How Canadians Value Nature: A Strategic and Conceptual Review of Literature and Research

CSoP Research & Consulting for *Environment Canada*
Randolph Haluza-DeLay, Ph.D.
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John Parkins, Ph.D.

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1   INTRODUCTION

"This is my church, the great outdoors."

> *(Palm Sunday, 2009: Comment from a elderly dogwalker as she and her dog passed my picnic table)*

Nature is important to Canadians. Period.

Nature is important because it is part of our self-identity. In the midst of national unity debates, the Citizen's Forum on Canadian Unity (commonly known as the Spicer Report, 1991) took the pulse of the nation. Among its efforts was a list of what they heard Canadians saying as their key Canadian values. Identified among the seven values was "*Attachment to Canada's Natural Beauty.*"

Nature is important because it is the basis of our society's functioning. Nature provides the natural resources and energy resources, the cleaning and waste deposit facilities and sufficient space for human society to operate. Commonly called *ecosystem services* these functions must be valued. Certainly, these functions must continue to operate whether or not we esteem them as valuable or not.

Nature is important because understanding the ecosystem services provided by the natural world is unlikely without experience of nature. Research shows a pervasive, transnational decline in nature-based recreation including in Canada, as well as declines in Canadian physical activity. Exposure to nature is often a significant predictor of environmental concern, leading one analyst to comment, "The pervasive decline in nature recreation may well be the world's greatest environmental threat" (Kareiva, 2008: 2758).

Nature is important because humans may require a profound connection to nature that goes beyond economic or leisure needs. Biologist E.O.Wilson, supported by social

scientists like Stephen Kellert, has proposed the "biophilia hypothesis" – that the human species has an innate "philia" (attraction) to life and the biosphere.

Nature is important for an amazing variety of spiritual, aesthetic, recreation, economic, artistic, business, tourism, quality of life, and other reasons.

We currently have weak means of figuring out how Canadians value nature. Many of the methods of valuation rely on economic procedures, which often do not capture a full range of values and the ways in which values extend beyond monetary dimensions. Certainly, all values cannot fit onto the same measurement ruler.

WHY THIS MATTERS:
United States Forest Service research scientist Daniel Williams (2000) commented on research on nature values:

I see a gap between recent theorizing about values in social and political science and how the topic is understood and applied in natural resources. Specifically the field tends to take its value concepts from either economics or social psychology and ignores more sociological and political theory formulations (http://www.fs.fed.us/rm/value/docs/dp-01-2.pdf).

Good research methodology has to conceptualize its topic before it can operationalize it. Otherwise, the so-called findings miss important features of the thing under study. It is vitally important to measure the right things in the right ways.

The document comprises the beginning of a more robust understanding of the ways Canadians value nature, focusing on methods to assess these values. However, in order to do that task sufficiently, several important observations must be heeded:

On "nature"…

► Nature is a complex notion, diversely understood by Canadians. For example, it could mean "wilderness" or "the world unaffected by humans" or "urban nature" or "my backyard garden" or even "naturalizing my lawn" or "natural health supplements."

► Language matters. The word "nature" implies things that other words do not. For example, one writer reports that some people use "the outdoors" instead, and associate the word "nature" with "cityfolk" (Satterfield & Slovic, 2004).

On "values" …

> ► The term "values" is used differently in different settings and scholarly disciplines. We present some of these differences.

> ► The relationship of values to behaviour is not well understood. Yet different disciplines, with their different conceptions and assumptions, have different theories about the values-behaviour relationship.

On "methodology" …

> ► One approach amidst such differences is to use a colloquial meaning of the word "values" – such as "the *importance* of nature to Canadians. But a robust "science of values" cannot ignore the scholarship that has resulted in more complex but more accurate understandings of values and their role in human action.

> ► Important and unresolved questions remain.

> > o Are values created by the valuer? Or do some values reside in the object that is valued? This is important because some values – ecosystem services and nonmarket values – may not be perceived, at least by some actors. Do they then exist or not?

> > o Are values better conceptualized as "objects" or as social "processes"? What is considered to be valuable often depends on what the particular culture has deemed to be valuable. To ignore this aspect results in devaluing other expressions of value – which is problematic given our multicultural nation.

> ► Mixed methods are required. Environment Canada would do well to utilize methodologies that are able to handle the deep, rich and contextual information that accurately represents the complicated ways that nature and values are represented in Canadian lives.

These are important questions! In order to place as much attention as possible on methods that have been used, or seem likely to be useful in studying the ways that

Canadians attach importance to what they perceive as nature, it will be important for Environmental Canada to consider how to best comprehend these social processes that shape the values of nature that Canadians mobilize in their individual and collective activity. These questions of theory and methodology are increasingly relevant to good data collection, democratic decision-making, and engagement with resource, protected lands, economic, and environmental planning.

Moving beyond previous research

The 1996 *Survey on the Importance of Nature to Canadians* was a mostly recreation and tourism-focused product. Environment Canada's bulletin announced the results that

> Canadians spend more than $11 billion and 1.5 billion person-days each year on nature-related activities…
>
> www.ec.gc.ca/science/sandesept/PrintVersion/print4_e.html

At the time, these were surprising numbers. Nature was "valued" more highly than people had assumed. However, because of its recreation-tourism focus, this assessment reflects only a fraction of the value that Canadians assign to nature. For example, gardening was not listed as a "nature-based recreation." In the survey, 'nature' is defined as "natural areas and the fish and wildlife that live in these areas" (Gray, et al, 2003: 130).

Furthermore, we consider the dollars and days forms of measurement reported to be a limited way of addressing how Canadians "value nature." The diversity of the Canadian population means that "value" will be attached to behaviours in ways that go beyond money spent and participation-days. Although the release indicated the *Survey on the Importance of Nature to Canadians* was created to "address the need for more scientific information on socio-economic aspects of the environment," the survey was limited to a portion of natural related values and economic values.

This report began with a passing statement by a lady walking her dog. Clearly, the tiny amount of money and couple hours spent were only a small part of the value she placed on nature that Palm Sunday. Some of the most important values of nature are "hard-to-define values" which defy easy empirical capture even as they make resource

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management more complicated (Driver, et al, 1996). Many of these values are not reducible to a monetary metric, as many resource managers have observed. Nevertheless, some form of value assessment is often important, at least in order to give some legitimacy to values, and perhaps to manage for specific values within a specific locale. If only market values are measured in sophisticated ways but other values are not, legitimacy is likely to be only accorded to the easily quantifiable and monetarized calculations. We discuss some of these issues below before focusing on a wide range of existing studies on values of nature, drawing on a wide range of disciplines that study human action.

We hope that this report begins to make the case for careful consideration of the issues noted above, so that overly simplistic concepts and methods can be avoided. As Gray, et al (2003) comment on the 1996 *Survey on the Importance of Nature to Canadians*, "The definition of nature depends on the values held by the people who use it" (p.130). Additionally, the definition of nature that is used sets the conditions for what values can be assigned to that which is called "nature."

Understanding values and valuation

That the "language of values" resonates with people is becoming more apparent in the social sciences and in practical politics. What language is that? It tends to be casual, imprecise, evocative, general and colloquial. So while it can be effective in political campaigns (Lakoff, 2004), for social scientists, the use of this language is "slippery" and a "serious and escalating problem" (Reser & Bentrubberbäumer, 2005: 125). Popular talk of "values" is of limited use in resource management. It is not what neoclassical economists mean by "valuation" and is usually too general to assign worth or be used in adjudicating between competing uses or plans. Contrastingly, monetarized calculations of value by neoclassical economics often do not capture the importance of nature or values that people hold, particularly for those "hard-to-define" and non-market values. Therefore, all important values cannot be calculated with the same metric, particularly that of dollars. As an example, are the dollars given at a religious service an accurate indication of the

value by a person for that spiritual service? It is unlikely that the $20 in the offering plate signals the same value as $20 for a movie date.

Social processes affect which values we end up holding, as well as what "nature" is understood to be. Social processes also affect how we act on these values, particularly if our values are not supported by existing structures, or if those values are somehow devalued. Human beings do not only act on the basis of rational calculation of worth.

Based on the complexity of valuation, a strong recommendation in the report is that any assessment of "values of nature" will require attention to how values are produced, what values come to be held, and how they are manifested.[1] Therefore, it is important that well-conducted mixed-method studies take place. Costanza (2003) argues that social goals determine the basis for valuation and in this we agree.[2] Research methods and the definitions of such important concepts as "values" and "nature" (and even "Canadians") will differ depending on those social goals.

This report begins with a quick overview of the concept of "nature" and the concept of "values" in Section 2. While the words are often used, their meaning varies widely. Section 3 focuses on the idea of values and how value is assigned. It details how the term is used in five areas of study – conservation science, economics, psychology, philosophy and socio-cultural sciences. This section also reviews the major ways that these five disciplines have tried to assess the values of nature. Section 4 of the report details specific methodologies that have been used to elicit social values held by people, focusing on survey, narrative, ethnography, focus groups and spatial mapping techniques. Section 5 delves particularly into certain specific sectors of life that may represent how people value or show value of nature. Particular focus is placed on "nearby nature," nature and health, and how nature is valued in recreation and tourism. The detailed discussions in these sections and the more limited discussions about other life sectors provide extensive information of the many and diverse ways that nature is valued by Canadians. Section 6 concludes by placing nature-values in a broader, international research context. Values are part of the interpretive matrix that individuals use. Research is showing value clusters about sustainability; understanding the distribution of values held by Canadians can be a significant basis for effectively engaging them on environmental and nature conservation efforts.

2 CONCEPTS

This project's most basic concepts are present in its title: "Valuing Nature." These two concepts are not as simple as might be assumed, particularly if credible research is to be done on the topic.

What is "Nature"?

> *WHY THIS MATTERS:*
> *We'd come back from a 12 day wilderness trip. As we sat next to the cattails on the edge of the built pond in a suburban park, Mackenzie pointed around her, "It's all wrecked. Like, there's no nature here, right?" She paused as we watched a great blue heron fly across the sunset. We waited until it sailed out of sight into the gathering indigo in the east. Waving at the pond and the concrete platform, she continued, "So there's no nature here, no environment, there's nothing here to care about."*
> *Building on her notion of Nature as Pristine/Wilderness/Untouched, Mackenzie declared there was no point to environmental conservation in the place she lived. (Haluza-DeLay, 2001).*

"Nature" is one of the most complicated concepts in the English language. Western culture has often assumed a division between humans, their civilization or culture, and "nature". "Nature" also carries connotations of being a place that we go to. This was the implication of the 1996 *Importance of Nature to Canadians* survey. Nature was primarily wildland and distant locales (Gray, et al, 2003).

On the other hand, "naturalness" is seen as 'good' in the contemporary world, with a sort of moral authority. For example, Canadian farmer's markets provide an ethical value that makes the food "good food" (Connell, et al 2008). Yet, while much lands protection and management attempt to maintain "'naturalness,' a condition imagined by many to persist over time in the absence of human intervention," the very possibility of this project has been doubted even by land managers (Cole et al, 2008: 36). Cole and 15 co-authors provide an extensive discussion of the need to get beyond "naturalness." The Canada National Parks Act (1988) replaced maintaining parks in a "natural" condition with "ecological integrity" as the goal; this vision acknowledges

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certain kinds of human engagement as a part of nature. Certainly, protected areas – which most people consider "natural" – are a social creation.

In English, the word *nature* can be used with reference to "human nature" or "the nature of the organization" or "trees are part of nature." Even with a "common parlance" approach, to truly understand the importance of nature to Canadians, we must separate it from the stereotypical link with wilderness and include urban nature, gardens, nearby nature, greenspaces and pocket parks where most people live. But does nature also include West Nile Virus? Many people genuinely fear this sort of nature.

Furthermore, various groups within the multicultural Canadian mosaic will conceptualize nature differently, and for various reasons. Other languages (e.g., Hebrew) have no comparable word, indicating no comparable concept. If these factors are not accounted for, Canadians who appear to *value* nature differently may, in fact, differ in their *understanding* of nature, thus skewing any results that may be had (we report some of this research below, beginning on page 97). For example, Japanese conceptions of nature include intensively sculpted gardens, as represented in the Canadian Museum of Civilization. Compare with the teens in Haluza-DeLay's (2001) study who said that "Nature is where there are trees." But they did not believe that "natural trees" included the decades-old bonsai sitting on the window sill or the decorative ashes dotting carefully landscaped suburban lawns.

While the word "nature" may be have a so-called "common-sense" understanding in the English-speaking world, our country encompasses an ever-increasing range of cultures and groups who may mean significantly different things when they say "nature." For example, a study of Menominee Native Americans and rural Wisconsin European Americans showed that the Menominee considered humans to be *a part of* nature, whereas the Wisconsinites viewed humans as *apart from* nature (Bang, et al 2007). This simple difference was strongly correlated with substantial differences in worldview, values, and economic practice, and even cognitive operations between the two groups. In other words, culture – specifically, the different paradigms about the human relationship with nature – shapes the way we think about nature.

On this topic, language matters. Language conveys meanings – unintended or intentional. As writer Stephen Trimble describes, "Language has a lot to do with it [environmental conflict]. The language of the rancher… is incredibly concrete. The language that environmentalists use to describe the look of the place becomes more and more abstract the farther they get from it…" (in Satterfield & Slovic, 2004, p. 193). And some words ranchers use may frighten environmentalists: "Production kinds of words. Head of cattle, units of production. But the ranchers I've talked to speak with great sadness about how the urban environmental community simply doesn't understand what they are about" (p. 193). Rural and urban, environmentalists and ranchers and Aboriginal peoples, Indo-Canadians, English speakers, and every subset of the Canadian population show their meanings of nature in diverse ways that will make a broad assessment of the topic challenging.

