource Management Research Analyst at the BC Public Service Agency; and Teaching Assistant at the University of Victoria. At present, Dr. Caverley is the President of Turtle Island Consulting Services Inc. located in North Saanich, BC.

Natasha is also an active community member. Dr. Caverley is currently the Board Secretary for the Farmlands Trust (Greater Victoria) Society in Saanichton, British Columbia and is a member of the FORREX Socio-Economics Working Group. From 2008 to 2009, Dr. Caverley was a Forest Investment Account – Forest Science Program Board Member serving as the Chair of the Aboriginal Harmonization Working Group. To date, Natasha has authored over 20 publications (nationally and internationally) in human resource management, counselling psychology, public administration, natural resource management and indigenous studies. Dr. Caverley has also served as a reviewer for the *International Journal of Public Sector Management (IJPSM)* and *International Journal of Productivity & Performance Management (IJPPM)*.

Natasha is Canadian of Aboriginal (Algonquin), Irish and Jamaican ancestry.

Dr. Caverley can be reached by email at natasha@turtleislandconsulting.ca

Appendix C: Request for Participation Invitation – Community Interviews

REQUEST FOR PARTICIPATION INVITATION – COMMUNITY INTERVIEWS

Climate Change Adaptation Research for Forest and Rangeland Ecosystems: Resiliency Implications at the Landscape Level

Dr. John Innes (University of British Columbia - Vancouver, British Columbia) and his multidisciplinary research team were recently awarded funding by the Future Forest Ecosystems Scientific Council (FFESC) and BC Hydro to examine climate change at the landscape level within the South Selkirks region of British Columbia.

You are being invited to volunteer as a potential interviewee for the research study entitled, “Climate Change Adaptation Research for Forest and Rangeland Ecosystems: Resiliency Implications at the Landscape Level.”

I am part of Dr. John Innes’ research team and will be conducting community interviews on the socio-cultural dimensions of climate change resiliency and adaptation in the South Selkirks Region. Dr. Howie Harshaw (University of British Columbia) will be conducting a public opinion/social survey on climate change adaptation.

The Principal Investigator for the “Climate Change Adaptation Research for Forest and Rangeland Ecosystems: Resiliency Implications at the Landscape Level” study is Dr. John Innes. You may contact John at:

- Dr. John Innes, Professor, Department of Forest Resource Management - UBC
Telephone Number: 604.822.6761 or by email at: john.innes@ubc.ca

The purpose of this study is to utilize a holistic approach in addressing climate change - an approach that respects socio-cultural, environmental and economic interests as a benchmark for forest management practices. Based on their findings, Dr. Innes and his research team will develop recommendations for operational practices that foster resiliency in adapting to climate change. Overall, the research team plans to analyze climate change and its impacts on the relationship between people, forests, water, land, air, plants and animals - thereby, honoring the complementing strengths of sharing, acknowledging and utilizing indigenous science (aka. native science) and western science approaches in understanding our changing climate.

The face-to-face community interviews will examine human resiliency and coping characteristics of community members in the South Selkirks Region to climate change-related effects. The information/findings from the interview portion of the study will assist the project team in (a) giving a voice to diverse Aboriginal community (Métis and First Nations) perspectives and roles in the South Selkirks Region regarding the topic of climate change, resiliency and coping; and

(b) supplementing a public opinion/social survey being conducted by Dr. Howie Harshaw (University of British Columbia) in the Fall of 2010.

Participatory workshop reports, publications and final reports will be provided to the Ktunaxa Elders' Group, Ktunaxa Nation Council, Ktunaxa Treaty Council and Métis Nation British Columbia (MNBC) throughout the duration of the project.

When we are presenting results from our study to the MNBC, Ktunaxa Nation Council, Ktunaxa Treaty Council and Ktunaxa Elders' Group, we are not in a position to influence decision-making and/or planning as it pertains to climate change and natural resource management within the MNBC and its Chartered Communities and the Ktunaxa Nation Member Communities nor the Ktunaxa Nation Council, Ktunaxa Treaty Council and Ktunaxa Elders' Group.

You are being asked to participate in this study because you have met the selection criteria and self-selected to volunteer to participate in a face-to-face audio-taped interview with the researcher. Specifically, you were selected based on a combination of factors - your age, gender, geographic location, level of local community involvement and knowledge of natural resource management and related cultural issues. The selection criteria were used to ensure that a cross-section of the MNBC and Ktunaxa Nation population in the South Selkirks Region was asked to participate in the qualitative interview portion of the study.

If you agree to voluntarily participate in this research, your participation will include being asked a series of critical incident-styled questions and open ended questions regarding how climate change stressors interact and impact community members' degree of resiliency in the South Selkirks Region.

You are being asked to take up to a total of three (3) hours out of your schedule to participate in the interview process. You will be interviewed twice. The first interview is a two (2) hour face-to-face audio-taped interview asking you a series of critical incident-styled questions and open ended questions regarding socio-cultural changes (if any) you have observed and attributes that you believe make the South Selkirks Region resilient in the face of future community changes. The second interview will be conducted on the telephone for 60 minutes. This second interview is for you to review the method in which the researcher has collected your responses to ensure it properly reflects your experience.

- Demographic information will be collected as a means of interpreting the data. However, unless you formally request (in writing) to be cited or referenced (in general or with a specific quote) in reports or related publications, your name, initials and other identifying characteristics will not be connected to your responses. Your identity will remain **CONFIDENTIAL**.
- No copies of the transcripts or interview notes will be given to the Métis Nation British Columbia (MNBC), the Ktunaxa Nation Council, Ktunaxa Treaty Council or the Ktunaxa Elders' Group.
- If at any point, you elect to withdraw from the study, you may do so without any consequences or any explanations. If you withdraw from the study, your data will not be used in any part of the data analysis and interpretation.
- Your participation is completely voluntary.
- Your decision to participate, whether yes or no, will not affect your MNBC citizenship or Ktunaxa Nation community membership in any way.

- You can refuse to answer any of the questions put to you throughout the interview process.

