FOREST VALUES SURROUNDING ANCIENT CEDAR STANDS IN BRITISH COLUMBIA'S INLAND TEMPERATE RAINFOREST

by

Jessica N. Shapiro

B.A., McGill University, 2009

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS
IN
NATURAL RESOURCES AND ENVIRONMENTAL STUDIES

UNIVERSITY OF NORTHERN BRITISH COLUMBIA

August 2012

ABSTRACT

The Inland Temperate Rainforest (ITR) of British Columbia is a globally unique ecosystem containing areas of high biodiversity, including ancient cedar stands in the upper Fraser River valley. The forest is located in a region historically focused on the economic values of timber. Increased research about and recreational use of the forest, however, has demonstrated a wider array of forest values that is yet to be fully documented. The purpose of this research is to document the breadth of forest values surrounding the ancient cedar stands to gain a better understanding of the significance of this globally unique forest. Through content analysis, as well as surveys conducted in two communities in the ITR, data were collected from trail users, the public, and local residents. Results reveal a broad set of forest values that inform the ongoing debate currently surrounding the best and highest use of the ancient cedar stands.

Keywords: globally unique ecosystem, ancient cedar stands, forest values

Table of Contents

List of Tables

List of Charts

List of Figures:

DEDICATION

For my father, to whom I owe everything.

ACKNOWLEDGEMENTS

Thank you to the head that helped me formulate my greatest ideas, to the eyes that read every last word of this thesis, to the hands that held me through joy and frustration, and to the heart that believed in me, unwaveringly, every step of the way. This would have not been possible without you.

Thank you to my mother, my brother, my sister, and my grandparents for loving me so much that I had the confidence to take on this huge project. Thank you to my supervisor for introducing me to the cedars, for bringing a clear mind to an often messy state of ideas, and for always answering the phone willing to help. Thank you to my committee members for caring about my work. Thank you to my friends, Reza, Heather, and Eric, for being by my side as I explored this northern wilderness, and for making me laugh, often uncontrollably, under the pressure of this degree.

Thank you to Hugh and Kathy, Steve and Nikky, and Nowell, for accepting me into your homes and your hearts, for accommodating me throughout my research, and for inspiring me to feel the unique presence of your forests and your communities.

Finally, thank you to the Caledonia Ramblers for their dedication and selfless effort in the creation and maintenance of the Ancient Forest Trail – a pillar of outdoor recreation in the Robson Valley that visitors continue to enjoy year after year.

Chapter 1

INTRODUCTION

1.1 Research Question

The Inland Temperate Rainforest (ITR) is a globally unique wetbelt ecosystem

located in east-central British Columbia, Canada (B.C.) (Figure 1). Unlike the coastal

temperate rainforests for which B.C. is most well-known, the ITR is located more than

500km inland, along the western slopes of the interior mountains. Few forests in the

world parallel its biodiversity value (ILMB 2008), which makes it an important habitat

for many threatened or endangered species ranging from mountain caribou to canopy

lichens and old-growth (OGF) or ancient forests (Stevenson et al. 2011). Though this

rainforest has likely been discovered several times over by First Nations peoples, early

European settlers, and loggers, it has only recently been discovered for its ecological and

recreational values, especially in the old-growth forests, making it a popular destination

for research and outdoor activity.

Figure 1. Location of Prince George and McBride in British Columbia

Specific hotspots for biodiversity exist within the moist, wet, and very wet

Interior Cedar-Hemlock (ICH) subzones of the ITR, where stands of old-growth cedar

trees are able to reach ages up to 1,000 years or more (B.C. Forest Professional Magazine

2010). A particularly rich ICH subzone is located in the upper Fraser River valley,

concentrated between the communities of Prince George and McBride (see Figure 2).

This area supports one of the largest remaining areas of ancient western redcedars in

B.C.'s Interior (B.C. Forest Professional Magazine 2010).

Figure 2. The ICH Subzone of British Columbia's inland rainforest

Source: Stevenson et al. 2011.

In 2006, community members of the upper Fraser built the Ancient Forest Trail

(AFT), a 3-km hike that runs through an old-growth cedar stand 113km west of Prince

George (see Figure 3). Since its opening, the trail has become a popular destination for

day-trippers and international tourists, experiencing a steady growth of visitors each year

(Connell and Shapiro 2012). Increased awareness of the inland rainforest in this region

2

can be attributed to the trail's popularity, as well as the publicity in the media that has

surrounded it.

Figure 3. Location of Ancient Forest Trail
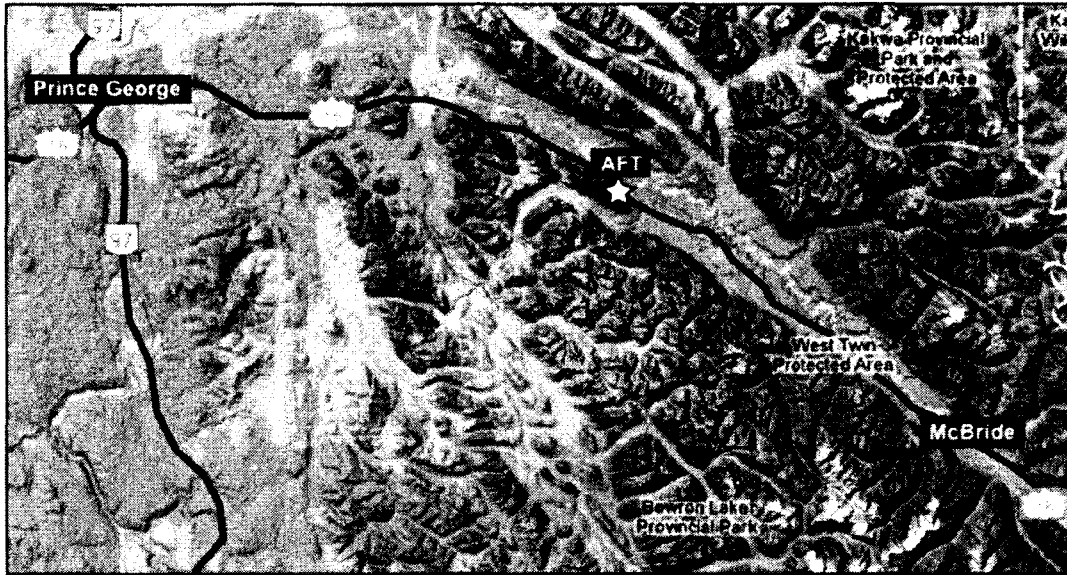
Source: Google Maps 2012.

Values concerning the stands of ancient cedar trees in the ITR have

predominantly focused on the economic worth of timber, since the region in which it is

located depends on an economy dominated by forestry (Robson et al. 2000). However,

since scientists, area residents, tourists, recreationists, and other members of the public

have come to appreciate the global significance of the ITR, it has become apparent that

there exist other types of values surrounding the ancient cedar forest that have not yet

been documented.

The study of forest values includes the documentation and analysis of values

relating to the material resources of a forest that contribute to human physical well-being,

the intangible benefits of a forest that contribute to the nonmaterial dimensions of the

quality of life, and the intrinsic benefits of a forest that exist independently of humankind

(Putney 2003). Held values will be explored in the present study as they reflect principles of what is moral, desirable, or just surrounding natural environments. Applied to forests, Bengston (1994) defines held forest values as "an enduring concept of the good related to forests and forest ecosystems" (p. 520).

The purpose of this research is to document the breadth of expressed forest values surrounding the ancient cedar stands in the ITR. General expressions of values surrounding the ancient cedars can be found in different sources. The Ancient Forest Trail guestbook and research conducted in the form of surveys at the trail represent the general values of trail users, who are either tourists or recreational day-trippers. Media pieces, including newspaper articles, government, community, and scientific reports, tourist pamphlets, and online visitor blogs, represent public value perspectives. Interviews with local residents also provide in-depth information on common value perspectives surrounding the forest.

Dome Creek and Crescent Spur are the two communities chosen for the sample of this study. The communities are located between Prince George and McBride (see Figure 4), and are situated within the ICH forest. For this reason, as well as their close proximity to the Ancient Forest Trail, it is believed that residents have intimate knowledge of the forest, as well as a vested interest in the future of the forest, making their value perspectives both meaningful and suitable for the study.

Using a content analysis procedure, whereby inferences are systematically made from databases of text, value expressions from the sources listed above are coded into different categories and organized into a forest value framework (a visual tool used to

conceptualize values) in order to provide a comprehensive look into forest values

surrounding the ancient cedar stands.

Figure 4. Map of Communities Dome Creek and Crescent Spur
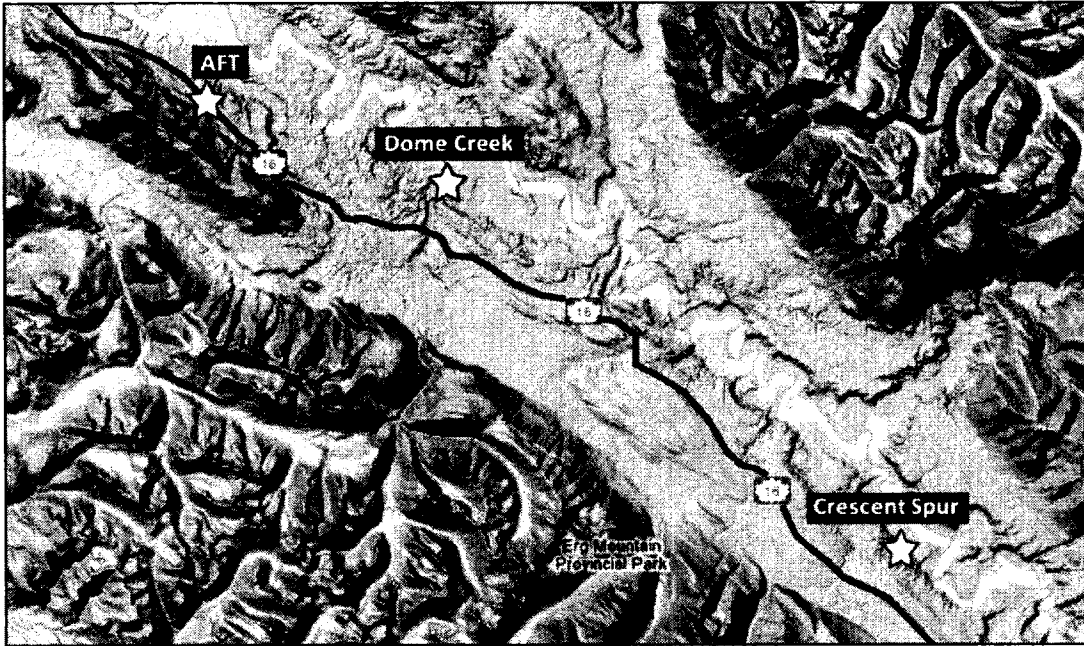
Source: Google Maps 2012.

The values people express about the ancient cedars are of interest given that the

ecosystem has recently been discovered as globally significant. Given the new

appreciation of the forest, an ongoing debate surrounding its best and highest use

revolves around the decision whether or not to harvest 'antique' cedar stands.

Since the late 1890s, forestry and timber harvesting dominated land use in the

inland rainforest (Stevenson et al. 2011). The earliest timber harvesting in this era was

generally for railway ties, homesteads, and local mills. From the early 1900s to the mid-

1960s, this forest wealth nurtured many small communities based on seasonal logging

operations, including Dome Creek and Crescent Spur. In 1999, an attempt to shift from

timber management to environmental management was made by the Province of B.C.

The shift initially reflected the emerging efforts by the government to protect biodiversity values in the ITR, and land use planning processes were revised with the aim of incorporating more non-timber values such as wildlife, tourism, and cultural values (Connell 2010). The growing appreciation for other non-timber values of the rainforest eventually conflicted with timber uses of the rainforest. In the following years, three formal complaints were submitted to the Forest Practices Board[1] regarding concerns about biological diversity and harvesting in 'antique' cedar stands. Scientific conferences were also held at the University of Northern British Columbia focusing on emerging research findings concerning the ITR, with the aim of improving sustainable management and examining social and community values.

In 2006, the Ancient Forest Trail was officially opened, and a couple months later the premiere screening of the film *Block 486* took place in Prince George. In 2008, the licensee that held the rights to the timber around the trail, TRC from McBride, announced its decision not to log the block and to become a cosponsor of the trail (Stevenson et al. 2011). In a recent newspaper article, the executive director of the B.C. Wilderness Tourism Association noted that Highway 16, along which the Ancient Forest Trail is located, is one of the province's most heavily promoted routes that tourists use each summer, and warned against compromising the scenic areas for their use (Prince George Citizen 2012).

The examination of held forest values surrounding the ancient cedar stands in the ITR will help tell the story of the forest, including the potential for conflicting values as well as the emerging discovery of broader values. The results from this study will offer

---

[1] The Forest Practices Board is an independent watchdog that conducts audits and investigations and issues public reports on how well industry and government are meeting the intent of British Columbia's forest practices legislation.

the most comprehensive collection of values relating to this forest, and help inform the current debate surrounding the ancient cedar stands.

This project is an exploratory study, and has implications for future research and policy decisions concerning the highest and best use of unique forests such as the ancient forest in the ITR. Research shows that environmental values can and do influence sectors of society (Kempton et al. 1995; Moyer, Owen, and Duinker 2008). Concerning matters of public policy, Kempton et al. (1995) find that people employ their values in deciding which environmental policies they favour. Lockwood (1999) notes that values also have the power to influence economic structure, as they are steadily changing the narrow anthropocentric view of economics into one where the natural world is not only of instrumental value to human wants and needs. Finally, values have the ability to transform human interactions with the environment by influencing individual and collective decisions (Dietz, Fitzgerald, and Shwom 2005). For this reason, forest values can be important indicators for identifying ecosystem management goals, setting the context for decision-making, and guiding choices (Xu and Bengston 1997).

1.2 Chapter Preview

Chapter 2 Literature Review provides the background and context for this research project and is divided into five sections. The first section summarizes recent evolutions of environmental and forest values, and how management practices have paralleled this evolution. A discussion of different sources of forest values, as well as categories that are used to organize values for this study will follow. The next section outlines forest value frameworks found in the literature. Following this, popular forest

values that have been found in other studies are defined and discussed. Finally, methods

for measuring forest values are examined, setting the context for the approach used in this

study. Chapter 3 outlines the study design and methods chosen to answer the research

question. Chapter 4 summarizes the results from all three databases of text by value

category. Chapter 5 uses the data collected in all three databases to interpret the findings

and discuss the significance and broader implications of the results. Chapter 6

summarizes the study, discusses limitations, and suggests areas for future research.

Chapter 2

LITERATURE REVIEW

2.1 The Evolution of Forest Values

Human values are at the core of individual and societal functioning (Bengston et al. 1994). Values are multidisciplinary, used in research across all social science disciplines (Mayton, Ball-Rokeach, and Loges 1994). Early research on values dates back more than 60 years with seminal work by Milton Rokeach (1973), who defined the concept of a value as "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode." Schwartz (1994), another pioneer in the field of values, described values as important life goals; standards which serve as guiding principles in a person's life. Both researchers view values as determinants of attitudes, recognizing their ability to guide action, judgment, and attributions (Rokeach 1973; Schwartz 1994). Values find their place at the micro/individual level, as well as the macro/societal/institutional level, and are thus important to social issues research.

The study of values relating to the environment became popular in the 1970s, when major issues such as air and water pollution, loss of aesthetic values, and resource conservation came to the forefront of America's policy agenda (Dunlap et al. 2000). Consequently, interest in measuring environmental concern relating to these problems started to grow. The field of environmental values has developed most in recent decades due to the significant evolution of environmental problems. Issues such as deforestation, loss of biodiversity, and climate change now cover wide geographical areas, with causes that are uncertain, and solutions that are often complicated and problematic (Dunlap et al.

2000). For this reason, values have been increasingly recognized as important determinants of public perspectives, and according to Bengston and Xu (1995), can play a critical role in ecosystem management and decision-making.

A growing number of social scientists and other observers have discerned a fundamental shift in environmental values in recent decades (Bengston 1994; Xu and Bengston 1997; Dietz et al. 2005; Dunlap et al. 2000; Kempton et al. 1995; Lockwood 1999; Manning et al. 1999; Owen et al. 2009). Factors cited as contributing to this change include a society less directly dependent on natural resources, a more urbanized public with increasing recreational and aesthetic values, increasing environmental degradation, and the environmental movement (Steel et al. 1994; Duinker 1998). This shift also suggests a reevaluation of the underlying worldview that has guided our relationship to the physical environment (Dunlap et al. 2000). The longstanding collections of values, attitudes, and beliefs that form the dominant social paradigm, through which many industrialized societies view the world, is now being challenged by a "new environmental paradigm" concerning humans and nature (Bengston 1994; Dunlap et al. 2000). The dominant paradigm emphasizes economic growth, control of nature, and ample reserves of natural resources. A newer environmental paradigm focuses instead on sustainable development, harmony with nature, and finite natural resources (Bengston 1994; Manning et al. 1999). At the core of this paradigm shift has been changing public values and attitudes about how people should relate to forests and the natural environment (Steel and Lovrich 1997).

A similar shift has also been documented in regards to policy and management in forestry. Since its origins in the late nineteenth century, the social needs of forest

management in the western world have been predominately utilitarian, endorsing wise

human use and development of resources, economic dominance over non-economic

values, and human control over nature (Robson et al. 2000; Tarrant and Cordell 2002).

Models used to manage forests have also concentrated heavily on the economic value of

timber (Hartmen 1976). This focus is said to have blinded some foresters and policy

makers to non-timber values, such as aesthetic and spiritual values, as well as to the

ecosystem function value of forests – the role of forest ecosystems in maintaining a

healthy and resilient setting for all life forms (Bengston 1994). The old resource

management paradigm, which guided public forest managers for many decades, focused

on "multiple-use sustained-yield" forestry (Bengston 1994). Sustained yield dates back to

18th and 19th century central European traditions of forest management, which aimed to

maximize and sustain the yield of a single resource – commercial timber (Behan 1991).

After World War II, multiple-use forestry became popular due to an increase of

demand for recreation, wildlife, water, and other non-timber forest resources (Bengston

1994). Yet forest management has fallen short of the ideal as it is known to emphasize

timber production to the detriment of other forest resources (Shands 1988). Public

dissatisfaction with traditional forestry stems from this perception, as well as from an

increased scientific understanding of the dynamics of forest ecosystems and concerns

about the impact of forestry on ecosystem sustainability (Bengston 1994). The failure of

traditional forestry practices to adjust to changing social and environmental values may

be the underlying reason for the challenges it faces.

The forestry paradigm of ecosystem management (Bengston 1994) arose from

growing public and professional concern that traditional forest management was no

longer socially acceptable due to its failure to incorporate expanding values into forest management (Robson et al. 2000). Perceived degradation of forest health, conflict over old-growth, and growing demand for non-timber forest values also contributed to this paradigm shift (Owen et al. 2009; and Cordell 2002). The main objective of ecosystem management is to maintain forest ecosystems as interconnected wholes, rather than just for the production of timber and other commodities (Franklin 1989), and to sustain the health of forest ecosystems while providing ecological, economic, social, and cultural opportunities for the long-term (Owen et al. 2009). Ecosystem management is also seen as a socially based approach to forest management due to its inclusion of public involvement in management decisions, and its focus on changing public values associated with forests (Tarrant and Cordell 2002). A central theme of this paradigm includes the need for management to recognize all forest values (timber and non-timber) and, in turn, make forestry practices more responsive to them (Bengston 1994). Socially sustainable forest management can also aim to serve outspoken, unspoken, and future citizens. According to Manning et al. (1997), many issues, such as clear-cutting, preservation of endangered species and biodiversity, wilderness designation and management, sustainability, timber salvage, and tradeoffs among competing uses, cannot be resolved without considering public values.

According to Koch and Kennedy (1991) people's forest values are communicated through three systems: (1) the economic system (in the price of wood products, outdoor recreation, or summer homes); (2) the political system (in legislation, budget allocation, and taxes and grants); and (3) the social system (in people's responses to interviews and questionnaires, the demand for various recreation opportunities, and letters to local

government). Forest managers have traditionally identified values that people attach to forests through the economic and political systems, however management has begun to pay increasing attention to the social system in order to work towards ecosystem management as discussed above (Robson et al. 2000).

Old-growth forests (OGFs) have faced their own specific shifts in values and management in the recent past. Economic and forest-management practices have emphasized harvesting OGFs for their commercial timber values before the resource is "diminished by decay" (Hilbert and Wiensczyk 2007). With changing societal values and increasing scarcity of OGFs, however, it is now common to see a wide range of OGF values including ecosystem, economic, aesthetic, spiritual, and cultural attributes (Owen et al. 2009). OGFs are recognized for providing ecosystem services such as carbon storage, water purification, wildlife habitat, and biological diversity in the form of species, genes, and ecosystems. The Association of British Columbia Professional Foresters (1993) has also outlined an array of economic values associated with OGF, including benefits from products such as timber and firewood, and the income generated through recreation, tourism, hunting, trapping, and fishing (Owen et al. 2009). Aesthetic features of OGFs and particularly large trees are often presented through painting, poetry, and writing as something especially beautiful, and sometimes have a profound effect on the human psyche (Owen et al. 2009). OGFs also hold a spiritual or moral value for some people, often embodied in feelings of respect, reverence, cultural connectedness, and sacredness (Owen et al. 2009).

Forestry conflicts are generally shaped by differences in values and in understandings of how human beings should relate to their environment (Steel and

Lovrich 1997). Conflicts often involve a series of trade-offs, i.e. economic development

or environmental protection; convenience or sacrifice; trees or jobs (Schultz 2003;

Seligman et al. 1994). Though these conflicts may be viewed from a variety of

intertwined perspectives (political, economic, or social), Seligman et al. (1994) state that

they are almost always zero-sum games, i.e., one group's interests are advanced at the

expense of another's. If forest companies are allowed to harvest extensively, old-growth

wilderness disappears; if they are restricted, there is an economic cost. Conflicts

surrounding the harvesting of OGFs in North America have been particularly contentious,

including a public incident in 2006 when Greenpeace activists blocked train and truck

shipments at Kleenex manufacturer's factory in Huntsville, Ontario, as part of an ongoing

protest over Kimberly Clark's use of OGFs in tissue products (Greenpeace 2006). This is

an example of conflict inspired by different opinions and perspectives regarding what

constitutes the highest and best use of OGFs. For this reason, foresters are increasingly

being placed in the role of conflict managers. Understanding public values equips forest

managers to deal with potential conflicts (either avoiding them or mitigating them more

effectively when they do occur), establish policies and goals, and define broad strategies

(Bengston et al. 2004; Brown and Reed 2000).

The influence values have on evaluating decisions is gaining increasing attention

as research continues to determine that personal values have powerful influences on

human behavior (Bonaiuto et al. 2002; Dietz et al. 2005; Owen et al. 2009; Rokeach

1973; Schwartz 1994). When values are activated by situational concerns, their influence

on behavior is further emphasized as values may change in importance relative to others

as one shifts from abstract considerations of values as guiding principles to the concrete

focus on the importance of values in specific situations (Karp 1996). In this way, values can reflect forest management and policy preferences (McFarlane and Boxall 2000) and therefore should be seen as worthy of the time and effort needed to collect them properly.

While all values are important to consider when making decisions surrounding a widely used natural area, the values of local people are specifically becoming recognized as important for forest management decisions. In a study by Robson et al. (2000) of Canadian, British Columbian, and Fraser Fort George Regional District groups, participants across all three groups ranked local affected communities as the people to which forest managers should be most responsive. Ignoring local people's interests and excluding them from the planning, management, and decision making of protected areas has been found to be the main source of conflict between forest companies and local people (Liu and Miao 2010).

Overall, the literature documenting the recent shifts in values concerning the ways in which people relate to forest ecosystems, as well as the ongoing threats to old-growth forests, support the need to document a wider array of forest values. This need to broaden the study of forest values has been found to be especially true for old-growth forests, which are often the subject of conflict due to their recognition as special environments. The ongoing shift in forest values is particularly relevant to the inland temperate rainforest, as it has only recently been discovered for its high ecological values. By documenting and analyzing public and local forest values surrounding the stands of ancient cedars in the ITR, a greater understanding of this special old-growth ecosystem can be gained, which has the potential to inform conflict and impact future forest management decisions.

2.2 Value Sources and Categories

There are many values associated with forests, such as aesthetic values, spiritual values, recreational values, and ecological values, and certain values are more often associated with old-growth forests than with other forest age-classes (Owen et al. 2009). Values stem from a variety of sources and can be organized into categories for easier study. This section will explore the different sources of forest values, as well as the ways in which they can be grouped and classified.

Kempton et al. (1995) found that western values associated with the environment derive from three sources: 1) religious values, whether traditional Judeo-Christian religious teaching or other feelings of spirituality, 2) anthropocentric (human-centered) values, predominately utilitarian and connected with environmental changes that affect human welfare, and 3) biocentric (living-thing-centered) values, which grant nature itself intrinsic rights of species to continue to exist. These sources of environmental values can be useful in focusing on the factors that influence how we come to value forests, rather than just on the values themselves. Understanding the sources that give rise to forest values can be used to analyze the significance of the range of forest values associated with the ITR.

In forest value literature, two types of values are generally presented: held values, which include desirable modes of conduct (e.g., stewardship), end-states (e.g., habitat), or qualities (e.g., beauty) (Rokeach 1973); and assigned values, which define the relative worth an object thus describing a preference relationship (Brown 1984; Moyer et al. 2008; Rokeach 1968). Prices and other monetary measures are indicators of assigned value, while held values do not appear to be bound relative to other values (Owen et al.

2009). These two value types are interrelated in that assigned values usually reflect a person's held values. Due to their encompassing nature, the present study explores held values surrounding the ancient cedar stands.

Bengston (1994) defines held forest values as "enduring conceptions of the good related to forests and forest ecosystems" (p. 520). Held forest values have been distinguished in the literature as either instrumental and intrinsic (Bengston 1994), instrumental and noninstrumental (Xu and Bengston 1997), or anthropocentric and biocentric (Steel et al. 1994). Instrumental and anthropocentric refer to those values associated with the utilization of forests for products and services that satisfy human wants and needs (McFarlane and Boxall 2000). Intrinsic, noninstrumental, or biocentric values refer to the worth of something as an end in itself, regardless of its usefulness to humans (Brennan 1992; Craig et al. 1993; Steel et al. 1994).

Kempton et al.'s (1995) sources of values reflect the evolution from sustained timber production to sustaining a range of forest values. If human-centered values dominate natural resource management, then forests can be defined in terms of the resources they provide for humans, such as forest products, employment, and life-support functions. Intrinsic values, by contrast, recognize nature as having inherent worth or a right to exist for its own sake, and human benefits from the forest are not necessarily the most important uses of the forest (Nash 1967). The value sources discussed above also form the foundation for many forest value frameworks, which are created and used by researchers to organize forest values in a way that makes them easier to study.