Personal experience also matters. Environmental education work shows how urban kids consider wildness in ways completely foreign to rural children; a spider can be "wild" and give rise to fear of nature (Bixler, et al, 1994). Wells & Lekies' (2006) structural equation modelling reconfirms findings discerned by previous research– significant life experience in nature *as children* is a crucial element in producing environmental values. But does a garden constitute "nature"? How about an overgrown space in the midst of the city, or a vacant lot; or a semi-naturalized schoolyard? These types of "nature" have been shown to give many children their only taste of "the natural" (Nabhan & Trimble, 1995; Haluza-DeLay, 1997) and may play a very important role in child development (Kahn & Kellert, 2002). Considerable research shows that two distinct sources of information – direct personal experience and media – are largely used by people to form their environmental attitudes and beliefs (Xiao &Dunlap, 2007). But direct contact with nature is also declining (Louv, 2005; Pergams & Zaradic, 2008). Parks Canada visitation rates have declined since the mid-1970s; do such declines indicate anything about the value placed on that type of nature?

In *The Culture of Nature*, Wilson (1991) showed that Canadian approaches to the land have been either that of total development or that of total preservation. This model supports the nature/human dichotomy, which results in nature-preservation amounting to a form of "geographical taxidermy" (Cannavó, 2007). Alternatively, the IUCN model of land protection establishes a diverse range of points, including "working landscapes" that maintain a hybrid conjunction of nature-culture. So, in one nation, farm landscapes are valued enough to have institutionalized protection; while in another country there may be value (or not) but not protection. Such "cultural landscapes" represent a different form of "natural beauty." Nature is not a simple concept. Neither is our interaction with those things we call nature and "natural."

What are "Values"?

Ethics is about trying to determine "the good, the end, the right, obligation, virtue, moral judgement, aesthetic judgement, the beautiful, truth and validity" (Frankena, 1967: 229). Pursing *The Good* (*Sunnum bonum*, literally, "the end goal") is the true purpose of humanity, according to classical philosophers. At the least, what is good was not to be determined solely on *use value* to meet human preferences, desires, needs and perceived needs. In contrast with this historic conception of goodness, the term "value" meant "what is the worth of its use?" This economic understanding is inherent in the language of "value" and "valuation" (Frankena, 1967). The meanings of these concepts have shifted comparatively recently, so that so that we now understand "values" as equivalent with "what is good." In other words, we see ourselves and others as acting on the basis of the values we and they hold, or, we act toward things on the basis of how they are valued. According to historians like Frankena and Taylor (2004), the shift began sometime around 1850, as part of the historical developments of modernity and capitalism. The Good became equated with "what can we use it for?" and more crassly, "How can we make money from it?"

This conflation of values and *The Good* are evident in the way that researchers are now defining values in terms of both "preferences" and "enduring concepts of the good" (Manning & More, 2002; Xu and Bengstrom, 1997) at the same time. Preferences for

something are now seen to correspond with ultimate good. All well and good, perhaps, but it means that value is completely subjective to the held preferences of the valuer. Also, that the means of valuing is the totality of value. For example, if the value of a forest is conceptualized as monetary, *The Good* might be in making the forest pay out. So while we might refer to this study as "the importance of" nature, others discuss "valuation."

Under the assumption that nature is to be used, compiling a list of "values" would have been relatively noncontroversial. It would simply itemise those things considered useful by a specific set of human persons. Value, in this way, is understood to be *anthropocentric* (human-focused)*, subjective* (dependent on the subject, the one who places value) and *instrumental* (for a purpose). In other words, current assumptions take for granted that values are placed by humans upon things and that values are relative; they are mere preferences among different potential uses. That means no thing has a value in and of itself (*intrinsic value*).

WHY THIS MATTERS
E.B. White's <u>Charlotte's Web</u> shows the conflict between these different types of values. Because of Charlotte (the spider)'s actions about Wilbur (the pig), the farmer (Zuckerman) is faced with the conflict of how to 'value' Wilbur (as nature). Is Wilbur's value for his economic (and instrumental) value, or on other values? Is Wilbur's value purely subjective (provided by the farmer) or is there an intrinsic value that Wilbur has? (Sagoff, 1991)[3]

This understanding clearly contrasts with assumptions about values as based on a comprehension of the good, the beautiful, the right and the true. This is a normative rather than subjective way of looking what is good, and requires careful discernment. By the dawn of the 20th-century, the instrumental, subjective and anthropocentric presuppositions of the "values" vocabulary came to hold sway as one of the dominant ways of determining courses of action. Values were understood as nothing more than the projection of preference by a valuer (understood to be placed by humans alone); now goodness, right behaviour and even truth became "values" determined by and thus relative to whomever expressed them. Expression of the preferred value of things were often a function of social position; those with power to acquire what they valued were able to establish what was to be considered the proper means of valuation and even the proper values to be held by all. There are also cultural considerations about how language

and social processes shape values perception. Biologist Gary Paul Nabhan discussed some of these socio-cultural processes in the aftermath of publishing *The Forgotten Pollinators,* about insects in the American Southwest:

> I felt there were a lot of ways to talk to farmers, fishermen, beekeepers, a variety of people who make their livelihoods from interactions with the natural world… We introduced other ways to value pollinators besides the dollar loss to consumers with rising food prices, all the while trying to come into the discussion about utilitarian versus non-economic uses. A lot of people have said to me, "I never thought about the value of these things to me before." And "If you had hit me with aesthetic arguments at the same time I was being barraged by either the logging industry or other people, it wouldn't really have had the impact that it did." (in Satterfield & Slovic, 2004: 250).

In conclusion, the notion of values is not straightforward. This discussion makes two important distinctions which need to be considered in doing research on values. First, will values be considered exclusively as objects (held by someone), or will values also be viewed as social processes? Second, are values just another word for preferences, or do values have some relationship to something(s) greater than preference? These two questions inform much of this report.

3   CONCEPTUALIZING VALUES FOR RESEARCH

It is important to note this brief history of the discourse on values because the term may otherwise be taken for granted rather than recognised as historical products laden with assumptions. In addition, popular usage of the term tends to be casual – more like "the importance of" – which can be confusing, non-specific, or minimize deeply held values:

> An increasingly salient problem and management challenge, however, is what precisely is meant by such reference to *values* [in nature-protection contexts], and what is being measured and managed... The confusion also reflects pervasive disciplinary divides with respect to discipline and practice-specific conceptual and operation meanings of 'values.' (Reser & Bentrubberbäumer, 2005, p. 126)

To illustrate this divergence even within thoughtful and disciplined use, we consider the ways that five academic domains – conservation sciences, economics, psychology, philosophy, and socio-cultural sciences (e.g., sociology, human geography, anthropology) – have considered "values." The social sciences all conceive of values as something held by human beings, with no ontological status apart from human assignment. Philosophy questions whether that assumption is appropriate. Natural sciences focused on conservation often term properties of natural items as "values." The approaches to valuing nature of five disciplines are discussed in the following sections.

WHY THIS MATTERS:
A citizen process showed that Chicagoans held four "visions of nature" about the city's waterfront:
- *nature as designed landscape*
- *nature as [wildlife] habitat*
- *nature as recreation*
- *nature as pre-European settlement landscape.*

The values associated with each of these ideas of nature affected citizens' perception of management of the Waterfront. The process kept advocates from different visions involved. Final plans included accommodation of differing values about nature based on these different conceptions of nature. Although it made for a more complicated situation, ignoring this plurality of values would have led to more management problems in the long-term (Gobster, 2001).

Conservation Science Approaches to Valuing Nature

We use "conservation sciences" here to imply natural resource management sciences. So-called "science-based" approaches often do not include social sciences, although they may include economics (Van Dyke, 2008). In the conservation sciences, These are often associated with an increasing way of conceptualizing natural ecological functions as "ecosystem services" which ultimately serve humanity and human society. These "values" may be monetarized, although the procedures for doing so are not yet well conceived. In this report, we will *not* address ecosystem goods and services except as it illuminates use of the concept "values of nature."

Often, natural sciences conceptualize "values" as if they were constituent parts of natural features. For example, Ducks Unlimited Canada has a series of 16 fact sheets on "Natural Values" (Table 1).

Table 1: List of "Natural Values" from Ducks Unlimited.

Natural Values: Linking the Environment to the Economy is a series of bulletins developed by Ducks Unlimited Canada to improve the environmental and economic understanding of natural systems. In Canada, policy, legislation and regulation efforts must accelerate to protect our important resources. (http://www.ducks.ca/conserve/wetland_values/conserve.html) 1: Ecological Goods and Services 2: Freshwater 3: Soil 4: Atmosphere 5: Biodiversity 6: Wetlands 7: Grasslands 8: Lakes and Rivers 9: Riparian Areas 10: Forests 11: Agriculture and the Environment 12: Forestry and the Environment 13: Urban Natural Capital 14: Marine Areas 15: Boreal Forest 16: Conserving Canada's Natural Capital

Such approaches are based on "science-based management," while endeavouring to place science into the language of values. The characteristics of healthy ecosystems are called

values which seem to give values a status intrinsic to ecosystems. Presented this way, the implication is that healthy ecosystems and protected natural areas provide services to human society. Nature is conceived as "natural capital", which may give it the same status – for better or for worse – as other forms of human or financial capital.

A second example is Gray's (2004) listing of "values" of the geodiversity of the planet (Figure 1). The 32 values presented here are a mix of characteristics and benefits. Gray is clearly aware that values are assigned. However, he also presents many of these characteristics as inherent properties of the ecosystems, albeit with utility for human societies.

Intrinsic value	1. Intrinsic value	Abiotic nature free of human valuations
	2. Folklore	Giant's causeway, UK; devil's tower, USA
	3. Archaelogical/Historical	Petra, Jordan; Stonehenge, UK: local tools and artefacts
	4. Spiritual	Uluru, Australia; N.American Indian sites
	5. Sense of place	White Cliffs of Dover, UK; Rock of Gibraltar; local places
Aesthetic value	6. Local landscapes	Sea-views; countryside walks; vernacular buildings
	7. Geotourism	Grand canyon, USA; Norwegian fjords; Canadian Rockies
	8. Leisure activities	Rock climbing; caving; whitewater rafting; fossil hunting
	9. Remote appreciation	Nature in magazines and TV; "Walking with dinosaurs".
	10. Voluntary activities	Wall repairs; footpath construction; mine restoration
	11. Artistic inspiration	Literature (Hardy); music (Sibelus); painting (Turner)
Economic value	12. Energy	Coal & peat; oil & gas; uranium; geothermal; hydro-electrical; tidal
	13. Industrial minerals	Potash; fluorspar; kaolinite; rock salt
	14. Metallic minerals	Iron; copper; chromium; zinc; tin; gold; platinum
	15. Construction minerals	Stone; aggregate; limestone; brick clay; gypsum; bitumen
	16. Gemstones	Diamonds; sapphires; emerald; onyx; agate
	17. Fossils	Tyrannosaurus "Sue": fossil and mineral shops
	18. Soil	Food production; wine; timber; fibre
Functional value	19. Platforms	Building and infrastructure construction
	20. Storage & recycling	Carbon in soil & peat; oil & gas in traps; hydrological cycle
	21. Health	Nutrients & minerals; therapeutic landscapes
	22. Burial	Human burial; landfill sites; underground nuclear chambers
	23. Pollution control	Soil & rock as a water filter; landform screens
	24. Water chemistry	Mineral water; whisky
	25. Soil functions	Agriculture; viticulture; forestry
	26. Geosystem functions	Continued operation of fluvial, coastal, aeolian processes
	27. Ecosystem functions	Biodiversity
Research & education value	28. Scientific discovery	Geoprocesses; geotechnological; geoforensics
	29. Earth history	Evolution; geological history of earth; geoarcheology
	30. History of research	Early identification of unconformities; igneous activity, etc
	31. Environmental monitoring	Ice cores; sea-level change; pollution monitoring
	32. Education & training	Field studies; professional training

Figure 1: Summary of geodiversity values from Gray (2004), taken from Reser & Bentrubberbäumer (2004: 132).

Clearly, these are important, and valuable, functions of healthy ecosystems, but they are not "values" themselves, at least in terms of the definition provided above of "estimations of the worth of something" or "pursuits of the good." These "values" are characterized as intrinsic to the natural systems, but ultimately they are assigned by human beings, in

terms of value to human functioning. Furthermore, these "values" are in a social contest with other values, such as timber, or mineral production. As will be discussed in the philosophy section below (page 34) this differs from *existence value*. Thus, such inherent *values* are not intrinsic *value*. Natural values are characteristics, not inherent goodness. The benefit of this stance is that these values may be considered against other values, and can be calculated in the human metrics assignable to such values (Costanza et al, 1997, Daily, et al 2000; Van Dyke, 2008). A key textbook in conservation biology (Van Dyke, 2008) includes an extensive section on econometric valuations of ecosystem services, as well as the econometric methods we describe below. Van Dyke does describe other non-market and non-ecosystem service values. Unfortunately, he includes these under the rubric "ethics", and does not give much methodological attention to them except through surveys utilizing ratings or likert scales. In contrast, we assert that values are not properties of objects, and cannot be considered independent of the social procedures involved in adjudicating what so-called values are valued most highly.

Economic Approaches to Valuing Nature

"Standard neoclassical economics" (Dore & Webb, 2003, p. 101) generally assigns value primarily based on estimations of worth in two forms: direct value (consumption, use-values; which may include so-called *existence values* such as aesthetic or bequest values) and indirect value (assets that yield a return). In terms of nature, environmental economists have pushed to include the indirect value of "natural capital" in "green accounting" systems (e.g., World Bank, 1997). A further move has been the attempt to calculate the worth of "ecosystem services." Ecological economics also recognizes that there are values that do not merely serve human social systems, although these are harder to evaluate; it also acknowledges that imposing a universal metric (such as monetarization) on all values may not be productive. Furthermore, the valuation methods used by economists are a meaning-making system that should be seen as a cultural artefact (Costanza, 2003). Lastly, preservation of nature (e.g., biodiversity, intact ecosystems, etc) is an ethical responsibility, and needs to be addressed in ethical terms

rather than merely on a monetary calculation. Economic calculation can, however, contribute to social choices.

With a disciplinary focus on human behaviour and public choice, economists have sought to develop conceptual frameworks to think about values and specific tools for understanding value choices, preferences, and trade-offs. These frameworks that include value domains such as intrinsic and instrumental are not unlike those found in other disciplines, but a key distinction within this literature is an emphasis on method. In fact, it is difficult to discuss economic approaches to valuing nature without talking about method. This section includes a brief review of seminal research on the topic of environmental values in economics and then highlights several dominant methods that are utilized to assess economic values.