Each face-to-face/one-to-one interview will be conducted by Dr. Caverley on an individual basis in locations convenient to the participants. Honoraria will be provided to interview participants to acknowledge their degree/level of knowledge and experiences.

Data from this study will be disposed of after the completion of final reports and publications pertaining to this study. Data from this study will be kept for five (5) years, after which time the data will be destroyed.

If you have any concerns about your rights or treatment as a research subject, you may contact the Research Subject Information Line in the UBC Office of Research Services at 604.822.8598 or if long distance, email to RSIL@ors.ubc.ca or call toll free at 1.877.822.8598.

If you are interested in participating in the community interview process or require further clarification about the research study, please contact Natasha Caverley directly at 250.656.1076 or by email at: natasha@turtleislandconsulting.ca

I thank you in advance for your interest and participation in this study!

Attached is a list of Frequently Asked Questions (FAQs).

Thanks/Meegwetch,

Dr. Natasha Caverley, Co-Team Leader
and Researcher – South Selkirks Climate
Change Research Study
on behalf of Dr. John Innes, Professor
Faculty of Forestry - UBC

Appendix D: South Selkirks Qualitative Study General Overview

Climate Change Adaptation Research for Forest and Rangeland Ecosystems: Resiliency Implications at the Landscape Level

GENERAL OVERVIEW

Dr. John Innes (University of British Columbia - Vancouver, British Columbia) and his multidisciplinary research team were recently awarded funding by the Future Forest Ecosystems Scientific Council (FFESC) and BC Hydro to examine climate change at the landscape level within the South Selkirks region of British Columbia. This research study is based on the need to use a holistic approach in addressing climate change - an approach that respects socio-cultural, environmental and economic interests as a benchmark for forest management practices.

Based on their findings, Dr. Innes and his research team will develop recommendations for operational practices that foster resiliency in adapting to climate change. Overall, the research team plans to analyze climate change and its impacts on the relationship between people, forests, water, land, air, plants and animals - thereby, honoring the complementing strengths of sharing, acknowledging and utilizing indigenous science (aka. native science) and western science approaches in understanding our changing climate. The research team is comprised of Aboriginal (First Nations and Métis), academia, Government of British Columbia, Nature Conservancy of Canada (BC Region), forest industry representatives and consultants who specialize in natural sciences, social sciences and indigenous science.

In April and May 2010, community members from the Ktunaxa Nation Member Communities and Kootenays (Region 4) Métis Nation BC Chartered Communities will be invited to participate in individual community-based interviews.

The face-to-face interviews will examine human resiliency and coping characteristics of community members in the South Selkirks Region to climate change-related effects. The information/findings from the interview portion of the study will assist the project team in (a) giving a voice to diverse Aboriginal community (Métis and First Nations) perspectives and roles in the South Selkirks Region regarding the topic of climate change, resiliency and coping; and (b) supplementing a public opinion/social survey being conducted by Dr. Howie Harshaw (University of British Columbia) in the Fall of 2010.

Participatory workshop reports, publications and final reports will be provided to the Ktunaxa Elders' Group, Ktunaxa Nation Council, Ktunaxa Treaty Council and Métis Nation British Columbia (MNBC) throughout the duration of the project.

April/May 2010: Community Interviews with up to 16 participants from Ktunaxa Nation Member Communities and Kootenays (Region 4) Métis Nation BC Chartered Communities.

Based on a pre-determined set of criteria, community members will be asked to volunteer to participate in an audio-taped face-to-face interview (in confidence) with one of the project researchers – Dr. Natasha Caverley. Selection criteria such as age, gender, geographic location, level of community involvement and knowledge of natural resource management and related cultural issues ensure that a cross-section of the Ktunaxa Nation and Métis Nation BC population in the South Selkirks Region is asked to participate in the interview portion of the study.

Participants will be asked a series of critical incident-styled questions and open ended questions regarding how climate change stressors that interact and impact community members' degree of resiliency in the South Selkirks Region. Each interview will be conducted by Dr. Caverley on an individual basis in locations convenient to the participants.

The first interview is a face-to-face audio-taped interview for up to two (2) hours. The second interview will up to one (1) hour in length and it will be conducted on the telephone. This second interview is intended for participants to review the method in which Dr. Caverley has collected their responses to ensure it properly reflects their experience.

The targeted launch date of the South Selkirks Climate Change One-To-One Community Interviews is April 2010.

Please feel welcome to contact the Principal Investigator and his researchers at the University of British Columbia.

- Dr. John Innes, Principal Investigator – South Selkirks Climate Change Research Study
Telephone Number: 604.822.6761 or by email at: john.innes@ubc.ca
- Dr. Natasha Caverley, Co-Team Leader – South Selkirks Climate Change Research Study
Telephone Number: 250.656.1076 or by email at: natasha@turtleislandconsulting.ca
- Dr. Howard Harshaw, Co-Team Leader – South Selkirks Climate Change Research Study
Telephone Number: 604.822.3970 or by email at: howie.harshaw@ubc.ca

If you require further clarification about the community interview portion of the research study, please directly contact Dr. Natasha Caverley.

Thanks/Meegwetch,

Dr. Natasha Caverley, Co-Team Leader and Researcher
South Selkirks Climate Change Research Study
on behalf of Dr. John Innes, Professor
Faculty of Forestry – UBC

Sample South Selkirks Climate Change Community Interview Questions

The following are a series of sample questions for the community interview portion of the South Selkirks Climate Change Research Study.

Understanding Your Community

General

- Imagine you are describing your community to someone who is moving here, how do you personally define and describe your First Nations Community? (*Probe - characterizing details – descriptive words, total population, main industries, geographic boundaries*)
- How has your First Nations Community changed in the last five years? (*Prompts: socially, economically, environmentally*)
- What would indicate to you that your First Nations Community was doing well?