2.3 Forest Values

Below are descriptions of held forest values, specifically those most commonly connected to old-growth forests. Instrumental values include tangible materials values that support the economy, such as forest products, minerals, and other natural resources that can be extracted from nature and sold in the market, and landscape values such as recreation and tourism. Tourism opportunities include outfitting and guiding (Brown and Reed 2000; Manning et al. 1999; Moyer et al. 2008), and recreation provides people with an opportunity to get away from their routine, and re-create a less stressful, more natural state of mind and perspective (Tims 1999). According to Putney (2003), recreational value is found "when the intrinsic qualities of natural areas interact with humans to restore, refresh, or create anew through stimulation and exercise of the mind, body, and soul (i.e. re-creation)" (p. 7). For some people, nature can be a place to show what they can do (they want a mountain to conquer), and for others, values are reached as they are "let in on nature's show" (they watch as hummingbirds) (Rolston 1994). These two sorts of uses are referred to by Rolston (1994) as the gymnasium and the theatre, and can often be combined.

Life-support values are material values that provide the necessary functions and services for the survival and well-being of humans and other living things (Moyer et al. 2008). Life-support values include the production, preservation, cleaning, and renewal of air, soil, and water (Brown and Reed 2000; Moyer et al. 2008; Rolston 1994). Also included in this category is biodiversity, which describes the number, variety, and uniqueness of living organisms, including genetic species, and ecological diversity

18

(Moyer et al. 2008; Rolston 1994). Habitat for wildlife is another life-support value that is described as the place where a population of flora, fauna, or micro-organisms live.

Intrinsic values include socio-cultural values; those which contribute to the identity and well-being of the social collective and the participation of individuals in that collective (Moyer et al. 2008). Cultural ties to natural places are important sources of values, especially in forests where people feel they can continue to pass down the wisdom, knowledge, and traditions linked with that area (Brown and Reed 2000; Moyer et al. 2008; Rolston 1994). Putney (2003) defines this value as, "The qualities, both positive and negative, ascribed to natural, cultural, and mixed sites by different social groups, traditions, beliefs, or value systems that fulfill humankind's need to understand, and connect in meaningful ways, to the environment of its origin and the rest of nature" (p. 7). This has also been described in the literature as historic value, where people value the forest because it has places and things of natural and human history (Brown and Reed 2000) or identity value, where natural sites link people to their landscape through myth, legend, and history (Putney 2003).

Educational value is another socio-cultural value that is characterized by the opportunity to learn more about nature (Manning et al. 1999). This value is particularly linked with childhood experiences. Burgess et al. (1988) find that, "The importance of early contact with nature and with the physical environment emerges as a very powerful theme in all the group discussions.... Naturalistic areas gain appeal essentially through a richness of imaginative opportunities for children" (p. 323). Rachel Carson (1962) also recognized the importance of the childhood years for developing respect and love for nature. Learning about specific natural areas can be accomplished through the use of

interpretive signs, such as those located at the Ancient Forest Trail. Through environmental education it is possible to build an understanding of humankind's relationship with its natural surroundings, which could eventually shape a positive environmental ethic to guide behavior (Roggenbuck and Driver 1999). Scientific, or learning value (the opportunity for scientists to study nature and ecology through scientific observation and experimentation) is another material value that helps humans understand, and thrive in the natural world (Brown and Reed 2000; Manning et al. 1999; Rolston 1994).

Some values come in the form of concern for nature separate from human well-being. Manning et al. (1999) and Moyer et al. (2008) use the term "moral" or "ethical value" to express the opportunity to exercise a moral and ethical obligation to respect and protect nature and other living things. This is also described as intrinsic value, which is the identification with something through the rational or emotional designation of inherent worth (Brown and Reed 2000; Moyer et al. 2008; Rolston 1994). Rolston (1994) also outlines an intrinsic value termed "life value" that represents the life that all living things share – a sort of kinship that is a center of value for itself. Finally, Putney (2003) describes a similar value called "existence value", which is the "satisfaction, symbolic importance, and even willingness to pay, derived from knowing that outstanding natural and cultural landscapes have been protected and exist as physical and conceptual space where all forms of life and culture are valued and held sacred" (p. 8).

Intergenerational equity, or future value, is also a popular value found in old-growth forest value literature. According to Kempton et al. (1995), it is essentially the idea of intergenerational ethics: an obligation between our generation and future ones (p.

101). Kempton et al. (1995) found that "[t]he emotionally strongest of anthropocentric values was a concern for one's descendants" (p. 95), and results from their study showed that 17/20 informants raised concern for children (mostly their own) when considering environmental longevity. Future value is also described as "allowing future generations to know and experience the forest as it is now" in Brown and Reed's (2000) study on forest values (p. 243).

Spirituality and religion are considered values that are more difficult to define, yet many published studies use spirituality as a value category in their research (e.g., Brown and Reed 2000; Driver et al. 1999; Manning et al. 1999; Putney 2003;Rolston 1994; Xu and Bengston 1997). Putney (2003) describes this category as the qualities of natural areas that inspire humans to relate with reverence to the sacredness of nature. Kempton et al. (1995) found that most participants in their study reported experiencing a spiritual feeling directly from contact with nature. According to Driver et al. (1999), nature-based spiritual experiences include: introspection and reflection on deep personal values; the elements of human devotion, reverence, respect, wonder, awe, mystery or lack of total understanding; inspiration; interaction with and relationship to something other and greater than oneself; sense of humility; and sense of timelessness, integration, continuity, connectedness, and community.

Another such benefit of natural settings is their beauty or aesthetic quality. Aesthetics is considered to be an anthropocentric value by Kempton et al. (1995), and can be viewed as either utilitarian (instrumental), where the good of something is equated to how useful it is to humans, or noninstrumental, where the worth of something is an end in itself (Xu and Bengston, 1997). When one enjoys forest scenery, sights, sounds, and

smells, it can provide them with a source of inspiration, peace, harmony, and/or security, making aesthetic value utilitarian. On the other hand, some authors believe that the value is not in the benefits that people receive from them, but in the naturally occurring qualities of forests themselves (Driver et al. 1999). Aesthetic value has historically had and continues to have profound impacts on pubic land policy and management: "One of the main reasons that we have set aside certain natural areas as national, state, and county parks is because they are considered beautiful" (Callicott 1992, as cited in Xu and Bengston 1997, p. 46). It is used frequently as a measure for environmental value research (e.g. Brown and Reed 2000; Manning et al. 1999; Moyer et al. 2008; Putney 2003; Rolston 1994), and is an important value to consider when deciding between clear-cuts (ugly) and old-growth forests (beautiful).

Forest values, though sometimes ethereal and intangible, exist as part of the human dimension of ecosystem management. Planning for values of nature requires sound information about a broader spectrum of benefits than public land managers have concerned themselves with in the past (Elsner et al. 1999). In order to document these values, it is necessary to understand that experience, imagination, and feelings are part of what connect people to special natural places. Documenting this array of forest values is not easy, however, it is necessary in order to gain a full understanding of the significance of natural environments.

2.4 Forest Values Frameworks

Rokeach believed that there are significant theoretical and practical advantages to identifying a limited set of value types that are recognized in various human groups in

order to gain information on values (Schwartz 1994). Many environmental value studies have recognized the benefits of this approach to managing knowledge, and have developed different value categories, or types, in order to test their research questions (e.g. Brown and Reed 2000; Moyer et al. 2008; Rolston 1994; Xu and Bengston 1997). Categories of forest values can range from as few as two (e.g. instrumental and non-instrumental, or material and non-material) to dozens, depending on how broadly or narrowly the categories are defined, and can be organized into frameworks, which are useful visual tools for studying values. Categories can be deduced from the literature or developed from existing data on the topic being studied (Mayring 2000).

Many studies have identified values and value categories associated with forests. Typically, frameworks usually start with a division of two held value categories, e.g., instrumental and non-instrumental, material and nonmaterial, or anthropocentric and biocentric. Values frequently associated with human-oriented use and sustenance categories (instrumental, material, and anthropocentric) include economic, ecological, and recreational values. Values typically associated with non-use categories (non-instrumental, nonmaterial, and biocentric) include aesthetic, cultural, spiritual, educational, and ethical values (Bengston & Xu 1995; Brown and Reed 2000; Manning et al. 1999; Rolston and Coufal 1991).

Bengston and Xu (1995) have created a simple value framework that has been used (e.g. Brown and Reed 2000; Moyer et al. 2008) for studying forest values (see Figure 5). The framework distinguishes four end-values describing how people value forests and forests ecosystems: economic/utilitarian, life-support, aesthetic, and moral/spiritual value. The first two end values are instrumental values, in which the good

is equated with what is useful as a means to some desirable human end, and the last two

are considered non-instrumental values, where the worth of something as an end in itself,

rather than a means to some end.

Figure 5. Forest Value Framework

Forest Values

Instrumental **Non-Instrumental**

Economic/ Utilitarian **Life Support** **Aesthetic** **Moral/ Spiritual**
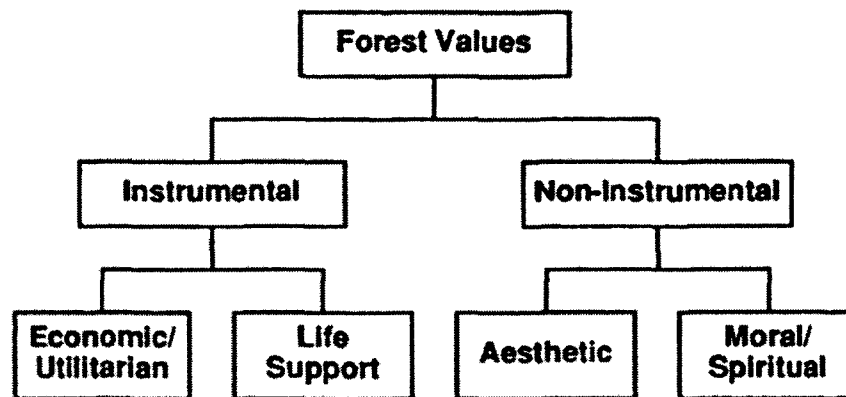
Source: Bengston and Xu 1995.

Bengston and Xu (1995) use this value framework for statistical content analysis

because they find it to be mutually exclusive—a condition where each forest values can

be viewed as conceptually distinct. This framework does not include a number of

important and obvious forest values such as recreation, biodiversity, and scientific values

because Bengston and Xu (1995) believe it is important to separate *values* and *objects of*

value (Brown and Reed 2000). This distinction between what they term a "root" forest

value, such as life-support, and an object of value, such as biological diversity, however,

is not common in other forest value frameworks. The reason for this may lie in the fact

that, though mutually exclusive, this framework may suffer from too few end-values

given the human predisposition to blur the distinction between values and objects of

values in forestlands (Brown and Reed 2000).

A forest value framework that draws upon the Bengston and Xu typology has been created by Moyer et al. (2008) to reflect the breadth of material and nonmaterial values found in old-growth stands. Moyer et al. (2008) used results from Moyer (2006) and Owen (2006) to develop a forest value framework reflective of old-growth, which provides three levels of values and a broad set of distinct nonmaterial values associated with old-growth (see Figure 6). The framework starts with the same primary categories that Bengston and Xu (1995) use, however they are renamed as 'material' (tangible good or service) and 'nonmaterial' (an understanding, concept, experience, or belief that is valuable to the mind or soul), as Moyer et al. believe these terms better represent the values of their participants. For example, environmental services such as carbon storage and water purification, were not valued solely for their utility in achieving human ends, but instead were valued for the necessary functions they provide for both humans and other living beings (Moyer et al. 2008).

The framework includes three levels of OGF values: main value types (material and non-material), value subcategories (e.g. economic, ethical, etc.), and a list of end-values described by objects, processes, and characteristics that explain each subcategory. A table of definitions also accompanies the framework for each of the three levels of OGF values (see Table 1). As generic forest value frameworks may not be specific enough to deal with differences between forest types, Moyer et al.'s (2008) framework benefits from a wider range of forest values, and a comprehensive set of held values relating specifically to old-growth forests. As well, following Bengston and Xu (1995), they have built their framework to allow uses and characteristics to fit into more than one category.

Figure 6. Old-Growth Forest Value Framework
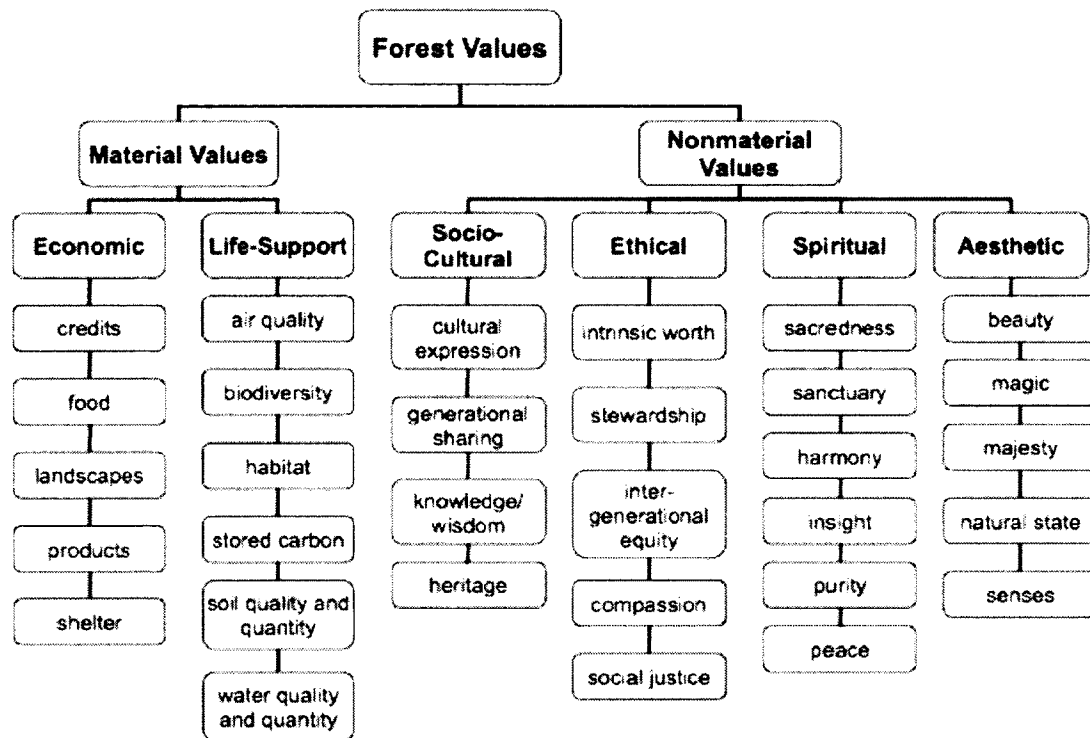
Source: Moyer et al. 2008.

Other less structured frameworks have also been used in the literature to accommodate values for different types of forests at different sizes and locations. Rolston and Coufal (1991) developed a forest framework that was meant to expand the five conventional uses (recreation, timber, range, watershed, and fish and wildlife, as per 1960 Multiple Use-Sustained Yield Act) governing national forest management into categories that would integrate human and biotic values. The framework features the values outlined by Bengston and Xu (1995), however the values are not organized in a dichotomy, but instead are presented as a typology. Rolston and Coufal's (1991) typology consists of ten

Table 1. Forest Value Framework Definitions

Main Value Type	Value Sub-Category	End Value	
		Name	**Definition**
Material: values that are instrumental to physical and bodily needs	**Economic:** tangible material values that support a cash-based or subsistence-based economy	Credits	credits issued for ecosystem services; (processes bartering, trade); (objects supplies, money, securities)
		Food	material that is consumed to capture energy and sustain health, (processes hunting, fishing, gathering), (objects wild edibles, deer, moose, salmon)
		Landscapes	the structure and features of a specific area of land including physical, biological and built elements; (processes recreation, tourism); (objects trails, physical and natural amenities)
		Products	something that is made from raw materials, (processes logging, value-added); (objects timber, medicine, furniture, firewood, paper)
		Shelter	covering that provides protection, particularly from the elements; (processes construction, thatching); (objects timber and canopy cover)
	Life-Support: values that provide necessary functions and services for the survival and well-being of humans and other living beings	Air quality	status of the atmosphere with regard to the existence of potential pollutants, (processes air purifying, absorption of air pollution)
		Biodiversity	number, variety, and uniqueness of living organisms, including genetic, species, and ecological diversity; (processes biological processes, biological systems)
		Habitat	place where a population of flora, fauna or micro-organisms lives, (processes habitat protection, habitat loss)
		Stored carbon	the long-term storage of carbon in the forest (trees or soil) or oceans so that the build-up of carbon dioxide will reduce or slow (processes carbon sequestration, carbon fixation)
		Soil quality and quantity	capacity of soil to function within an ecosystem to provide for flora and to maintain and improve water and air quality; (processes nutrient cycling, retaining moisture)
		Water quality and quantity	the condition of water with respect to the amount of impurities in it and the amount of it, (processes water purification, surface run-off, water cycle)
Non-material: values that are instrumental to the needs of the mind and soul	**Social/ Cultural:** values contributing to the identity and well-being of the social collective and the participation of individuals in that collective	Cultural expression	the manifestation of beliefs, norms, language, and material traits of a particular social group (processes making a canoe, collecting medicinal plants)
		Generational sharing	people from different generations learning from each other
		Knowledge/ wisdom	the fact or condition of having information, or of being learned; insight and judgement; (processes education, research) (object benchmark, reference point)
		Heritage	something immaterial, like an ideology, that is passed from one generation to another
	Ethical: values supporting a personal or collective moral claim, include a sense of responsibility to other people, nations, generations, and species	Intrinsic worth	designation of inherent worth and moral relevance through rational or emotional identification with something that is other [22]
		Stewardship	evoking a sense of trust and care through the conscientious and responsible management of something
		Inter- generational equity	concern for the rights and needs of future generations
		Compassion	sympathy for the suffering of other beings and a desire to relieve or prevent that suffering
		Social justice	concern for the well-being and fair treatment of people and groups of people
	Spiritual Values: values associated with " the experience of being related to or in touch with an 'other' that transcends one's individual sense of self and gives meaning to one's life at a deeper than intellectual level"[53 p. 25]	Sacredness	experience of, or connection to, that which is holy or divine
		Sanctuary	a place of refuge and solitude
		Harmony	the combination of elements that form agreement of feeling
		Insight	the act or fact of apprehending the inner nature of things or of seeing intuitively
		Purity	freedom from that which contaminates, defiles or corrupts
		Peace	a mental or spiritual state marked by calmness of heart and mind; spiritual serenity
	Aesthetic: values based on a sensory appreciation of the physical qualities and features of the forest	Beauty	pleasurable qualities associated with artistry, form, colour, and originality
		Magic	something that creates an effect of otherworldliness
		Majesty	large and impressive in size, scope, and/or extent
		Natural state	existing in or produced by nature, not artificial or an imitation, an undisturbed area
		Senses	physical sensations such as smell, taste, temperature, vision, and hearing

Source: Moyer et al. 2008.

27

values: life-support, economic, scientific, recreation, aesthetic, wildlife, biotic diversity, natural history, spiritual, and intrinsic (moral). Brown and Reed (2000) have since expanded and clarified this typology for their own use to include additional forest values, for example, cultural and therapeutic value, as suggested by Rolston (1989), and future and subsistence value. The benefit of these value frameworks is their ability to adapt to different studies, however, a less structured and unspecific typology may be less helpful in future studies.

As the literature shows, it is common for researchers to develop or use existing value frameworks to organize different held values under study. This study looks at forest values surrounding an old-growth forest in the ITR, and therefore shares many similar value expressions with Moyer et al.'s (2008) study. The detail and specificity that is provided with Moyer et al.'s framework makes it appealing to use, specifically for prioritizing and discussing multi-constituency values, and identifying categories for future surveys. The Moyer et al. (2008) old-growth forest value framework provides a well-suited structure for studying ancient cedar stand values at a public and local level in the ITR.

2.5 Measuring Values

Forest value research has employed various methods to identify values people express towards natural environments. Contributions to the literature have come from a wide range of disciplines, including natural, economic, social, philosophical, and psychological sciences.

Economists' use of a contingent valuation (CV) method has been a prevalent tool used to measure environmental values. This approach attempts to quantify assigned values for identification and preference purposes. The CV method elicits an individual's preference by asking them how much they would be 'willing to pay' to improve the status of a particular environmental state or good (Kalof and Satterfield 2005). In turn, this quantification of assigned values can be compared to other quantitative information in areas of the economy and the environment for incorporation into decision-making (Gregory 1999). Strengths of economic valuation include its ability to considerably broaden the range of goods and services that can be valued, as well as making it easier to include assigned value information (dollars and/or numbers) into standard decision making processes such as benefit cost-analysis or multi-criteria ranking (Owen et al. 2009).

A key weakness related to economic measurements of values is the difficulty of capturing people's full range of values, including held and intrinsic values. Some authors caution that in the application of cost-benefit analyses there is an inevitable bias in the sorts of values that figure into the calculations (i.e., a bias toward those considerations that are readily quantifiable) (Nash 1967). Moyer et al. (2008) believe that many common techniques for studying values that rely on economic theory have proved inadequate for encompassing the complexity of values, as well as the array of values surrounding forest ecosystems. Dissatisfaction with the economic definitions of value, as well as a strong tradition in the study of attitudes and beliefs in sociology and psychology, has fueled alternative non-monetary studies of value (Kalof and Satterfield 2005).

Non-economic methods have become increasingly influential in measuring widening forest values (Kennedy 1985). Methods such as content analysis, surveys, focus groups, interviews, and mixed method approaches have been employed to study non-monetary concepts of values. Findings show that different techniques can influence the articulation of intensity with which some values are held. Some methods allow human experience to be examined quite thoroughly, while others allow for large populations to be studied and for general trends to be discerned.

In several studies, values are assessed by asking respondents to rank or rate values in terms of their importance to the individual as guiding principles in their lives (Seligman et al. 1994). According to theorists such as Rokeach (1973), the ranking of values relative to each other forms a fairly stable value system that is used by individuals to determine attitudes and behavior. When an issue is raised for an individual, the relevant values are activated in the individual's stable value system, and the attitude is determined by the relative raking of the values.

Researchers have practiced various methods in order to measure forest values including surveys, interviews, content analysis, focus groups, and mixed method approaches. Examples of how researchers have employed some of these methods are discussed below.

2.5.1 Surveys

Surveys have the potential to capture useful information on value perspectives (Babbie 2011). In a study done by Brown and Reed (2000), a mail survey was administered to Alaskan residents to study the relationship between measured forest

values and potential forest uses and forest policy preferences. Their sampling method

consisted of randomly selecting individuals from households in 12 communities in close

proximity to the Chugach National Forest (CNF), "under the assumption that households

in these communities would have the greatest interest in forest planning issues" (Brown

and Reed 2000, p. 242). One section of this survey requested participants to allocate a

hypothetical $100 among 13 possible forest values. The list of forest values included in

the questionnaire was based on Rolston and Coufal's (1991) forest value typology,

however the authors chose to alter the list in order to expand and clarify the typology.

The study measured frequency and mean scores using the hypothetical dollar amount

data, and found that the four most frequently acknowledged forest values for the CNF

were aesthetic, recreation, life sustaining, and biological diversity.

The use of a survey instrument was also employed by Parkins et al. (2004) for

collecting indicators of well-being in the forest-based communities of McBride and

Valemount in the Robson Valley. The construction of the survey was based on themes

developed through workshops and interviews. The aim of the survey was to further

develop community-based indicators of well-being from a wider audience. In this way,

social science survey research methods can be used to understand, document, and

systematically measure people's non-market social values.

2.5.2 Content Analysis

Content analysis is a widely employed technique used in order to study

environmental values (Xu and Bengston 1997). It has been employed by social scientists

for many purposes, such as examining research questions (e.g. Stankey's (1972) study on

biocentric values in wilderness ecosystems), analyzing time trends (e.g. Schoenfeld, Broom, and Bavec's (1980) work on the changing environmental message of the forest industry), and uncovering categories and themes in units of analysis for later use. Some studies use manually coded content analysis while others use computer-coded procedures, such as research conducted by Xu and Bengston (1997). The purpose of the latter study was to empirically analyze published records to document the evolution of national forest values from 1982-1993. A computerized content analysis procedure was used to systematically identify and specify certain characteristics within the chosen databases of text.

An important aspect of Xu and Bengston's (1997) study is its premise — "language used in social discourse is not mere words, but is an expression of values" (p. 2). Many authors also believe that language is an important indicator of values and ideology. As Lakoff and Johnson (1980) have observed, "[i]t is reasonable enough to assume that words alone don't change reality... but changes in our conceptual system do change what is real for us and affect how we perceive the world and act upon those perceptions" (p. 145-146). Kempton et al. (1995) suggest that the increase in American environmental consciousness may be observed in changes in language:

> The same patch of land once referred to as a swamp is now more likely to be called wetlands, and the area once called jungle is now called a rainforest. The process of shifting word choice reflects a change from considering these areas as threatening or disgusting to considering them to be essential components of the ecosystem and precious environmental resources (Ross 1993, as cited in Kempton et al. 1999, p. 6).

Changes in our language, therefore, reflect changes in our systems of beliefs and values, which are found to have a powerful influence on the way we think and behave (Xu and

Bengston 1995). In addition, Xu and Bengston's (1997) study used newspaper articles as a proxy for the expression of public forest values. Kellert (1985), in his landmark study of wildlife values and attitudes, argued that newspaper articles "can be relatively good indicators of generally held views and interests" (p. 20). News media text is not a direct measure of public forest values, as the media can shape the opinions and attitudes of the public, however, the media does still reflect the views of the public, and can thus serve as a rough representation of public values.

In order to capture public forest values, this study uses content analysis on a combination of print and online articles to gather expressions surrounding the ancient cedar stands in the ITR. Examples of print sources include local and international newspapers, government and community reports, as well as the Ancient Forest Trail guestbook and survey responses collected at the trail. Online sources include visitor blogs, research reports, and community websites. The language used in these media is assumed to reflect generally held forest values based on the literature outlined above. Through manual coding, these expressions will be discerned and organized into value categories according to Moyer et al.'s (2008) old-growth forest value framework.

2.5.3 Interviews

Interviews are a useful tool for recording value expressions since they allow researchers to ask open-ended questions during face-to-face encounters. Methods such as surveys and content analysis can provide a plethora of information regarding environmental values. The challenge, however, is to explore more deeply what a questionnaire answer or media statement means. Questions used in interviews can

encourage paragraph-length answers rather than word- or sentence-length answers, and allow informants leeway to elaborate or even bring up new topics they consider relevant.

When conducting research to explore American environmental values, Kempton et al. (1995) used semi-structured interviews to yield insights into people's environmental beliefs and values not otherwise accessible through survey methods. The sample for Kempton et al.'s study included forty-six informants that the authors felt bracketed the range of variation in environmental views across the society (Kempton et al. 1995). Interviewees were referred to as informants rather than respondents due to their active role in the interview process, and because it is assumed that they know more about the subject under discussion than the interviewer. Another strength of the interview method lies in the use of probing questions, which researchers use to pursue topics raised by participants and paraphrase what participants say in order to verify or correct their interpretations. Though the textual analysis of such interviews can prove to be very time and resource consuming, interviews are appropriate for studies that aim to provide rich and in-depth descriptions of human experiences, attitudes, and beliefs.