Held values are defined as ''an enduring conception of the preferable which influences choice and action'' (Brown 1984: 232). Defined slightly differently, Bengston identifies held forest values as ''an enduring concept of the good related to forests and forest ecosystems'' (1994: 520). Both of these definitions refer to a long-term, enduring, or deep seated notion of "the good" or "the preferable." In a sense, this idea of held values is related to the philosophical idea of value as intrinsic or existing as an end in itself.

According to Brown, held values often relate to norms such as desirable modes of conduct (honesty and courage), end states of existence (equity and freedom) or qualities such as beauty and uniqueness.

Assigned values are also identified in the literature. If held values are expressions of preference or norms about what constitutes the good life, then assigned values have to do with relationships between people and an object. This understanding of values is closely linked to the idea of instrumental values, or the valuing of objects as a way of achieving specific ends. According to Brown, the notion of assigned values is not an ideal term because the idea of something being assigned a value (for instance some aspect of nature) is something of a misnomer.

In fact, people probably do not place, or assign, anything. Rather, the preference relationship between a person and an object, given the person's

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held values, results in different objects being of different importance or worth (1984: 233).

For economists, these assigned values or *preference values* are the main source of attention when thinking about the value of nature to Canadians.

Based on this approach to understanding values in economics, numerous tools or methods are utilized to assess economic value. For the most part, these tools involve the expression of value in monetary terms as a way of distilling apparently incommensurable objects and expressions of value into a singular expression (dollars). According to Brown (1984), there are a number of reasons for expressing values in monetary terms, including the fact that monetary values already exist for many things (particularly those things that are traded in markets). The setting of prices is a social phenomenon resulting from exchanges between individuals; prices tend to reflect scarcity and they also provide opportunities for individuals to express trade-offs between several social choice sets.

One of the basic distinctions in economic research involves analysis of goods and services which are traded in markets and therefore have a price attached to them (e.g., carbon), and goods and services which are not traded in markets with no market price attached to them (e.g., visits to local parks). When it comes to understanding the value of nature to Canadians, the assessment of values in nature, as expressed in monetary terms, commonly falls within the realm of *non-market economics*. This field of study concerns itself with aspects of environmental valuation, where specific market mechanisms often do not exist and where alternative pricing mechanisms must be constructed. The section to follow provides an overview of dominant economic approaches valuing nature.

Methodology in Economic Valuation

Damage, replacement, and substitution costs

Work conducted by Costanza (published in the journal *Nature* in 1997) and colleagues in the 1990s exemplifies this aggregate approach to the economic valuation of nature. In this analysis, Costanza determined that the total value of global environmental services was approximately $33 trillion, half of which went to nutrient cycling. Similar work was carried out on a smaller scale by researchers in Canada on the economic value

of the boreal ecosystem. In a report published in 2005 by Anielski and Wilson, their work determined that the market value of boreal natural capital extraction was approximately $38 billion in 2002. This market value was contrasted with an assessment of the non-market values from the boreal forest, pegged at $93 billion in 2002. High value services included flood control and water filtration, pest control from boreal bird species, nature-related activities, and carbon sequestration. In an aggregate sense, the importance of nature to Canadians can be understood in this way. These values are calculated through methods of aggregating diverse types of ecosystem services over large landscapes, and then such services are converted to a monetary value – as an expression of what it would cost society if such ecosystem services began to fail and required replacing through human intervention (pest management, water filtration, etc).

Although such efforts to value nature through *replacement valuation techniques* tend to receive considerable attention and stimulate public debate, these broad-based valuation efforts are not particularly popular amongst economists. Many economists who work with environmental values continue to focus on more modest approaches to understanding the value of nature through an exploration of individual choices and trade-off analysis that can be extrapolated from random sets of individuals to society as a whole. Several of these economic valuation techniques are reviewed below.

Stated preferences

Contingent valuation method (CVM) is one of the most popular methods in determining a price for non-market environmental services. In this approach, research focuses on the ways in which survey participants state their willingness to pay for a particular environmental service, contingent upon the scenarios or trade-offs that are presented to them. In this sense, CVM is associated with the *stated preference* approach to valuation in economics. As an example, survey respondents are asked their willingness to pay for the restoration of wetlands in a region that would require the development of alternative water sources and an increased level of taxation. Through a series of *choice experiments* (choices between a series of scenarios that involve for example higher or lower tax rates, high or low levels of nature conservation) economists can determine the

level of increased taxes that a population is willing to pay for enhanced ecosystem service. One of the strengths of this method is its ability to capture what economists identify as *passive use values.* These are values held by individuals that are not easily identified through directed observation or preferences that might otherwise be observed through individual behaviour. A related approach is to study willingness to accept compensation, which combines replacement costs with stated preferences.

This method of valuing nature is commonly associated with a local context such as habitat restoration but there may be opportunities to explore larger-scale contingencies such as stated preferences for carbon sequestration, or efforts to mitigate climate change that affects all Canadians.

Revealed preferences

There are several revealed preference approaches to valuing nature within the economic literature. In contrast to the stated preference method, where survey participants may express a willingness to do something, but may in fact not do anything, revealed preference approaches tend to examine ways in which individual preferences for environmental services or nature values are revealed or observed through individual behaviours.

The *hedonic pricing method* examines ways in which the value of nature, ecosystems, or environmental services has an impact on the price of goods that are traded in markets. For example, property values are affected by environmental amenities such as clean air and water, lack of noise, viewscapes, etc. This economic method can express the value of nature through revealed changes in these property values. As an example, using spatial economic models in Alberta, Boxall, et al (2004) determined that property values are negatively correlated with the number of sour gas wells and flaring oil batteries within 4 km of the property. This analysis of revealed preference through housing prices or other goods traded in markets can signal a value for nature and result in price changes that are reflected in market.

Travel cost method involves an assessment of the time and travel expenses incurred by an individual to access a particular nature activity such as hiking or fishing in

a park. These travel expenses are a reflection of value for that nature-related activity. Willingness to pay is revealed through travel costs and is calculated on the basis of how many trips an individual takes as well as some estimate of the expense that is incurred by the individual. Short trips to a municipal park may be inexpensive but if such trips are frequent, the overall value of that experience may be greater than a longer trip that is undertaken less frequently. A study conducted in 1994 in Alberta focused on the travel costs of people visiting recreation sites in the Rocky-Clearwater forest area of Alberta (Boxall et al. 1996). Based on this analysis, the non-market benefit provided to the province from these recreation areas was calculated to be about $750,000 in 1994.

With information about the home location of survey respondents and the location and frequency of travel destinations, the *Importance of Nature to Canadians* survey (1996) was constructed, in part, to undertake this type of travel costs method as a monetary expression of nature values within the Canadian population.

One of the distinctions in the 1996 *Survey on The Importance of Nature to Canadians* was the predominant focus on survey respondent behaviour – *revealed preference* – and the economic value of nature-related activity. A number of questions focused on what Canadians did with regard to nature activities, where they went and how often they went there. In New Brunswick, for instance, residents spent $208 million on nature-related activities during 1996, about half of which was spent doing outdoor activities as the survey defined them. On average, participants in NB spent $229 or about $13 per day of participation. These data are further broken down into different types of nature-related activities such as fishing and hunting.

Although this information is valuable in understanding the activities of Canadians with regards to nature and their economic significance, it is only one measure of value. The 1996 survey tells us nothing about more deeply held values regarding nature and how these values may be distributed across the population of Canada. Currently there is little to no systematic national information on intrinsic or deeply held values. Values and valuation are not synonymous, particularly if the process of valuing is assumed to follow a neoclassical economic model without attention to psychological and social processes. As Reser & Bentrubberbäumer (2005: 127) note,

the use and meaning of values and valuing by economists is idiosyncratic to that discipline and does not accord with general social science usage (Bazerman et al., 1997; Sagoff, 1998). Nevertheless this 'socio-economic' usage is often incorrectly understood by non social scientists as essentially synonymous with mainstream social science use and convention.

Other disciplines show that the relationship of values with behaviour is much more complex.

Psychological Approaches to Valuing Nature

Psychology asks, how do values operate in lifeworlds? Psychology also studies how our individual minds, thoughts, emotions and bodies are affected by the biological and geological world. Generally, psychology treats values as objects, residing in people, so that research can uncover and measure the values. However, the relationship of values with behaviour is much less secure. A psychological understanding shows that human beings do not only act on the basis of rational calculation of worth, especially monetary worth.

Values-Attitudes/Norms-Behaviour

It is one thing to think of values as legitimate albeit abstract objects, but it is also important to consider how values get operationalized, or, conversely, what individual or collective activities imply about values. The 1996 *Survey* primarily operationalized "importance" through time and expenditures. To some extent this fits a conceptualizing of values as eventually operationalized through behaviours. But psychological research shows that values serve primarily as general orientations, and have to be operationalized by individuals as specific *attitudes*. Everyday behaviour is shaped by these attitudes toward particular objects, people, or ideas. In social psychology, a value refers to some end-state (What is it that I want?) or to a mode of conduct (How do I get something I want?), whereas attitudes mobilize the values in highly operational, context-specific ways. In a simple way, both attitudes and values are about the importance of something to an

individual. However, it is important not to ignore the scholarship that identifies the complexity that is closer to the reality of human behaviour. To summarize, in psychology, values:

- are held by individual or society.
- are abstract principles, that transcend concrete situations.
- direct our choices or appraisals.
- are ordered by their relative importance.
- have (some) effect on behaviours

The dominant psychological approach can be summarized as *values-attitudes-behaviours*, or, alternatively as *values-norms-behaviour*. Values are several steps removed from activity, mediated by other factors, although still assumed to be important.

A great deal of research is based on the work of a few key researchers in the psychology of values, particularly Milton Rokeach and Shalom Schwartz. Both articulate a limited number of values and the conceptual relation of values with needs, goals and so on. In Rokeach's schematic, there are two categories of values, *terminal values* – a belief about a desired end state – and *instrumental values* – a belief about the preferred means of getting to ends. Schwartz's modification makes the schematic more complicated. The Rokeach/Schwartz approach is the most commonly used means of measuring of value across a wide range of cultural groups around the globe. Considerable research on environmental values, forest values, sustainability values, and so on, has been based on variations of this model of values. It is important to note that values encompass all orientations, not just those conventionally labelled as "good." Hedonism and the pursuit of power are value-orientations, as are altruism, tradition, and universalism (broadmindedness)

The basic model is shown in Figure 2 (Stern 2000). Psychologists have proposed that behaviour is based on attitudes, which are based on values. The linkages between values on the left and behaviours on the right is schematically illustrated. Values are highly mediated. Our review shows that most of the focus to date on nature values in Canada is at the behavioural level on the right side of the diagram – what people do when they go out into nature. We know very little of the foundational links to these behaviours by way of more deeply held values and beliefs about nature. The three value scales

(biospheric, altruistic [sic], and egoistic) in Figure 2 are based on Stern and Dietz (1994); subsequent research has shown them to have divergent associations with environmental attitudes. Right from that basic tripartite cluster of values, that there will be different ways of valuing nature rather than a single metric is shown.
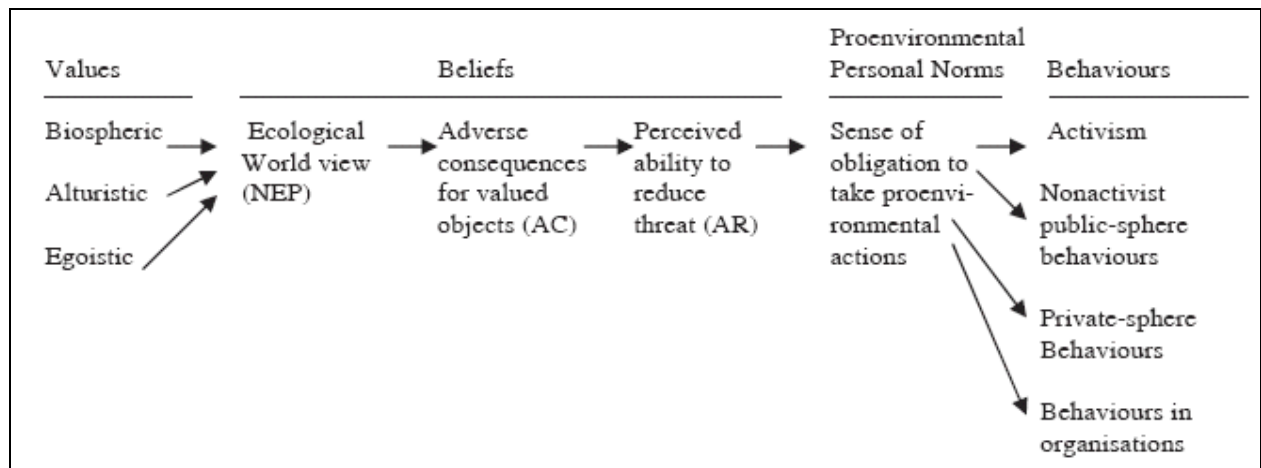
Figure 2. Schematic representation of values-beliefs-behaviours (Stern, 2000).