Threats and Opportunities

Pair #1

- What are the threats to the social, cultural and economic well-being of your First Nations Community? (*Probe – describe threats*)
- What are the opportunities for social, cultural and economic well-being of your First Nations Community? (*Probe – describe opportunities*)

Pair #2

- What are the threats to the environmental well-being of your First Nations Community? (*Probe – describe threats*)
- What are the opportunities for environmental well-being of your First Nations Community? (*Probe – describe opportunities*)

Understanding Your Landscape and Environment

- To what extent do you feel the location of your First Nations Community makes you more or less vulnerable to potential environmental/ecological changes? (*Probe – describe*)
- Climate change-effects such as natural disasters (landslides, floods and wildfires) are becoming more frequent and stronger; how do you feel climate change could affect your First Nations Community?
- To what extent are you concerned about potential environmental changes? (*Probe – at the individual and community levels*)

- What are some ways in which your First Nations Community has or could use Traditional Ecological Knowledge (TEK) in monitoring environmental and climate change?
- What are some ways in which your First Nations Community has or could use TEK in adapting to environmental and climate change?

Appendix E: Participant Informed Consent Statement

PARTICIPANT INFORMED CONSENT STATEMENT

Climate Change Adaptation Research for Forest and Rangeland Ecosystems: Resiliency Implications at the Landscape Level

You are being invited to participate in a study entitled, “Climate Change Adaptation Research For Forest and Rangeland Ecosystems: Resiliency Implications at the Landscape Level” that is being conducted by Dr. John Innes (University of British Columbia - Vancouver, British Columbia - Canada) and his multidisciplinary research team.

As part of Dr. Innes’ research team, Dr. Natasha Caverley (Turtle Island Consulting Services Inc.) will be conducting qualitative interviews on the socio-cultural dimensions of climate change resiliency and adaptation in the South Selkirks Region. Dr. Howie Harshaw (University of British Columbia) will be conducting a public opinion/social survey on climate change adaptation.

You may contact Natasha or Howie if you have further questions.

- Dr. Natasha Caverley, Vice-President, Turtle Island Consulting Services Inc.
Telephone Number: 250.656.1076 or by email at: natasha@turtleislandconsulting.ca
- Dr. Howie Harshaw, Research Associate, University of British Columbia
Telephone Number: 604.822.3970 or by email at: harshaw@interchange.ubc.ca

Dr. Caverley and Dr. Harshaw’s research is part of the broader “Climate Change Adaptation Research for Forest and Rangeland Ecosystems: Resiliency Implications at the Landscape Level” study that is being led by Dr. John Innes. You may contact John at:

- Dr. John Innes, Professor, Department of Forest Resource Management - UBC
Telephone Number: 604.822.6761 or by email at: john.innes@ubc.ca

If you have any concerns about your rights or treatment as a research subject, you may contact

- *Research Subject Information Line* in the *UBC Office of Research Services*
Telephone Number: (604) 822-8598 or if long distance e-mail to RSIL@ors.ubc.ca or toll free 1-877-822-8598

Specifically, our research will examine human resiliency and coping characteristics of community members in the South Selkirks Region to climate change-related effects. The information/findings from the qualitative interview portion of the study will assist the project team in (a) giving a voice to diverse Aboriginal community (Métis and First Nations)

perspectives and roles in the South Selkirks Region regarding the topic of climate change, resiliency and coping; and (b) supplementing a public opinion/ social survey being conducted by Dr. Howie Harshaw (University of British Columbia) in the Fall of 2010.

Participatory workshop reports, publications and final reports will be provided to the Métis Nation British Columbia (MNBC) throughout the duration of the project.

When we are presenting results from our study to the MNBC, Ktunaxa Nation Council, Ktunaxa Treaty Council and Ktunaxa Elders' Group, we are not in a position to influence decision-making and/or planning as it pertains to climate change and natural resource management within the MNBC and its Chartered Communities and the Ktunaxa Nation Member Communities nor the Ktunaxa Nation Council, Ktunaxa Treaty Council and Ktunaxa Elders' Group.

You are being asked to participate in this study because you have met the selection criteria and self-selected to volunteer to participate in a face-to-face audio-taped interview with the researcher. Consistent with qualitative research methods, purposive sampling was used to recruit participants for the interviews. For the qualitative interview portion of the study, you were selected based on a combination of factors - your age, gender, geographic location, level of local community involvement and knowledge of natural resource management and related cultural issues. The selection criteria were used to ensure that a cross-section of the MNBC and Ktunaxa population in the South Selkirks Region was asked to participate in the qualitative interview portion of the study.

If you agree to voluntarily participate in this research, your participation will include being asked a series of critical incident-styled questions and open ended questions regarding how climate change stressors that interact and impact community members' degree of resiliency in the South Selkirks Region.

You are being asked to take up to a total of three (3) hours out of your schedule to participate in the interview process. You will be interviewed twice. The first interview is a two (2) hour face-to-face audio-taped interview asking you a series of critical incident-styled questions and open ended questions regarding socio-cultural changes (if any) you have observed and attributes that you believe make the South Selkirks Region resilient in the face of future community changes. The second interview will be conducted on the telephone for 60 minutes. This second interview is for you to review the method in which the researcher has collected your responses to ensure it properly reflects your experience.

- Demographic information will be collected as a means of interpreting the data. However, unless you formally request (in writing) to be cited or referenced (in general or with a specific quote) in reports or related publications, your name, initials and other identifying characteristics will not be connected to your responses. Your identity will remain **CONFIDENTIAL**.
- No copies of the transcripts or interview notes will be given to the Métis Nation British Columbia (MNBC), the Ktunaxa Nation Council, Ktunaxa Treaty Council or the Ktunaxa Elders' Group.
- If at any point, you elect to withdraw from the study, you may do so without any consequences or any explanations. If you withdraw from the study, your data will not be used in any part of the data analysis and interpretation.

Appendix F: South Selkirks Interview Protocol – First Nations

SOUTH SELKIRKS CLIMATE CHANGE STUDY INTERVIEW PROTOCOL FOR [FIRST NATIONS] COMMUNITIES

Introduction

Purpose of the qualitative portion of the South Selkirks Climate Change Study: To determine and analyze the human resiliency and coping characteristics of [First Nations] Communities in the South Selkirks Region to climate change-related effects such as floods, landslides, reduced air quality and wildlife habitat loss for traditional food sources. This includes understanding the socio-cultural and demographic characteristics of the [First Nations] Communities that interact with one another and have full access within and between the South Selkirks Region.