2.5.4 Limitations

It is repeatedly cautioned in environmental and forest value literature that the methods used to obtain value information from the public are inherently limited. "There is resounding support for the claim that many of our most important values are nearly impossible to express directly – as definitive statements of belief, as claims or goals, and so on" (Satterfield and Slovic 2004, p. 281). Dietz et al. (2005) warn that "survey-based methods may be subject to measurement error because of the discrepancy between how

people respond to surveys and how they actually behave" (p. 344). Lockwood (1999) also notes that many elicitation instruments fail to "give participants any opportunity to explore different ways of expressing their values and [in the absence of alternatives] participants must offer a response that is against their preferred mode of value expression" (p. 394).

The difficulties faced when identifying and measuring social values (e.g. ecological and spiritual values) make it hard to determine how values are distributed across society, how they change in relative importance over time, how to measure their relative worth in relation to economic values, and how they are affected by policy changes and whether such changes are socially beneficial. As a result, many of these values have been unaccounted for in forest management, though they are the very values that have become increasingly important in society (Stankey and Clark 1991).

Some authors offer advice on these techniques. For example, Satterfield and Slovic (2004) suggest, "[i]n short, participants need a user friendly context in which relevant value information is rendered salient, enabling participants to be able to think about their values and thereafter provide the policy researcher with a good quality (i.e. informed and thoughtful) response" (p. 11). In open-ended surveys it is also important to address issues of interviewer interpretation and bias.

In this study, interviews are conducted in two communities situated in the inland rainforest. Information describing the interviews is posted in communal spaces within the community, such as the post office or community center, a month before the research starts. This gives participants a chance to begin thinking about their values surrounding the ancient cedar stands. Interviews generally take close to an hour, allowing participants

the necessary time to fully explore and communicate their relationship to the forest. Interviews take place in the respondent's home, allowing them to be in a comfortable space, as well as in, or very close to, the environment that is being studied. Participants are provided with a list of commonly held old-growth forest values from the literature in order to start the discussion. They are asked to make selections and rank values in order to fully explore their value choices, and encourage informed and thoughtful responses. Finally, by providing participants with definitions of these values, as per the literature, interviewer interpretation and bias is mitigated.

Chapter 3

METHODS

This study examined the breadth of expressed forest values surrounding the

ancient cedar stands in the Inland Temperate Rainforest by performing content analysis

on the Ancient Forest Trail guestbook, surveys, and media pieces, as well as interviewing

residents living in the interior cedar-hemlock forest. The content analysis aimed to

uncover general held forest values expressed by trail users as well as the public. The

purpose of the interviews was to document specific held forest values expressed by area

residents who have intimate knowledge of the ancient cedar stands, as well as a vested

interest in the future of the forest.

3.1 Overall Approach

To capture the breadth of value perspectives surrounding the ancient cedar stands,

information was collected using Moyer et al.'s (2008) old-growth forest values

framework, as it is a comprehensive and organized account of values expressed

surrounding old-growth forests such as the ancient cedar forest. The framework was used

to organize value expressions from three databases of text relating to the ancient cedar

stands. The Ancient Forest Trail guestbook and surveys conducted at the trail form the

first database of text. Media pieces online and in print relating to the ancient cedars make

up the second database. Moyer et al.'s (2008) framework was used in the interview

guides to elicit value expressions, and the third database of text contains resident

responses gathered from household interviews conducted in the communities of Dome

Creek and Crescent Spur. Data collection methods associated with the three databases of text are discussed in this section, as well as the methods of data analysis used for each.

3.2 Ancient Forest Trail Guestbook & Survey Database

3.2.1 Data Collection

The Ancient Forest Trail (AFT) is a three kilometre interpretive hike that runs through an old-growth cedar stand located 113km east of Prince George. The trail provided the location for gathering data on values expressed by trail users, including tourists and recreational day-trippers. Since its opening in 2006, the trail has become a popular destination for these groups, experiencing approximately 9,500 visitors in the 2011 summer hiking season (Connell and Shapiro 2012). For this reason, it was a convenient and appropriate location for gathering value perspectives. Values were expressed here through comments written in the guestbook at the trailhead, as well as through sentiments expressed in surveys conducted with trail users by University of Northern British Columbia (UNBC) researchers. Material was gathered from every guestbook that has been available at the trailhead between May 2008 to October 2010, and all surveys that have been conducted by UNBC researchers between 2007 and 2010.

The guestbook is located at the head of the Ancient Forest Trail. Volunteers installed the first guestbook in 2008, two years after the trail was opened. Its purpose is to give people a place to record their thoughts and feelings regarding the trail and the forest. Trail users are encouraged to include the date of their entry, their place of origin, and as many comments as they wish. Trail users are typically either recreational day-trippers or tourists, coming from as many as 11 Canadian provinces/territories, 25 U.S. States, and

20 different countries (see Table 2). The 2008-2010 guestbook is an unstructured forum
that yields insights into the values people hold concerning the ancient cedars. Since 2007,
UNBC researchers have also completed surveys on trail users to gain insight into trail
traffic, origin of hikers, and public knowledge of the inland rainforest. These surveys
have often included one open-ended question pertaining to how trail users viewed their
hike. This question has captured value perspectives concerning the trail and the forest.
Survey responses from 2007-2010 were included in this database.

Table 2. Guestbook Trail User Origins

Canadian Provinces	U.S. States	Countries
Alberta	Alaska	Australia
British Columbia	Arizona	Austria
Manitoba	California	Belgium
New Brunswick	Colorado	Brazil
Newfoundland	Florida	Canada
North West Territories	Idaho	Czech Republic
Nova Scotia	Illinois	Denmark
Ontario	Indiana	Finland
Quebec	Iowa	Germany
Saskatchewan	Louisiana	Ireland
Yukon	Maine	Israel
	Massachusetts	Italy
	Minnesota	The Netherlands
	Missouri	New Zealand
	Montana	Republic of Trinidad and Tobago
	New Mexico	Scotland
	New York	South Africa
	Ohio	Switzerland
	Pennsylvania	United Kingdom
	South Dakota	United States
	Tennessee	
	Washington	
	Wisconsin	
	Wyoming	

Source: Ancient Forest Trail Guestbook 2007-2010.

3.2.2 Data Analysis

Content analysis is a widely employed technique used by social scientists in the field of environmental values to examine research questions and uncover categories and themes in units of analysis. Inductive content analysis, where the researcher is meant to develop or formulate categories as close to the material as possible, can be used to suggest a limited and valid set of value categories for further study. As a preliminary step to assess the breadth of expressed forest values specifically linked to the ancient cedar stands, an inductive content analysis procedure was performed on the guestbook database. Through an iterative process, value categories were created, revised, and reduced. Moyer et al.'s (2008) old-growth forest value framework was then evaluated/assessed against the value categories and sentiments to confirm consistency between the framework and the guestbook ancient cedar stand values. Based on this preliminary assessment, it was determined that Moyer et al.'s (2008) framework was appropriate for this study of the ancient cedars.

To prepare Moyer et al.'s (2008) framework into a survey instrument for the interviews, modifications to their values were made. The most apparent of these are highlighted in Figure 7. Value categories and subcategories remain the same, however, values associated with the definitions of end-values (the right-hand column shown above in Table 1) were added into the framework so they could be used as key words in the value exercise. Based on the preliminary assessment of expressed values, value categories such as credits and social justice were removed from the framework as they were found to have less association with the ancient cedar forest in the ITR than other value categories. Through the preliminary inductive analysis it was also apparent that values

such as recreation, education, and community were appropriate to include in the framework as they were commonly expressed in the guestbook and media sources. To finalize the framework for use in the survey, minor changes were made to the wording of end-values to make them as easy to understand as possible. All modified terms remain consistent with work that Moyer et al. (2008, 2010) have done on old-growth forest values. By buttressing the values in the database with the literature, the aims were to support value categories, create more appropriate titles, and make specific definitions of each category easier to understand.

Figure 7. Modified Moyer et al. (2008) Old-Growth Forest Value Framework
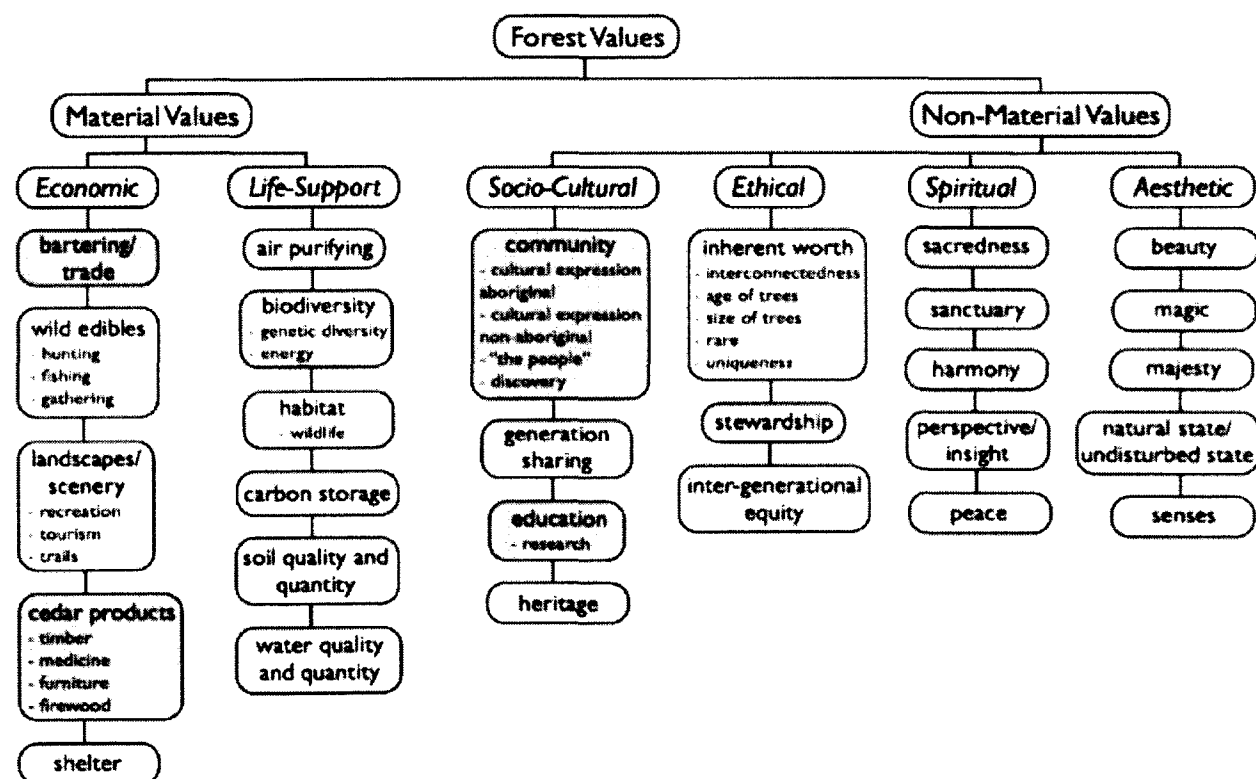
Note: The shaded boxes highlight modifications made to Moyer et al.'s (2008) value framework based on the preliminary assessment of expressed values in the AFT guestbook and media pieces.

NVivo 9 (QSR International, Cambridge), a software program for qualitative

data analysis, was used to organize and analyze the comments from the guestbook and

surveys. Using the values from Moyer et al.'s (2008) framework, 51 values were created

into "nodes" (as termed by the program), and value sentiments were coded according to

node. Descriptions for coding were provided by Moyer et al.'s (2008) research. NVivo 9

made data analysis more efficient as it allowed the quick organization and classification

of data, as well as the ability to work systematically to minimize errors in data analysis.

Although it is convenient for categories to be exhaustive and mutually exclusive, it is

clear that due to the intertwined nature of human experiences, this is not always possible.

Sentiments were coded into more than one node where it was applicable, which was

common in Moyer et al.'s (2008) research as well. The analysis of these data was

completed in a short period of time, therefore aiming for consistency during the analysis

process. After all comments were coded data were summarized by node/value category.

3.3 Media Database

3.3.1 Data Collection

Recording the breadth of expressed forest values surrounding the ancient cedar

stands involved identifying the different outlets that the public used to discuss forest

values. Media pieces concerning the ancient cedar stands in the ITR comprised the

second database of text. All types of media that mentioned the ancient cedar stands in the

ITR were included, from community websites and reports to tourism brochures, reflecting

perspectives from different groups, including scientists, logging company employees,

tourists, government officials, and community residents (see Table 3). Included in this

sample were media pieces as old as 2003 and as recent as 2011.

Table 3. Media Sources

Category	Sources	Year
Blogs	Robot Blogger	2007
	Miss 604	2010
	Arbor B&B Blog	2010
Newspapers	Straight.com	2010
	Opinion 250 News	2010
	Prince George Citizen	2007/2008
	National Post	2010
	Los Angeles Times	2010
	The Valley Sentinel	2010
Industry Publication	B.C. Forest Professional Magazine	2010
Government Sources	Super Natural British Columbia, B.C. Tourism	2010
	Website	2008
	Integrated Land Management Bureau	2009
	Official Prince George Visitor's Guide	2010
	Ministry of Forests and Range News Release	2010
	Forest Practices Board	2007
Community	Valhalla Wilderness Society (website/report)	2008
	Save-the-Cedar-League Report No.1,5,6	2003/2008
Scientific Research Reports	Forum for Research and Extension in Natural Resources Conference	2008
	UNBC Converging Interests	2007
	Northern Wetbelt Forests of British Columbia	2011
Film	Block 486 Documentary	2006

3.3.2 Data Analysis

Sentiments from the media sources included in this study expressing forest values

(for example, appreciation of aesthetics, feelings of spirituality, and/or enjoyment of

recreational activities in the forest) were selected, and collections of similar quotations

led to the initial formulation of inductive value categories as mentioned above. Later

these sentiments were assessed against and then re-categorized with Moyer et al.'s (2008)

old-growth forest value framework in NVivo 9.

3.4 Interview Database

3.4.1 Data Collection

The third perspective this study included was that of people living in the forest. Here it was possible to examine specific value expressions by asking open-ended questions during face-to-face household interviews. Generally, questions used in the interviews encourage paragraph-length answers rather than word- or sentence-length answers, and allowed participants room to elaborate, or to bring up new topics they consider relevant. Interviews were conducted with household residents living in the two definable settlements in the interior cedar-hemlock forest: Dome Creek and Crescent Spur (Figure 8). The communities were chosen based on their proximity to the AFT and their location within the ICH where ancient cedars are most prevalent.

Dome Creek is located between Prince George and McBride, 24km from the Ancient Forest Trail. The community was created by the construction of the CN railway in the valley, and for years Dome Creek was only accessible by train (Wheeler 1979). The first post office opened in 1916, and for a time Dome Creek was a bustling mill town that supported close to 2,000 people. The community had stores, churches, schools, and employment. Over time, however, small mills shut down for the pulp mills in Prince George and McBride, and since then employment in the community has been scarce, including only a limited amount of railway jobs, a few jobs at the Slim Creek highway maintenance station, and some tree planting and logging positions. Dome Creek is now mostly considered a homesteading community where people can go to see wildlife and scenery.

Figure 8. ITR Community Map

Prince George

Penny

Sugarbowl
Grizzly Den
Protected Area

AFT

Bend

Dome Creek

Urling

Crescent Spur

Goat River

West Twin
Protected Area

McBride
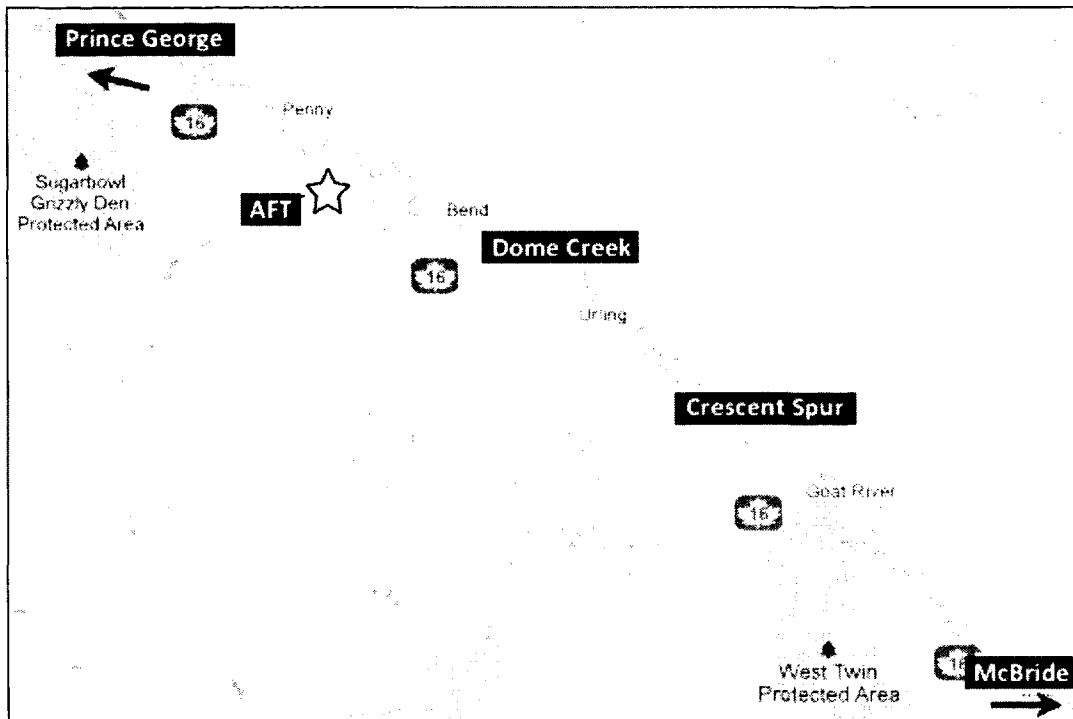
Source: Google Maps 2011.

The community supports 32 households and has a population of approximately 60-70 people who range from professional loggers, retirees, young families, and those simply looking to live outside of 'the system.' The majority of households are located off the main Dome Creek road, but a cluster of households are situated in Walker Creek, 14km east on the highway, and one Dome Creek resident lives at the Slim Creek highway maintenance station. Most households are set up as homesteads where residents grow food, farm, and raise animals such as chickens and cows. For this reason, households occupy a lot of land, are scattered throughout the forest, and are typically not visible from the main road. Figure 9 is a Google Earth map showing the layout of the households and other buildings in the community.

Figure 9. Dome Creek Household Map
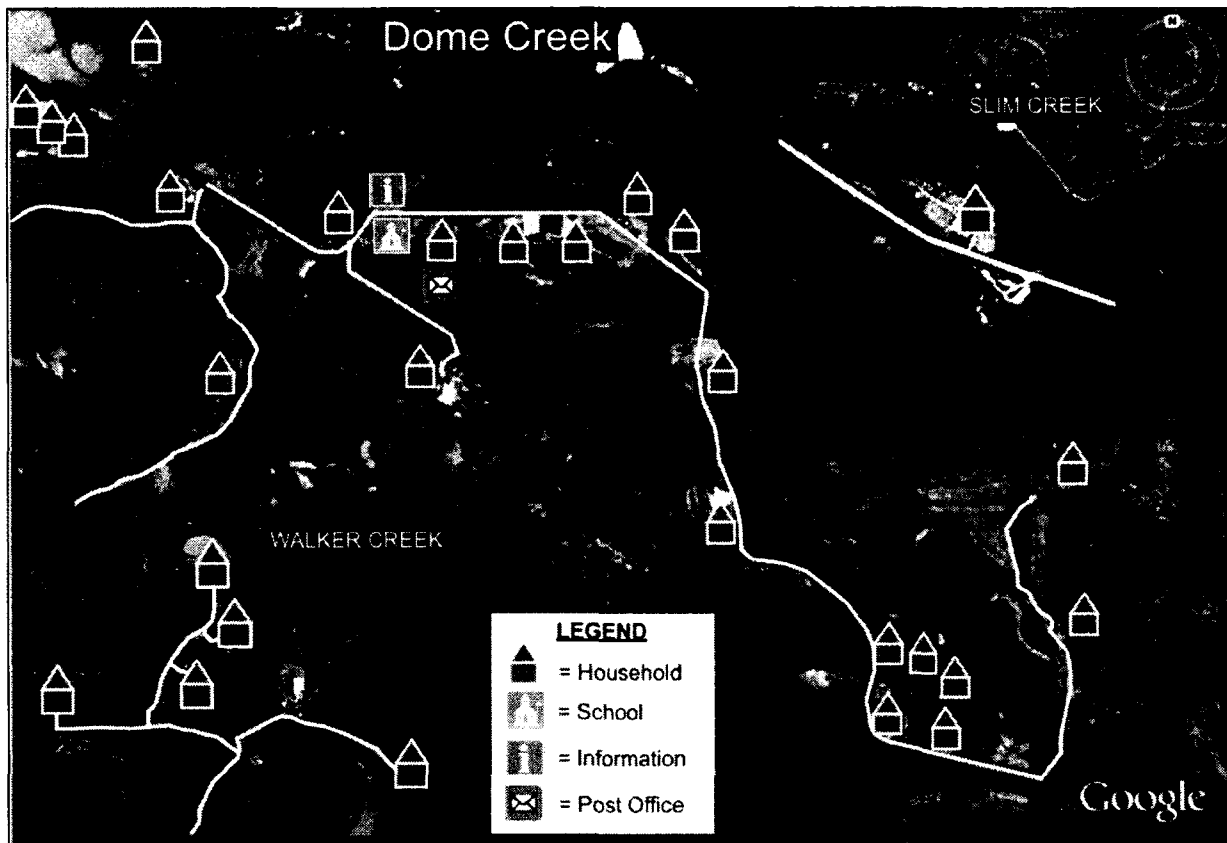
Source: Google Earth 2012.

Crescent Spur is a similar community that was also created when the Grand Trunk

Pacific Railway established a station in the area, around 1915 (Stevenson et al. 2011).

People who originally settled in the region came to work in agriculture and forestry,

however, like Dome Creek, employment is now limited. There are, however, three

tourism operators in the community: a heli-ski operation called Crescent Spur Heli-

Skiing, a summer and winter adventure tour guide company called Outdoor Life

Adventure Co., and a wilderness resort called Canadian Country Cabins. The community

now consists of 18 households (see Figure 10), maintaining a population of

approximately 30-40 residents.

Figure 10. Crescent Spur Household Map
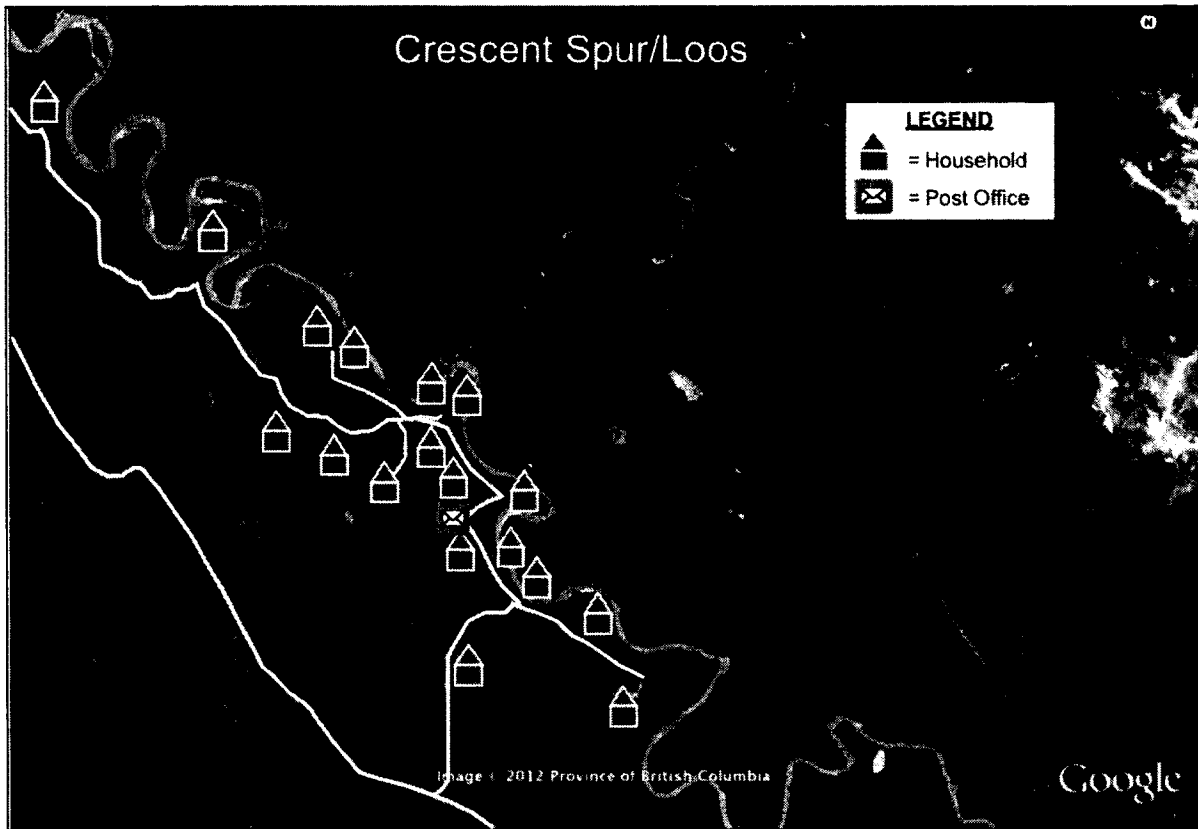
Source: Google Maps 2012.

Due to the small sizes of the communities, this study aimed to contact one

hundred percent of the households in Dome Creek and Crescent Spur by going door-to-

door in the communities in the summer months. A bulletin detailing the purpose and time

frame of the research was sent to the postmistresses of each community before the start of

the field season. Bulletins were displayed on communal boards at the post office, where

residents go to retrieve their mail. Due to the limited available information on these

communities, as well as the scattered geographical locations of the households within the

forest, it was helpful to meet with the postmistresses before starting the interviews to

collaborate on hand-drawn maps of the roads and properties in their communities. These

maps were invaluable tools for navigating between households in the forest and for verifying the total number of households in each community. The maps were continuously updated throughout the interviewing period from information gathered on the ground and then later redesigned using Google Earth images of the Robson Valley, as seen above. Other information from the postmistresses was also passed on, such as the status of the residents (permanent/non-permanent) and any safety precautions they felt inclined to suggest.

The principle method for data collection was the use of semi-structured interviews. The interview guide consisted of two sections. The first section focused on the participant's context and background, his or her relationship to the valley, and the values that they have formed in relation to the forests in the valley as well as the ancient cedar stands. The interview guide consisted of questions concerning how long the resident lived in the valley, as well as what ecological features of the valley were important to them, followed by two related Likert scale questions, and concluding with an open-ended question that was guided by a value exercise (see Appendix B).