More importantly, the relationship of behaviours to values cannot be easily inferred from expressed behaviour (that was described above as revealed preferences). Considerable research shows an extensive "gap" between precursors such as values or knowledge and the eventual behaviour in environmentally responsive ways. For example, Kollmus and Agyeman (2002) propose the more complicated model in Figure 3. Values are one of many factors, and are both internal to the behaving agent and external in terms of societal factors that affect the internal factors. Value systems also affect the capability to acquire and act on new knowledge, as was as affect and are affected by emotions. Finally, Sarigöllü (2009) demonstrated in a study of Canadian environmental attitudes that accessibility (being at the forefront of a person's attention) or primacy (more recently activated than other attitudes; a time-sensitive form of being at the forefront of attention) of the attitudes were significant factors in acting in proenvironmental ways (see also, Biel & Nilsson, 2005). For example, if people have regular contact with natural areas, they are more likely to think about, value or support nature-related behaviour or public policy; the timely contact makes attitudes about nature more accessible.
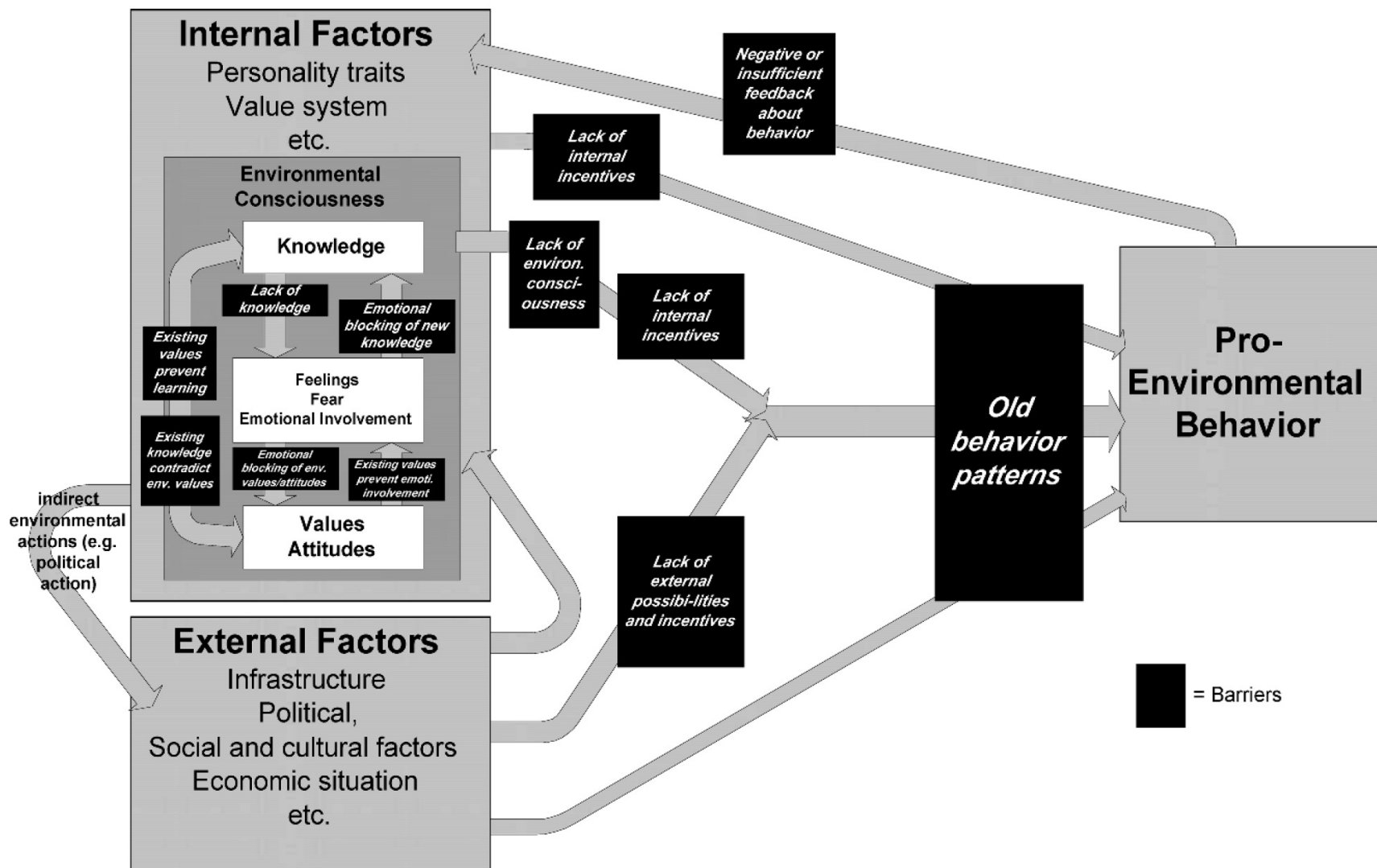
Figure 3: Model linking proenvironmental behaviour with precursor factors (Kollmus & Agyeman, 2002).

As all this research shows, values and behaviour are mediated by many other factors. In fact, Ojea and Loureiro (2007) found that differences in the biospheric-egoistic-altruistic value orientations affected willingness-to-pay estimates for environmental goods; this result demonstrates that any calculation of valuations must be placed within theoretical frameworks that will help explain the results. Often values-research has been atheoretical (Reser & Bentrubberbäumer, 2005; Dunlap & Jones, 2002).

A related but slightly different version of the study of environmental values is to consider the societal orientation as grounds for more specific values. For example, Inglehart proposes a simple binary: societies are at some level materialist (still focusing on survival needs) or post-materialist (survival needs are met, so higher order values may be considered). Protection of natural spaces is often considered a luxury so post-materialist societies would be hypothesized to have higher degrees of environmental concern and nature protection. Steger et al (1989) surveyed Americans and Canadians on these measures during an early wave of environmental interest and found national differences more relevant than postmaterial values. On this question of national values, a common but simplistic approach is to differentiate cultures along dichotomous lines; common in social psychology is a view that some nations are individualistic and others are collectivist in orientation, which will shape what values are produced. Presumably, individualistic cultures (like Canada) would value freedom to use nature, and personal pursuit of property or happiness, whereas collectivist cultures might value what nature provides to the common good. Following this line of research, Sarigöllü (2009) compared environmental attitudes among several sectors of Turkish and Canadian societies. His assessment showed "significant differences in environmental attitudes between collectivist versus individualistic, externally versus internally controlled, materialist versus postmaterialist, past-oriented versus future-oriented cultures" (p. 365). However, many other researchers have shown that valuing of nature and concern for environmental matters is not so simply divided (see Dietz, et al, 2005, for the most extensive discussion of this research). The environmental justice movement around the world undermines the claim that nature concerns are matters primarily for those who have already accomplished higher quality of life or living standards.

In yet another variation, researchers have considered whether nature values or environmental values are related to other general value sets like equality, responsibility, freedom, individualism, or democracy (Leiserowitz, et al, 2005 provides a solid summary). We do not have the space to describe this line of research in depth. The approach usually uses World Values Survey data and other cross-national studies to interrogate what relationships may exist among these broad value orientations: in other words, how nature or environmental values are nested within valuing democratic participation or how a value orientation for shared responsibility may affect valuing nature protection strategies. The relevance of this research is demonstrated in that Canadian resource management agencies are mandated to include public participation – one could say are "required to value" public participation in such things as sustainable forest management (see page 90 for further discussion), which leads to controversy when the participation does not seem to be given due accord (Parkins, 2002; Sheng, 2005). On a grander scale, some projections indicate that global sustainability may require a paradigm shift which would necessitate extensive value change, à la the Great Transition scenario.[4]

These variations show remarkably diverse theoretical frameworks into which social psychological research has sought to place nature or environmental values. These variations in approach and framework highlight that the purpose of the research – the social goals – are essential precursors to methodological development.

Biopsychological Approaches

A very different approach is represented by an emerging body of knowledge about the biopsychological *need* for nature and the physiological effects of nature. As summarized in *The Lancet,*

> the effect of green space is not solely based on promotion or enhancement of physical activity. Several studies have shown that contact (either by presence or visual) with green spaces can be psychologically and physiologically restorative, reducing blood pressure and stress levels and possibly promoting faster healing in patients after surgical intervention. (Mitchell & Popham, 2008: 1655)

Strife and Downey (2009) provide the most recent summary of a wide range of the benefits that come from access to nature and natural greenspace. Lack of access means many deficiencies, leading to the popularized label of "nature deficit disorder" (Louv, 2005). Benefits include better concentration, reduced stress and aggression, better academic performance, higher pro-environmental attitudes, higher cognitive functioning, better control of emotions, lower incidence of depression, lower attention-deficit and hyperactivity disorder, reduced drug use, reduced prescribed drugs, and more (Devries, et al, 2003; Kuo & Taylor, 2004; Maller et al, 2002, 2006; Strife & Downey, 2009). Increasing recognition of these benefits have led to calls – including by public health authorities (Eyles, 2009; American Public Health Association, 2007) – to address effects of lack of nature access (Louv, 2006; Frumkin & Louv, 2007; Maller et al, 2006).

In addition to physiological and psychological effects, researchers report an *emotional affinity* for nature. The research by Kals, Schumacher and Montada (1999) show that such emotional affinity is primarily based in direct experience of nature, and has a direct, positive relationship with conservation behaviours. Accessing nature can be an antidote to depression. A great deal of psychological research shows nature to be *restorative.* Nature helps restore attention, relieve stress and reduce mental fatigue. Experiments show office workers walking in a park will experience more restorative effects than those that merely walk (all other variables being held constant). These psychological benefits are higher with increased biodiversity (Fuller, et al, 2006).

Matsuoka & Kaplan's (2008) review of planning research showed the profession's increasing awareness that "nearby nature" met needs for regular contact with nature in human-dominated settings. In addition, the literature showed satisfaction of needs for aesthetics – which was clearly associated with *quality of* life (closely connected to workplace productivity, life satisfaction, entrepreneurship and attraction of new business and 'cultural creatives,' and economic prosperity, Devries & Peterson, 2009; Dayton-Johnston, 2001) – *psychological restoration*, and satisfaction of need for recreation. With astonishingly consistent results, research projects find such biophysical benefits from a wide range of forms of "nature" as,

> rooftop gardens, greenbelts and greenways as well as urban stream corridors and
> forests. They include hospital grounds and assisted living facilities, a corporate

campus, residential neighborhoods, parks and school yards, and even derelict

lands….In other cases, the environment is viewed through a window, or is the

actual setting of the study. Though the studies represent a great diversity of

settings, residential neighborhoods were the most frequent context. (p.9)

Across a wide range of manifestations, nature contributes to psychological and physical health and well-being. These sorts of biopsychological studies lend support to the notion of "biophilia," which socio-biologist E.O.Wilson proposed to explain that human beings – which are "natural" after all – have an innate and genetically-wired affinity for other life forms (Kellert & Wilson, 1993; Kellert, 1996; Kahn & Kellert, 2002). Such an attempt to explain complex behaviour is difficult to test, as the subdiscipline of eco-psychology has struggled to establish.

However, what is relevant for this project and other research on "values of nature" is that people may not expressedly *value* these benefits provided by nature, or acknowledge them as a legitimate need. This is particularly the case where science – whether medical, psychological, or social scientific – has not yet provided conclusive and incontrovertible proof of such needs (although traditional knowledge, intuition or other ways of coming to conclusions may have indicated a relationship). In this way, a *science*-based assessment – where science is assumed to mean those methods most like the physical sciences, and tends to be reductionist – can ignore those social, ecological or cultural values of nature not so readily discernible to scientific methods. In other words, simply because the best available science has not fully proven objective value does not mean that it does not exist. Furthermore, in cases where a strong scientific case has been made, just because policymakers, the public, or special interests have not come to value particular aspects of nature does not mean that nature does not have such value.

Finally, given the extensive bio-psychological, health and emotional benefits of access to nature, Strife and Downey insist that limited access is an injustice, and likely disproportionately and negatively disadvantaging particular sectors of the population. This needs research, particularly in Canada, which has lagged behind American researchers on matters of both nature-values and environmental inequality and justice (for the latter, see Agyeman, et al, 2009).

Methodology in Psychological Values of Nature

Experimental Designs

Psychology emphasizes its scientific and universal character, often employing rigorous experimental-control methods for research conducted in this field. Numerous experimental designs exist. Having a control group that is free from the experimental "treatment" yet the same in every other way as the experimental group enables the researcher to know that the cause of the effect is indeed the treatment. Research on restorative effects of walking in nature will have a carefully selected group walking in nature and another carefully selected group similar to the first group simply walking. Everything is the same except the "in nature" component. Therefore, if differences show in the empirical measurements used after the treatment, the research can confidently say the treatment (walking in nature) is the cause of the differences. Most health and psychology research uses some form of experimental method.

While this method seems rigorous, many factors make it difficult to impose rigid control group status on whatever is deemed to be causing an effect. When this "gold standard" cannot be achieved, other research designs have to be employed. More importantly, the experimental situation may not reflect "real life;" people do not live in rigidly controlled conditions. When the results of the experiment are applicable to real life, it is (ironically) called "ecological validity." To overcome problems of ecological validity researchers often use in-the-field experiments that are as close to everyday life of participants as possible. But the variability of ordinary life conditions mean that field experiments cannot be controlled as well, so there is increasing uncertainty that particular effects are truly the result of the hypothesized cause. Finally, people do not behave as if they are cogs in a machine. Human beings adapt, adjust, figure things out, deploy their own ideas – in short, operate on the basis of the meanings that things have for them – so experimental studies may ignore how people really are, or generalize as if people are basically interchangeable.

Survey Scales

Most of the research within socio-psychology that has gained international recognition is the development of several survey scales that are used to measure environmental values (that is, the left side of the schematic in Figure 2). As noted above, one major research program is based on surveys with items drawn from the Rokeach/Schwartz theories of values. These items form a "scale" to measure the values. The scale involves 56 survey items that participants are invited to rate on a nine point continuum. The items are subdivided into ten groupings (subscales) that include: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity and security. The Schwartz scale includes one item on "unity with nature." Several researchers have modified the scales in ways to capture value dimensions that include biospheric-humanistic distinctions (Dietz at al, 2005). Compared to the research in the United States, there is limited Canadian research on environmental values, with much of it contained in cross-national comparisons, or of recent vintage (Steger, et al. 1989; Blake, Guppy & Urmetzer, 1997; Frizzell & Pammett, 1997; Kennedy, et al 2009; Sarigöllü, 2009; Schultz, Zelezny & Dalrymple, 2000; Xiao & Dunlap, 2007). Such recentness means that changes over time cannot be assessed. There is a great deal of Canadian "forest values" research based on this model. Furthermore, the way this research is presented primarily assumes that these value-attitude relationships are universal (see page 39 for socio-cultural research that shows nature-related values are context-dependent).

When ascertaining commitment to the environment, researchers have used varying measures. Attitudes, behaviours, and values are among those variables that studies assert measure the respondent's commitment to the environment. Merely a few of the variable categories used on such surveys are sampled in Figure 4.

The diversity of measurements used make comparisons challenging. Proenvironmental beliefs, values, attitudes and actions are not the same thing, and cannot be assumed to represent the same values. Also, questions may not measure what the researcher thought they would; a question about government spending on the environment, for example, may tap respondent views on government spending, not environmental interest. And in all of this, one must remember the extensively mediated relationship between behaviour and values. Finally, *environmental* values are not the same as *nature* values.