You are being asked to participate in this portion of the South Selkirks Climate Change Research Study to help us gain a better understanding of how the local [First Nations] Communities in the Kootenays perceive their ability to adapt to climate change in the South Selkirks Region.

Focus:

- To examine how climate change stressors interact and impact [First Nations] Community Members' degree of resiliency in the South Selkirks Region through critical incident-styled questions and open-ended interviewing with you.
- To examine the socio-cultural changes (if any) you have observed as well as the attributes that you believe make the South Selkirks Region resilient in the face of future community changes.

Use of Information

The interview portion of the study will aid our project team in...

- Giving a voice to diverse Aboriginal community (First Nations and Métis) perspectives and roles in the South Selkirks Region regarding the topic of climate change, resiliency and coping; and
- Supplementing a public opinion/social survey being conducted by Dr. Howie Harshaw (University of British Columbia) in the Fall of 2010.

Overall, the research findings from this study are intended to inform resource policy makers, planners and program managers on strategies and key factors that can maintain or enhance resiliency attributes of individuals and/or groups in the face of adversity (e.g., adapting to

climate change). Participatory workshop reports, publications and final reports will be provided to the Elders' Group, Ktunaxa Nation Council and Ktunaxa Treaty Council throughout the duration of the project.

Confidentiality of responses. My agreement with _____ (print name) is that the raw data (e.g., copies of transcripts or interview notes) **will not** be given to the Ktunaxa Nation Council. At no time will you be identified by name, initials or other identifying characteristics in your responses in research reports or published documents.

In cases where the interviewee requests to be cited or credited for any information (either in general or with a specific quote), prior written consent must be granted by the interviewee to use his/her name or a pseudonym.

In adherence with the Ktunaxa Nation's *Code of Ethics for Research*, results of our research (not raw data) with communities will be shared with the Elders' Group, Ktunaxa Nation Council and Ktunaxa Treaty Council in the form of research reports or published documents.

Note. Though demographic information will be collected, it is a means for me to interpret the data from the interview sessions.

Request for Audio Taping of Interview

The audio tapes used in this session will be stored in my office cabinet under lock and key during the duration of the study. Data from this study will be disposed of after the completion of research reports and academic publications pertaining to this study. The destruction date of this data will be December 31, 2012.

Note. If participant agrees to be audio-taped during the interview, he/she is to sign the second signature line of the consent form which pertains to audio taping.

Rapport Building and Demographics

I am going to ask you some demographic questions.

- Age?
- Highest level of education?
- Occupation? (how long?)
- Marital status?
- Family/parental status?
- How long have you lived in this First Nations Community?
 - If less than two years, where have you lived most of your life (or adult life, if older)?
- Including yourself, what is the total number of people currently living in your household?

- Of these people, how many are family members and what is their relation to you?
- What language(s) do you usually speak at home?

Understanding Your Community

General

- Imagine you are describing your community to someone who is moving here; how do you personally define and describe your First Nations Community? (*Probe - characterizing details – descriptive words, total population, main industries, geographic boundaries*)
- How has your First Nations Community changed in the last five years? (*Prompts: socially, economically, environmentally*)
- What would indicate to you that your First Nations Community was doing well?

Pair #1

- What do you see as the most significant strengths of your First Nations Community?
- What do you see as the most significant weaknesses of your First Nations Community?

Historical

I would now like to ask you some questions about the history of your First Nations Community.

- What would you say are some of the most important events in the history of your First Nations Community?
 - Follow Up: Why or how are these particular events important?

Threats and Opportunities

Pair #1

- What are the threats to the social, cultural and economic well-being of your First Nations Community? (*Probe – describe threats*)
- What are the opportunities for social, cultural and economic well-being of your First Nations Community? (*Probe – describe opportunities*)

Pair #2

- What are the threats to the environmental well-being of your First Nations Community? (*Probe – describe threats*)
- What are the opportunities for environmental well-being of your First Nations Community? (*Probe – describe opportunities*)

Sense of Place

- Some people see themselves interconnected and interrelated to their community. Is this true of you? (*Probe – how strongly would you say that you identify with your First Nations Community – to what degree is your First Nations Community connection a reflection of who you are as an individual?*)
- What are the factors which keep you here in this First Nations Community?
- (If not retired or permanently off work) – would you move away from this First Nations Community if a job opportunity came up somewhere outside your community? (*Probe - Why?*)
- If you did move away from your First Nations Community for a job opportunity, would you still think of this community as home? (*Probe: Why or why not?*)

Social and Cultural Factors

- How has your First Nations experiences, culture and way of life been passed on to you? (*Probe – describe*)
- In your opinion, why is it important to protect and conserve First Nations cultural values in your community?
- What guidance (e.g., criteria/checklists) is currently available for identifying and recognizing First Nations cultural values? (*Probe – describe the guidance*)
- To what extent do you feel that cultural aspects of your First Nations heritage are sufficiently emphasized in Government of British Columbia natural resource management (e.g., Ministry of Forests and Range, Ministry of Environment) policies, programs and services? (*Probe – why or why not?*)

Pair #1

- What are some of the strengths of education and training in your First Nations Community (*Prompts - includes both informal and formal education*)?
- What are some of the weaknesses of education and training in your First Nations Community (*Prompts - includes both informal and formal education*)?

Pair #2

- What are some of the strengths of social services in your First Nations Community? (*Prompts – level and access to needed services*)
- What are some of the weaknesses of social services in your First Nations Community? (*Prompts – level and access to needed services*)

Pair #3

- What are some of the strengths of health services in your First Nations Community? (*Prompts – level and access to needed services*)
- What are some of the weaknesses of health services in your First Nations Community? (*Prompts – level and access to needed services*)

Understanding Your Landscape and Environment

- To what extent do you feel the location of your First Nations Community makes you more or less vulnerable to potential environmental/ecological changes? (*Probe – describe*)
- Climate change-effects such as natural disasters (landslides, floods and wildfires) are becoming more frequent and stronger, how do you feel climate change could affect your First Nations Community?
- To what extent are you concerned about potential environmental changes? (*Probe – at the individual and community levels*)
- What are some ways in which your First Nations Community has or could use Traditional Ecological Knowledge (TEK) in monitoring environmental and climate change?
- What are some ways in which your First Nations Community has or could use TEK in adapting to environmental and climate change?
- Many communities in British Columbia have experienced a recent economic shock relating to the global recession, downturn in the BC forest sector and impacts from the Mountain Pine Beetle (MPB) infestation. Has anything like that happened here?
 - Follow Up: In what way did your First Nations Community cope? Please describe.