The Likert scale questions posed to residents asked, "On a scale from 'highly important' to 'not at all important,' how important to you are:" 1) the forests in the valley and 2) the ancient cedar stands in the valley. The Likert scale provided 5 options: "highly important," "important," "moderately important," "somewhat important," and "not at all important." This question aimed to get participants thinking about the role the forests play in their lives, preparing them to speak about their importance in more depth in the next section. The answers from these questions also produced information on the relative importance of all the forests in the valley compared to just the ancient cedar stands

The next section of the interview aimed to facilitate a conversation about forest values concerning ancient cedars in more depth. Since values can sometimes be hard to evoke and/or explain and on the spot, Moyer et al.'s (2008) modified old-growth forest value framework was used in the construction of the interview guide to elicit value information from household residents that was then explored to gain further insights into their meaning and importance for the residents. To help residents express their values, the 51 value categories from Moyer et al.'s (2008) old-growth forest value framework were presented to respondents on a sheet of paper with boxes beside each value and extra lines where participants could include any values they felt had been left out. Participants were asked to place a checkmark in the boxes beside the values that were "important" to them in respect to the ancient cedar stands. Following this, they were asked to review their selections and circle the values on the list that they considered "most important" to them concerning the ancient cedar stands. It was suggested to participants that the list of "most important" values be shorter than the previous one, around five values categories; however there was no minimum or maximum number enforced. Each of the values presented on the sheet of paper had a corresponding magnet with the value name written on it. After the participants had selected their "most important" values, corresponding magnets were placed on a metal clipboard and given to the participants.

With the magnet board displaying their "most important" values in their hands, they were then asked to physically maneuver the values on the board in a way that would make it easy for them to speak about the values. It was suggested that participants could organize them hierarchically, from most important to least important, though this was not obligatory. When the respondent had settled on an arrangement, they were asked to speak

about their values using probes such as, "Why did you choose these values as most important?" "Why did you organize these values in this way?" and "How do these values relate specifically to the ancient cedar stands?"

The opportunity to visually maneuver a list of values has been used by Rokeach (1967) in the Rokeach Value Survey (RVS), and was also useful for this study as it gave participants a unique space to consider their values by moving them into positions on the magnet board that represented how the values fit into their lives. Rokeach (1973) and Schwartz (1994) have also used the ranking technique in their studies to measure the importance of values as guiding principles in people's lives. It has also been reported in Axelrod's (1994) research that it is helpful for individuals to be able to identify one value domain as most important when compared to all others. While Schwartz (1994) suggests that ranking can lead to contradictions between relevant values, this interview exercise did not force respondents to discriminate among equally important values. Respondents were free to arrange equally important values ways that suited them, for example, side-by-side on the magnet board.

Advantages of semi-structured interviews in a door-to-door survey include higher response rates, a minimized amount of "don't know's" and "no answers," and the ability to clear up ambiguity on the spot to ensure relevant responses (Babbie 2011). A general limitation to using Moyer et al.'s (2008) framework is the potential bias created by introducing a set of predetermined values to participants; however, this is done with the intention of providing participants with the tools to express themselves more easily in a short amount of time, and therefore the limitation has been accepted as a part of this study.

Almost all interviews were conducted in person in the communities between July and August. Three interviews were outstanding after the summer months. One interview was conducted over the phone, and the other two took place at a local café in Prince George, as well as at a participant's second home in Prince George.

3.4.2 Data Analysis

The interviews were recorded by hand, as well as audio recorded to ensure accuracy, and were later transcribed using a computer into separate Microsoft Word documents. A qualitative approach was used for the data analysis. The documents were entered into NVivo 9 and organized and analyzed using the nodes from Moyer et al.'s (2008) framework as described above. As well, the "most important" values participants selected during the interview exercise were accumulated and analyzed using Microsoft Excel to examine what the most frequently selected "most important" values were. Finally, variables such as age, gender, and years lived in the valley were collected in NVivo 9 and later analyzed in Microsoft Excel to assess any potential connections between these variables and the expressed values.

3.4.3 Ethics

Research projects involving human subjects at the University of Northern British Columbia go through Research Ethics Board approval before the study is conducted. For this part of the study, a standard questionnaire was filled out describing different ethical aspects of the proposed interviews, such as how participants will be selected and contacted, how individual consent and confidentiality will be addressed, and how and for

what length of time the data will be stored. In addition, a copy of the thesis proposal was submitted with this application. A complete application package for this thesis was submitted in May 2011. After minor changes to the consent and information form, the project was approved by the Research Ethics Board to proceed. All participants signed a consent form as required by the Research Ethics Board (see Appendix A) that included a description of the project and the nature of their involvement.

Chapter 4

RESULTS

4.1 Introduction

To analyze the breadth and depth of values surrounding the ancient cedar stands

in the Inland Temperate Rainforest, I examined three databases of text: (1) Ancient Forest

Trail Guestbook & Surveys (2007-2011); (2) Media Pieces (2003-2011); and (3)

Household Interviews (2011). (1) Comments written and captured in the Ancient Forest

Trail Guestbook and through on-site trail surveys reflect forest values of trail users, who

are typically either recreational day-trippers or tourists. (2) Media pieces are used to

study expressions of public forest values as seen in newspapers, research reports, online

blogs, community and government documents, and film. (3) Interviews with local

residents provide specific information on forest values surrounding the ancient cedars.

Included in this section are summaries and profiles of each database of text, brief

summaries of each value category, including the end-values and corresponding

definitions, and results according to the six main value categories in Moyer et al.'s (2008)

framework: Economic, Life-Support, Socio-Cultural, Ethical, Spiritual, and Aesthetic.

4.1.1 Guestbook and Survey Summary & Profile

The Ancient Forest Trail provided the location for gathering data on values

expressed by tourists and recreational day-trippers. Values are expressed here through

comments voluntarily written in the guestbook at the trailhead, as well as sentiments

expressed in surveys conducted with trail users by researchers from UNBC. From 2007 to

2011 there were approximately 337 comments written in the guestbook located at the

head of the Ancient Forest Trail. It is common for guestbook users to record the date and their city/province/country of origin beside their comments. From this information it was calculated that approximately 22% of the comments came from local recreational day-trippers (residents of the City of Prince George and those living within the Fraser Fort George District H), 62% of the comments were written by tourists (outside the City of Prince George and Fraser Fort George District H), and 16% of the comments did not have an origin attached. Of the local recreational day-trippers who commented in the guestbook, 54% came from Prince George and the rest came from McBride, Dunster, Valemount, Dome Creek, and "Robson Valley East." People visiting from the province of British Columbia made up 34% of the guestbook comments. Tourists who left comments in the guestbook hailed from 20 different countries, 25 different U.S. States, and 11 Canadian Provinces/Territories.

4.1.2 Media Profile

Media pieces were the second database of text used to cover the breadth of values surrounding the ancient cedar stands in the Inland Temperate Rainforest. Media pieces can be reflective of public opinion, and the sources in this database came from many different groups including scientists, recreationists, logging company employees, government officials, and community residents. The media pieces were collected in the summers of 2010 and 2011, and relevant value statements were accumulated and later categorized into value categories.

This database of text was divided into six categories: (1) online blogs, (2) newspapers, (3) government sources, (4) community documents, (5) scientific research

reports, and (6) film. Online blogs include those that are written by individuals recounting

their experiences in the valley, as well as local Bed and Breakfast establishments

promoting sightseeing in the area. Newspaper articles come from online sources such as

Opinion 250 News, as well as local and national newspapers such as the *Prince George*

Citizen, the daily newspaper for the City of Prince George (which has run two full-page

stories on the ITR), and the *National Post*. Government sources include ministry news

releases, government reports, and B.C. tourism documents such as the *Prince George*

Visitor's Guide, which has featured pictures of the ancient cedars inside and on the front

pages of the pamphlets. Media from industry includes a forestry magazine, and local

community groups such as the *Valhalla Wilderness Society* have published reports and

created websites concerning the ancient forest. As well, Dome Creek residents filed

formal complaints to the Forest Practices Board concerning conservation/harvesting of

the ancient cedars. The University of Northern British Columbia has also produced

research reports on the ITR that have been published online, as well as documents from

conferences concerning natural resources in the valley. Finally, a documentary film

entitled *Block 486* was created in 2006, which introduces viewers to B.C.'s inland

rainforest by exploring whether or not a stand of ancient cedars (designated as Block 486)

should be harvested. There is an average of three sources per value category that range

from the years 2003 to 2011, with a total of 21 sources.

4.1.3 Household Interview Profile

Community residents living in the upper Fraser River valley have intimate

knowledge of the inland rainforest and because they are a group who is affected by

decisions made concerning the forest, documentation of their values adds an even greater understanding to the significance of the ITR. Responses to the interviews expressed the breadth of values residents have, the depth of their values, as well as the relative importance of forest values in their lives.

With this type of research there is a challenge of creating user-friendly contexts in which participants feel their values are significant, allowing them to provide the study with quality (i.e. informed and thoughtful) responses. In this study, some residents presented suspicion concerning the research project, commonly because UNBC is tied to the protection of ecological features of the ITR. Most residents, however, were very friendly, and because they all lived in the forest, they generally felt empowered when speaking about their values.

Dome Creek and Crescent Spur were the two definable settlements in the region, and household interviews were conducted from June-September 2011. I was able to complete approximately 5 interviews a day. Of the 51 households in both Crescent Spur and Dome Creek, 34 were successfully interviewed. Of the 51 households, 41 households were deemed approachable for various reasons (e.g., other households were accessible only by boat, compromised the safety of researchers, etc.), resulting in an 83% response rate.

4.2 Economic Values

Economic values include the tangible/material values that support the economy, encompassing the end values of bartering/trade, wild edibles (hunting, fishing, gathering), landscapes/scenery (recreation, tourism, trails), cedar products (timber, medicine,

furniture, firewood), and shelter. Wild edibles are defined as material that is consumed to capture energy and sustain health. The processes of wild edibles include hunting, fishing, and gathering. Landscapes are the structure and features of a specific area of land including the physical, biological, and built elements. The processes of this value are recreation and tourism, with objects such as trails. Cedar products are those things made from raw materials, objects such as timber, medicine, furniture, and firewood. Finally shelter is defined as the covering that provides protection, particularly from the elements.

4.2.1 Guestbook and Surveys

Economic values in the guestbook concentrate mostly on landscape values such as recreation and tourism. Trail users describe their recreational activities in the forest as fun, great exercise, a treat, unique, a wonderful adventure, inspiring, wondrous, absolutely amazing, excellent, enjoyable, incredible, interesting, beautiful, a real pleasure, a great walk, better than expected, and "best hike ever." Many trail users say that their experience in the forest was worth their time, and some comment that seeing the ancient cedar trees was "well worth the hike." The accessibility of the site is praised, and many comments refer to the hike through the ancient forest as a great family activity, especially for those with young children and dogs. Recreation is enjoyed in the summer as well as in the winter, and trail users write about bringing friends along with them the next time they visit the site.

Some trail users comment that the Ancient Forest Trail should be put in more guidebooks, and others say they would like to see the site created into a park, or national park. Tourists who commented in the guestbook speak positively about their experience

in the forest and enjoy the trail as a tourist attraction/excursion while they are exploring

northern B.C.: "Was the highlight of our West Coast tour!" Some people write about

planning their holidays around a trip to the trail, and again, many look forward to

bringing guests with them to the site. Comments also compare the forest favorably to

other national parks and tourist experiences in B.C.: "Thought there was an impressive

Ancient Cedar loop in Whistler but this is even better."

People use the words great, wonderful, awesome, interesting, beautiful,

enthralling, and amazing to describe the actual trail running through the forest. Trail users

believe that the trail is well marked, and many comments praise the quality of the

interpretive signs present throughout the walk. The most common comments relating to

the trail, however, are expressions of gratitude towards the volunteers who work on the

trail, for example: "Thank you for donating your time and hearts to make this beauty

known to the public," and, "Great addition to the trails of northern B.C., and a privilege

to enjoy something that has been crafted with so much passion."

Trail users express a desire to financially contribute to the building, maintenance,

and preservation of the trail, and others comment that they have left money in the

donation box at the head of the trail: "As pensioners we can only do a little (especially

outside of our local area) but we'll gratefully leave $10 as a token of our appreciation of

what you are doing." Comments express that the money being used to build and maintain

the trail is well spent, and some visitors say they are happy to see how the TD Bank

Friends of the Environment Foundation is using their funds to aid in the construction of

the trail.

There are many comments in the guestbook, however, that express worry about the effects of recreation and tourism on the forest, specifically in relation to the roots of the ancient cedar trees. Some believe it would be best to keep the trail small and less populated, and people write comments encouraging hikers to stay on the designated trails. Others prefer the trail not being overly developed, as it sets it apart from other hiking trails in B.C.: "Nice not to have lots of people on trail. Comparing it to Coastal trails – appreciate that it was quiet and more peaceful."

Finally, comments from trail users are unanimously against the cutting of cedar for products such as timber, furniture, or paper: "I wish for people to experience the woods as more than just toilet paper and furniture." Trail users are also against logging at the site, and some comments express hope that B.C. forestry won't cut in the ancient cedar area:

> These trees, which are magnificent in years and stature, would understand best the turning of the year and the patience that comes with it. Let those who would cut them down, not only think of their wood, but of the immense swaths of time stored in their growth. When during our time, the future seems so uncertain with crises, how can we not value the wisdom of the trees which have lived through countless futures and uncertainties?

People express that there is not enough value to be gained by logging the forest, and a tourist from Australia wrote, "Please Canadians, show you have more sense and can look forward to something other than the almighty dollar." Some trail users instead prefer economic gain through tourism in the area:

> I just can't understand why it is worth cutting down a small grove of trees like this. It is at most 5 years of low paying jobs. If you leave them there people will be coming by to look at them for years. The area gains a reputation that attracts people with money and sustains the region for far longer than short term interest.

While trail users generally feel recreation and tourism may present a threat to the forest through overuse and damage to roots, comments relating to economic landscape values are predominantly positive in comparison to those relating to economic timber values.

4.2.2 Media Pieces

Media pieces range from government to community documents, often expressing opposing economic values surrounding the ancient cedar forest. In the documentary *Block 486*, it was suggested by community members that the government and politicians only care about the forest in terms of economic potential (Block 486 2006). One community resident in the documentary expressed their desire to protect the forest from deforestation, and said they would pay one million dollars (if they had it) to keep the forest safe. A community report also stated that there is growing desire among scientists, conservationists, local rainforest communities and residents, and others throughout the world to "safeguard the forest from commercial development" (Save-the-Cedar-League 2007). Finally, a government report states that old-growth management areas can address environmental and social risks of biodiversity management without introducing additional or undue economic impacts to government (ILMB 2008).

Researchers at UNBC are looking into opportunities for economic benefits outside of logging the ancient forest; for example, the *Prince George Citizen* speaks about a UNBC professor researching economic benefits of the forest and avenues to get the most revenue out of the site, including student and professor recruitment for UNBC and CNC, recreation, tourism, cultural, spiritual, and research values, along with trapping and other industries (2007). Another researcher from UNBC commented that the forest has the

potential to lead alternative economic development in the region, aside from value the

forest has in terms of high biodiversity levels (Prince George Citizen 2007). A similar

sentiment concerning legacy values leading to new economic avenues was also expressed

in the *B.C. Forest Professional* Magazine (2010).

On the other hand, the manager from the logging company in McBride, TRC, was

interviewed in the documentary *Block 486* and spoke about the economic gain of logging

in the forest: "If you convert the values of our product right through to a cubic meter

basis, we would be talking about $500,000" (Block 486 2006). The manager spoke about

a balance between managing and harvesting cedars since employment by the mill is a big

factor in McBride's community: "I think it is fair to say without the TRC mill in McBride

the community would be very much downsized and maybe non-existent." He also

expressed that there was considerable investment in the forest at the time due to the fact

that they had invested in all the groundwork necessary to get to the cutting permit stage in

the forest. A TRC news release stated that in the first year of logging they could provide

enough employment for one shift a year (Ministry of Forests and Range British Columbia

2010). The Minister of Forests praised the McBride community spirit when people pulled

together to re-open the mill in town: "Our focus is always on job creation and the

addition of 30 jobs will have a significant impact on a resource-dependent community"

(Ministry of Forests and Range British Columbia 2010).

The Forest Practices Board, however, found the operations under the forest

license to be uneconomic for value-added manufacturing, and stated concern about

impacts of approved harvesting on the Ancient Forest Hiking Trail (Forest Practices

Board 2008). It was also written in a scientific article that local sawmills over the years

have tried, and generally failed, to successfully use the trees, and local employment has suffered as a result (UNBC 2007).

Other economic activities, such as hunting, have been considered to be a potential avenue for economic benefit in the region. Recreation has been frequently discussed as an economic avenue in an array of media pieces. For example, the *Prince George Visitor's Guide* from 2009 boasts, "The Ancient Forest has become one of the most popular destinations for hiking and for enjoying one of the most beautiful ecologically significant areas in northern B.C." One community document states that the recreational values are some of the highest in the world (Save-the-Cedar-League 2007), and other sources, such as online newspapers and blogs (Straight.com 2010; Miss604 2010), support the decision to make Driscoll Ridge and the Ancient Forest Trail recreational and interpretive sites under the Forest and Range Practices Act. Online blogs also display high-quality artistic photographs of the ancient cedar forest, some photographers traveling from other countries just to photograph the "ancient giants" (Robot Blogger 2007). Recreation is also an industry for an outdoor adventure company from Crescent Spur that, as it states in a news article, takes groups into the ancient forest on snowshoeing hikes (National Post 2010). Quick access from the highway is also mentioned as a positive attribute for recreation in the ancient cedar stands.

Tourism is seen as a potential economic benefit of the forest as well. The Ancient Forest Trail is seen as a site that can sustain tourist activity: "There aren't that many places for tourists to stop along Highway 16 in the Robson Valley, so a lot of them pull in here to break up their journey" (Straight.com 2010). Online blogs detail the trail through the forest and promote it as a place to take family and friends. The *Prince George Citizen*

also wrote in an article that the hike is both educational and enjoyable (2008), and an

article in the *B.C. Professional Magazine* states, "The trail attracted almost 10,000

visitors in 2009, on a site that was basically unknown three years earlier" (2010).

Community residents interviewed in the documentary *Block 486* express that they

do not want to see the ancient cedars logged for cedar products: "It certainly should not

be made into fence posts and shakes" (2006). Sentiments also express the high levels of

biodiversity in the forest that some believe should take precedent, and others residents in

the documentary believe the trees are not a renewable resource:

> We feel any logging in the ancient forest, because it's not sustainable,
> because it's not replaceable, should not take place. When it's gone it's gone. I
> don't know how anyone can argue that you can replace a thousand year old
> tree. You can't grow a 1,000 year old tree, it's just not going to happen.

In a press release, the manager of TRC commented that the logging company and

the residents are trying to find a middle ground: "Not completely setting the trees aside

for one set of values, and not logging all the ancient cedar stands for values for the mill,

and the community in McBride" (Ministry of Forests and Range British Columbia 2010).

There were complainants from the area residents, however, who in a community report

expressed that they believed the harvesting would be detrimental, and in 2005 when 119

volunteers created the Ancient Forest Trail, a newspaper article stated, "they knew it was

going through a logging block, but hoped it would receive protection before any logging

began" (Prince George Citizen 2007). The *Prince George Citizen* later published an

article saying, "The Provincial Government is initiating a study to identify ancient forests

which hopefully will lead to them being appreciated for their aesthetic and nature value

rather than as a source of lumber" (2008). Other community members and groups also

stressed the importance of putting a halt to the logging for future generations.

Conversely, in a Ministry of Forests News Release, TRC was reportedly happy to be "firing up its saws again, producing cedar products and employing workers" (Ministry of Forests and Range British Columbia 2010). The Minister of Forests commented, "anytime you have a mill re-opening, it's a good day" (Ministry of Forests and Range British Columbia 2010). TRC considers the use of cedar for products as "salvaging" the cedar and creating "value added products" such as fencing, since the cedar would otherwise be "lost, pushed into a pile and burnt": "TRC prides itself on making use of lower-grade logs that are not sawlog quality that would otherwise go to waste on the forest floor" (Ministry of Forests and Range British Columbia 2010). The company also values cedar products as they see it as creating employment in their community.

As the *B.C. Professional Magazine* summarized in an article concerning the inland rainforest: "Cedars simultaneously represent a forestry resource, an internationally significant biodiversity repository, and a major cultural legacy" (2010).

4.2.3 Household Interviews

Community residents who have lived in the region for decades often recall in their interviews the time when there was an abundance of saw mills in and around their communities. However, in recent years, local forest products have gone to pulp mills in the bigger cities (Prince George and McBride), and residents say that this, in addition to the decreased use of human labour in the logging industry, has caused an "injury to economics" in the valley. When it comes to the ancient forest, some residents of Dome Creek and Crescent Spur strive for a balance between using and preserving the forest: "We don't want to totally destroy it; we don't want to totally leave it alone. We've got to

use it in the middle of the line, where everybody's got access to it." The economic values

of logging vary greatly between some community residents. For example, one respondent

believes that "logging is beautiful," and shouldn't be hidden from the public because "it

is important that people see that logging supports 15 people at $80,000 a year."

Conversely, some residents do not support or see purpose in economic gain from logging

in the ancient cedar forest. Majority of respondents are specifically against clear-cut

logging in the ancient forest.

Some residents appreciate products made from the cedar in the valley. The uses

that people enjoy cedar for include weaving, rail fencing, boards and batons for houses,

cedar shakes, fence posts, and firewood. One respondent explained how they make good

use of cedar on their property:

> "All the rail fences came from cedars that were lying on the ground or on the
> property. Once the posts rot, we bring it in here and we cut them up. We use
> them in the garden, or we use it for kindling, so the process continues on and
> on."

Residents praise cedar as a very important wood in their lives because it is "resistant and

resilient." One family spoke about hand splitting all the cedar shakes on their roof years

ago. Some people believe that cedar also makes beautiful products, which are appreciated

because they can last a long time. Respondents link cedar products to job creation as

well. There are some residents who believe we can use the cedar trees, but that it should

be done in a responsible manner.

Other respondents, however, don't believe there is a market for cedar products.

Many people discuss the poor quality of the cedar for products: "I've done a lot of

logging in my day and the cedar in this country is so borderline as far as something you

can get a product from." People admit that cedar is one of the better woods, but residents

say that most of the cedar in the valley is hollow with a thin shell, and therefore people lose money trying to shake block it. Residents also say that cedar trees in the valley are rotten in the center, which is a natural condition for them, but again, "it makes them unusable in a lot of cases for different kinds of wood products." People remark that there is only one tree in a thousand in the ancient forest that has usable wood, which is the reason that people cannot make any money from logging the trees. Some residents wish they could use the cedar wood, but they express that it's not worth the trouble: "The big problem with it is that there are other things that grow way better here. That's because cedar doesn't grow properly here; it rots, the snags are pretty dangerous, and I don't have the best use for it."

Other residents don't support any types of cedar products being made in the valley: "I think the non-economic values of the cedar forest probably trump the economic values because I don't see a lot of economic value in mulch, and I've seen too many times that something that has these other inherent values is sacrificed for a fairly small amount of economic value." These residents do not think of making cedar products from the cedar living specifically in the area of the Ancient Forest Trail because they are concerned about the impact harvesting the cedar would have on the trail. Residents say they do not believe ancient cedars are a renewable resource because they don't grow fast and it's very hard to return the trees back into the habitat again:

> "Cedar products are not important to me. Shakes and shingles and fence posts and rail, do we have to sacrifice those trees for that? I'm not saying don't use any cedar, because we do, but use it in moderation – don't cut down an ancient forest, and use fallen trees for your shakes."

Timber is generally equated with jobs in the valley. Some people speak about forest management ("taking out what should be taken out") and selective logging

amongst the cedar positively, as they say it would be better than falling it, piling it up, and burning it, as they do currently. On the other hand, some residents are completely against taking timber out of the ancient forest: "It's a small tiny bit of trees that are very unique and with the timber industry the way it is right now it's pretty ridiculous to cut it down for pennies when it can't be regenerated." Another resident who used to be a logger recalls a time when a fellow logger said to him, "we're going to run out of food before we ever run out of timber." He believes that now the logging industry has changed in terms of mass production and clear-cuts, and that the waste with the cedar is huge.

Other activities people enjoy in the forest include hunting, however some residents suggest that it is better to hunt with a camera, and have noticed decreasing populations of wildlife during hunting season. Fishing is also a celebrated activity in the valley, however one respondent remembers how much salmon you once could "literally scoop out of the creek," and says that those days are no longer. Some attribute the decline in salmon to the fisheries fish fence that was put up to study the salmon. People also like to gather different kinds of berries, shed antlers, and greens from the forests in the valley. One respondent said she picks berries specifically at the edge of the cedar forest, another resident said they collected combs in the cedar forest, and a third said they collect cedar bark (fallen) for weaving.

People enjoy recreational activities in the forests such as snowmobiling, four-wheeling, hiking, snowboarding, boating, etc. Some residents speak about educational value in recreation, for example: "Taking [kids] on recreational activities in the forest is a way for them to learn and appreciate. I think you have to experience to truly learn." Residents enjoy going for walks on the trails in the forest, or using the trails to run around in the

forest. Some people express concern about the trails potentially destroying the delicate features of the forest such as mosses and roots. Concerns about the impacts of recreation can be complicated:

> "It's a catch 22 situation, on one hand you want to advertise that it's there and have everybody come out and witness it so that maybe it will affect them and they might think twice, but if you double the amount of people that just walk through there it impacts it."

Other people don't consider putting in a trail as causing much damage, and still consider the forest 'undisturbed' with trails.

A family in Crescent Spur speaks about their outdoor adventure company, and their desire to work with children and youth in outdoor settings. They say they utilize the ancient forest stands both in the valley and at the Ancient Forest Trail. Residents are generally happy that the Ancient Forest Trail is getting a lot of attention:

> "It's really nice to have those places for recreation, and obviously people enjoy that. If you can give them a place where they can have a trail and something to look at, they'll definitely go, and we get to see that every time we drive down the highway. There are a lot of people at that trail."

People take guests to recreate with them at the Ancient Forest Trail (from elderly parents to friends), and some people paint and sketch in the cedar forest. Some residents comment that they want to see the ancient forest untouched so their children can recreate in it, and others describe summer and winter recreation activities that they love to do in the forest. On the other hand, there are residents that don't use the forest for recreation, some who think B.C. has enough parks, and as one resident explained, "when you've worked all day, going for a hike just doesn't cut it."

There is a spectrum of values concerning tourism in the valley and in the ancient cedar forest, and some strongly opposing opinions are present in the resident responses.

Some believe that there is untapped potential for tourism in the ancient forest: "City people crave diversity and seeing natural stuff, and they can come back year after year after year. If you cut, then it's gone." Some residents think tourism is important, and is the direction in which the economy needs to go. For some, tourism is valued as an alternative to logging because logging is no longer an economic option for community members in the valley: "It's the only way people in the future can make their money, or make a living." Ideas of tourism include campsites, bed and breakfasts, hiking, snowshoeing, skiing, interpretive tours, boat rides, and horseback riding.