Environmental knowledge
  General knowledge
  Knowledge of local issues
Self-Identification as "an environmentalist"
Attitude toward particular concerns, e.g.,
  Nuclear concerns
  Wilderness
General attitudes:
  Government involvement on environmental
    issues
  Support for nature protection
  Support for government spending on
    environment
  Support for government environmental
    regulation
  Support for local protection
Particular behaviours or actions
  Recycling
  Buying local
  Using public transit
  Writing a letter on an environmental issue to
    political representative
  Participating in boycotts

Figure 4: Sample of typical variables in environmental attitudes research.

New Ecological Paradigm

A more explicitly nature-focused assessment of values in social psychology and sociology was developed by Dunlap and colleagues during the 1970s as a way of understanding what they observed to be deeply held transformations in public values about the environment. In contrast to the dominant social paradigm (DSP) which prominently claims a kind of human triumphalism or domination over nature, this emerging notion of nature was termed the New Ecological Paradigm (NEP). The NEP focused on ways in which citizens understood the interactions of humans and nature, the potential for harm, and the need for care. To quantify this change, researchers developed a NEP scale which has become a prominent tool to assess environmental values within the context of survey research (see Figure 5).

Originally, Dunlap and colleagues referred to the NEP as a measure of ecological *worldview* – to what extent is ecological mindedness present within a population? More

recently, as the schematics presented by Stern and others continue to articulate

distinctions between values and other related concepts, Dunlap has revised his idea of

NEP as a measure of value. Dunlap et al (2000)
state that

> the NEP items primarily tap "primitive
> beliefs" about the nature of the earth and
> humanity's relationship with it. According
> to Rokeach (1968: 6), primitive beliefs form
> the inner core of a person's belief system
> and "represent his 'basic truths' and
> physical reality, social reality and the nature
> of the self."

Figure 5: Sample of survey items from New Ecological Paradigm Scale (Dunlap et al 2000).

There are 15 survey items in the NEP scale, with a

focus on the extent to which survey respondents are ecologically minded. The respondent

is invited to agree or disagree with the statement on a 5 point Likert-type scale.

An advantage to the assessment of nature values through the Rokeach/Schwartz

scale or the NEP scale is that both scales are used extensively in other parts of the world

to assess public values and environmental values in particular. The prevalence of these

scales elsewhere provides an opportunity for comparative work between Canada and

other countries. More importantly, the reason for undertaking nature values assessment of

this kind is the conceptual and empirical link between specific kinds of values and

specific kinds of behaviours. As our understanding of nature-related activities continues

to grow through subsequent survey research in Canada, it will be important to understand

something more about the left side of Figure 2, where basic values (including worldviews

and beliefs) are known to underline these nature-related activities and may serve fruitful

in management decision-making (Devries & Peterson, 2009). According to this social

psychological research, values do not correspond to the neoclassical assumption of

people rationally acting on held values such that behaviours are revealed preferences of

the values. Nevertheless, to know something about the anatomy of environmental values

in Canada, how they vary from one region to the next, one cultural group to the next, and

how they are changing over time, is to know something about the changing relationship between the natural world and citizenship in Canada.

Philosophical Approaches to Valuing Nature

Having given birth to the all the other disciplines surveyed in this section of the report, it is not surprising that each discipline's discussion of values is "philosophical." The advanced theoretical component of any disciplinary field is often considered philosophy. Does this mean that

> *"Philosophy means thinking as hard and as clearly as one can about some of the most interesting and enduring problems that human minds have ever encountered."* -- John Perry, Michael Bratman and John Martin Fischer (2007)

focussing on philosophy itself is unnecessary? Why does philosophy matter when all the other disciplines do it anyway?

Ever since the natural and social sciences split off from philosophy, the discipline has directed its focus towards three essential questions: the nature of reality, the ability to know, and the study of values. This last area is obviously of fundamental importance for this project. If the value of nature to Canadians is to be assessed, then we must think hard and clear about what values are. To do that requires reliance on specifically moral philosophy – the subfield of philosophy known as *axiology*. Indeed, most disciplinary assumptions about "values" parasitize on philosophy. What these disciplines tend to take for granted at the theoretical level, philosophy is supposed to expose to critical reflection. It is crucially important to note that the vocabulary of value is itself theory-laden, and the theory by which it is laden is questioned by ecologically-minded value theorists. The stereotypical notion that values are merely subjective, instrumental, and exclusively attributed to human individuals is certainly controversial, yet has come to dominate the notion of "values of nature" in disciplines like economics and, to a lesser degree, other Western academic disciplines. However, the dominance of this underlying and usually unnoticed theory-ladenness is starting to be critiqued even from within the disciplines that have taken it for granted. Because the problems philosophy navigates are some of the most challenging human minds have ever encountered, definitive resolutions are not to be

expected. We summarise below the primary areas where values of nature are subject to philosophical dispute.

Origin and Realness of Values

Where do values come from? How real are they? This is the first aspect of the question "what are values?" On the one hand, values may be understood as being nothing but subjective projections by the valuer onto an otherwise value-neutral object. They are the preferences, biases and desires of a valuing subject.[5] This position may be referred to as "value subjectivism," denying the possibility of objective (independent-of-the-mind) reality of values.

On the other hand, values may be understood to be something beyond the preferring subject, that is, actually "being there." For example, when someone says that "an apple is valuable," the value referred to is an entity or property which is itself valuable – not merely valuable because of the preferences of the subject – in the same way that an entity might itself possess a mass of 50 grams or be 75 decibels loud.[6] This position may be referred to as "value objectivism," whereby values originate in the object rather than the subject, and have a level of independence from mere preference.

As already noted in our section on basic concepts, the vocabulary of contemporary value-theory is implicitly subjectivist. Environmental

> *If values of nature are **merely subjective**, they are easily ignored and trivialised.*

philosophy challenges the anti-objectivist bias prevalent in today's dominant discourses about nature. Environment Canada would do well to not assume, explicitly or implicitly in the way potential survey questions are worded, that values are merely projections of subjective preference.

Why is Nature Valuable?

> *Most disputes about the value of nature concern what nature is good for: a **mere resource to be exploited** or **something more**?*

Independent of where value ultimately comes from or "resides," there is the question of what values are for. The issue of why or in what manner something is valuable is distinct from – although easily confused with – the earlier question of how the valuableness exists.

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The basic options in this category are "instrumental" and "intrinsic" value, a distinction going back to Aristotle and adopted by virtually all disciplines that concern themselves with values. Instrumental value is equivalent with a thing's utility as a means to a separate end, whereas an intrinsically valued thing is valued as an end in itself (Palmer, 2003). Instrumental values are extrinsic to the thing, whereas intrinsic values are internal to the thing.

It is easy to conflate instrumental valuing with value subjectivism and intrinsic valuing with value objectivism, but this is not the case. According to J. Baird Callicott (1985) nature may be valued intrinsically (for the sake of itself) while the intrinsic value of nature is still generated by valuing subjects (human or nonhuman alike).[7] Holmes Rolston (1988), on the other hand, understands instrumental value objectively. The instrumental value of trees for firewood is not something we impute to trees, but rather something we find there: we arrive on the scene to put what is already there to (our) use.

> - *Instrumental values (like firewood) can be objective (the value is in the wood, not in my head).*
> - *Intrinsic values are held subjectively by human valuers.*

Future survey methodology should endeavour to elicit a wide range of both instrumental and intrinsic values from Canadians, and avoid simply equating these value categories with value subjectivism or value objectivism.

What Aspect of Nature is Valuable?

Are individual bighorn sheep more valuable than the species itself? Is "nature" valuable as a whole when the health of the bighorn sheep species requires that individual bighorn sheep die from parasite infections? The final controversy in basic moral philosophy of nature concerns the unit of valuation: are values to be found, ultimately, in individuals of a certain sort (e.g., human, sentient, living), in systems (e.g., species, ecosystems, the Earth, the cosmos), or in abstract qualities which apply to either individuals or systems (e.g., flourishing, integrity, biodiversity, naturalness, homeostasis) (Palmer 2003)? The general consensus may be that "nature" is at least a system characterised by some relevant abstract quality rather than an agglomeration of atomistic

individuals, but the importance of individuals in nature is still a matter of some debate (e.g., ecocentric communitarians versus biocentric individualists, or environmentalists versus animal welfare or rights activists). Environmentalists are not always animal activists: clubbing baby seals isn't necessarily bad for "nature", although it is bad for the baby seals that get clubbed! Future empirical research should seek to discover which aspects of nature (certain parts or "the whole") are valuable to Canadians.

Environmental Aesthetics

Not all values are ethical or moral. Correspondingly, environmental philosophy includes not only environmental ethics but also

> - *Does appreciating **natural beauty** make someone an environmentalist?*
> - *Is natural beauty **easier to discount** than other values?*

environmental aesthetics. This includes valuing nature as beautiful, picturesque, scenic, expressive or even sublime. The scope of environmental aesthetics has grown, however, from merely appreciating "pristine nature," to appreciating a range of humanized environments – from rural landscapes to shopping malls – ultimately including everything except "works of art," strictly defined (Carlson & Berleant, 2004; Porteous, 1996).

The aesthetics of nature appreciation goes back to the 18th century, when aristocrats went on picturesque landscape tours. In this sense, the aesthetics of nature has a more established cultural pedigree than environmentalism. It is likely that the majority of Canadians positively value nature aesthetically, even if they would not identify themselves as "environmentalists." Examples of the preponderance and appeal of aesthetically valuing nature are many: the French oil company Total currently advertises its presence in Alberta's tar sands with a scenic picture of a northern, pine-fringed lake; Alberta's re-branding as "Freedom to Create; Spirit to Achieve" features numerous vistas of pristine nature and human-dominated environments with narrative text about "open places"[8]; advertisements for large pick-up trucks are replete with breathtaking scenery; the variety of calendars featuring animals, landscapes or related art is innumerable.

Environmental aesthetics was neglected in the early 20th century and its contemporary resurgence is a result of environmentalism.[9] However, it remains a matter of debate whether aesthetic values can sufficiently ground an environmental ethic. Classically, aesthetics has involved concepts of elitist disinterest and distance. Environmentalism is arguably about re-establishing a connection with nature, rather than reinforcing separation from it. This artistic separation may also be why it seems effortless to use aesthetically pleasing images of nature and other environments to sell the public on what are arguably damaging to nature (Beder, 2002; Gunster, 2002; Wilson, 1991). Nevertheless, attention to the aesthetic valuing of nature is crucial in future Environment Canada projects even if for no other reason than its predominance in and appeal to overwhelmingly large segments of Canadian society.

Values Pluralism

What are we supposed to do when Canadians strongly differ on the value of nature? This practical situation can be informed by the deliberations in environmental philosophy between values pluralism and values monism. Values monism is the position that all of the values one holds in life – from personal & familial to political to environmental – should be mutually consistent and thus be derived from a unifying moral perspective or worldview. Values pluralism is the position that the values one holds may justifiably be mutually inconsistent and even contradictory, and that valuing subjects must map, prioritize and resolve disputes among these values without recourse to a unifying theory, principle, or "metanarrative".

Values monism does not think that a unifying metanarrative for all of our value commitments has already been found; it is fully aware of the current, fragmented state of social norms. Instead, it asserts a unifying moral philosophy as a crucially important goal.[10] Moreover, monism does not view this unified moral theory as an absolute, but as a humanly-limited socio-cultural project. Moral pluralism, by contrast, is stereotypically deconstructionist, characterised by suspicion of metanarratives. Unifying theories are totalising and colonialist, and thus dangerous and undesirable goals. Pluralists often mistake monists for absolutists.

The relevance of the moral pluralism debate for the ways Canadians value nature is how value incommensurability is to be handled. Pluralists expect conceptually irresolvable value conflicts, while monists believe it is possible for opposing parties to come to substantive agreements. Some pluralists may not even want to attempt to resolve disputes between parties, asserting that such variance is desirable. Other pluralists wish to resolve conflicts, but would do so using supposedly theory-neutral processes like negotiation or compromise.[11] Monists argue that such conflict resolution is biased towards certain dominant interests and value-commitments, and that some values are worth too much to be sacrificed. That is, pluralists think that values incommensurability can only be overcome by "objective" quantitative methods (like cost-benefit trade-offs or deliberative democratic procedures) whereas monists think it can be overcome only by mutually agreeing on a common values framework (which involves rejecting at least one of the frameworks at issue in the conflict).

At the societal level, the plurality of incommensurable values may be a fact, but is not necessarily something which society should simply accept without trying to find common ground (Trainor, 2006). Vaske, et al (2001) found that value orientations along a biocentric/anthropocentric orientation continuum consistently predicted respondents' norms toward national forest management. Such pluralism is certainly behind much resource conflict, but disagreement may not always be at the level of values held. Value conflict may be in the processes by which determination of value is made. For example, some values held by particular social groups are unrecognized by other actors, as in

Page's (2007) study of Aboriginal participation in B.C. government aquaculture planning (page 39), or Braun's (2002) study of the value discourses of B.C. forest management, and many of the cases in Adkin (2009) and Agyeman et al (2009). Even time was perceived differently by Inuit than for Euro-Canadians (Goehring and Stager, 1991), so valuing land and identifying with the earth differently is to be expected. Other social sciences contribute to understanding these processes (Williams, 2002; Snyder, Williams & Peterson, 2003). It may be possible to engage in a dialogue which could allow for substantive agreement on the value of nature rather than some form of "managed disagreement." We simply need better research into the diversity of values held and the ways that valuing occurs regarding nature, natural environments, and natural resources.

Socio-Cultural Approaches to Valuing Nature

Socio-cultural sciences – such as sociology, human geography, anthropology, history, and cultural studies – emphasize the processes of value formation, rather than treating values solely as empirical objects with no developmental process. They demonstrate that what is valued is what we tell each other is valu-able. Human action is – to greater or lesser degrees depending on all sorts of factors – influenced by social institutions, relations and cultures.