Moving Forward: Individual and Group Decision-Making

- How are local First Nations communities involved in shaping the future of their community? (*Probes: how do community members have input into decision-making? Is their input encouraged?*)
- Are there any associations or organizations in your First Nations Community that stand out as being particularly important? (*Probe for spiritual groups, service organizations, health and wellness groups*)
 - Follow Up: Why are these associations and organizations important?
- Where do First Nations community members go to discuss local issues or organize community events?

- Do you pay much attention to local Band politics? For example, do you attend local Band Council meetings, read their minutes, or keep up to date with what the Band Council is doing?
 - If yes – do you think your involvement has had an effect on how decisions are made in your First Nations community? (*Probe: if yes, how?*)
- Over the next 5 – 10 years, how would like your First Nations Community to transform in order to adapt to climate change?
 - Follow Up: What sorts of activities/initiatives would need to happen for the community to change in this way?

I would like to further talk with you about how people in your First Nations Community work together, and the ways, if any, in which they support each other and are involved in activities like decision-making.

- To what extent do people in your First Nations Community feel a sense of support from friends, family, neighbours or other community members? (*Probe – describe some specific examples of neighbours helping others, community social events, sense of social support*).

Critical Incident-Styled Questions

I am going to ask you to describe four challenges/hardships which happened in your community in recent years.

“COMMUNITY CHALLENGE”

AB

CD

Definitions: “Community challenge/hardship” – a small, medium or large group-related incident or adversity that your First Nations Community has faced in recent years. The community challenge/hardship could be a natural disaster (e.g., flood) or human tragedy (e.g., closure of a major local industry).

- Please think of two community challenges/hardships (Community Challenge “A” and Community Challenge “B”) that had a successful outcome.
 - List a descriptor of each situation on the cue cards in front of you.
- Please think of two community challenges/hardships (Community Challenge “C” and Community Challenge “D”) that had an unsuccessful outcome.
 - List a descriptor of each situation on the cue cards in front of you.

Let’s begin with the scenarios in which there was a successful outcome.

*Successful Outcome*Community Challenge “A”

- What happened at the time of the incident?
- Who was involved?

Community Challenge “B”

- What happened at the time of the incident?
- Who was involved?

Ok. Let’s discuss the scenario in which there was an unsuccessful outcome.

*Unsuccessful Outcome*Community Challenge “C”

- What happened at the time of the incident?
- Who was involved?

Community Challenge “D”

- What happened at the time of the incident?
- Who was involved?

I am now going to have a conversation with you regarding the similarities and differences between the four scenarios. I will ask you to make comparisons in groups of three.

- In what ways are “A” and “B” similar to each other and different from “C”?

Good. This will be the interview format for this portion of the interview. From the set of four cue cards, I am going to ask you to describe similarities and differences of these scenarios in various combinations of three. I want you to tell me one or more ways in which you can put two of them together so that they are like each other and different from the third.

- Tell me something about two of the scenarios within the cue card set that make them different from a third in how community members handled the incident.

Coping

In the next section of the interview, I will be asking you to describe how you cope with challenges/hardships.

Pair #1

- What types of actions are you demonstrating when you are “coping well” with a challenge/hardship?
- What types of actions are you demonstrating when you are “not coping well” with a challenge/hardship?

Pair #2

- When others are “coping well” in the community, what do you most admire about them?
- When others are “not coping well” in the community, what do you least admire about them?

Communal Coping

- What are some characteristics about your First Nations Community that help people cope during difficult times?
 - Follow Up: What holds your First Nations Community together? For example, any important traditions?
 - Describe examples of ways the community has thrived during difficult/challenging times?

Resiliency

The final section of the interview involves discussing personal characteristics and behaviours of individuals dealing with stressful situations in the community.

Personal Characteristic: A distinguishing trait or quality.

Behaviour: An action or response to one's environment.

Definition of “resiliency”: the ability for systems to adapt to change.

Before we commence this portion of the interview, I wanted to provide you with a definition of the term “resiliency.” I would be interested in finding out what the term “resiliency” means to you in the context of your community?

On the sheet of paper in front of you, list as many words as possible which you feel describe the term “resiliency.”

I am now going to have a conversation with you regarding the similarities and differences between six people. Similar to our discussion of challenging community incidents/hardships, I will ask you to make comparisons in groups of three.

- Please think of three people that you know quite well either in your personal life or in the community who handle stress very well.
 - List the first name of each individual on the cue cards in front of you.
- Please think of three people that you know quite well either in your personal life or in the community who do not handle stress very well.
 - List the first name of each individual on the cue cards in front of you.

“PEOPLE”
ABC
DEF

Crisis

- Tell me something about two of the individuals in the cue card set that make them different from a third in the way they deal with a crisis.
- In what way are two of the individuals in the cue card set similar to each other and different from a third in terms of how they interact with people during a crisis?

Definition of “crisis”: a turning point; a community incident or hardship; a personal tragedy, emotional upheaval or a state of uncertainty in one’s life.

Change

- Tell me something about two of the individuals in the cue card set that make them different from a third in how they approach new situations.
- In what way are two of the individuals in the cue card set similar to each other and different from a third in terms of how they interact with people in new situations?

After listing constructs...

Preferences

While you have been describing similarities and differences between the various individuals outlined in the cue card set, I have written down your responses in the form of phrases. Based on the various comments you have made so far, I am now going to ask you about your personal preferences in relation to the characteristics which you have outlined in your interview responses.

[Note. Based on constructs elicited from the earlier interview responses on resiliency]

- Which do you think is a better quality of a community leader, people who are “X” or people who are “Y”?