Some residents believe the recognition the ancient forest is getting is "wonderful." One respondent explained that when the Ancient Forest Trail was built, Dome Creek was given a grant in order to participate in the tourism it would create. The community built a little tourist center on the main road, and converted the old heritage hall into a museum. The tourist center now serves as a place where locals gather and showcase crafts and paintings that tourists can buy: "We get a lot of people down here that stop, and ask questions. It's nice to see it switching. It's nice to see the motor homes on the highway as opposed to logging trucks all the time."

The owner of the Slim Creek rest area, located down the road from the Ancient Forest Trail, expressed that they've never seen such a busy place: "It's packed every day, even when it's pouring down rain, there are just piles of people in there." Community members agree that tourists find the ancient cedars interesting and amazing, and are happy and amazed to see how many people the trail brings to the valley. Some residents believe that tourism can help protect places like the ancient forest, keeping the trees standing for a long time: "Tourism has its good side because once you have world

awareness it's difficult for a country to do away with!" Others believe tourism can encourage values among people that are more diverse than just wood products. Tourism was also linked with education as it gives people the opportunity to "share and learn." Some residents express concern about tourism, admitting that it's important because it saved the forest, but are more interested in eco-tourism, or an alternative that won't damage the forest too much (no excessive tourism).

Some residents are in the middle of the spectrum and would prefer to support both timber and tourism, and some residents don't support tourism at all. The residents who don't support tourism don't believe it is developed enough at the moment, and speak about tourism as a secondary industry. One resident doesn't think there is a substantial traffic route in the valley: "There's a gentleman up the road that built a bunch of cabins, but they're never full because the traffic isn't here." Some residents are skeptical of the success of tourism for reasons such as bugs, rain, and location in the valley. People point out that tourism only pays around eight dollars an hour, whereas if you are logging you can be making up to fifty dollars an hour: "Tourism is made for people with a lot of money to set up hotels and recreational opportunity… [they] reap all the benefits and leave you with eight bucks an hour." Stronger opinions against tourism suggest that it doesn't contribute to their community all, pointing out that people who come from Prince George contribute nothing because they go back home at the end of the day, and people coming from the other direction just stop briefly to take in the sights and then move on through: "The effect is virtually nil unless there is someone giving tours."

4.3 Life-Support Values

Life-support values are those that provide necessary functions and services for the survival and well-being of humans and other living beings. The end values of this category include air purifying, biodiversity (genetic diversity, energy), habitat (wildlife), carbon storage, soil quality and quantity, and water quality and quantity. Air purifying is the status of the atmosphere with regard to the existence of potential pollutants. Biodiversity refers to the number, variety, and uniqueness of living organisms and includes genetic diversity and energy created by biological processes and systems. Habitat is a place where population of flora, fauna, or micro-organisms live, which includes wildlife. Carbon storage is the long-term storage of carbon in the forest (trees or soil) so that the build up of carbon dioxide will reduce or slow. Soil quality and quantity refers to the capacity of soil to function within an ecosystem to provide for flora and maintain and improve water and air quality, such as its ability to retain moisture. Finally, water quality and quantity refers to the condition of water with respect to the amount of impurities in it and the amount of it.

4.3.1 Guestbook and Survey

Expressions of life-support values were quite few in the guestbook and surveys, however of the comments, many were found regarding biodiversity in the forest. Plant life that people associate with the ancient forest include trees, ferns, mushrooms, lichen, and moss gardens. People wrote that they appreciated the web of life that all species in the ancient forest are part of, and others spoke about maintaining the balance of nature in the forest. People generally believe that the ancient cedar forest is an important habitat

for animals. The air quality in the forest is spoken about positively as well, "The smells of the cedar definitely clear the sinuses of PG air," and the people wrote that the water quality was "fantastic" and "spectacular."

4.3.2 Media Pieces

Media expresses values that contribute to the survival of humans and other living beings. Air quality and water quality in the forest are praised in some sources for being clean, and biodiversity values are constantly discussed, with many sources referring to the forest as the highest biodiversity ecosystem in the region: "There are few forests in the world that parallel the ancient forest's biodiversity value" (ILMB 2008). A UNBC professor commented that the Ancient Forest Trail is particularly special in terms of biodiversity levels (B.C. Forest Professional Magazine 2010), and in the FORREX conference it was discussed that in many ways, the flora that occur in the ancient forest are many times richer than that of coastal temperate rainforests (Merric and Wiensczyk 2008). It is a site recognized by media as a center of dispersal for thousands of rare species of lichen and fungi, and it is said that there is high animal and plant diversity in combinations that happen nowhere else. A report by the community organization, *Save-the-Cedar-League*, stated that the ancient rainforest is the last remaining place in the world outside of parks where you can still see healthy 'core populations' of all seven of the charismatic 'focal species': mountain caribou, chinook salmon, grizzly bear, wolverine, lynx, cougar, and wolf (2007). Save-the-Cedar-League (2007) also stated that new species are being discovered at a faster rate than in any other North American ecosystem.

In 2008, the Dome Creek Forest Information Committee submitted a complaint to the Forest Practices Board expressing concern that the biodiversity targets were not refined enough to capture old-growth forest stands that have specific moisture regimes and slop positions (Forest Practices Board 2008). They point out that similar biodiversity levels are present in wet temperate rainforest stands in Australia and New Zealand, which have largely been designated as World Heritage sites. It is the belief of the government that old-growth management areas (OGMAs) already in place can substantially address the environmental and social risks of biodiversity management, however, the need for spatial biodiversity planning in the ICH forest has been stressed by community members, researchers, public stakeholders, and the environmental sector since 1990.

Media pieces report that the region provides important habitat for many threatened or endangered species, ranging from mountain caribou to canopy lichens and old-growth or antique forests. A researcher at UNBC interviewed in *Block 486* thinks partial cutting around the "old, old trees" could be a solution to maintaining habitat. Community members also express carbon storage values in the ancient forest:

> "This forest out here is a huge carbon sink. It eats carbon dioxide. If you have a species out there that eats carbon dioxide, and you have a carbon dioxide problem, it could be a no brainer that you don't cut those trees down" (Block 486 2006).

It was expressed in the documentary, *Block 486*, that the biggest revenue of the forest could come from carbon storage, and the carbon the ancient cedars store was also linked to preventing global warming (2006).

4.3.3 Household Interviews

Ecological values are critical to some residents, as people believe the forest provides them with everything they need to live. People sometimes express that the forest is one circle that is all dependent on each other. Some residents believe that if they don't take things out all at once, the forest will be able to look after everyone.

Air purifying in the ancient forest is highly important to residents (most residents rate it as their most important value):

> "Air purifying continues the cycle of the health of the earth and us living here. That's the job that the ancient trees have been given to do, and you got to let them do it. If you cut them down then you can't really let them do their job."

People believe that forests are like the lungs of the earth, and because humans need air to live, air purifying values are rated as very important. People compare the air quality in the valley to that of other places they have lived, for example:

> "We're all fairly well aware that our trees are a major process in purifying out air, and when you come from Alberta to here, even our little girls have no doubt in their mind that they breath better, sleep better, and everything here than we did in Alberta."

Some people believe the old cedar trees purify the air more than any other kind of tree on the planet. Some residents also believe the trees scrub the pollutants out of the air, and describe the air in the valley as "nice," "clean," and "crisp." Air purifying is listed as one of the reasons people chose to move into the valley, and people see air quality as interwoven with the ecological processes they care about.

Another important value to community residents is biodiversity as it is either referred to as a central value among their 'most important' values, or listed as their most important value:

"I think a lot of the world is going towards monoculture in a lot of things, so biodiversity is really important I think, especially considering possible climate change or any kind of change that can happen in the future. If the biodiversity stays, it leads to a lot of other things too, like research on a lot of plant life hasn't been done yet. It ensures that there are not only old things living, but a mix of things, young and old. There are many more textures and layers if you are in an area with biodiversity compared to a monoculture area."

People list ecological features of valley as major criteria for moving into the valley.

People believe the ecosystem in the ancient forest is relatively intact, and speak about the very high levels of biodiversity they believe to be present in the forest:

"The ancient forest up here is one of the very few, if not the last remaining inland temperate rainforests, as a result you get a whole diversity of plants and wildlife, insects and birds, and all kinds of different animals, and it's unique in the world basically. There is no other place where some of these things grow or thrive or flourish."

People believe the ancient forest also has very high levels of genetic diversity, which some say is important to them. Some believe that to have good genetic diversity you have to leave some areas more or less untouched, and people describe the genetic diversity around them as "hard to beat." On the other hand, some residents don't place such a high value on the biodiversity in the old-growth forest:

"I'm not a real learned man when it comes to biodiversity and all that, but I really don't put a tremendous difference in value to the old-growth cedar forest than I would to any brush around here because I know that that's just as important because there's probably more critters running around for protection in the bush than in the old-growth forest."

Some residents value the habitat that the ancient forest provides for wildlife, and place high values on the fact that some animals need the specific ecosystem conditions of the ancient forest to live. People believe the habitat in the ancient forest is world unique and very important for keeping wildlife in the area: "I think they are doing away too much with habitats, and it's important to keep one natural, where predator and prey are

allowed to have their natural cycles." People speak specifically of the ancient cedar trees as providing good habitat, especially shelter for bears for example, because they are hollow. People believe clear-cutting is detrimental to habitat, and that wildlife would prefer to take shelter deep in a forest rather than in a clear-cut.

Some residents value wildlife very highly and believe wildlife is an integral part of a balanced forest. Types of wildlife people speak about interacting with in the valley include: cougars, bears, mountain caribou, grizzly bears, fish (salmon), deer, elk, and wolves. Some residents express pride concerning their "world unique" wildlife: "We have the highest caribou population and grizzly population that exists in the world." People specifically appreciate seeing owls and moose tracks in the ancient forest, and some love seeing rare animals such as mountain caribou, mountain goats, grizzly bears and cougars: "Those are the ones that get my blood flowing when I see them." People see wildlife on an everyday basis in the valley, however they also contend with wildlife everyday as well. These interactions, including protecting their property from bears, are expressed as enjoyable, but also a nuisance. Finally, one resident expressed concern with the way tourists interact with wildlife in the valley (for example, feeding bears and petting baby cubs) and believes these interactions could be very dangerous.

Carbon storage is believed to be critical by some residents because it is linked to human functioning: "56% of all the carbon that is stored in Canadian forests is stored in the inland rainforest. It's subhuman to destroy this forest because you're destroying your support systems." Some residents say that storing carbon is the job the ancient trees have been given to do, and are therefore against harvesting the ancient cedars:

"Thousands and thousands of cedar trees have been cut down and just wasted, and that carbon is getting dispensed into the atmosphere again. That's another reason I don't want to see any of that harvesting up here at all."

One resident wishes that the government would "pay people 'x' amount of dollars NOT to log your property for carbon storage, etc." so that people could have an economic incentive to hang on to their timber.

People believe that soil quality and quantity is a very important ecological feature of the valley. Some residents complain that when loggers took trees out in the past they didn't conserve the topsoil, leaving only 2-3 inches of topsoil in some parts: "We need to keep our soil quality, and the way to do that is that we have to have some ground cover, and we have to have not only cedar, but other trees and everything else." One resident believes he has an impressive amount of topsoil on his property: "The Brazilian rainforest is growing on 1 cm of topsoil; I have 3 feet of topsoil!" Residents are concerned when the soil runs into the river and turns the river brown: "I think clear-cutting is a disaster. The soils here are very, very slippery." People are also concerned about the soil drying out in the ancient forest: "If the ancient cedar stands dry up this valley is in trouble. There would be a huge, huge fire along here. That forest would go up like crazy. That's what really saves this area, because it is so moist."

Water is seen as very important to residents and it is listed by some residents as one of their reasons for moving into the valley. Many residents see water as a precious resource:

"Fresh water is one of the most important things because it's going to be one of the most valuable commodities on earth. We are very fortunate, but that doesn't mean that because there is abundance you can squander it, because the rest of the world is very envious of Canada with our water."

Majority of people believe the water in the valley is very clean, "perhaps due to the lack of major oil and gas developments that would otherwise pollute the water." People also link the fact that they have clean water to the forest: "The forest protects us – it's the watershed, it purifies the water." Logging is seen as affecting water quality: "The trees are all a part of the cycle that gives us good water, so we just have to protect every element of the cycle." In general, water seems to be a point of pride for Dome Creek and Crescent Spur residents.

4.4 Socio-Cultural Values

Socio-Cultural values are those contributing to the identity and well-being of the social collective and the participation of individuals in that collective. End values include community (cultural expression aboriginal/non-aboriginal, "the people," discovery), generation sharing, education (research), and heritage. Cultural expression refers to the beliefs, norms, language, and material traits of a particular social group. Generation sharing entails people from different generations learning from each other. Education has to do with the fact or condition of having information, or of being learned, and research is a process of that. Finally, heritage is something immaterial, like an ideology that is passed from on generation to another.

4.4.1 Guestbook and Survey

Many comments in the guestbook express values contributing to the identity and well-being of the social collective surrounding the ancient forest. The majority of comments convey gratitude towards the different people involved with the Ancient Forest

Trail, such as volunteers, researchers from UNBC, community members and groups, and the TD Friends of the Environment Foundation: "Thanks to all who studied it, saved it, and are bringing it to the world's attention." Trail users express thanks for the work that has gone into "championing the cause" of "saving" the forest. Some trail users refer to the community members involved with the protection of the forest as "guardians," and one trail user wrote, "Never underestimate the will of just a few people to bring about positive change." Comments also express gratitude for making the forest accessible, such as: "Thank you for your work of love in providing this opportunity for all to connect to this treasure." Others users appreciate the ongoing trail improvements and write thanks to those who work on maintaining the trails.

Many trail users stress preservation values, such as: "I sincerely hope we are successful in preserving this wilderness," and write about "fighting" to save the trees ("Keep up the good fight!"). Other types of socio-cultural values conveyed feelings of provincial or national pride due to the forest being close to Prince George, British Columbia, and in Canada: "A true treasure in our backyard," "Glad to be part of this province," and "We are lucky to be in Canada." Visitors from Prince George expressed surprise that they were unaware of the forest's/trail's existence for so long, and sometimes express that it feels as if they are in another country when they are in the forest. Some visitors write comments that compare the ancient forest to ecosystems in their own countries ("We do not have such in Germany, so you should keep them here!"), or comment that the ancient forest is as "magnificent as," for example, the California Redwoods.

There are many comments that refer to the forest as a hidden treasure, jewel, gift, treat, and some trail users say they "love" the forest. People write that they are "inspired" after hiking in the forest, either by the conservation efforts that took place around the trail, or by the ancient cedars themselves. A couple of trail users write that the forest reminds them of fantastical places from films, such as *Lord of the Rings* and *Jurassic Park*. Trail users want to know what they can do to help with the cause of protecting the forest, and write about their desire for the forest to become a national park, heritage site, or "at least a protected site."

Some comments refer to the 'discovery' of the forest, sometimes linking UNBC graduate student, Dave Radies, with "discovering this spectacle of nature." Other comments value the experience of feeling like you are the first person in the forest, and others say they would prefer to keep the forest less accessible so they can keep the special feeling of the forest as "a place where only adventurers go."

Trail users, as well as UNBC students and professors who have been brought to the forest for class lectures, stress educational values. Many comments especially surround the importance of experiential learning in the forest for children:

> "We thoroughly enjoyed our walk through the "sacred grove." We particularly enjoyed watching the children and their delight and wonder at these forest giants. It is only through such experiential learning that the children, who are our future, will come to understand the intimate connection we have with nature and that really, we are servants of nature. Thank you!"

Many people use the word 'wisdom' in their comments to explain what they received from their time in the forest and with the ancient cedars. People speak about "exploring" and "learning" in the forest, and say that the forest is stimulating for the mind. Finally,

some visitors refer to the forest as "a time capsule of history," which contributes to heritage values in the socio-cultural category.

4.4.2 Media Pieces

Values that contribute to the identity and social well-being of individuals and the collective include many preservation sentiments relating to old-growth in the ITR. The *Prince George Citizen* reported that efforts began in the late 1990s by community groups to designate the interior cedar-hemlock forest and Driscoll Ridge toe-slopes as old-growth management areas (Prince George Citizen 2008). Some community reports say that because the ancient cedars are one of the earth's oldest and largest living organisms, and because they produce the most productive ecosystems on earth, they deserve our commitment to protect them. A community resident from the documentary believes, "To see the forest logged does not serve the public in the long-term as well as it would if it were preserved as an interpretative trail" (Block 486 2006). Some sources write about the opportunity to designate the area as a new world heritage site, and because the ecosystem occurs exclusively in Canada, some sources say it should be up to Canadians to ensure its long-term preservation. Media sources also refer to the ancient forest as a "treasure," and one German tourist wrote in her online blog that seeing the cedars was "a dream come true" for her (Opinion 250 News 2010).

Community values also include employment and logging, however, though timber is a valuable resource for the communities, it is expressed by residents that:

> "Part of the role of community in British Columbia is to participate in the management of the environment that surrounds us. So we're hoping that community, government and industry can work together to ensure the long-term sustainability of the ancient forest ecosystem" (Block 486 2006).

Discovery is also a value expressed about the ancient cedar stands in the media: "Tourists tell us that one of the highlights of a trip here is the sense of discovering a place that's not very well known or publicized. This is one of a dozen such unique sites in the world" (Straight.com 2010). Dave Radies is attributed in many media sources as being the "forestry researcher" that discovered the large cedar trees surrounding what is now the AFT, and this discovery is said to have created excitement in the international scientific community. An online blogger linked discovery with protection of the ancient cedars: "If we can get more visitors then maybe everyone will be able to discover just how special this area really is – making sure the land is protected and appreciated" (Miss604 2010).

Media addresses children benefiting from the forest through the development of their imaginations and learning from the informative signs. Educational value in the forest is also showcased by the UNBC classes that come to the forest for labs, plant diversity surveys, etc.: "Multiple UNBC researchers and classes have visited the region to study the region's biological systems and their value for recreation, biodiversity, and economics" (UNBC 2007). Research is also valued in the media because it brings people to the forest:

> "These forests are now yielding more newly discovered species than any
> other forest on Earth, due in part to research funded by the Valhalla
> Wilderness Society, and in part due to the independent efforts of scientists to
> document this threatened biodiversity before it is destroyed by clear-cut
> logging" (Valhalla Wilderness Society 2003).

In a Forest Practices Board report, the chief forester in the region also encouraged and supported the on-going research being documented in the ICH: "This research will help

improve forest management policies and practices, which can be reflected in future timber supply analyses" (Forest Practices Board 2008).

Finally, heritage values are mentioned in community documents as being important as the age of the ancient forest is seen as connecting people to a sense of legacy, "of passing on the essentials of life from generation to generation" (Valhalla Wilderness Society 2011). People believe it is important to preserve their heritage for the future, and this is linked to preservation of the ancient forest in some media. The *B.C. Forest Professional Magazine* wrote, "In today's world global recognition of these legacy values is a potent economic tool. Managed properly, it can encourage the development of new economies in B.C.'s central-interior region" (2010).

4.4.3 Household Interviews

Some residents link the ancient forest to their identity and social well-being: "I value the ancient cedars in specific because that's where I feel the presence of the old forests are contributing to my quality of life the most," and:

> "All the cedar trees as you drive down in here were slated to go a few years ago, and we fought really hard to keep them, mostly just for the drive down, because it's peaceful, and when you get off the highway there's a calming effect."

Some residents express the desire to see people living harmoniously in the valley with roots deeply planted, "not expecting the forest to give them great wealth so they can haul it away to some other place." People also want to live sustainably, and stress the importance of local economies. Some residents count themselves lucky to live in the valley: "We have an almost ideal situation where humans can interact potentially in a positive way with the natural ecosystem. That is pretty rare, particularly in the northern

hemisphere." Other residents simply say that their community has just been the "right place" for them. People stress that the forest is a big part of their communities: "We've all logged and used the forest, and flown over it, and driven by it, but as soon as you realize that it is a forest, then you express the forest through what you do."

Residents say that there are a lot of people who use the forest who still want to see the forest standing. Some residents wish people would think in terms of generational impact: "We should save the ancient forest for future generations, so that kids can see them. I used to log for a living, but now there's hardly anything left – save it! Save the forest!" Residents also value education in the cedar forest, and link the age of the ancient cedars to their educational value, "Old-growth has stood the test of time so I think we can learn from it." People believe the signs at the Ancient Forest Trail are educational: "It's super that they're putting the signs up around as well to educate people so they know what they're looking at and that they're also starting to understand." Tourism is linked to educating people around the world about the importance of the ancient cedars, and education is also seen as a tool for preservation:

> "The rainforest is an incredible teaching tool and I think that the more engagement there is where people have first-hand experience, the more you can come away with a commitment to seeing that survive, so there is a small connection there."

Residents express interest in getting people to study the forest, and see the knowledge gained by research as a way to help people take care of the ecosystem. People believe there is a lot of research left to do with the ancient cedar trees: "That's the cool part of it – there's more to be explored in a world that you think is explored out."

4.5 Ethical Values

Ethical values are defined as those supporting a personal or collective moral

claim, including a sense of responsibility to other people, nations, generations and

species. They include intrinsic worth values such as interconnectedness, age of trees, size

of trees, rare, uniqueness, stewardship values, and inter-generational equity values.

Intrinsic worth is defined as the designation of inherent worth and moral relevance

through rational or emotional identification with something that is 'other'. Stewardship

refers to a sense of trust and care through the conscientious and responsible management

of something. Lastly, inter-generational equity is the concern for the rights and needs of

future generations.

4.5.1 Guestbook and Survey

Values supporting personal and collective moral claims in the guestbook include

the importance of interconnectedness and the web of life within the ancient forest. More

prominently, trail users express many values relating to the age of trees in the forest.

Comments express that the trees are not a renewable resource because of their age, and

should therefore be preserved. People write about being surprised that there is such an

"old and amazing forest in Canada," and comment about being "impressed" and

"amazed" at the age of the trees, which some trail users believe helps them gain

perspective on time: "We humans are just nibbling on time. The trees are the time."

People express being surprised by the size of the trees as well: "We've never seen

so many big trees in one area, often only one is kept." The words people use to describe

the size of trees in the forest include tall, huge, gigantic, big, large, giant, magnitude, and

some trail users say they are the biggest trees they have ever seen. People comment specifically about 'Big Tree' on the trail as being "amazing" to them.

Visitors believe the forest is unique and use the words "special," "different," or "an anomaly" to explain this value. People attribute the forest's uniqueness to its location as well as the fact that it has been able to survive for so long. People also regard it as unique because they have never seen something like it before (either in the size of the trees, or the beauty of the trees) and recognize that there is only one forest like it in the world due to its location inland and above the equator. Finally, people link the forest's uniqueness with the desire to preserve it: "What a great spot – must be preserved, can't be many more wonders of the world!" People also believe the forest is a "rare treasure" or a "rare gem" due to the fact that they don't see trees like the ancient cedars often anymore, "To observe a biosphere so rare as this makes me wonder if our common sense and duty as individuals to be respectful to our planet will hold up and hold onto what we have."

Stewardship values can also be seen in preservation comments, especially those expressing the desire to make the ancient forest a protected park. Other comments are explicit in saying that nature is for humans to protect, and people go on to link ideas of preservation with inter-generational equity, which is expressed through comments about saving/protecting the trees for future generations: "Hope this area stays as it as now for generations to follow."

4.5.2 Media Pieces

Interconnectedness is discussed in the media as people stress the importance of the web of life in the ancient forest, as well as the dependence of humans on the ecosystems that support them. A community member in the *Block 486* documentary commented:

> "In some ways the animals are nourishing the rainforest, in some ways the forest is nourishing the animals, and it's a circular system, and as soon as you pull a piece out the whole system collapses. Lichens are in the system, mosses, all the birds and all the mammals that are here are parts of the system. So the maintaining of this rainforest is so critical to many, many species" (2006).

It was also written on the B.C. tourism website, "When one of the brethren dies and falls, it returns its nutrients to the earth and thus its death spawns new life" (British Columbia 2010).

Age of trees is seen as important in the media, and it is written on the *Valhalla Wilderness Society* webpage, "Just how diverse human life spans create human culture over many years, many tree life spans create an antique forest over many centuries" (Valhalla Wilderness Society 2003). People talk about the trees standing guard over creatures of the forest and some media expresses hope that representative stands of the oldest of these forests will be permitted to persist. Also, age of trees is linked to carbon storage as the older a tree is the more carbon it stores. The oldest forests of the Robson Valley are also said to contain some of the most complete records in existence of inland B.C.'s biological past, and "may in fact contain one of the longest unbroken biological traditions of any forested inland region at temperate latitudes" (Block 486 2006).

Some of the comments from media about size of the trees include, "Massive red cedars," "Many of the more than 10-feet in diameter," "Towering with amazing gnarled branches," "Record-sized Ancient Red Cedars," "There's something elementally

impressive about the large trees," and, "No matter how many times you stand beside one of these behemoths, the scale of so much biomass on display brings you up short." There were also many comments about the value of the rarity of the ancient forest: "Only a fraction of the interior cedar-hemlock forest consists of stands similar to the Ancient Forest Trail" (ILMB 2008). The forest is considered one of the world's last primeval landscapes, rare in Canada, rare in the world, and a globally rare ecosystem boasting rare species; for this reason the need to conserve it is presented as an urgent argument in some media pieces.

Uniqueness is valued in the ancient forest as expressed through almost all media sources: "I think that the inland rainforest of B.C. is worth a great deal because it is in fact unique in the world," said a UNBC researcher in the *Block 486* documentary (2006). Comments in community and government sources express the significance of the trees through their uniqueness, and believe visitors will enjoy the forest and tell their friends about it for this reason. The mountain caribou habitat contributes to the forests' uniqueness, as stated in some scientific articles. Uniqueness is also attributed to the amount of old cedars in the area of the Ancient Forest Trail.

Stewardship values are expressed through comments in media such as, "It is entirely up to Canadians to ensure [the forest's] long-term preservation. No one else can do it for us" (Save-the-Cedar-League 2007). As well, a letter from a German environmental group called Robin Hood was published in a community report, and said: "It is your responsibility to maintain this heritage of humankind for the next generations on this planet" (Save-the-Cedar-League 2007). Other articles say that humans have a duty to maintain rare wild places and leave the future generations with a world enriched by

human stewardship. Sentiments also explain that the trees deserve our commitment to protect them, and that part of the role of community in British Columbia is to participate in the management of the environment that surrounds us.

A community report also expressed inter-generational equity values, hoping that representative stands of the oldest of these forests will be permitted to persist as outdoor laboratories for coming generations of forest research. One source explained:

> "There is no inheritance more important to pass on to one's children than a healthy planet... The campaign to stop the logging of old-growth Inland Rainforest is critically important to the future of our children" (Save-the-Cedar-League 2007).

It is clear through comments presented in newspaper articles, community reports, and government documents that there is some importance in the eyes of the public to raise awareness about the ecological history and significance of the ancient cedars, which may give them an opportunity to "grace many more generations with their presence."