> *WHY IT MATTERS:*
> *The Canadian Press reported in December 2008 that the Oxford Junior Dictionary has dropped words like "beaver" and "dandelion". The dictionary is aimed at 7-year schoolchildren. Other nature terms eliminated include heron, magpie, otter, acorn, clover, ivy, sycamore, willow and blackberry. The Dictionary has added terms like the electronic Blackberry, blog, MP3 player, voicemail and broadband. Canadian wildlife artist Robert Bateman said the decision is telling kids that nature just isn't that important. (Canadian Press, December 9, 2008).*

Does it say something about the culture when schoolchildren find "Blackberry" but not "blackberry" in their dictionaries? Do the children acquire particular values about nature and technology from such repeated incidents? Social institutions and cultural practices form values in individuals through various channels of socialization. Neither values nor nature can be separated from the process of valuation, and these processes must be seen

as social and cultural. If value is calculated in terms of dollars, does that reinforce market values and marketable qualities over those things that may be harder-to-define but equally important to human flourishing?

Socio-cultural approaches attempt to understand the processes of how things came to be as they are in human society, or how they came to be understood in particular ways. In other words, we can say that anything beyond our raw biology is "socially constructed." We understand, interact with our own and others' constructions (or concepts), and put our understandings into action. Social institutions are obviously social constructions. The justice systems in Quebec and English Canada are constructed in different ways. The concept of "nature" is constructed differently in Menominee and American culture (Bang, et al, 2007). That monetarization of nature has become the most accepted valuation method is a social and cultural construction, originally unique to Western civilization but now exported around the world (Milton, 1996).

As we have tried to show, economics and psychology have useful places in understanding a topic as important, comprehensive and extensive as "how Canadians value nature." But the genesis and application of values is not reducible to such logics. These logics themselves should be seen as outgrowths of socio-cultural processes, processes that are as large as the grand sweep of modernity, yet also as small but significant as the socialization in one's family of origin.

WHY IT MATTERS:
After the Exxon Valdez ran aground and spilled its oily load in Alaska in 1989, government and corporate people tried to evaluate the losses with an eye to possible compensation for those losses. The exercise nearly ran aground itself in efforts to value the cultural and social losses suffered by indigenous peoples. The monetarized value attached to loss of a village was initially suggested to be the cost to move the village elsewhere. Assuming simple substitutability ignored all sorts of familial, social and geographic relations, ways of life, knowledge and subsistence practices attached to that locale, systems of meaning, social organization, and collective identity that would be lost or were impacted. Some studies even showed post-Valdez alteration in family visitation patterns – crucial to quality of life, social and cultural capital, child-rearing and minimization of risk. To their credit, the Valdez compensation board shifted towards ethnographic methods to determine values of the losses experienced by oil contamination. (Snyder, Williams & Peterson, 2003).

Perhaps the most obvious way to identify how socio-cultural processes shape values, valuation and concepts of nature is to compare what we can only call "mainstream society" in encounter with another culture. Much of Canadian resource valuation has been confronted with the incomparability and incommensurability of Aboriginal cultures and values. Aboriginal conceptions of the land are often at odds with economic valuation procedures, including even the problem of conceptualizing monetary exchange in regards to the object. For example, MacGregor (2009) shows how water management in regards to Aboriginal peoples has been negatively impacted by Eurocentric managers' inability to conceive of water as having cultural and religious significance, meaning that value incomparability occurs. Kinship with the land or the loss of cultural presence cannot be valued in terms of property values, nor generally in the culturally-different value systems of the mainstream Canadian society.

> By focusing on a sociocultural view of meaning formation, we are forced to examine not just what values people hold, but where these values and meanings come from, how they vary from place to place and community to community, how they are negotiated in society, how they are used in conflict situations, how they are impacted by globalization, and how they influence policy decisions (Williams, 2002, p.130).

Attention to these meaning-making and value-assigning processes are the primary contribution of social-cultural approaches, such as sociology, anthropology, and social geography, but also including history, cultural studies and more. The socio-cultural approach recognizes that values are a product of processes, and have to be assessed in some context. The alternative is to detach the values from the value-formation. An ecological equivalent is to take the fish from the water and expect to comprehend it; merely not knowing if the fish and its structures are a result of freshwater or saltwater context greatly reduces the ability to comprehend the fish. Among the key recommendations of this study is to avoid a "goal-rational" result, assuming that any assessment of values results in technical, measureable results that are meaningful out-of-context. It is for this reason that we emphasize *valuation* below, recognizing that values are always about a dynamic process of *valuing* and not static objects.

Methodology in Socio-Cultural Valuations of Nature

Acknowledging the context-dependent character of values leads toward several types of analysis. The first methodology approaches values as particular understandings produced by the history and culture of particular societies. The common criticism that Western worldviews value nature primarily (or exclusively) as natural resources for human exploitation is one example of this approach. Another example is the assertion that nature, wilderness, or The North are crucial parts of Canadian identity. Culture forms the very ways that we can conceive of nature, and the values that we can hold. A second methodology is less sweeping. This approach highlights and understands values as shared meanings produced in specific social contexts, although individuals are able to alter the influences of those contexts. Often, case study methods, ethnographies, narratives, and interview methodologies are used. Research in this approach has repeatedly shown that how people mobilize values into action is dependent on contexts, which means that research methods must either access or activate these contexts.

Studying Canadian Culture

Historical analysis can demonstrate how particular social forms have arisen. These social forms – which include values, conceptions and institutions – all have a history that needs to be unpacked in order to understand how "valuing nature" is constructed. Many cultural scholars have shown that European-derived societies – as Canada has historically been – conceive of nature in particular ways. As one example, Williams writes about *wilderness,* a narrow subset of what we usually mean by the word "nature." He concludes with a statement that asserts the importance of a broader and insistent conceptualization of the primary question of this project,

> Achieving compatibility among ecotourism, ecological, and traditional values of
> wilderness is tantamount to resolving the contradictions inherent in
> Enlightenment thought (p. 3).

Williams carefully explains that the dominant conceptions of nature are as "natural resources" for human use. The only limitation to use values in this dominant social paradigm is if ecological integrity is believed to be in danger of being too greatly

degraded for the continued function of human societies. By this worldview, nature is euphemized as "ecosystem services" or "natural capital." Many cultural analysts have argued that this way of valuing nature is a major part of the modern worldview shaped by the European Enlightenment and industrial revolution.

In a second example, Canadian scholar Tihamer Richard Kover (forthcoming) points out that agriculture encourages the view that wild nature is chaotic and needs management to "produce." This worldview contrasts with more "egalitarian" understandings of the relationship between humans and animals that appears "fundamental to the symbolic thought and cosmological understanding of many foraging peoples." It is worth noting that the Menominee mentioned earlier are the recent descendants of a predominantly forager culture ("Menominee" is the Algonquin word for "wild rice people"), whereas European worldviews are the cumulative product of over 10,000 years of pastoralism and sedentary agriculture. The point is that the values held are held in large part because of our cultural contexts. Therefore, not only our conceptions of "nature" but our understandings of "nature's value" must be examined with careful attention to cultural factors. Even more dramatically, Bang and colleagues (2007) conclude that there is research support for the effect of cultures not only on particular concepts of nature and the human place in the world, but also that these cultural variations shape cognitive reasoning. In other words, we think differently because of culture and our thinking about nature is different because of differing cultures.

While we feel that this approach is of considerable importance, for the most part we leave aside such large-scale cultural processes. As Canada becomes more culturally diverse, these culturally-derived meanings/values and the ways these values are formed and enacted will be increasingly variable. An historically informed understanding will help in navigating this diversity. Specific research on nature values and cultural diversity and research on the role of nature in Canadian identity is also discussed beginning on page 97. Recognizing that the ways Canadians may value nature will have historically and culturally-contingent variability will help Environment Canada's research be reflective of the diversity of values that Canadians do hold.

Studying Social Contexts

This approach recognizes that people act on the basis of the meanings that things (objects, institutions, values, behaviours) have for them, and that these meanings are primarily a result of the interactions we have with others. This approach corresponds with symbolic interactionist theories of human action. While we are able to modify our interpretations, people do so primarily within a range of interpretations that is more or less socially acceptable. How we understand situations and then act in them is a process of social learning that produces a type of interpretive knowledge which may be explicit but is often tacit. From this perspective, behaviours are not an automatic outgrowth of values, or even the attitudes held by persons. Instead, action comes from a complex array of factors that make each situation unique although often similar to other situations.

Within this broad approach, there are many ways of researching the social and cultural processes happening in particular contexts. Researchers have emphasized a variety of dimensions, including the effects of social structure or individual agency, or the role of gender, class, ethnicity, or the importance of personal identity, group identity, roles, impression management and more. Gender is a sound example. There are broad social understandings of what it means to be a boy, man, girl, or woman in our society. There are ethnic culturally specific understandings of these constructs as well that interact with the broad understandings. Families, schools and other agents of socialization "teach" gender also. So people come to perform roles in gendered way, like the fact that 95% of Canadian nurses are female despite decades of attention to such gendered circumstances. But people also come into contact with others that may enable them to become aware of other ways of acting in particular roles or circumstances. We develop a set of gender repertoires that get unconsciously activated or consciously mobilized in particular situations.

Human behaviour is complex! A comprehensive understanding of how values are formed and acted upon depends on understanding all these factors. It also means paying attention to the individual at some times, their specific social interactions some times, and the large-scaled social factors at others. For example, the teens in Haluza-DeLay's (1999, 2001) interviews drew upon the shared experience of a wilderness trip as well as cultural narratives about wilderness to develop their concepts of "nature" and "the environment"

after the trip. During the trip they contrasted "nature" and "civilization," and a wide set of values associated with each. Nature was valued for the characteristics of being "out there," undisturbed, not manmade [sic], not familiar, relaxing, free, beautiful, and not busy. One consequence of this mental model of nature was that they decided "home" did not have "nature." For these teens, that meant "there was nothing here to care about" (ergo, no environment).

This short summary hardly begins to scratch the rich complexity of their experience and the ideas which ultimately shaped their values and behaviour. Similarly, Dunk's (1994) study of forest workers in north-western Ontario showed the complex interactions of conceptions, values, and social circumstance. Using interviews and ethnographies, Dunk concluded that forest workers have a wide set of values about the forest "not solely determined by narrow economic concerns" (p. 28). These values were partly constructed in opposition to what they perceived of as environmentalist values and a perception that environmentalists came from southern Ontario. Thus, regional identity and work in the forest were influential factors in their forest values.

Natural resource social scientist Daniel Williams' (2002) own review of a number of Arctic wilderness studies showed other social processes that shape the way nature in general or wilderness in particular can be valued:

> Reconciling the divergent meanings and constructions of wilderness is not just a debate about which meanings and values are at stake, it also involves examining the appropriate social mechanisms and institutional arrangements by which society orders, evaluates, and decides about their relative production, maintenance, and distribution. (p. 125)

Williams' career has produced an extensive body of scholarship on how to valuate nature (particularly in resource management). He and his colleagues eventually developed a tentative framework that places these meanings and mechanisms squarely in "the uneven power relations embedded in the politics of resource valuation" (Snyder, et al, 2003, p. 107). Social processes that shape values are best teased out by research methodologies designed for understanding the deeply contextual *verstehen* of human action.

Even if social scientific methods are utilized, overreliance on quantitative methods can miss important other values. DeVries and Petersen (2009) warn that

economists specifically, focusing on ends-means tradeoffs, have been accused of ignoring the subjective "quality of life." They recommend the increasing use of social survey data to include the subjective element. Later, they expand their methodological toolkit even further into qualitative narrative and scenario-driven research. Similarly, Robertson (2006) warns against methodological enclosure. As Robertson labels it, "the nature that capital can see" is that which has been able to be quantified and valuated for purely instrumental use-value. Other types of nature that are not so easily quantified become invisible. In a similar way, Aboriginal people have experienced cultural loss that has not been valued because of the ways they have been made invisible until recently in Canadian society (e.g., Cole, 2006; Lawrence, 2009; Lovelace, 2009). In terms of social fairness, context-dependent research that recognizes the relevance of culturally-derived values is important.

Presumably objective and "scientific" projects may be coordinated by values that have less to do with what nature has, the science indicates is important, or what people in general value, and more to do with political and economic uses (Adkin, 2009). There are many factors that affect the dispersion of particular values in the general population that have little to do with objective processes. For example, in spite of medical evidence, for a person to say he or she *needs* nature may get him or her one labelled, say, as "a treehugger" (White, 1996). In such a case, the dismissal of an important felt need legitimizes certain values and delegitimizes others. It would do little good to cite as objective witness the Mitchell and Popham (2008) paper in *The Lancet*, or the research on bio-psychological need for nature, and much less valid to cite a religious value of nature. So values are not merely objects that are held in a static way, but constantly in contention with other values and social processes. These processes include how and whose values are communicated via mass media or who has the power or money to act on their values or shape public policy to provide access to what they value.

Research in the socio-cultural approaches can employ many methods, mostly yielding qualitative data through either inductive or deductive means. We have explained how formations of values of nature are developed through socially contextual processes. But research is also showing how even activation of values is contextual. Since much

behaviour is routinized, and values may be tacit, better research methodologies would be accessing values *in situ*.

For this reason, many analysts highly recommend much more use of ethnography as a method of assessing nature values in action. This requires a concept of "culture" that is beyond the scope of discussing in this report. Ethnography is a preferred method for "mapping culture" and understanding the processes of meaning-making and how it is shaped by varying actors. Using examples from resource management situations, Snyder, Williams and Peterson (2003), assert that ethnography is the method best suited for analysis of the processes of negotiation and communication like between state bureaucrats and local people who operate by different cultural practices.

Often it is assumed that cultural diversity is a function of the presence of indigenous peoples and "ethnic others." But we should recognize that that culture shapes everyone's practices; we need ethnographies of the agency culture and corporate culture – that is, the culture of those who typically have more power in resource or nature management situations. In other words, corporate and government actors also have values that shape the way they do things and see the world, as Goldman (2005) showed in his ethnography of the World Bank's sustainable development work. World Bank consultants created particular forms of "green knowledge" and bureaucratic institutions that reinforced their expert knowledge despite local values and knowledge more relevant for particular ecosystem realities. Other researchers have consistently demonstrated how ethnography can systematize information about the power deployed by different actors, and the actual processes by which some values are legitimized and others are made to seem invalid. Such research methods can result in "identifying actors, interests and ideologies" in land, nature and resource management contexts and lead to more effective decision-making (Snyder et al, 2000: 121).