[Repeat for all constructs listed from the interviewee’s responses]

Feedback/Debriefing

As mentioned at the beginning of the interview, the responses that you have provided will be used in understanding how [First Nations] Community Members in the South Selkirks Region adapt to changes in their community (e.g., adapting to climate change). In addition, your responses will supplement the design of a public opinion survey on climate change resiliency and adaptation which will be launched in the Fall of 2010. The interview questions were developed and structured in a way to elicit your perceptions, values and feelings on adapting to socio-

cultural changes at the personal and community levels. The resiliency definition exercise allowed you to think about resiliency characteristics for that particular section of the interview. In addition, I wanted to find out from you what your personal definition is for the term “resiliency.” Your responses have allowed me to understand your perceptions around resiliency and coping characteristics.

After our interview session, I will transcribe our interview so we can have one final discussion about your responses before the project team commences the public opinion survey portion of the study. I will contact you in the next week to ten days to arrange a telephone interview. The second interview is for you to review the method in which I collected your responses to ensure it properly reflects your experience. This interview will take up to 60 minutes (maximum).

Raw data (e.g., transcription and interview notes) will not be given to Ktunaxa Nation Council; however, in accordance with Ktunaxa Nation’s *Code of Ethics for Research*, final reports and related publications will be shared with the Ktunaxa Nation Council. At no time will you be identified by name, initials or other identifying characteristics in your responses in research reports or published documents. However, in cases where the interviewee requests to be cited or credited for any information (either in general or with a specific quote), prior written consent must be granted by the interviewee to use his/her name or a pseudonym.

The audio tapes used in this session will be stored under lock and key during the duration of the study. The tapes will be destroyed after the completion of the study.

Before we conclude today’s interview session, do you have any questions and/or comments regarding the interview or the broader South Selkirks Climate Change Study?

Thank you for participating in this portion of the study!

If you have any additional questions and/or comments, please feel free to contact me at (250) 656.1076 or by email at: natasha@turtleislanconsulting.ca

Appendix G: South Selkirks Interview Protocol – Métis Kootenays Region

SOUTH SELKIRKS CLIMATE CHANGE STUDY INTERVIEW PROTOCOL FOR MÉTIS KOOTENAYS REGION RESEARCH PARTICIPANTS

Introduction

Purpose of the qualitative portion of the South Selkirks Climate Change Study: To determine and analyze the human resiliency and coping characteristics of Métis Kootenays Region Chartered Communities in the South Selkirks Region to climate change-related effects such as floods, landslides, reduced air quality and wildlife habitat loss for traditional food sources. This includes understanding the socio-cultural and demographic characteristics of the Métis Kootenays Region Chartered Communities (Region 4) that interact with one another and have full access within and between the South Selkirks Region.

You are being asked to participate in this portion of the South Selkirks Climate Change Research Study to help us gain a better understanding of how the local Métis citizens in the Kootenays perceive their ability to adapt to climate change in the South Selkirks Region.

Focus:

- To examine how climate change stressors interact and impact Métis citizens' degree of resiliency in the South Selkirks Region through critical incident-styled questions and open-ended interviewing with you.
- To examine the socio-cultural changes (if any) you have observed as well as the attributes that you believe make the South Selkirks Region resilient in the face of future community changes.

Use of Information

The interview portion of the study will aid our project team in...

- Giving a voice to diverse Aboriginal community (Métis and First Nations) perspectives and roles in the South Selkirks Region regarding the topic of climate change, resiliency and coping; and
- Supplementing a public opinion/social survey being conducted by Dr. Howie Harshaw (University of British Columbia) in the Fall of 2010.

Overall, the research findings from this study are intended to inform resource policy makers, planners and program managers on strategies and key factors that can maintain or enhance

resiliency attributes of individuals and/or groups in the face of adversity (e.g., adapting to climate change). Participatory workshop reports, publications and final reports will be provided to the Métis Nation British Columbia (MNBC) throughout the duration of the project.

Confidentiality of responses. My agreement with _____ (print name) is that the raw data (e.g., copies of transcripts or interview notes) **will not** be given to the Métis Nation of British Columbia (MNBC). At no time will you be identified by name, initials or other identifying characteristics in your responses in research reports or published documents.

In cases where the interviewee requests to be cited or credited for any information (either in general or with a specific quote), prior written consent must be granted by the interviewee to use his/her name or a pseudonym.

In adherence with the MNBC – Ministry of Natural Resources *Research Agreement Framework*, results of our research (not raw data) with communities will be shared with MNBC in the form of research reports or published documents.

Note. Though demographic information will be collected, it is a means for me to interpret the data from the interview sessions.

Request for Audio Taping of Interview

The audio tapes used in this session will be stored in my office cabinet under lock and key during the duration of the study. Data from this study will be disposed of after the completion of research reports and academic publications pertaining to this study. The destruction date of this data will be December 31, 2012.

Note. If participant agrees to be audio-taped during the interview, he/she is to sign the second signature line of the consent form which pertains to audio taping.

Rapport Building and Demographics

I am going to ask you some demographic questions.

- Age?
- Highest level of education?
- Occupation? (how long?)
- Marital status?
- Family/parental status?
- How long have you lived in this MNBC Chartered Community?
 - If less than two years, where have you lived most of your life (or adult life, if older)?
- Including yourself, what is the total number of people currently living in your household?

- Of these people, how many are family members and what is their relation to you?
- What language(s) do you usually speak at home?

Understanding Your Community

General

- Imagine you are describing your community to someone who is moving here, how do you personally define and describe your MNBC Chartered Community? (*Probe - characterizing details – descriptive words, total population, main industries, geographic boundaries*)
- How has your MNBC Chartered Community changed in the last five years? (*Prompts: socially, economically, environmentally*)
- What would indicate to you that your MNBC Chartered Community was doing well?

Pair #1

- What do you see as the most significant strengths of your MNBC Chartered Community?
- What do you see as the most significant weaknesses of your MNBC Chartered Community?

Historical

I would now like to ask you some questions about the history of your MNBC Chartered Community.

- What would you say are some of the most important events in the history of your MNBC Chartered Community?
 - Follow Up: Why or how are these particular events important?