4.5.3 Household Interviews

Some people believe the ancient cedar trees have inherent worth: "The value is in the tree itself, not so much the lumber, or product, or whatever you get out of it," though residents find it much easier to explain their worth in terms of what they can do (teach, nurture, etc.) and express many of the end values of inherent worth present in the framework (age, size, rare, etc.). Other resident's find it harder to see inherent worth in the trees, and ask, "besides the size and age of the trees, what are they good for?"

Interconnectedness is a value that many people relate to and use to express their overarching feelings concerning the importance of the ancient cedars. Interconnectedness is described as complex and intricate, and some residents refer to it more easily as the

"web of life." People speak about the value of interconnectedness between cedar trees and other features of the valley: "All the other forests are like the buffer zones for the cedars to keep them from drying out. If you removed all the other forests, you'd remove the buffers and all the cedars would dry out." People also express interconnectedness between cedars and animals: "You take away the trees, you take away the animals, and it just falls from there." One resident speaks about a cedar he has on his property as being a mother tree: "I've left it standing because it provides so much habitat, food, and fertilizer for that specific spot it's on. It's been a mother tree for 5 or 6 hundred years." A lot of people link the idea of balance to interconnectedness: "If you take one thing away, you create an imbalance," and one resident describes interconnectedness as 'symbiotic relationships' between certain species, "For example, I don't think those cedars would be as old as they are if it wasn't for some of the lichens on them, so they feed each other and grow with each other, which I think is amazing."

Age of trees is popular value among residents in the valley, and is linked with many other values such as education, research, tourism, majesty, perspective/insight, and uniqueness. Some residents regard the ancient cedars as the oldest trees left in North America, and other residents list the age of the trees as one of their reasons for moving into the valley. Some residents speak about the difficulty in determining the age of the trees, and claim that this makes the cedars more interesting. People are generally impressed with the age of the cedar trees in terms of the seemingly perfect conditions the rainforest ecosystem provides them with to reach ancient ages, as well as the changing forest conditions they have had to survive through. Residents believe that their age is a triggering point for interest and education. Many residents point out that the ancient cedar

forest takes longer and is harder to replace than other forest types, and this adds to the value of the trees: "I was a logger, and I'd say inherently the older something is it seems to have more value to me. It's harder to replace, and takes longer to replace." Residents also link the age of the cedars to the need to protect/respect them: "All we hear at meetings here is 'trees are a renewable resource' but I don't think they understand the complexity of how old the trees are and what a big job they do in the ancient stands." Some residents, on the other hand, value young cedar more than ancient cedar:

> "I believe that the young cedar are more important than the ancient cedar because the ancient cedar is a dying and decaying forest. There's a bunch of biomass going to waste there, and sure they are ancient, but they'll fall over in a hundred years, but the young ones that are growing up are going to last 400-500 years too if we don't cut them down. Although the ancient cedar are big and barky and beautiful, they don't really have as much green mass to them because once they're done growing, they're done, and they're hollow in the middle."

Size of trees is also valued among residents, especially for those who recognize the cedars as some of the biggest trees in North America. People enjoy the size of the cedars and are proud and impressed when they speak about how many people it takes to reach around the trees: "There is one grand daddy tree that us three couldn't reach around even halfway probably. The rest are big like this table."

The ancient forest's unique and rare location inland is another reason residents value the forest. People believe the cedars are rare because there are not many ancient trees left in the world, and some believe the forest is unique due to it's location in the province; for these reasons people believe that it is important and deserves protection/preservation. On the other hand, some resident's don't see the trees as rare or unique; they just seem them as part and parcel of the valley.

Some residents value stewardship through a conversation lens. For example, one

resident came to the valley looking for "the largest biodiversity forest with the most

massive trees in the world" because they wanted to protect it. Some residents believe that

they are in a proactive role of "caretakers of their ecosystem" and believe stewardship

will play a big role in the future. Intergenerational equity values are apparent in resident

comments, the most popular being desire for children/grandchildren/nieces and nephews

to be able to see, experience, and value the forest. Some residents are concerned that if

logging in the valley stays as it is, there won't be anything left for "the kids":

> "We have grandchildren now and we'd love for them to be able to walk the
> ancient cedar forest and see it untouched. We raised our children hiking in
> the woods in the area, so for future generations to be able to do that with so
> much freedom would be great."

4.6 Spiritual Values

Spiritual values are those associated with the experience of "being in touch with

an 'other' that transcends one's individual sense of self and gives meaning to one's life at

a deeper than intellectual level" (Moyer et al. 2008). The category includes values such as

sacredness, sanctuary, harmony, perspective/insight, and peace. Sacredness is the

experience of, or connection to, that which is holy or divine, and sanctuary refers to a

place of refuge and solitude. Harmony is described as the combination of elements that

form agreement of feeling, and perspective/insight is the act of apprehending the inner

nature of things or of seeing intuitively. Finally, peace refers to a mental or spiritual state

marked by calmness of heart and mind; spiritual serenity.

4.6.1 Guestbook and Survey

Some people refer to their experience in the forest as a "spiritual journey." Some comments discuss the "energy" felt in the forest and from the ancient cedar trees, and trail users talk about how they "connected" with the forest while on their hike. One trail user said, "Wonderful place to refuel the spirit!" and another commented, "There is a wonderful energy here that needs to be nurtured. Beautiful place to meditate." People also report being "in awe" of the trees, and feeling as if they are in "another world" when they are in the forest. People refer to the ancient forest as a "fairytale forest," and use the word "transcending" to describe their experiences in the forest. Some people have the feeling of "going into the past" on their hikes, and people refer to the forest as a "miracle." Many comments represent a religious spirituality as they express thanks God and Lord Jesus for what they believe is "God's creation" (the forest). People also value the forest as a sacred place as well as a sanctuary, commenting on the silence, solitude, and feeling of escape they get in the forest.

Trail users value harmony in the forest, and write things such as, "is refreshing to the soul," "feels like home," "gave us a great feeling," has an "amazing atmosphere," "soul healing," "paradise," and "uplifting," "In the forest I am whole, perfect, strong, powerful, loving, harmonious, and happy." People also have strong feelings of peace in the forest, and describe their experience as relaxing, calm, silent, peaceful, serene, and tranquil. A volunteer working on the trail wrote, "Relocated the trail counter before relinquishing my cares and woes to the peace of the Ancient Forest."

Finally, expressions of the value of perspective/insight can be seen in comments such as, "Reminds me of how precious and marvelous life can be," and "My hike inside

this anomaly has now and forever changed my view on natural resources and human

aesthetics." Many people also report that their experience in the forest makes them take

another perspective on conservation and resource use.

4.6.2 Media Pieces

A community resident in the documentary *Block 486* referred to the ancient forest

as "heaven," and another resident in the documentary commented:

> "To me the forest is worth a spiritual connection that connects me to
> eternity. When I walk into that forest and meet these trees I feel immortal.
> As immortal as the trees are; as nature is" (2006).

There is also reference in some media to the forest being a "sacred place."

Harmony is valued in the forest, and one community source reports experiencing

a "hidden music" amidst the silence of the old-growth forest (Valhalla Wilderness

Society 2003). People also appreciate the value of peace in the forest, as they refer to the

cedars in some media as "peaceful giants." Lastly, perspective/insight values are

expressed in media through comments such as: "Everything in the Ancient Forest is

bigger – the trees, the ferns, and the awareness that as humans we are only privy to a

snapshot of the cycle of life" (Tourism Prince George 2009). Also, "There's a sense of

'being' here that you won't find elsewhere; the sense of appreciation for who we are as

human beings" (Straight.com 2010).

4.6.3 Household Interviews

Some residents speak about valuing feelings of transcendence and deep meaning

in the ancient forest, which come through in comments such as, "The cedar forest is a

spiritual place where I feel connected," and "You definitely do feel different when you're in that forest." Some residents believe that this feeling of spirituality is an important part of their being. Other residents do not feel that the ancient forest is a more spiritual place than other forests, and some feel it is even less of a spiritual place than other forests. Sacredness is also a spiritual value that has different meanings for people. One resident links the value to inherent worth: "The word sacred just means that it shouldn't be touched because it has value," and other people link the size of trees and the trees themselves in the ancient forest to feelings of sacredness. Other residents do not think the forest is a sacred place and are weary of those who do: "A lot of these tree huggers are making a religion out of it, and when that happens, don't push your religion down my throat," and "I believe every life is sacred, but putting a tree in front of a human being goes a little bit too far for me."

Some people believe the forest is a sanctuary for people and wildlife, which is linked to the undisturbed nature of the environment, and residents also speak about the quiet and solitude they find in the ancient forest. People have values of harmony and peace in the forest expressed through comments concerning the calming atmosphere in the ancient forest, which some residents believe is good for their mental state. Finally, perspective/insight is valued by many residents, and is most commonly linked with the age of the ancient forest: "These ecosystems have been in place for a long time, and if we look at them we can have a different appreciation and understanding of how important [they are]." Residents see the perspective they gain in the ancient forest as a way to keep their "egos in check," and some residents report feelings of insignificance in the forest:

"It's a very grounding experience, and you feel that you are part of (which you are) the natural environment."

4.7 Aesthetic Values

Aesthetic values are based on a sensory appreciation of the physical qualities and features of the forest and include end values such as beauty, magic, majesty, natural/undisturbed state, and senses. Beauty is the pleasurable qualities associated with artistry, form, colour, and originality. Magic is something that creates an effect of otherworldliness, and majesty refers to large and impressive in size, scope, and/or extent. Natural/undisturbed state is that existing in or produced by nature; not artificial or an imitation. Lastly, senses are the physical sensations such as smell, taste, temperature, vision, and hearing.

4.7.1 Guestbook and Survey

People describe the scenery of the ancient cedar stands as rustic, beautiful, awesome, and enthralling. They compare the forest to Cathedral Grove on Vancouver Island and similar scenery in Vancouver. Comments mention the green trees ("lushing greenery") in comparison to some of the pine beetle destruction in the area. One trail user wrote, "A delightful diversion on an otherwise unremarkable highway."

Other words used to describe the beauty of the forest are stunning, picturesque, spectacular, fresh, wonderful, shining, magnificent, cool, strange, fascinating, interesting, breathtaking, and stupendous. People speak very positively about the beauty of the forest, for example, "Everywhere you turn there is more beauty," and "Makes life worth living

to hike in beauty such as this." People link beauty with sacredness, as well as with the need for preservation.

Some people also say the cedars "look" magical, and people use the words enchanting, awe-struck, unbelievable, wondrous, impressive, and majestic to explain the value of majesty. Trail users comment that the forest feels like an undisturbed place, even a place where they feel as if they are "intruding on nature." People who express that they would like to see the forest remain natural are concerned with not disturbing the roots of the trees. Finally, people value senses such as the sounds and smells of the forest. One trail user commented that the rain in the forest made their hike a "musical experience," and others say that the oxygen and smells of cedar are refreshing and amazing.

4.7.2 Media Pieces

It is found in some media that the public hopes that the ancient forests will be appreciated for the aesthetic value rather than a source of lumber. Aesthetic values are captured in comments from visitors on online blogs: "Carpeted with a deep layer of Champagne powder, this outdoor cathedral of towering trees reached to the wintry sky like so many spires" (National Post 2010). High quality photographs of these aesthetic experiences are attached with the comments found in online media pieces (Los Angeles Times 2010; Miss604 2010; Robot Blogger 2007). The cedars are often described as beautiful in other sources, and some sources speak about the experience of being "transported back in time," or "traveling through time" in the forest, which represents the otherworldliness value of magic. Other magic values are related to children's imaginations, "[Children] have a field day in the forest imagining all the elves and

goblins that may live in the nooks and crannies of these gnarled and whimsical trees"
(Prince George Citizen 2008). "Awe-inspiring" and "impressive" are common terms
found across media sources that describe majesty values. As well, many media pieces
talk positively about the natural/undisturbed state of the forest: "Small bridges and fences
marking the trail boundaries are some of the only signs humans have visited the area"
(Prince George Citizen 2008).

Finally, it is found that the public values the sensory experience in the forest:
"The scents and smells of the forest air are as rich as the ecological history embodied in
the trees, and one follows the trail in a sense of amazement," and "At one point I think it
stopped snowing but flakes continued to float around like flour, gracefully sifted through
the outstretched arms of the giants." People also appreciate that the forest, even in the
winter, is alive with colour.

4.7.3 Household Interviews

The landscape in the valley is described as "entertaining," and people believe the
beauty in the valley is "self-evident." Residents describe aesthetic features including the
mountains, trees, old-growth/ancient growth, and young growth in the valley:

> "The mountains with the trees on it are the beautiful part of the landscape. It's
> nice to not have to look at high-rises, tar, and pavement, or go through tourist
> traps. There is a lot of wilderness here and that's what adds to the beauty of
> the landscape."

Aesthetically, residents point out that it is undesirable to walk into a clear-cut, "and
nobody will." Some people believe that the ancient forest, as well as other forests in the
valley, are beautiful and attribute moving and staying in the valley to the beauty of the
forests. Some residents, on the other hand, don't put any importance on the beauty of the

ancient cedars: "I don't find the ancient cedars beautiful; to me the only thing I see

holding up a cedar tree is the bark."

Some residents value magic and majesty in the forest, which are expressed

through comments about feelings of release and the sensation of being "somewhere

special." Residents place high value on the natural/undisturbed nature of the ancient

forest and some say it provides them with a space to feel part of the natural environment:

"The fact that it's undisturbed and there is wildlife – it's hard to find that in the world."

People, however, are concerned about logging and trail building disturbing the natural

state of the ancient forest. Others believe that trail building is not that harmful in the

ancient forest: "It's nice to leave things in an undisturbed state, short of excluding putting

in some trails and stuff like that, but you're not really doing that much damage to make a

nice walking trail for people." Finally, one resident speaks about the senses that he values

everyday, "from the first bird chirping in the morning, to the smells, to the sound of the

creek gurgling by my window."

4.8 Results of Quantitative Analysis

4.8.1 Valley Forests versus Ancient Cedar Stands

The objective of the first section of the survey was to set the context for talking

about values and to assess the relative importance of the forest in relation to the

participant's lifestyle in the valley. The first set of questions helped to understand the

relationship residents have with the valley and its forests. A Likert scale question was

used to measure a) the importance of all the forests in the valley relative to one's

lifestyle, and b) the importance of ancient cedar stands relative to one's lifestyle. The

scale included the following options: 'highly important,' 'important,' 'moderately important,' 'somewhat important,' and 'not at all important.' There was little variation in the results for all forests in the valley, as participants either selected 'highly important' (82%) or 'important' (18%) (Chart 1). Answers to the ancient cedar stand question were dispersed across the scale, revealing a slightly higher 'not at all' (9%) response than a 'somewhat important' (6%) response.

Chart 1. Importance of all forests versus ancient cedar stands
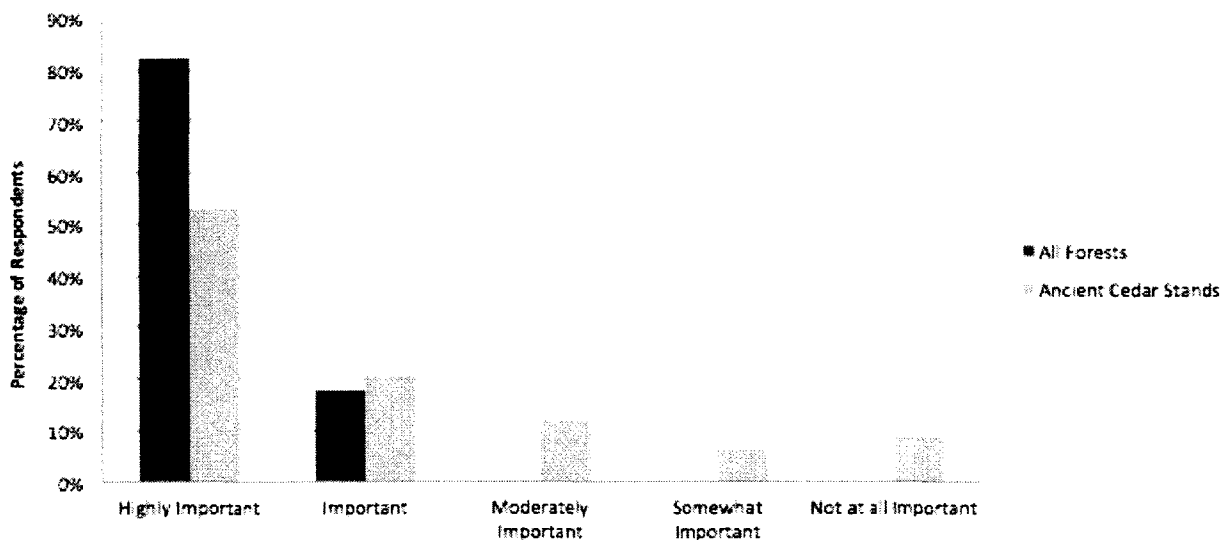
4.8.2 Most Important Cedar Values

As part of the value exercise in the interview guide, participants were asked to create a smaller list of their 'most important' ancient cedar stand values. The amount of 'most important' values that participants selected in the interviews varied with a range of three to fourteen and an average of five. Thirty value exercises were completed in total, as four of the participants chose not to participate in the exercise either due to difficulty as a result of age, or disinterest. A total of 167 'most important' values were selected

across 30 interviews. Results showed that air purifying was the most popular 'most important' ancient cedar value with a frequency of 14 selections among participants (Chart 2). Habitat was the next most prevalent value with a frequency of 10 selections among all participants. Following habitat was natural/undisturbed state with a frequency of 9 selections, and beauty with a frequency of 8 selections among all participants. Age of trees, tourism, and water quality and quantity were tied with a frequency of 7 selections for each. The top five 'most important' values fall mainly under the value categories of life-support and aesthetic, including one economic value and one ethical value.

In Chart 3, results show that life-support values were the most frequently selected 'most important' values among participants, followed by economic values, ethical values, aesthetic values, socio-cultural values, and spiritual values. Chart 4 demonstrates the percentage of times an end-value was selected at least once for each value sub-category. Again, end-values under the life-support category were most frequently included in resident's 'most important' values surrounding the ancient cedar stands, followed by aesthetic, ethical, economic, spiritual, and socio-cultural.

Chart 2. The 'Most Important' Values Selected by Local Residents (n=30; the number of end-values selected by each participant varied.)

Number of Times the End-Value was Selected as 'Most Important'

Forest Values (y-axis, top to bottom):
Air Purifying, Habitat, Natural/Undisturbed State, Beauty, Age of Trees, Tourism, Water Quality & Quantity, Biodiversity, Carbon Storage, Landscape/Scenery, Cedar Products, Genetic Diversity, Sacredness, Uniqueness, Wildlife, Education, Soil Quality & Quantity, Interconnectedness, Intergenerational Equity, Recreation, Timber, Inherent Worth, Magic, Majesty, Rare, Sanctuary, Stewardship, Trails, 'The People', Cultural Expression (aboriginal), Cultural Expression (non-aboriginal), Energy, Heritage, Hunting, Research, Senses, Shelter, Size of Trees, Wild Edibles
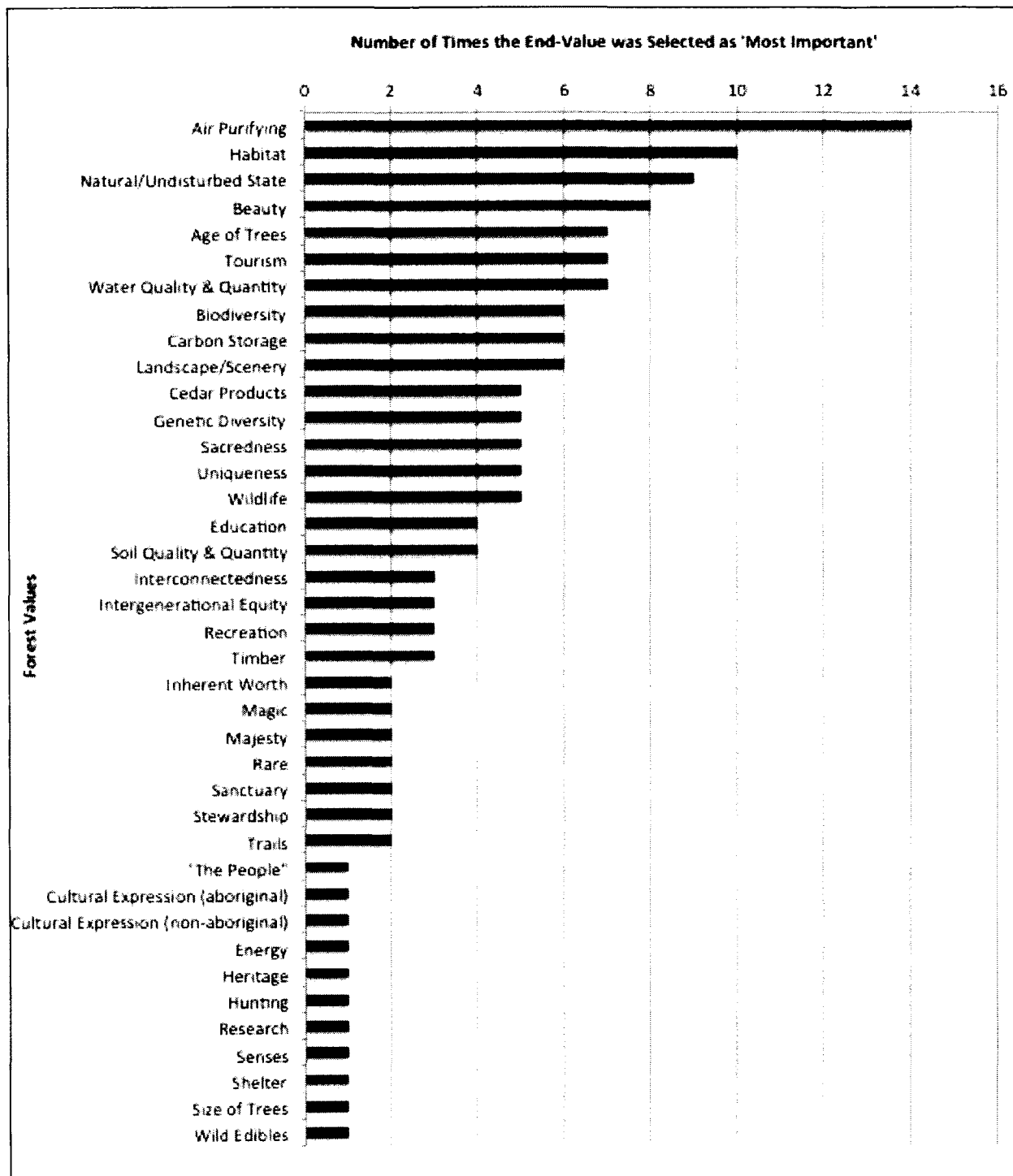
Chart 3. 'Most Important' Values Arranged by Subcategory (the number of end-values selected by each participant varied.)

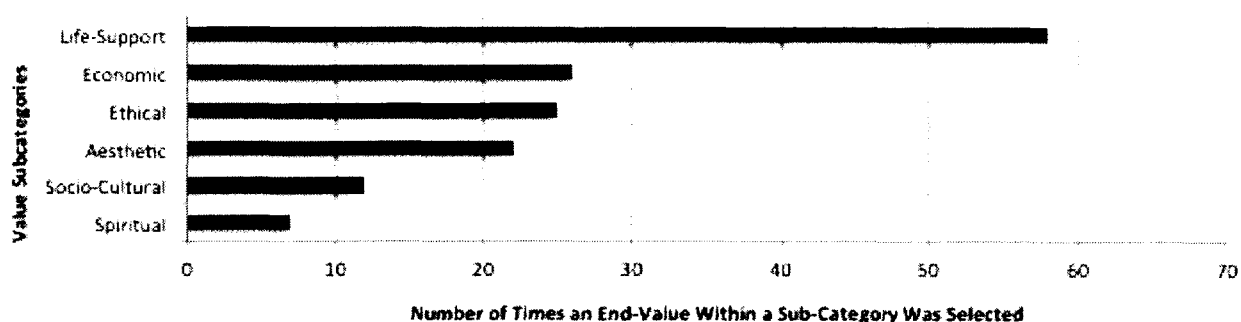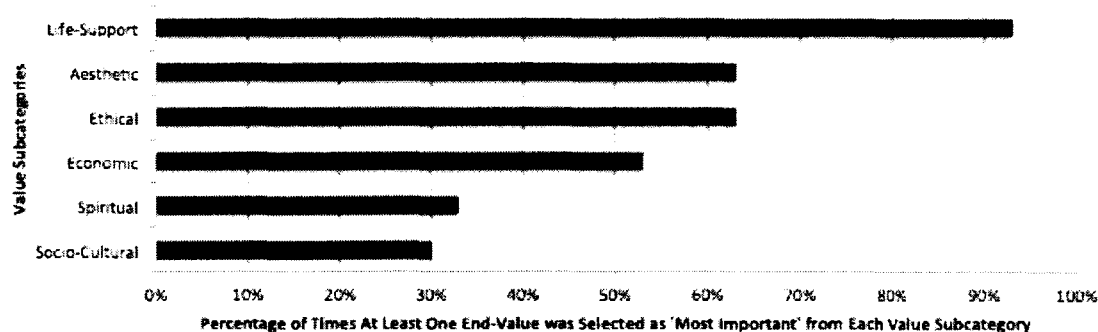**Number of Times an End-Value Within a Sub-Category Was Selected**

Chart 4. 'Most Important' Values Selected At Least Once Per Subcategory (n=30)

Percentage of Times At Least One End-Value was Selected as 'Most Important' from Each Value Subcategory

4.8.3 Relationship between forest values and sociodemographic characteristics

Forest values and various sociodemographic characteristics such as gender, years lived in the valley, and community were explored to identify relationships, if any, varying variables. The figures below describe the differences and similarities between different sociodemographic groups of local residents according to Moyer et al.'s (2008) subcategory values. Percentages show the frequency with which each group (e.g. male/female) chose at least one value from each of Moyer et al.'s (2008) subcategory values as part of their 'most important' values list. The economic value subcategory was separated into 'timber,' 'tourism,' and 'other economic values' because the end-values of

103

'timber' and 'tourism' have the potential to represent conflicting opinions, therefore

viewing them separately allows for a greater understanding of the subcategory.

The variable 'gender' represents male and female respondents (Chart 4). Results

from six surveys that were answered by couples were left out of the 'gender' calculations.

Females in both communities did not choose timber as one of their 'most important'

values surrounding the ancient cedar stands, and only 20% of men included it in their

'most important' value list. Males also appear to favour 'other economic values'

associated with the ancient forest, while females favour tourism slightly more than males.

Other values among gender groups seem to have received very similar amounts of

endorsement, with only socio-cultural values appearing to be favoured more by females

than males (see Chart 5).