Secondly, values research should attend to current learning theory. Bruner's (1985) learning work shows that most knowledge is associative, that is, connected to other "bits" of knowledge. Knowledge, even tacit knowledge, requires activation. Therefore, research methodologies must allow respondents to explore the connections in order to form their expressed, explicit knowledge. As all good experiential learning theory has shown, the "making public" (e.g., speaking or writing about what people think

they "know") action causes solidification of the "knowledge." Values may be held firmly by a research participant, but they are shaped through the elicitation process – they are rarely fully formed or particularly available without context. Decontextualized elicitation methods strip the respondents' expressions of relevance, or ask participants to produce their own contexts in which to embed the verbalization of their values. The latter would reduce reliability of the elicitation.

Purely rationalistic models of information-processing are giving way to models that show knowing is an active and on-going process – a permanent process of *constructing* – in which emotion plays a necessary role. For this reason, numerous scholars believe that we humans are "storied people" and that narrative knowing may fit human life better than abstract, decontextualized knowledge. In narrative knowing, the mind engages in action-oriented, detail-driven thought that is sequential and context-specific (Polkinghorne, 1988). Research should also take account of the likelihood that people will be unaware of some of the effects of their unconscious or tacit personality structures, socialization, or social structures (such as the difficult to discern effects of hegemony, ideology, taken-for-granted norms, tacit cultural cognitions, media and other institutions, or political economic mediations) in shaping their knowledge and behaviour. Taken together, these features show that *ecological validity* – the approximation of the real-life situation – is a crucial feature for truly understanding values and nature.

In conclusion, socio-cultural context is critical to meaningfully credible understanding of actual values of nature. Furthermore, methodology should be carefully chosen to correspond to the actual ways that people's values are formed, used, and made public, and the social goals for which the research is sought. Leiserowitz et al (2005) criticize most research on nature or environmental values for not being theory driven, therefore being capable of describing trends only. In the following section we discuss some of the more salient research methods.

4   METHODOLOGIES FOR VALUING NATURE

In his well-received book *Thinking Ecologically: Environmental Thought, Values and Policy,* Morito (2002) asks how we can make better environmental management decisions. The question before that question, for Morito, is whether environmental management is about *science* or about *values*? He draws on extensive historical research to show, compellingly, that the dominant values of Western civilization are now at odds with the ecosystems upon which society is based. An obvious problem is that measuring citizen values may ignore those less-valued-but-no-less-important things of nature.

In the much simpler realm of measuring tourism value in natural protected areas, Eagles, McLean and Stabler (2000) write:

> Science and management are fundamentally dependent upon measurement. The volume, flow, scale, and impact of a phenomenon are understood through measurement. The more comprehensive and precise the measurement, the better the understanding. (p. 62)

In some cases, the best empirical "measurement" may involve rigorously conducted qualitative methods ("empirical" should be understood in ways that include systematic data collection regardless of methodology). The necessary first step for sound measurement is a solid understanding of what is being sought by "values of nature." We recommend methodological pluralism as the way to assess the values Canadians hold for nature. Both inductive and deductive methods should be utilised. This avoids problems of conceptual entrapment, wherein the indicators used by the researcher as partial measures of the thing under study (or the researcher or agency's beliefs and choice of indicators) become the totality of the thing itself. The 1996 *Survey on the Importance of Nature to Canadians* is an example; by limiting "nature" to wildland recreation and related concepts, urban nature, gardens and other concepts that could have been nature were ignored. The survey is thus a cultural document, reinforcing "nature" as "out there" that one travels to, which, as mentioned earlier (see page 45), has negative consequences for later commitment to value nature at home.

Careful methodological consideration is needed for other reasons. Since the days of Kant, we have understood that morality must acknowledge intrinsic value in some things, rather than value objects merely as means to serve our desire ends. Similarly, nature has some value other than to serve human desires. Yet as Morito and many other analysts have shown clearly, typical means of establishing value – especially when limited to neoclassical economic valuation techniques – privilege instrumental values. Nature becomes "natural resources" and non-market values may be dismissed. More emphatically, human beings do not only act on the basis of rational calculation of worth, especially monetary worth. As we have commented above, it is essential to place "values of nature" into a theoretical framework which will shape methodological choices.

The primary methodologies used to measure values include

- survey
- ethnography
- narrative

As broad assessments, surveys are by far the most commonly used. They are able to amass large amounts of data and large sample sizes, with population generalizability. However, they also extract self-response biases and abstracted information that may or may not correspond well with behaviour in concrete situations. Experimental designs have the benefit of testing against control groups and running a variety of scenarios. External validity may be a problem, although computer simulations can minimize artificiality. Ethnographic research is extremely beneficial for context-specific information about behaviour, and social processes of valuation. However, this method is often time-consuming, and lacks broad generalizability although the quality of information may make it worthwhile. Finally, narrative is highly touted for the ways that it can generate extensive data on values, data which is contextualized, relevant, richly informative and with a high degree of validity. Since narrative understanding is usually generated through interviews or writing, the main disadvantages are in the immense amount of word-data that are generated and must be managed. However, efforts are being made to address such problems, and content analysis techniques are being improved.

Although these four methods are the most common methods, they are not the only ones used in research on values of nature. Researchers who have sought to study values associated with nature have also used:

- Focus-groups
- Intensive interviews
- experimental (including computer simulation)
- Discursive/Content analysis
- Scenario Response/Value cluster sets
- Concept mapping
- Spatial mapping

The following discussion will be brief, and will be based on what we know about values research (described in previous sections). It focuses on methods we believe combine the available theory frameworks, importance of context-rich information, and Environment Canada's need to produce results that represent the Canadian population.

Method: Survey

Surveys have been the most common way of assessing values and nature. We have described some of the research above, such as the values-attitudes and new ecological paradigm research, and the attempt to link psychosocial variables with value sets. Much of this research has used ratings scales, such as 5-point agree/disagree likert scale questions. Many of these scales have been developed to have high degrees of reliability. In addition, surveys have been extensively used in contingent valuation strategies.

Since surveys are so well utilised, we will not dwell on them. They may be over-utilized, particularly as values require particularity that surveys are designed to ignore in the effort to have generalizability. We do point out a number of issues below, and suggest that a survey which utilizes narrative techniques, concept mapping or spatial methods be developed by Environment Canada.

Survey methods strip the affective and contextual characteristics from human experience – a form of affective poverty that is insufficiently consistent with current

research on cognitive function. This "de-animation" process erases many of the value orientations and the "activation features" that are essential to comprehending values held and in action. According to Slovic & Satterfield (2004: 9), this method can "deny respondents a means for realistic engagement in the task and thus leave them struggling to conjure up a scenario to which a set of values might apply." Who has not had the experience of desiring to provide more detail to a telephone survey than the crisp choices allowed by the CATI operator at the other end of the line? "Hard-to-define-values" are hard to define and describe by researchers, policymakers and general public alike.

Wording of surveys can matter greatly. Language must be used to pose questions to which respondents must approximate a common understanding. Interpretations of the data require many kinds of judgments about the respondent's reality—definitions and judgments that must be defensible, but without knowledge of what was in the respondent's mind, often cannot be determined. For example, Dunlap's NEP scale includes a question "Humans were meant to rule over the rest of nature." Anecdotal evidence suggests that this question generates conflicting responses among Christian respondents, even environmentally active ones. The question seems to activate Biblical language that leaves respondents desiring to add margin notes providing explanation, such as "if 'rule' is understood like Jesus the Servant-King." Culturally diverse understandings may also be misconstrued by the language used in a survey.

Surveys may ask about what participants lack knowledge about. Therefore, background information is often required. But that background is not neutral. "Just the facts" is an illusion of objectivity, and is only one expression of information; "evocative knowing" is another: "Most value elicitation practices begin with the premise that we can ask respondents direct questions and receive direct answers about values… But the simple question-answer premise is not fully upheld by research" (Satterfield, 2002, p. 334-335). Satterfield describes three linked problems:

- values for nonmarket goods can be poorly defined in the respondent's mind;
- elicitation contexts may be "stripped" of value-relevant information, but such practices so fully expunge the context of meaning that empty or shallow responses follow;

- if context is necessary, what should that context look like?

Satterfield recommends the use of narratives, and offers suggestions for synthesizing them with large-scale surveys.

Method: Narrative

Narrative is a way of understanding rather a method itself. It assumes that we are "storied people." Considerable research shows that we come to understand how to act on the basis of the moral stories that people tell, and that we express ourselves through stories better than through abstract structured propositional statements (Polkinghorne, 1988; Satterfield & Slovic, 2004). Semi-structured interviews are often the way that researchers use a narrative approach, which has the clear disadvantages of being time-consuming, costly, and generating large amounts of word-data that must be managed, transcribed, and analysed. For these reasons, narrative is usually assumed to be appropriate for small sample studies. It has been extensively used in Canadian environmental education (Hart, 2002). Narrative approaches often allow free-ranging, unstandardized expression on the part of participants. Stefanovic (2002) interviewed hikers on the Lake Ontario Waterfront Trail, eliciting their narrative accounts of the trail and the values it held for them. Bell (2003) got Toronto school children to tell stories of their schoolyards in a schoolyard habitat programme.

Narratives may also be more formal. Narrative is an essential component of Aboriginal worldviews and attention to aboriginal values cannot be done without attention to their stories (Cole & O'Riley, 2009; Cruikshank, 2006; Goehring & Stager, 1991). Traditional Ecological Knowledge is often carried in stories (Huntingdon, 2000). Such narratives also form bonds, bring community membership together and pass on key norms and values.

There has been increasing effort to use narrative approaches in large sample studies. For some years the United States Forest Service (USFS) ran a well-respected content analysis team handling the voluminous comments on USFS policies (Hanscom, 2004). Narratives could also be constructed through which to elicit responses. Shanahan, Pelstring and McComas (1999) asked 1000 survey recipients to respond to a story about

an environmental problem. Comparing the responses to questions about the narrative with a scale also embedded in the survey, they concluded that narrative responses tapped value dimensions other those generated by the survey scale and that these responses also added significantly to predictive models. However, they observed a lower than expected response rate, which they attributed to the narrative task despite it being only moderately more intensive than checking survey boxes.

Experiments have shown that information can be provided as fully through narratives as through traditional, didactic means (e.g., Satterfield, Slovic & Gregory, 2000). In fact, many researchers have found that narratives were more effective in making the technical information salient to participants. Narrative is particularly good at comprehending lay models (cultural models) of cognition, as in Kempton et al (1995) seminal study of a variety of citizen types and their understandings of causes and policy solutions for climate change, ozone depletion and air pollution[12].

Narratives could be combined with concept mapping, which can utilise existing software and web-based interfaces. Canadian scholar Glover and colleagues (2008) used photos in combination with narratives during focus groups in a community planning process. They provided particular pictures and asked groups to talk about the meanings the photos elicited in an effort to categorize community values. More open-ended techniques would have participants provide their own narratives or photographs. This technique allows "the landscape-change process to be situated within the social meanings relevant to a community" (Glover, et al, 2008: 384). Glover has used similar techniques in assessing the role of community gardens in producing social capital and citizenship (Glover, 2004; Glover, Parry & Shinew, 2005). The point is to entice people to tell what they know or what they value through stories that they can tell.

Method: Ethnography

Ideally, narrative-based knowledge would be supplemented by ethnographic observation. Social and cultural processes are essential in the formation of values, and even in the social construction of nature. Some mention of the use of ethnographic techniques in environmental management contexts has been made. Analytic ethnography

(a theoretically-driven form, rather than the more typical grounded theory form of ethnography) may address some of the problems associated with ethnography, such as the difficulty of generalizing results (Lofland, 1995; Snow, et al 2000). "Rapid ethnographic assessment" and "quick ethnography" are techniques that may overcome the problem of timelines. They have been used in parks management settings (Handwerker, 2001; Taplin et al, 2000). At this point, given the stated intentions of Environment Canada's four-pronged approach, we will not address this methodology further except to state once again that finding a means of capturing the ways that values are formed and shaped is a crucial aspect of directing the country toward increased valuation for environmental sustainability.

Engagement Methods (focus groups)

In the effort to engage the deep, rich understanding of people's values and maintain the contexts that make values meaningful, interviews or focus groups might be used. While many planning exercises use public participation processes, these are costly and time-consuming. They are extremely effective at discerning values and social processes. Burgess, Limb & Harrison (1988) evaluated one such advisory group run by an environmental agency. Over time, as interpersonal trust developed, solely rational communication became broadened and deepened by participants' affective and emotional facets. Parkins (2002) warned about what can happen in a longstanding advisory group that is co-opted by powerful stakeholders.

How public engagement is done is important. Failures of community consultation can sometimes be a result of using "facts-dominated forums" during "values-based conflicts." One such instance was the process to develop a Canadian nuclear waste disposal strategy (Sheng, 2005). The structure of these consultations was to be "fact-based" and not allow "emotion" into the hearings. In order to be heard, participants were forced to translate their core values into something else in order to express their concerns. The result often led to errors of fact, disorganized or rambling statements, and too-easy dismissal of the values that participants really wanted to express. Sheng demonstrates that

an ethnographic imagination is useful to discern the subtle social practices and exclusions that happen in specific institutional practices and social situations.

New techniques for computer-assisted, large sample processes are in development. The British organization Citizen Science for Sustainability recently published *A Review of Tools and Techniques for Community Foresight for Sustainability* (available at http://www.suscit.org.uk/resources/documents/JuliaMethodsFinal_Formatted.pdf). Another technique being used with focus groups is based on the popular Sim City computer game. The purpose of "Deliberative mapping" is to foster informed discussion about complicated environmental planning issues. A briefing document is available from the facilitation firm that has collaborated with the Georgia Basin Futures project in British Columbia (http://www.deliberative-mapping.org/papers/f-briefing-2.pdf). The spatial visualization helps provide context for the discussion about values and actions. While these specific examples have been used with focus groups, there are novel ways of including spatial components into broad survey methods as well. Doing so may combine the benefits of large sample size research with the context of narrative-type research.