Threats and Opportunities

Pair #1

- What are the threats to the social, cultural and economic well-being of your MNBC Chartered Community? (*Probe – describe threats*)
- What are the opportunities for social, cultural and economic well-being of your MNBC Chartered Community? (*Probe – describe opportunities*)

Pair #2

- What are the threats to the environmental well-being of your MNBC Chartered Community? (*Probe – describe threats*)
- What are the opportunities for environmental well-being of your MNBC Chartered Community? (*Probe – describe opportunities*)

Sense of Place

- Some people see themselves interconnected and interrelated to their community. Is this true of you? (*Probe – how strongly would you say that you identify with your MNBC Chartered Community – to what degree is your MNBC Chartered Community connection a reflection of who you are as an individual?*)
- What are the factors which keep you here in this MNBC Chartered Community?
- (If not retired or permanently off work) – would you move away from this MNBC Chartered Community if a job opportunity came up somewhere outside your community? (*Probe - Why?*)
- If you did move away from your MNBC Chartered Community for a job opportunity, would you still think of this community as home? (*Probe: Why or why not?*)

Social and Cultural Factors

- How has your Métis experiences, culture and way of life been passed on to you? (*Probe – describe*)
- In your opinion, why is it important to protect and conserve Métis cultural values in your MNBC Chartered Community?
- What guidance (e.g., criteria/checklists) is currently available for identifying and recognizing Métis cultural values? (*Probe – describe the guidance*)
- To what extent do you feel that cultural aspects of your Métis heritage are sufficiently emphasized in Government of British Columbia natural resource management (e.g., Ministry of Forests and Range, Ministry of Environment) policies, programs and services? (*Probe – why or why not?*)

Pair #1

- What are some of the strengths of education and training in your MNBC Chartered Community (*Prompts - includes both informal and formal education*)?
- What are some of the weaknesses of education and training in your MNBC Chartered Community (*Prompts - includes both informal and formal education*)?

Pair #2

- What are some of the strengths of social services in your MNBC Chartered Community? (*Prompts – level and access to needed services*)
- What are some of the weaknesses of social services in your MNBC Chartered Community? (*Prompts – level and access to needed services*)

Pair #3

- What are some of the strengths of health services in your MNBC Chartered Community? (*Prompts – level and access to needed services*)
- What are some of the weaknesses of health services in your MNBC Chartered Community? (*Prompts – level and access to needed services*)

Understanding Your Landscape and Environment

- To what extent do you feel the location of your MNBC Chartered Community makes you more or less vulnerable to potential environmental/ecological changes? (*Probe – describe*)
- Climate change-effects such as natural disasters (landslides, floods and wildfires) are becoming more frequent and stronger, how do you feel climate change could affect your MNBC Chartered Community?
- To what extent are you concerned about potential environmental changes? (*Probe – at the individual and community levels*)
- What are some ways in which your MNBC Chartered Community has or could use Métis Traditional Knowledge in monitoring environmental and climate change?
- What are some ways in which your MNBC Chartered Community has or could use Métis Traditional Knowledge in adapting to environmental and climate change?
- Many communities in British Columbia have experienced a recent economic shock relating to the global recession, downturn in the BC forest sector and impacts from the Mountain Pine Beetle (MPB) infestation. Has anything like that happened here?
 - Follow Up: In what way did your MNBC Chartered Community cope? Please describe.

Moving Forward: Individual and Group Decision-Making

- How are local Métis citizens involved in shaping the future of their MNBC Chartered Community? (*Probes: how do citizens have input into decision-making? Is their input encouraged?*)
- Are there any associations or organizations in your MNBC Chartered Community that stand out as being particularly important? (*Probe for spiritual groups, service organizations, health and wellness groups*)
 - Follow Up: Why are these associations and organizations important?
- Where do MNBC citizens in your Chartered Community go to discuss local issues or organize community events?

- Do you pay much attention to local MNBC politics? For example, do you attend MNBC Chartered Community meetings, read their minutes, or keep up to date with what the Chartered Community is doing?
 - If yes – do you think your involvement has had an effect on how decisions are made in your MNBC Chartered Community? (*Probe: if yes, how?*)
- Over the next 5 – 10 years, how would like your MNBC Chartered Community to transform in order to adapt to climate change?
 - Follow Up: What sorts of activities/initiatives would need to happen for the community to change in this way?

I would like to further talk with you about how people in your MNBC Chartered Community work together, and the ways, if any, in which they support each other and are involved in activities like decision-making.

- To what extent do people in your MNBC Chartered Community feel a sense of support from friends, family, neighbours or other community members? (*Probe – describe some specific examples of neighbours helping others, community social events, sense of social support*).

Critical Incident-Styled Questions

I am going to ask you to describe four challenges/hardships which happened in your community in recent years.

“COMMUNITY CHALLENGE”

AB

CD

Definitions: “Community challenge/hardship” – a small, medium or large group-related incident or adversity that your MNBC Chartered Community has faced in recent years. The community challenge/hardship could be a natural disaster (e.g., flood) or human tragedy (e.g., closure of a major local industry).

- Please think of two community challenges/hardships (Community Challenge “A” and Community Challenge “B”) that had a successful outcome.
 - List a descriptor of each situation on the cue cards in front of you.
- Please think of two community challenges/hardships (Community Challenge “C” and Community Challenge “D”) that had an unsuccessful outcome.
 - List a descriptor of each situation on the cue cards in front of you.

Let’s begin with the scenarios in which there was a successful outcome.

*Successful Outcome*Community Challenge “A”

- What happened at the time of the incident?
- Who was involved?

Community Challenge “B”

- What happened at the time of the incident?
- Who was involved?

Ok. Let’s discuss the scenario in which there was an unsuccessful outcome.

*Unsuccessful Outcome*Community Challenge “C”

- What happened at the time of the incident?
- Who was involved?

Community Challenge “D”

- What happened at the time of the incident?
- Who was involved?

I am now going to have a conversation with you regarding the similarities and differences between the four scenarios. I will ask you to make comparisons in groups of three.

- In what ways are “A” and “B” similar to each other and different from “C”?