Chart 5. Value Categories Favoured by Males and Females (Male: n=15, Female: n=8)
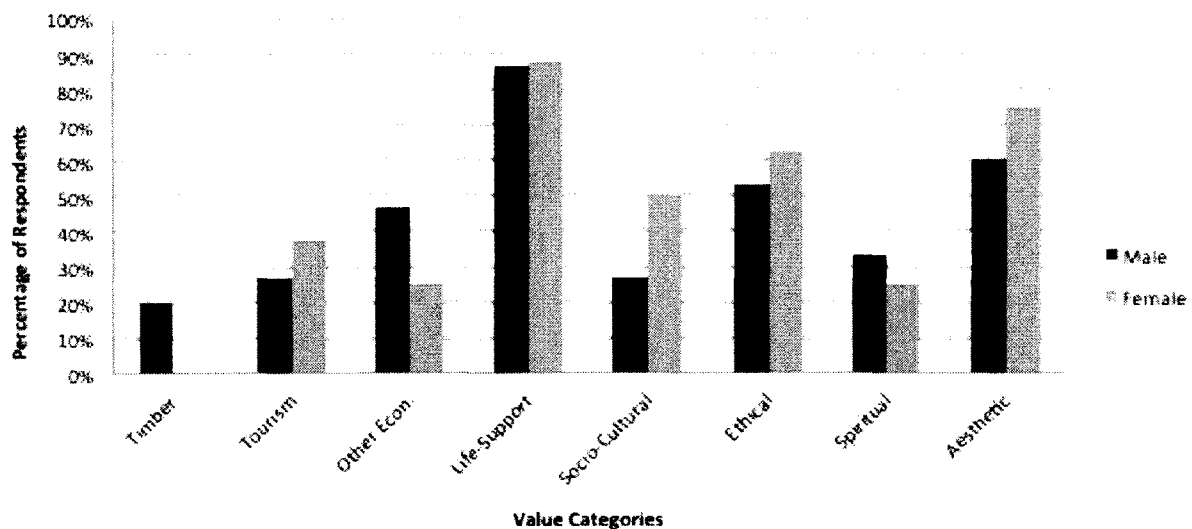
The variable 'community' refers to the two communities involved in the study,

Dome Creek and Crescent Spur. Chart 6 displays 'most important' values selected by

residents from each of the communities. Results show that Dome Creek and Crescent

Spur have a very similar breadth and selection of 'most important' values, with Crescent

Spur residents stressing importance on all three economic end-values slightly more than

Dome Creek residents.

Chart 6. Value Categories Favoured by Dome Creek and Crescent Spur (Dome Creek: n= 19, Crescent Spur, n=11.)
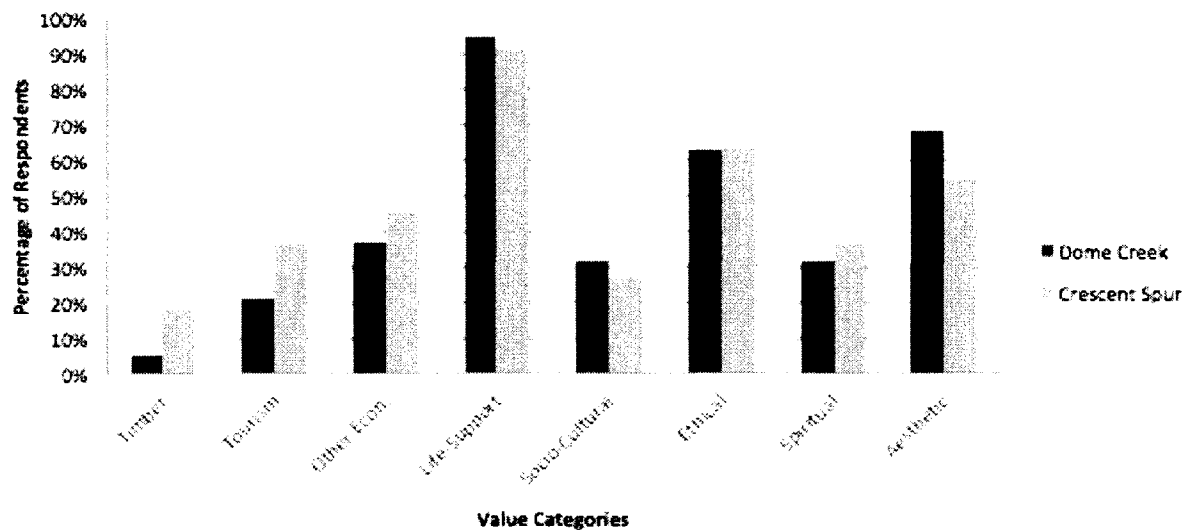
The variable 'years of residency' is separated into two categories: '5 and less' and

'more than 5' (see Chart 7). This describes whether the resident is relatively new to the

community, or conversely, has been living there long enough to settle in. The average

number of years lived in the valley is 22 in Dome Creek and 18.5 in Crescent Spur.

Residents who have lived in the valley for more than five years stress the importance of

timber, tourism, and other economic values more than those who have lived in the valley

for five years and less. Residents who have lived in the valley longer also selected ethical

values as 'most important' more frequently, while the rest of the value subcategories

represent close similarities between the two groups.

105

Chart 7. Value Categories Favoured by Years Lived in the Valley (5 and Less: n=22, More than 5: n=8)
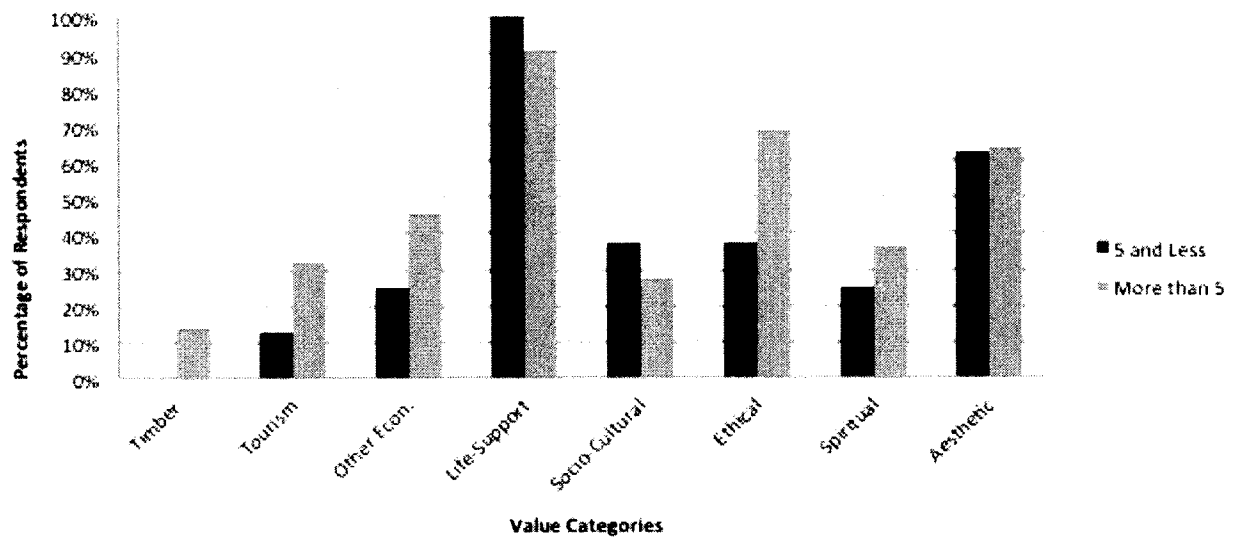
Chapter 5

DISCUSSION

The purpose of this research was to document the breadth of expressed forest

values surrounding the ancient cedar stands to add to our understanding of old-growth

forests and unique ecosystems. Thirty-four local residents were interviewed, three years

of guestbook comments from the Ancient Forest Trail were compiled, and twenty-one

different media pieces reporting on the forest and the ancient cedar trees were collected.

The data from these sources revealed rich and varied perspectives of the old-growth

forest values of trail users, the public, and local residents. The results tell a story of the

inland rainforest, specifically the widening breadth of non-material forest values, the

factors that come to influence those values, and the role conflicting values play in the

debate surrounding the ancient cedar stands. This story is important in the context of the

ongoing debate surrounding the best and highest use of the ancient cedar stands. Insights

from this study's results can be used to discuss future implications of held forest values

on ecosystem management and policy decisions surrounding ancient cedar stands in the

ITR.

5.1 Sources of Values

Material and non-material forest values stem from sources of environmental

concern, which are outlined by different authors throughout the literature on forest values

(Bengston & Xu 1995; Kempton et al. 1995; Stern, Dietz, and Kaloff 1993; Tarrant and

Cordell 2002). While Moyer et al.'s framework focuses on values themselves, value

sources focus on the factors that influence how people come to value forests. These

sources are often presented as 'anthropocentric,' describing human-centered values, 'biocentric,' describing living-thing-centered values, and as Kempton et al. (1995) include, religious sources of value such as traditional Judeo-Christian beliefs or other forms of spirituality. Understanding where values stem from can be helpful in interpreting their significance, as it lends insight into individuals' decisions regarding ecological issues (Axelrod 1994).

Evidence from this study, as well as Moyer et al.'s (2010) research, demonstrates that residents feel strongly about life-support values such as air purifying and water quality and quantity. This may be a result of the fact that residents live in remote forest communities, and thus have a stronger connection to the natural environment around them, as well as a heightened realization of their dependence on the ecosystems they live in. Conversely, trail users do not hold strong life-support values, probably because their experience with the forest is, unlike for residents, very temporary. This result suggests that values are strongly linked to people's personal experiences with the forest. For example, many residents in Dome Creek and Crescent Spur are past loggers, which might explain the strong connection they have with the economic value of timber (though not specifically related to the ancient cedar trees), and visitors to the valley value the forest for its recreational opportunities. These results reveal a strong human-centered, or anthropocentric tendency to be influencing factors in valuing natural environments.

A 'most important' value chosen by more than 40% of the participants in the interview exercise was air purifying, which reflects more than one orientation from Kempton et al.'s (1995) value sources. Air purifying can stem from a human-centered consideration if the respondent is concerned about the quality of air in regards to their

own well-being, or for the benefit of humanity. Air purifying is also instrumental to the health of ecosystems, therefore the value can also stem from a biocentric source. It was apparent from the conversations with participants that air purifying values were held in concern for humanity as well as for all ecosystems, which suggests that the value is supported by multiple sources.

The less frequent mention and endorsement of economic values among participants can be attributed in part to the characteristics of the ancient cedar forest. For example, hunting, fishing, furniture, and medicine, were infrequently expressed values in relation to the forest, as it appears that other forests in the region are better suited for these purposes. Among economic values, anthropocentric sources of values were reflected in timber values. Logging is seen as being personally beneficial as it provides employment, as well as socially beneficial, as it helps sustain communities. Socio-cultural values relating to preservation were also anthropocentric in nature, including education, community, and heritage, which were valued mostly for the greater social good.

Aesthetic values are categorized as non-material in the Moyer et al. (2008) framework, and are often anthropocentric in nature as they benefit the individual viewing the landscape (Xu and Bengston, 1997). Among aesthetic values, beauty and natural/undisturbed state were among the top five 'most important' forest values surrounding the cedars, with an approximately 25% selection rate. This strong response towards aesthetic values was also found in Owen et al.'s (2009) study, where several respondents noted the importance of the natural/undisturbed state of old-growth forests, and recognized them as a place of respite from urban life and degradation. Moyer et al.

(2010) also provided this result: "the natural state, or the absence of human disturbance…seemed to be an important part of what made it unique and valuable" (p. 258). Comments from household residents relating to beauty in this study mostly reflect personal benefit, however in the guestbook, a wider human-centered orientation is present as well, as people wish the forest to be preserved so future generations can witness the beauty of the ancient cedars.

Complexity and beauty of old-growth forests also inspires spiritual values. Spiritual values, which are categorized as non-material, appear to stem from religious sources, both Judeo-Christian as well as other feelings of spirituality, as the ancient forest is valued for providing individuals with personal feelings of harmony, peace, and perspective/insight. Spiritual feelings related to peace, tranquility, and harmony, as well as gaining insight or perspective in a forest, were also found in Moyer et al.'s (2010) study to be popular values experienced when in OGF conditions.

Habitat and age of trees are two most frequently selected "most important" end-values that largely stem from a biocentric value source. Results show that residents have an appreciation for species that are part of the ancient forest ecosystem, as well as for the ancient cedars themselves. Biodiversity in the ancient cedar ecosystem is also highlighted in many media sources for the benefits it has to different species that live in the forest.

Values stemming from human-centered considerations surrounding the ancient cedars are most prevalent in this study, as all participants (trail users, the public, and residents) place importance on those values that benefit themselves and others. Concern for living things, however, is also a factor that affects how people value the ancient cedar stands, and values stemming from a biocentric source are often regarded as important as

well. Religious sources of value are present in spiritual connections to the forest people haves and are reflected mostly in comments from participants who have enjoyed time physically in the forest. Results, therefore, emphasize all three sources of value that give rise to forest values in the ancient forest, and dominant anthropocentric values demonstrate that there are many aspects in and about the forest that benefit humans individually and at large.

5.2 Significance of Values

5.2.1 Conflicting Values

Categories where value conflicts are present also speak to the significance of values, as they indicate different group interests that can be taken into consideration when forming old-growth forest policy. While some end-values received unanimously positive comments such as air purifying, habitat, and education, other end-values had a large amount of opposing opinions such as timber and tourism, highlighting contentious issues surrounding the ancient cedar forest. These comments came mostly from area residents, as interview methods allowed for a deeper discussion into values. One end-value that was a source of many conflicting values among residents was the economic value of tourism. Residents were divided on the issue of tourism being an economically viable option for the future of the valley for reasons including the pay, the traffic in the valley, and the accessibility of their location. Positive aspects of tourism conveyed by residents included seeing a change in the valley, believing it to be a continuous resource, and recognizing it as an option that promotes conservation of special ecosystems. The conflict over the value of tourism is also reflected in the debate surrounding the ancient cedar stands, as

the Minister of Jobs, Tourism, and Innovation leans towards timber over tourism in response to dwindling forest resources (Prince George Citizen 2012).

The value of cedar products was another point of difference for local residents. Due to their remote locations in the forest and their resource dependent lifestyles, many residents enjoy using cedar for shakes, shingles, and firewood, particularly because it does not rot. On the other hand, many residents feel that the quality of cedar wood in the forest is too poor to make products from as the trees are mostly hollow. Aside from its quality, another reason residents do not support cedar products in the valley is because they believe that the non-economic values of the ancient cedar stands outweigh the economic value of the products it can make. This has to do with the broadening forest values surrounding the ancient cedar stands, as well as the fact that logging companies in the valley can only salvage the cedar in the valley for products like mulch and fence posts.

Timber is another value with mixed opinions, as logging has a rich history in the valley but is currently becoming a dwindling industry for small communities. This understanding is often paralleled by residents in the valley, and since jobs are generally scarce within Dome Creek and Crescent Spur, some residents hold timber values to be very important. As well, some residents have memories of the days when Dome Creek and Crescent Spur were lucrative logging communities and feel their roots are in timber production. These residents often see the worth of a tree in its ability to be of use to humans, and specifically with the ancient cedars it is believed that they are using what would "otherwise go to waste on the forest floor." On the other hand, some residents believe that the 'waste' actually comes from the logging practices associated with

harvesting cedar for timber, and that there is no money to be made from logging cedar because of its poor quality. The majority of residents who did not highly value logging and using the cedar for timber stated that it is because the cedars are not a renewable resource and therefore cannot be replaced easily or quickly like other species of trees in the valley.

People also differed in their endorsement of ethical values, especially concerning the idea of the inherent worth of old-growth cedar. For example, some residents feel very strongly about the value of the cedars due to their age, and have a tendency to attach this value to other values such as uniqueness, tourism, majesty, and perspective/insight. People believe due to their age, cedar trees provide more for the ecosystem, and stress that this adds to their irreplaceability. Age of trees is also viewed as a triggering point for interest and education, and is linked to values such as research and preservation. On the other hand, some residents do not value the age of the cedars, and place value on young cedar instead. These residents believe that the ancient cedar is dying and decaying forest that is going to waste, and that conversely, young trees put more back into the environment.

The rareness of the ancient cedar forest was an important value to some but not to others. Because the ancient forest is among only a few inland rainforests in the world, some residents believe that the cedars, as well as the diverse array of other species living in the forest, are rare and deserve protection/stewardship. This is also paralleled by scientific literature, which recognizes the provincially and internationally unique ecological status of the interior wetbelt (Stevenson et al. 2011). Other residents, however, believe the trees are just "part and parcel" of the valley, and do not see them as rare or

unique. While local resident opinions are important to study considering the intimate relationship residents have with the forest ecosystems they live in, it is also worth noting that residents may be incapable of judging the "rarity" or "significance" of an ecosystem, that while locally abundant, is globally endangered.

It is apparent from these findings that the intimate connection residents have with the forest can result in appreciation of the ancient cedar stands due to non-material values such as inherent worth, spirituality, and beauty, or an aversion to considering the ancient cedars as special because they are either common place for residents and/or residents are more concerned with material values that directly benefit themselves.

5.2.2 Informing the Debate

The ongoing debate surrounding the cedars mirrors the breadth and sources of values found in this study as the government and community express concerns both for the livelihood of the provincial community at large, and also for the health of the old-growth forest ecosystems, and those systems that depend on them. The history of forest values in the upper Fraser valley, in accordance with literature on the nature of evolving forest values, predominantly focused on timber values related to economic worth. However, as research and recreation in the inland rainforest increased, non-timber forest values concerning the stands of old-growth cedar trees in the ITR began to receive increased attention. Throughout the debate, a breadth of end-values from Moyer et al.'s (2008) old-growth forest value framework can be found.

Similarities exist between the conflicts present in the debate and the results from this study. In the debate it is clear that there are two concerns that are publicized often -

the creation of jobs and the concern for biodiversity monitoring in the forest to ensure sustainability. These two concerns are categorized as material values (life-support versus economic) in Moyer et al.'s (2008) framework. The sources of these values are mostly anthropocentric (concern for benefits to humans) in nature; therefore it makes sense that they are the most discussed when considering the best management of the forest.

It is clear in the debate as well that residents, government reports, and scientific conferences, recognize life-support values as important. From loggers to environmentalists living in the valley, everyone selected at least one life-support value as 'most important' to them regarding the ancient cedars. Air purifying was especially stressed, as it is one of the most obvious values related to the functioning of life. Within the debate, this reveals that, above all else, people are concerned that their environment is healthy and can provide them with the processes and functions they need to maintain a good quality of life.

A gap also exists, however, between the values presented in the debate and the values revealed in this study. Trail users, residents, and the public stress an array of values including education, sacredness, and inherent worth. These values aren't reflected in much detail in the debate. Neither the FPB nor the government commonly mention that the ancient forest should be preserved for research, the age of its trees, or for the spiritual connection people have to it, which often are important to people in a way that transcends efforts to express them in economic terms.

Another difference between the debate and the values expressed in this study is that logging appears to be the provincial government's primary method for generating money in the valley. The results from this research, however, indicate that many people

believe that tourism has the potential to become an alternative industry in the valley. Within the debate, this alternative is not explored in detail.

The conflict between harvesting and preserving the forest can be addressed by recognizing specific values held surrounding certain areas of the forest. When deciding which areas in the ITR to preserve, areas that hold the highest number of end-values should be considered. From this research it appears that the more values a forest type provides for people, the bigger a role it plays in their lives.

5.3 Implications for Forest Management

The results from this study have implications for forest management decision-making as they highlight the uniqueness and importance of a specific forest type. Results show old-growth forests are important to people in a variety of value categories including life-support, socio-cultural, and aesthetic. These results can provide guidance on type and location of old-growth conservation areas. As the purpose of this particular project was to document the first collection of the breadth of values surrounding ancient cedar stands in the ITR, future researchers can aim to identify, for example, the relationship between these values and context specific conflicts and/or policy preferences.

5.3.1 Future Research

This study's investigation into forest values was largely descriptive when examining residents' attitudes, beliefs, and values. Residents were asked what they appreciated about the forest, rather than asked to engage in judgments about context-specific management choices. While expressions of environmental values are of merit in

116

and of themselves, in order for values research to directly inform policy, Satterfield and

Gregory (1998) believe that the products of the research must be shown to apply to

specific policy contexts. This would aid the success of policy systems, which the

literature stresses should be inclusive of public values, in using information about

environmental values to evaluate conditions and make decisions about difficult trade-offs

(Shindler et al. 1999). Considering the current conflict around harvesting or preserving

ancient cedar stands in the valley, therefore, it would be interesting to assess these values

while providing specific context, in order to help inform policy (Seligman et al. 1994).

Taking the next step to study values relevant to real problems is also supported by

Shindler et al. (1999), who state that identifying people's values about forest resources is

important, but is not the end of the story in today's complex struggle for sustainable

forest solutions. From a research perspective, social scientists can play a significant role

in helping identify strategies for incorporating values into policy by expanding methods

to gather and analyze information that is relevant to real problems facing decision-makers

and concerned citizens. For example, Moyer et al.'s (2008) old-growth forest value

framework is a tool for discussing and prioritizing values, as respondents have the

opportunity to identify priority values in relation to the framework categories. Future

research can use these priority value categories to discuss criteria and indicators for

management options. As well, inter-relationships between the levels and among

categories within the levels of the framework can be assessed. For example, habitat can

be valued for supporting the life of other species, but may also be linked to ethical

convictions about intrinsic worth. Further research could provide insight into the specific

nature of these inter-connections in order to rework to framework to represent these differences better.

In addition, it is important to consider how management can be used to maximize the expression of the whole range of values in OGF areas such as the ancient cedar stands in the ITR. For example, logging techniques that are capable of maintaining the natural processes and habitat needs for OGF-dependent wildlife should be pursued so that economic activities such as timber harvesting can occur while still preserving other values and providing environmental services (Kimmins 1997). Due to the high spiritual, aesthetic, and ethical values found in old-growth forests, Owen et al. (2008) point out that it would also be worth considering how harvesting techniques might be modified to maintain the features that enhance personal experiences in OGF. Furthermore, as many sources stressed in this study, attention should be paid to ensuring that recreation and tourism activities have a minimal impact on the forest ecosystem. In relation to the ITR, the Forest Practices Board has recognized a real need for the government to maintain coordination and monitoring of old-growth retention areas to ensure that they are being properly managed.

Since forest management conflicts are social problems, they require social solutions that address the values that society seeks to satisfy (Robson et al. 2000). Future research on ancient cedar forest values in the ITR can do more to inform and be included in future forest management considerations. The guidance these forest values provide can contribute to reducing and resolving the conflict present in resource dependent communities located in unique ecosystems such as the inland temperate rainforest.

The Moyer et al. (2008) framework was a helpful tool for studying the increased

breadth of values surrounding ancient cedars as it provides a comprehensive

categorization of public forest values that should be considered and explored in old-

growth forest research. The framework was originally built on the assertion that there are

more than just market-based economic values involved in society's relationship to its

forests (Bengston 1994). Consequently, an abundance of detailed nonmaterial values

reflective of old-growth forests is presented in the framework. The breadth of values

surrounding the ancient cedar stands in the ITR can be understood using the Moyer et al.

(2008) old-growth forest value framework, where value categories, subcategories, and

end-values are all well represented across the different databases of text. In this study, the

public expressed both material and non-material values surrounding the ancient cedar

stands. The breadth of values can be seen across value subcategories, as well as from the

array of end-values expressed within each value subcategory. These results suggest that

Moyer et al.'s (2008) framework can be used for similar purposes to support other forest

management decisions.

The predominant opinion among local residents was that life-support values rank

highest for the benefit of both people and other species living in the valley. The

consensus among trail users was that recreational, aesthetic, and spiritual values are

important aspects of the forest. Through the media the public expressed that the value of

biodiversity was important to safeguard. From these results it is clear that a more

complex and broader range of material and non-material values exist surrounding the

ancient cedar stands in the valley than has been previously documented. It is apparent

that people would like to safeguard their non-material values surrounding the cedars, as

some people are actively looking for a change in the use of the cedars and an expansion

of industries in the valley. "Decadent" forest opinions, such as those expressed by TRC

and the government, seem to be a minority among trail users, the public, and local

residents. This shift from seeing the ancient cedars as 'wasted trees' to considering them

a part of a rainforest ecosystem represents a shift in social paradigms, as has been

experienced by society on a bigger scale (Bengston 1994; Dunlap et al. 2000). Future

research could extend this examination to the community of McBride, located west of the

Ancient Forest Trail, where the population is more heavily involved in industry, and

logging companies have rights to the timber in the ITR. This examination could explain a

broader range of factors that influence how a community values of forest, and more

specifically, what timber interest does to old-growth forest values overall.

5.4 Limitations of the Research Design

Attempts were made to ensure methods used in this study provided valid and

reliable documentation of the held forest values surrounding the ancient cedar stands in

the ITR. However, as is common with academic research, limitations exist in relation to

the choices made for gathering data from participants. These limitations are discussed

below.

By gathering information from the AFT guestbook and media pieces, as well as

interviewing community residents living in Dome Creek and Crescent Spur, some value

perspectives may have been missed or underrepresented. For example, timber values may

have been better demonstrated by interviewing those individuals employed in the logging

industry in McBride and Prince George. In addition, the guestbook can only garner

comments that people voluntarily write and therefore may be missing perspectives. The tourist value perspective may have been more completely captured if interviews were conducted in person with people at the trail, as some trail users may not have left comments in the guestbook, or may not have expressed themselves fully when doing so. Finally, the community perspective may also have been more richly demonstrated if interviews had been conducted in the community of McBride, as McBride heavily depends on the economic benefits from logging in the region and also supports hotels that service tourists who pass through the valley.

By using only a qualitative approach, it was difficult to garner large amounts of responses. Results in the form of number values could have been helpful in summarizing value expressions over a larger amount of people. A quantitative method could have involved sending a survey instrument to McBride, Prince George, and all Robson Valley communities in order to gather a more comprehensive understanding of values surrounding the ancient forest. Economic valuation, for example, could have demonstrated what people would pay to keep their values protected surrounding the ancient cedars, providing a more specific interpretation of what type of management choices they would support.

Limitations exist by using a value framework from the literature as the basis for studying specific forest ecosystems. Because the Moyer et al. (2008) framework is not inclusive of all the possible values associated with old-growth forests, some end-values did not relate specifically to the ancient forest and the two communities in the study area, while other values specific to the communities were not present in the framework. In an attempt to mitigate this limitation, the framework was modified slightly and participants

were provided spaces on the value sheet to add their own values. However, when modifying the framework, you run the risk of losing its universal application and its ability to be replicated.

Another limitation that is inherent in value research is the variability within value definitions. Regardless of the definitions presented in the interviews, residents may have used their own understanding of value categories to define the values presented to them. When comparing values, therefore, the data may not be fully representative of what the resident intended. Providing a single set of definitions from Moyer et al.'s (2008) study to all participants was one attempt to address this limitation, however the potential for misinterpretation still exists.