Good. This will be the interview format for this portion of the interview. From the set of four cue cards, I am going to ask you to describe similarities and differences of these scenarios in various combinations of three. I want you to tell me one or more ways in which you can put two of them together so that they are like each other and different from the third.

- Tell me something about two of the scenarios in the cue card set that make them different from a third in how community members handled the incident.

Coping

In the next section of the interview, I will be asking you to describe how you cope with challenges/hardships.

Pair #1

- What types of actions are you demonstrating when you are “coping well” with a challenge/hardship?
- What types of actions are you demonstrating when you are “not coping well” with a challenge/hardship?

Pair #2

- When others are “coping well” in the community, what do you most admire about them?
- When others are “not coping well” in the community, what do you least admire about them?

Communal Coping

- What are some characteristics about your MNBC Chartered Community that help people cope during difficult times?
 - Follow Up: What holds your MNBC Chartered Community together? For example, any important traditions?
 - Describe examples of ways the community has thrived during difficult/challenging times?

Resiliency

The final section of the interview involves discussing personal characteristics and behaviours of individuals dealing with stressful situations in the community.

Personal Characteristic: A distinguishing trait or quality.

Behaviour: An action or response to one's environment.

Definition of “resiliency”: the ability for systems to adapt to change.

Before we commence this portion of the interview, I wanted to provide you with a definition of the term “resiliency.” I would be interested in finding out what the term “resiliency” means to you in the context of your community?

On the sheet of paper in front of you, list as many words as possible which you feel describe the term “resiliency.”

I am now going to have a conversation with you regarding the similarities and differences between six people. Similar to our discussion of challenging community incidents/hardships, I will ask you to make comparisons in groups of three.

- Please think of three people that you know quite well either in your personal life or in the community who handle stress very well.
 - List the first name of each individual on the cue cards in front of you.
- Please think of three people that you know quite well either in your personal life or in the community who do not handle stress very well.
 - List the first name of each individual on the cue cards in front of you.

“PEOPLE”
ABC
DEF

Crisis

- Tell me something about two of the individuals in the cue card set that make them different from a third in the way they deal with a crisis.
- In what way are two of the individuals in the cue card set similar to each other and different from a third in terms of how they interact with people during a crisis?

Definition of “crisis”: a turning point; a community incident or hardship; a personal tragedy, emotional upheaval or a state of uncertainty in one’s life.

Change

- Tell me something about two of the individuals in the cue card set that make them different from a third in how they approach new situations.
- In what way are two of the individuals in the cue card set similar to each other and different from a third in terms of how they interact with people in new situations?

After listing constructs...

Preferences

While you have been describing similarities and differences between the various individuals outlined in the cue card set, I have written down your responses in the form of phrases. Based on the various comments you have made so far, I am now going to ask you about your personal preferences in relation to the characteristics which you have outlined in your interview responses.

[Note. Based on constructs elicited from the earlier interview responses on resiliency]

- Which do you think is a better quality of a community leader, people who are “X” or people who are “Y”?

[Repeat for all constructs listed from the interviewee’s responses]

Feedback/Debriefing

As mentioned at the beginning of the interview, the responses that you have provided will be used in understanding how Métis citizens in the South Selkirks Region adapt to changes in their community (e.g., adapting to climate change). In addition, your responses will supplement the design of a public opinion survey on climate change resiliency and adaptation which will be launched in the Fall of 2010. The interview questions were developed and structured in a way to elicit your perceptions, values and feelings on adapting to socio-cultural changes at the personal and community levels. The resiliency definition exercise allowed you to think about resiliency

characteristics for that particular section of the interview. In addition, I wanted to find out from you what your personal definition is for the term “resiliency.” Your responses have allowed me to understand your perceptions around resiliency and coping characteristics.

After our interview session, I will transcribe our interview so we can have one final discussion about your responses before the project team commences the public opinion survey portion of the study. I will contact you in the next week to ten days to arrange a telephone interview. The second interview is for you to review the method in which I collected your responses to ensure it properly reflects your experience. This interview will take up to 60 minutes (maximum).

Raw data (e.g., transcription and interview notes) will not be given to MNBC; however, in accordance with MNBC’s Ministry of Natural Resources *Research Agreement Framework*, final reports and related publications will be shared with the organization. At no time will you be identified by name, initials or other identifying characteristics in your responses in research reports or published documents. However, in cases where the interviewee requests to be cited or credited for any information (either in general or with a specific quote), prior written consent must be granted by the interviewee to use his/her name or a pseudonym.

The audio tapes used in this session will be stored under lock and key during the duration of the study. The tapes will be destroyed after the completion of the study.

Before we conclude today’s interview session, do you have any questions and/or comments regarding the interview or the broader South Selkirks Climate Change Study?

Thank you for participating in this portion of the study!

If you have any additional questions and/or comments, please feel free to contact me at (250) 656.1076 or by email at: natasha@turtleislanconsulting.ca

Appendix H: Protocol for Second Interview

SOUTH SELKIRKS CLIMATE CHANGE STUDY INTERVIEW PROTOCOL FOR MÉTIS KOOTENAYS REGION AND [FIRST NATION] COMMUNITY MEMBERS

RESEARCH PARTICIPANTS

SECOND INTERVIEW (ONE-ON-ONE TELEPHONE INTERVIEW) - FOLLOW UP

After our first interview session, I transcribed our interview so we could have one final discussion about your responses before we commence the public opinion/social survey portion of the study. This second interview is for you to review the method in which I collected your responses to ensure it properly reflects your experience.

(Review findings from echo-based and repertory grid questions)

- Do you have any additional comments to add to your interview responses?

Thank you for your participation!

The next phase of the study will be the design and administration of a public opinion/social survey on resiliency and adaptation to climate change. Community members from the Métis Kootenays Region Chartered Communities and [First Nations] Communities will be randomly selected to participate in this portion of the study.

Again, if you have any questions regarding the South Selkirks Climate Change Research Study, feel free to contact me at 250.656.1076 or by email at: natasha@turtleislandconsulting.ca

Appendix I: Repertory Grid Sheet for Community Interview Data Collection

Elements	Similarities	Differences
Cue Cards: <u>AB</u> -C		