Cold-calling houses in the communities presented the limitation of potentially rushed and underdeveloped responses. If a person was not prepared for the interview (i.e. if they were busy working their land since it was haying season), they may have provided rushed answers in order return to work. If the interview was pre-arranged, respondents might have been able to manage their time more appropriately and reflect on their values prior to the interview. Also, because researchers were strangers to respondents, respondents may have felt protective of their opinions, and subsequently withheld honest answers.

A limitations related to the use of a multi-step value exercise was that some elder residents found it harder to work with the long list of values and felt slightly intimidated by the multi-step, hands-on process. Other reasons for this difficulty included poor eyesight and trouble using a pen to check off the boxes on the value list. Help provided by researches in reading the list of values to the participants and checking off the value

boxes alleviated this limitation. The help received in choosing their values, however, may have made it more difficult to compare values relative to others. As well, results from interviews with elder participants may include bias as a function of increased researcher involvement.

Chapter 6

CONCLUSION

People are part of forest ecosystems; they derive material and non-material services from them, they live, work, and play in forests, and their social values, behavior, and knowledge of forest ecosystems affect them in both direct and indirect ways (FEMAT 1993). Forests appear to be valued differently by people with different relationships to the forest. For example, people living within a forest often value the environment for its life-support qualities; people working in the forest who are dependent on the timber industry value it for its economic potential; tourists often value a forest for its recreational opportunities; scientists studying a forest are sometimes captured by its rarity or uniqueness. One group may be incapable of judging a forest for all of its values accurately, therefore a range of value perspectives is important to consider. Documenting and measuring the breadth of forest values can help broaden the understanding of the best and highest uses of unique ecosystems, such as the ancient cedar forest in the ITR.

Methods used in this research were successful in gathering and analyzing value perspectives from three different groups of people: trail users, the public, and local residents. I would recommend this method to future forest value studies, as overall it was a creative and effective way to allow people the freedom to consider their held values on the spot. It does not require many supplies, and the equipment is easy to carry from place to place. The way in which people choose to organize their values on the magnet board can also lend itself to a whole other level of analysis that could potentially speak to the pattern and complexity of people's values, and how they see those values shaping their lives.

Results from this research revealed a wide breadth of values surrounding the ancient cedar stands including material values economic in nature, life-support values beneficial to all species, and an equal breadth of non-material values represented through aesthetic, socio-cultural, spiritual, and ethical value categories. Sources of values among the three study populations (trail users, the public, and residents) stemmed from anthropocentric, biocentric, and religious/spiritual influences. Some values received unanimous endorsement from respondents, such as air-purifying and beauty, exemplifying common concerns among different groups of people. Conflict between timber and tourism, cedar products, and inherent worth values such as age and rarity of trees also produced valuable insights into the debate between conserving and harvesting the old-growth forests.

The current debate is lacking in consideration of the wider array of non-material values surrounding the ancient cedar stands. The results form this research represent a breadth held forest values surrounding the ancient forest, as well as areas of conflict among values, that has previously been undocumented. Community members, policy makers, and researchers, can use the results from this study to identify areas within the ITR that may be more socially and economically sensitive to harvesting.

Logging has been a major part of the economy in the upper Fraser River valley, and with dwindling future forest prospects, communities have been looking increasingly to the interior wetbelt for their wood supply. On the other hand, other community residents, recreationists, and scientists have recognized the ITR environment as globally unique and significant, and are concerned about the cumulative impacts of forest harvesting on old-growth cedar stands. The values of different users of the forest

ecosystem are therefore important to consider in this situation. It has become apparent through this conflict that the timber value, which has historically been the primary indicator of a forest's worth, is not the only useful indicator for management decisions; exploring all held values, such has been done in this study, informs the highest and best uses of forest ecosystems.

There is consensus across a broad literature that values are a reasonable way of conceptualizing how we make decisions about the environment (Dietz et al. 2005) and how individual action can and does blossom from a strong set of environmental values. Providing expressed held forest values to various systems (political, economic, social) allows natural resource managers to understand better what values individuals and groups assign forest practices. In this way, values can have an effect on public policy, economics, and human stewardship of the environment. This does not necessarily mean that if our values are environmentally conscious then globally unique ecosystems like the ITR will no longer be threatened. However, if environmental policy options are based on an appreciation of how humans value nature then we may be able to relate to and manage natural areas more appropriately.

REFERENCES

Arbor B&B. 14 Jul 2010. "The Ancient Forest near Prince George." Blogger.
    <www.arborbnb.blogspot.ca/2010/07/ancient-forest-near-prince-
    george.html>

Association of British Columbia Professional Foresters. 1993. "Position statement: old-
    growth forests. In Forestry on the hill: old-growth forests." Canadian Forestry
    Association, Ottawa, ON. 1185 (9598): 55–57.

Axelrod, L. 1994. "Balancing Personal Needs with Environmental Preservation:
    Identifying the Values that Guide Decisions in Ecological Dilemmas." *Journal of
    Social Issues* 50(3): 85-104.

Babbie, E. *The Practice of Social Research*. 12. Belmont: Wadsworth, 2011.

B.C. Forest Professional Magazine. 2010. "World Heritage Sites in the Upper Fraser
    River Watershed?" Coxson, D. 17(3): 22-24.

B.C. Ministry of Forests. 2011. "Prince George Timber Supply Area Report: Rational for
    Allowable Annual Cut Determination." British Columbia, Ministry of Forests,
    Mines, and Lands.

B.C. Ministry of Forests. 2011. "Prince George Timber Supply Area: Timer Supply
    Review." British Columbia, Ministry of Forests, Mines, and Lands *Data Package*.

Behan, R.W. 1991. "Forests and plantations and Potomo-centric statutory fixes (but
    downhome forestry is here)." *Forest Perspectives* 1(1): 5-8.

Bengston, D.N. 1994. "Changing Forest Values and Ecosystem Management." *Society
    and Natural Resources* 7(6): 515-533.

Bengston, D.N. and Z. Xu. 1995. "Changing National Forest Values: A Content
    Analysis." United States Department of Agriculture, Forest Service.

Bengston, D.N., T.J. Webb and D.P. Fan. 2004. "Shifting forest value orientations in the
    United States, 1980–2001: A computer content analysis." *Environmental Values*
    13(3): 373–392.

"Block 486." (2006) Olak, Richard, director. DVD. 34 minutes.

Brennan, A. 1992. Moral Pluralism and the Environment. *Environmental Values* 1(1): 15-
    33.

Bonaiuto, M., G. Carrus, and H. Martorella. 2002. "Local identity processes and environmental attitudes in land use changes": The case of natural protected areas." *Journal of Economic Psychology.* 23: 631-653.

Brown, G. and P. Reed. 2000. "Validation of a Forest Values Typology for Use in National Forest Planning." *Forest Science* 46(2): 240-247.

Brown, T.C. 1984. "The concept of value in resource allocation". *Land Economics* 60 (3): 231-246.

Burgess, J., M. Limb, and C.M. Harrison. 1988. "Exploring environmental values through the medium of small groups: 1. Theory and practice." *Environment and Planning* 20 (13 April): 309-326.

Carson, R. *Silent Spring.* Boston MA: Houghton Mifflin Company, 1962.

Craig, P.P., H. Glasser, and W. Kempton. 1993. "Ethics and Values in Environmental Policy: The Said and the UNCED." *Environmental Values* 2(2): 137-157.

Connell, D.J. (2010). *Socio-economic Benefits of Non-timber Uses of BC's Inland Rainforest: Research Bulletin.*

Connell, D.J. and J. Shapiro (2012). *Socio-economic Benefits of Non-timber Uses of BC's Inland Rainforest: Research Bulletin.*

Connell, D.J., J. Shapiro, and J. Hall (2011). *Socio-economic Benefits of Non-timber Uses of BC's Inland Rainforest: Research Bulletin.*

Dietz, T., A. Fitzgerald, and R. Shwom. 2005. "Environmental Values." *Environment and Resources* 30(25 July): 335-372.

Driver, B.L., D. Dustin, T. Blatic, G. Elsner, and George Peterson. "Nature and the Human Spirit: Overview." *Nature and the Human Spirit.* Ed. B.L. Driver, D. Dustin, T. Blatic, G. Elsner and G. Peterson. Pennsylvania: Venture Publishing, Inc., 1999. 3-8.

Duinker, P. 1998. "Public participation's promising progress: advances in forest decision-making in Canada." *Commonwealth Forestry Review* 77: 107–112

Dunlap, R.E., K.D. Van Liere, A.G. Mertig, and R.E. Jones. 2000. "Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale." *Journal of Social Issues* 56(3): 425-442.

Elsner, G., D. Lewis, F. Snell and W. Spitzer. "The Role of Public Lands in Maintaining and Rejuvenating the Human Spirit." *Nature and the Human Spirit.* Ed. B.L. Driver, D. Dustin, T. Blatic, G. Elsner and G. Peterson. Pennsylvania: Venture Publishing, Inc., 1999. 9-13.

Forest Ecosystem Assessment Management Team (FEMAT). 1993. "Forest Ecosystem Management: An Ecological, Economic and Social Assessment Report of the Forest Ecosystem Management Team." 2 vols. U.S. Government Printing Office, Washington D.C.

Forest Practices Board. May 2008. "Biodiversity in the Interior Cedar-Hemlock Forests Near Dome Creek." Complaint Investigation 070762.

Forest Practices Board. June 2012. "Conserving Old-Growth Forests in BC: Implementation of old-growth retention objectives under FRPA." Special Investigation.

Franklin, J.F. 1989. "Toward a new forestry." *American Forests.* 95(11/12): 37-44.

Google Maps. 03 Jan 2011. "Map of Dome Creek and Crescent Spur." Available from: <http://maps.google.ca >

Google Maps. 20 Apr 2010. "Map of Ancient Forest Trail." Available from: <http://maps.google.ca >

Google Maps. 01 May 2012. "Map of Communities Dome Creek and Crescent Spur." Available from: <http://maps.google.ca >

Google Earth. 2006. 06 May 2012. "Map of Dome Creek." 53°44'34.34 N 121°01'20.51 W.

Google Earth. 31 Dec 2005. 06 May 2012. "Map of Crescent Spur." 53°34'51.64 N 120°40'25.50 W.

Graneheim, U.H. and B. Lundman. 2004. "Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness." *Nurse Education Today* 24(2): 105-12.

Greenpeace. 2006. "Greenpeace activists blockade Kimberly-Clark factory in Ontario." <http://www.kleercut.net/en/>

Gregory, R. "Identifying Environmental Values." *Tools To Aid Environmental Decision Making* New York: Springer, 1999. 32-55.

Hartmen, R. 1976. "The Harvesting Decision When A Standing Forest Has Value." *Economic Inquiry* 14: 52-58.

Hilbert J. and A. Wiensczyk. 2007. "Old-growth definitions and management: a literature review." *BC Journal of Ecosystems and Management* 8: 15–31.

Integrated Land Management Bureau. 2008. "Guidance and Technical Background Information for Biodiversity Management in the Interior Cedar-Hemlock Zone within the Prince George Land and Resource Management Plan Area." Integrated Land Management Bureau, Government of British Columbia: Victoria, British Columbia.

Kalof, L. and Satterfield, T. "Environmental Values: An Introduction – Relativistic and Axiomatic Traditions in the Study of Environmental Values." *The Earthscan Reader in Environmental Values* London: Earthscan, 2005. 131-155.

Karp, D. G. 1996. "Values and their Effect on Pro-Environmental Behavior." *Environment and Behavior*.

Kellert, S. R. 1985. "Historical trends in perceptions and uses of animals in 20th century America." *Environmental Review* 9(1): 19-33.

Kempton, W., J. S. Boster, and J. A. Hartley. *Environmental Values in American Culture* Massachusetts: The MIT Press, 1995.

Kennedy, J.J. 1985. "Conceiving forest management as providing for current and future social value." *Forest Ecology Management* 13: 121-132.

Koch, N.E. and J.J. Kennedy. 1991. "Multiple-use Forestry for Social Values." *Ambio* 20(7): 330-333.

Lakoff, G. and M. Johnson. *Metaphors we live by*. Chicago, IL: University of Chicago Press, 1980.

Liu, J., Z. Ouyang, and H. Miao. 2010. "Environmental attitudes of stakeholders and their perceptions regarding protected area-community conflicts: A case study in China." *Journal of Environmental Management* 91(11): 2254-2262.

Lockwood, M. 1999. "Humans Valuing Nature: Synthesizing Insights from Philosophy, Psychology and Economics." *Environmental Values* 8: 381-401.

Los Angeles Times. 10 Feb 2010. "Photo Essay: British Columbia Prepares for the Olympics in Vancouver" [Sports] < http://latimesblogs.latimes.com/olympics_blog /2010/02/photo-essay-british-columbia-prepares-for-the-olympics-in-vancouver.html>

Manning, R., W. Valliere, and B. Minteer. 1999. "Values, Ethics, and Attitudes Toward National Forest Management: An Empirical Study." *Society & Natural Resources* 12(5): 421-436.

Ministry of Forests and Range British Columbia. 18 Aug 2010. "TRC Cedar Mill Re-opens and Puts 30 People to Work." Ho, C. [Prince George].

Mayring, P. 2000. "Qualitative Content Analysis". *Qualitative Social Research* 1(2). <http://qualitative-research.net/fqs/fqs-e/2-00inhalt-e.htm>

Mayton, D.M, S.J. Ball-Rokeach, and W.E. Loges. 1994. "Human Values and Social Issues: An Introduction." *Journal of Social Issues* 50(4): 1-8.

McFarlane, B. and P.C. Boxall. 2000. "Factors influencing forest values and attitudes of two stakeholder groups: the case of the foothills model forest in Alberta, Canada." *Society and Natural Resources* 13: 649–661.

Merric, J. and A. Wiensczyk. "Conservation and Community Conference: BC is Home to Globally Rare and Diverse Inland Rainforest Ecosystem." *Forrex: Forum for Research and Extension in Natural Resources.* 21 May 2008. 16-17.

Miss604. 03 Feb 2010. "The Ancient Forest." sixty4media <www.miss604.com/2010/02/the-ancient-forest.html>.

Moyer, J. 2006. "Values and attitudes toward old-growth forest: a Narrative Study of Leaders in Canada's Forest Sector." *Thesis for Master of Environmental Studies* Dalhousie University.

Moyer, J.M., P.N. Duinker, and F.G Cohen. 2010. "Old-growth forest values: A narrative study of six Canadian forest leaders." *Forestry* 86(2): 1-7.

Moyer, J.M, R.J. Owen, and P.N. Duinker. 2008. "Forest Values: A Framework for Old-Growth Forest with Implications for other Forest Conditions." *Open Forest Science Journal* 1: 27-36.

Nash, R. *Wilderness and the American Mind.* New Haven, CT: Yale Univ. Press, 1967.

National Post. 23 Feb 2010 "Dashing through the snow – with dogs!" Kula, J. [Ottawa] <http://www.nationalpost.com/story.html?id=2603275>

Northern Wetbelt Forests of British Columbia. "Inland Rainforest." [Prince George] <web.unbc.ca/~wetbelt/Inland-Rainforests.htm>.

Olson, R. *From Liaboe to Loos and Beyond.* Prince George, B.C.: Papyrus Limited, 2011.

Opinion 250 News. 21 Aug 2010. "Ancient Forest Visit A Dream Come True." [Prince George] <http://www.opinion250.com/blog/view/17279/1/ancient forest visit a dream come true>.

Owen, R.J., P.N. Duinker, T.M. Beckley, and A.M. Nova. 2009. "Capturing Old-Growth Values for Use in Forest Decision-Making." *Environmental Management* 43: 237-248.

Owen, R.J. 2006. "Old-growth-forest values of citizen constituencies in Nova Scotia, Canada." *Thesis for Master of Environmental Studies* Dalhousie University.

Peterson, G.L. and A. Randall (eds.). 1984. *Valuation of Wildland Resource Benefits.* Westview Press Inc., Boulder, Colorado.

Prince George Citizen. 4 Aug 2007. "Ancient Rainforest Well Worth the Visit." Crowley, H. [Prince George]. 38.

Prince George Citizen. 9 Aug 2008. "Roots Run Deep: A Walk Through the Ancient Forest." Myrissa, K. [Prince George] A1,17.

Prince George Citizen. 7 Apr 2012. "Bell leans toward timber in answer to tourist association concerns." Neilsen, M. [Prince George]. < http://m.princegeorgecitizen. com/ article/20120407/ PRINCEGEORGE0101/304079988/-1/princegeorge0101/ bell-leans-toward-timber-in-answer-to-tourist-association-concerns&template=JQMArticle>

Putney, A.D. "Introduction: Perspectives on the Values of Protected Areas." *The Full Value of Parks: From Economics to the Intangible.* Ed. David Harmon and Allen D. Putney. Maryland: Rowman and Littlefield Publishers, Inc., 2003. 3-11.

Robotblogger. 25 Dec 2007. "Block 486." Adam, M. Robotbreeder.com. <robotbreeder.com/Robotblogger/2007/12/block-486.html>.

Robson, M., A. Hawley, D. Robinson (2000). "Comparing the social values of forest-dependent, provincial and national publics for socially sustainable forest management." *Forestry* 76(4): 615-622.

Roggenbuck, J. and B.L. Driver. "Public Land Management Agencies, Environmental Education, and an Expanded Land Management Ethic." *Nature and the Human Spirit.* Ed. B.L. Driver, Daniel Dustin, Tony Blatic, Gary Elsner, George Peterson. Pennsylvania: Venture Publishing, Inc., 1999. 383-401.

Rokeach, M. *Value Survey.* Sunnyvale, Calif.: Halgren Tests, 1967.

Rokeach, M. *The nature of human values*. New York: Free Press, 1973.

Rokeach, M. 1968. Beliefs, attitudes and values: A theory of organization and change. Jossey-Bass, San Francisco.

Rolston H. III. "Anthropocentric Values." *Conserving Natural Value*. New York: Columbia University Press, 1994. 134-141.

Rolston H. III and J.A. Coufal. "Forest ethic and mulitvalue forest management." *Journal of Forestry* 1991; 89: 35-40.

Rolston H. III. *Philosophy gone wild*. Buffalo: Prometheus Books, 1989.

Satterfield, T. and R. Gregory. 1998. "Reconciling environmental values and pragmatic choices." *Society & Natural Resources* 11(7): 629-647.

Satterfield, T. and S. Slovic. *What's Nature Worth?* Salt Lake City: The University of Utah Press, 2004.

Save-The-Cedar-League. "Bridge the inland Parks With Ancient Rainforest Biodiversity." Report No. 1: 1-4.

Save-The-Cedar-League. 2007. "A Rainforest Conservation Corridor for Robson Valley: Part 2." Report No. 5: 1-4.

Save-The-Cedar-League. 2007. "*2nd Edition Robson Valley Ecoguide*." Educational Report No. 6: 1-4.

Schoenfeld, A.C., G.M. Broom, and N. Bavec. 1980. "The changing environmental message of forest industry." *Journal of Forestry* 78(10): 629-631.

Schultz, P.W. 2003. "Reframing Environmental Messages to be Congruent with American Values." *Human Ecology* 10(2): 126-136.

Schwartz, S.H. "Beyond individualism/collectivism: New dimensions of values." *Individualism and Collectivism: Theory Application and Methods*. Newbury Park, CA: Sage, 1994.

Seligman, C., G.J. Syme, and R. Gilchrist. 1994. "The Role of Values and Ethical Principles in Judgments of Environmental Dilemmas." *Journal of Social Issues* 50(3): 105-119.

Shands, W.E. 1988. "Beyond multiple use: Managing national forests for distinctive values." *American Forests* 94(3/4): 14-15, 56-57.

Shindler, B., F. Resources, L.A. Cramer and J. Appl. 1999. "Shifting Public Values for Forest Management: Making Sense of Problems." 14(1), 28-34.

Stankey, G.H. 1972. "The use of content analysis in resource decision-making." *Journal of Forestry* 70(3): 148-151.

Stankey, G.H. and R.N. Clark. 1991. Social Aspects of New Perspectives in Forestry: A Problem Analysis. The Gifford Pinchot Institute for Conservation Monograph Series. Greytowers Press, Milford, Pennsylvania, pp. 33.

Steel, B.S. and N.P. Lovrich. 1997. "An introduction to natural resource policy and the environment: Changing paradigms and values." In B. S. Steel (ed.) Public lands management in the west. Greenwood Publishing, Wesport, CT, pp. 3–15.

Steel, B.S., P. List and B. Schindler. 1994. "Conflicting values about federal forests: A comparison of national and Oregon publics." *Society and Natural Resources* 7: 137–153.

Stern, P.C., T. Dietz and L. Kaloff. 1993. "Value orientations, gender, and environmental concern." *Environment and Behavior* 25: 322–348.

Stern, P.C. and T. Dietz. 1994. "The value basis of environmental concern." *Journal of Social Issues* 50: 65–84.

Stevenson, S.K., H.M. Armleder, A. Arsenault, D. Coxson, S.C. Delong and M. Jull. *British Columbia's Inland Rainforest: Ecology, Conservation, and Management.* Vancouver: UBC Press, 2011.

Straight.com. 10 Nov 2010. "Snowshoers Make Tracks in Ancient Forest." Christie, J. [Vancouver] <www.straight.com/article-357186/vancouver/snowshoers-make-tracks-ancient-forest>

Tarrant T.M. and K.H. Cordell. 2002. "Amenity values of public and private forests: examining the value-attitude relationship." *Environmental Management* 30: 692–703.

The Valley Sentinel. 26 Nov 2010. "Green Party Deputy Leader Visits Ancient Forest Trail." Howard, R. [Robson Valley] <thevalleysentinel.com/?p=705>

Tourism Prince George. 2009. "Prince George Official Visitor Guide." [British Columbia] 2009: 1-34.

Tims, D. "The Perspective of Outfitters and Guides." *Nature and the Human Spirit.* Ed. B.L. Driver, D.D., T. Blatic, G. Elsner, and G. Peterson. Pennsylvania: Venture Publishing, Inc., 1999. pp. 177-184.

University of Northern British Columbia. 2007. "Converging Interests: The Value of an
Ancient Forest." [Prince George] <www.unbc.ca/media/2007/10_radies.html>

Valhalla Wilderness Society. 2011. "BC's Rare Inland Temperate Rainforest." [New
Denver] <www.vws.org/project/inland/TheInlandRainforest.html>

Wheeler, M. *The Robson Valley Story*. McBride: The McBride Robson Valley
Story Group, 1979.

Xu, Z. and D.N. Bengston. 1997. "Trends in national forest values among forestry
professionals, environmentalists, and the news media, 1982-1993'." *Society &
Natural Resources* 10(1): 43-59.

Parkins, J.R., J. Varghese and R.C. Stedman. "Identifying indicators of community
sustainability in the Robson Valley, British Columbia."

135

CONSENT FORM

UN**BC**

**Vulnerability of Old-growth Forests
in British Columbia's Inland Temperate Rainforest**

Dear Participant:

The management of remaining old-growth inland temperate rainforest (ITR) stands in the upper Fraser River valley is a high priority for the region. For this reason the University of Northern British Columbia is collecting information about the social and biological values associated with the ITR. Our research will synthesize existing data sets, and conducting additional field- and community-based studies to address knowledge gaps. Our examination of the social and economic impacts of climate change on ITR stands will focus on assessments in three major areas: (a) perceived values of future non-timber uses of the ITR; (b) perceptions of vulnerability of non-timber uses under different climate change scenarios; and (c) opportunities for adaptation.

In this part of the project we are asking residents of Dome Creek and Crescent Spur to participate in an interview. The interview should take about one hour. Your participation in this project is **completely voluntary** and **you may withdraw your participation at any time** during the project without penalty or risk of any kind. You may choose to answer only the questions you are comfortable with. Should you choose to withdraw then your information will also be withdrawn.

All information you provide will be recorded, with your consent, by written notes and by audio tape. **Your interview responses will be kept confidential.** The information we collect will be stored electronically in a database that can only be accessed by the researchers of the project team. All personal identifying information will be removed from this database. In addition, any hard copy interview notes will be stored in a secure locked filing system. All data will be destroyed within five years.

You may direct questions about the study to David J. Connell, Assistant Professor, UNBC, at 250-960-5835 or connell@unbc.ca. Complaints about the project should be directed to the Office of Research, UNBC, at 250-960-5650 or reb@unbc.ca. Thank you for your participation.

I have read and understood the above and I voluntarily agree to participate in this study. I understand that I can ask questions and withdraw my participation at any time.

_____	_____	_____
Participant name (please print)	Participant signature	Date

_____	_____	_____
Researcher name	Researcher signature	Date

136

Appendix B: Sample of Interview Questions

A – Living in the Valley

Objective: To set the context for talking about values, and to assess the relative importance of the forest in the participant's lifestyle in the valley.

Our first set of questions will help us to understand your relation with the valley and its forests. We'll start by asking a question you've probably answered a hundred times already.

1) Can you tell us why you moved to the valley?

- Why here?

    - Were you born in the valley?

    - Move here?

        - Why did you move here?

        - What brought you here? [Job? Family? Valley?]

    - How long have you lived here?

    - Have you ever had an opportunity to leave?

        - Why did you stay [or come back]?

2) [Forest] How important are the ecological features of this valley to you, such as the rivers, mountains, forests, and wildlife? *(general)*

- To what extent is the **forest** important to you:

    ☐ Highly important
    ☐ Important
    ☐ Moderately important
    ☐ Somewhat important
    ☐ Not at all important

Explain [prompt if needed]

- [Prompt for assessing their level of awareness of the ancient cedars if it is not clear by their previous responses: *There exist specific pockets throughout the valley that support ancient cedar stands. Toe slopes are an ecological feature that helps retain snowmelt moisture and promotes the growth of these ancient cedars.*]
  How important are the stands of ancient cedars to you?

  ☐ Highly important
  ☐ Important
  ☐ Moderately important
  ☐ Somewhat important
  ☐ Not at all important

B – Forest Values

Objective: To facilitate a conversation about forest values concerning the ancient cedars in a way that is easiest for the participant.

1. [initial question] **We'd now like to know about your values relating to the ancient cedar stands. For this we have a short exercise for you.**

   a. *Show participants a list of values and ask them to place a checkmark in the box next to the values that are **important to them**.*

   b. *From the values selected, ask the participant to identify the **most important values** by placing an asterisk beside each one. (The list should be smaller now). Select these values from the magnets and place them on the metal board.*

   c. *Ask the participant to review their final list of ranked values. Ask if they would like to make any changes to the values included in the list or to the order of the values. (If values seem poorly chosen, prompt by mentioning broader value categories)*

   d. *Ask participant to rank these values in order from most to least important.*

2. **Explain why you have ranked these values in this way.**

Appendix C: Personal Background

Jessica Shapiro is from Toronto, Ontario. Living in Prince George was her first experience in British Columbia and the north. She completed her Bachelor of Arts degree at McGill University in Humanistics, which is an interdisciplinary degree examining the literature surrounding the question: "what does it mean to be human?" She graduated with a minor in Psychology.

Jessica has worked as a student journalist since high school. During the interim between her two degrees Jessica worked at Greenpeace as a door-to-door canvasser. Jessica has also had extensive experience abroad, mainly in Spain and Argentina as both a student and a traveler.