Spatial Modelling Methods

One novel use of the survey research technique involves an explicit utilization of participatory mapping techniques within the household survey process. McIntyre et al. (2008) utilized this technique in their research within north western Ontario. Utilizing a three-phase research process, researchers invited research participants to identify specific locations where specific recreation values were located on the landscape. In this sense, this work started from an explicit recognition that nature values have a spatial dimension, and one that is not expressly defined by or delimited by the boundaries of parks, protected areas, or other bounded natural areas.

The initial phase of research involved *focus groups* where research participants were invited to express their experiences with a defined forest areas and what made it a good place to visit. Focus groups in particular were useful in this context because they allowed participants to hear from each other, learn where similarities and differences exist between visitors to the forest area, and move toward some general understanding.

The second phase of research involved *value mapping* within the focus group session on a map of the study area at a scale of 1:50,000. This collaborative effort between focus group participants resulted in key insights about the location of recreations values. Lastly, a *user survey* was administered to users of the forest area in surrounding communities, such as Thunder Bay.

One of the key findings from this study is the identification of "spatial valuation zones" which are clusters of values, in this case recreation values in particular, that are clustered within specific regions of the forest area. The research clearly shows that these valuation zones are not necessarily consistent with legislated recreation areas such as parks or protected areas.

In another study that utilized similar methods, Beverly et al. (2007) from the Canadian Forest Service, built on the pioneering work of standard mail survey techniques for participatory mapping. Instead of a mail survey, however, Beverly and colleagues developed a method that utilized internet-based technologies for participatory mapping. In this method, an invitation was distributed via mail to research participants, were they were invited to visit a website and enter an access code. This procedure for access provided some rigour in terms of who was able to access the maps and participate in the study. On this site, participants were asked "What values are important to you?" and were then invited to place icons on maps of the region around Swan Hills, Alberta, to indicate these values. Icons included values such as: educational, economic, spiritual, and aesthetic.

From these value indications that were expressed through an internet-based mapping tool, specific value maps were identified as represented in Figure 6.

One of the key findings from this research was the way in which particular kinds of values, as expressed on maps, were clustered in interesting ways. For instance, the most important values identified by respondents were recreational, economic, wilderness and aesthetic. But these values were clustered so that educational, economic, and historic (cultural) values were geographically closer to community than subsistence, biological diversity or wilderness values.
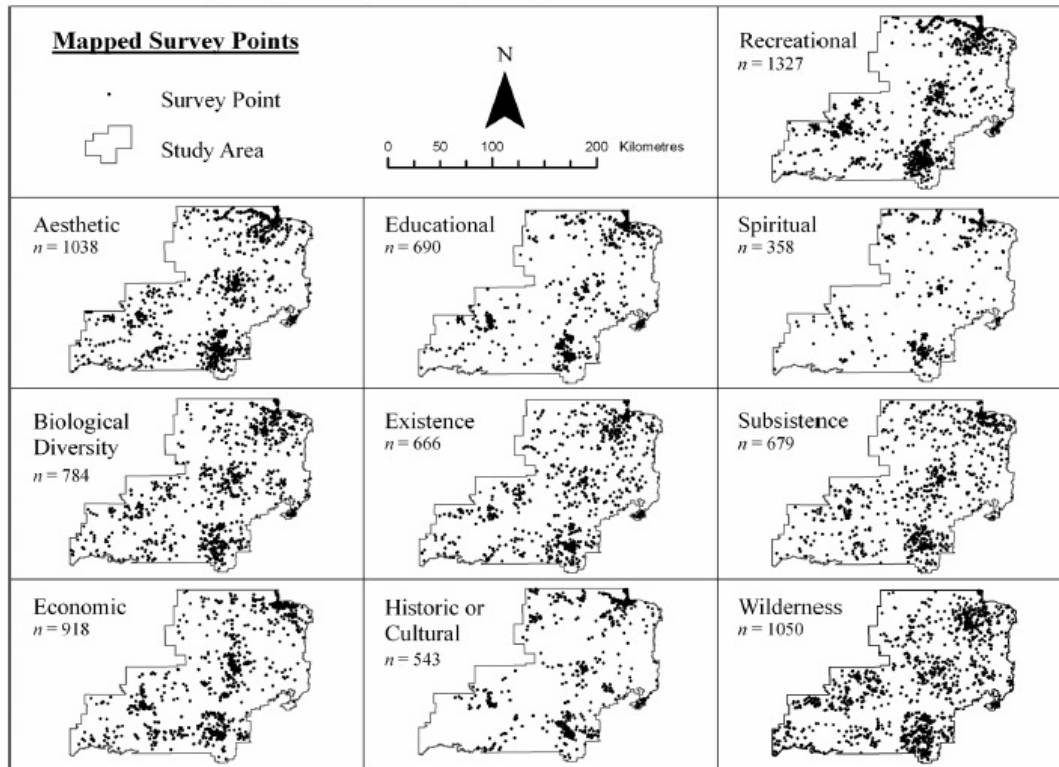
Figure 6: Location of values mapped by research participants (Beverly et al 2007).

To investigate the importance of nature to Canadians, spatial mapping may provide useful alternatives to traditional mail surveys. Although the 1996 survey offers some spatial dimensions to nature values, these values were predominantly expressed in terms of recreational values. Maps could be generated from the 1996 dataset to illustrate important recreation / tourism-related values. With extended mapping techniques such as the mail survey with mappings or the internet-base tool, Canadians could be invited to provide more diverse representations of nature values in spatial terms. These spatial representations may be within urban or rural settings. Moreover, existence values can also be represented on these maps – where no prior visit or experience within a specific place is required. For Canadians who lack the means or the physical proximity to places such as the Rocky Mountains, the opportunity to express the importance of nature in this way may be advantageous. Similarly, expressions of nearby-nature may also be an important innovation within this method.

5 OPERATIONALIZING HOW WE VALUE NATURE

Despite the discussion above, research that has tried to assess or measure "values of nature" has resulted in a wide variety of meanings of the term. However, as Reser & Bentrubberbäumer (2005) warn, the term can lose its meaning. The risk is that *everything* can count as a value. For example, in numerous reports with titles that begin "The Economic Values and Impacts of [fill in the blank: trails/sport-fishing/the Ottawa River]," the term "values" really means "uses." But aesthetic value is not a use-value. Nor can spiritual values be easily exchanged for other places. And ecosystem service-value can easily degrade with use.

In light of the intended purposes of this report, we make the same warning about casual use of the word values without careful conceptualization. Nevertheless, what follows identifies research generally on the *importance* of nature for Canadians in a number of sectors of Canadians' personal and collective lives. In the following sections, our effort was primarily directed at Canadian research. This was difficult to find, particularly as academic literature focuses on explaining social phenomena and does not usually distinguish itself as Canadian in any easily searchable manner. We used several Canadian and general databases, and Google Scholar with searches that include words relevant to sections represented below, valu* and Canad*. We also went through Canadian scholarly journals on an issue-by-issue basis, and scoured the membership lists of disciplinary associations. Non-academic research is highly diffuse, with no central repositories. We used extensive internet searches with words targeted toward the sections represented below. We requested information from targeted individuals, work groups, and associations.

Our greatest concern is the potentially gargantuan nature of this project. One set of 16 scholars recently listed 37 academic disciplines, sub-disciplines and trans-disciplines that to one degree or another address environment-society interactions (Pretty, et al, 2008). A review merely on the values of recreation covered nearly 600 studies (ORRC, 2008). The answer to the question "What aspects of human behaviour can be investigated to reveal the importance of nature to Canadians" is as varied as the

frameworks and disciplines and aspects of the life sectors used to ask the question. The simplest and least useful answer approach is:

- ► "Nature" is broadly conceived to mean "anything that someone thinks is somewhat 'natural,'"
- ► "Values" is broadly conceived to mean "anything perceived as important is 'valued.'"

If this broad conceptualization is used, then the range of indicators that can "show" that "Canadians value nature" can be as wide ranging as "we engage in eco-tourism and mountain-climbing" to "we take 'natural' food supplements" to "we put flowers on our dinner table" to "we think nature is so good and abundant that it will provide for all our needs and desires." Each of these could represent a way that nature is valued; but it is unreasonable to understand what the values are from such behaviours. Nor would it be fruitful to list all the nature-including recreation activities, natural food supplements, flower arrangements, resources extracted, and 10,000 other indicators, and assume that a "value of nature" has been calculated. For these reasons, researchers have typically sorted sets of values into a limited number of categories. Samples of indicators can be used to give a depiction of each category. Respondents could be asked to rank-order their categories of value. However, as noted in the methodological discussion of Chapter 4, there are serious concerns about the assumption that values can be de-contextualized.

A sample of the value sets is shown in Table 2. The variability shows the complexity of a project to identify the values of nature that Canadians hold. We will make our own recommendations at the end of this report. Consistent with our earlier discussion about the character of "values" and how they are assigned, we cannot simply say, "The research shows that the values of nature are X". There is not a definitive answer that will satisfy all or even most of the variable ways that nature and values are constructed.

Table 2. Sample sets of value-categories derived from recent research.

Anderson, 1990, in Williams, 2002	Bang, Medin & Atran 2007	Satterfield 2001 (in descending order of number of mentions by participants)	Manning, Valliere & Minteer 1999 (see Table 5 for descriptions)	Xu & Bengston, 1997 And Tarrant & Cordell, 2002	Axelrod 1994	Beckley, 1998
Use/market *(various forms of use, or economic valuations)*	Holistic	Ecological Sustainability	Aesthetic	Economic/Utilitarian *(operationalized as wood production)*	economically-oriented	Extraction
	Spiritual	Rights/Equity	Ecological			Production
	Traditional	Recreational	Recreational		socially-oriented	Subsistence
	Survival skills	Philosophical/Spiritual/Religious	Education	Life support *(operationalized as support for clean air)*		Tourism/Recreation
Intrinsic *(valuing the object for what it is)*	Moralistic	Aesthetic	Moral/ethical		universally-oriented	Ecological
	Ecologistic	Life Support	Historical/cultural			Psycho-Cultural-
	Abstract respect	Historical/Evolutionary	Therapeutic	Aesthetic *(operationalized as appreciation of scenic beauty)*		Existence &
Personal *(loved and cherished; idiosyncratic & non-substitutable)*	Abstract liking	Future Generations	Scientific			Bequest
	Abstract	Population Sustainability	Intellectual			Psycho-Cultural-
	knowledge	Economic	Spiritual			Historical &
	Personal utility	Employment	Economic	Moral/Spiritual *(operationalized as "heritage")*		Spiritual
	Distant utility	Biodiversity				
		Place Identification				
		Pharmacy				
Shared *(value as public symbols and expressions of shared ideals)*		Wilderness				
		Intrinsic				
		Community				
		Complexity				
		Scientific/Intellectual/Creative				
		Recovery				
		Existence values				
		Cultural Sustainability				
		Cultural Symbolisation				
		Oppositional Forces				

The sections below represent major dimensions of Canadian life. Because "nature" – broadly construed – touches every facet of collective and individual life, this review is forced to stay general rather than delve into the depth of any area. However, two areas are discussed more thoroughly. These subjects are nature-based recreation and urban nature. We have done this because outdoor recreation was central to the 1996 *Survey of the Importance of Nature to Canadians* but the field of leisure studies understands nature-based recreation more broadly than was included in the 1996 Survey. The 1996 survey also focused on nature as wildlands. But the research shows a need to broaden that concept as well; therefore, the lengthier section on urban nature is intended to assist in that process. Even in these sections, the topic cannot be said to be comprehensively studied.

The research reported in these sections demonstrates many different ways of assessing values of nature. Some summary boxes are provided, and sample data that could be collected in a broad-based survey of Canadian attitudes about nature-values. Selections of further items can be culled from the sections as future research on the topic develops.

Ecosystem services

When it comes to understanding the value of nature to Canadians, recent years have witnessed a significant amount of work related to valuing ecosystem goods and services. Part of this work has to do with mapping out the complex interactions of ecosystem

- Nature provides many services essential for the flourishing of human society.
- These include such hidden services as waste flushing and space to live, but also food, disease mitigation, resources and so on.
- In recent years, much work in ecological economics and conservation biology have sought to give a monetary value for these services.
- There are deep concerns about whether this approach to valuing nature is beneficial or not.

functions and the ways in which forests, wetlands, grasslands and lakes provide a variety of vital functions. These functions are important not only for human survival but also for non-human or planetary regulation. It is unclear what knowledge of ecological services there is in the Canadian population. Few provinces include much ecology in their science programs or environmental education in schools, so ecological literacy is likely weak.

This implies that ecosystem services may be "hidden" from awareness. However, knowledge alone is not sufficient to incur valuation for these services, as values, attitudes, habits, barriers, and socio-cultural influences are important parts of population level ecological literacy and environmental action.

Within the Canadian context, efforts to value ecosystem services are taken up within several key organizations that extend beyond the academic community. Within the National Round Table on the Environment and Economy (NRTEE), efforts to value ecosystem services involve attention to nature conservation and the sustainability of Canada's *natural capital*. The term natural capital often encompasses ecosystem goods and services in a holistic way, but there continues to be significant differences in our assessment of certain natural capital values. For instance, given current market conditions, we know that goods like timber and pulp have a value that is determined by global markets. In contrast, since the water filtration services of wetlands are not traded in markets, these values are less well understood and are often not recognized or appreciated by Canadians.

Given these challenges, the NRTEE has set out to gain a better understanding of natural capital values in Canada. It notes in a 2003 report that conservation of natural capital is not sufficiently achieved through a system of parks and protected areas (NRTEE, 2003). Based on this recognition, a program called the Conservation of Canada's Natural Heritage was established to promote conservation at all levels of government and society, on public and private lands.

Quoting a recent success story in the United States, the NRTEE points to New York State where officials faced a major decision over the construction of a costly new water filtration plant to feed the growing water demands of New York City. Instead of investing $6-8 billion in a new treatment facility, a decision was made to invest a much smaller sum of money (approximately $1.5 billion), into "land acquisition, training and incentives for landowners to reduce pollution and maintain watershed health throughout the Catskills, Delaware and Croton watersheds" (NRTEE, 2003, p.10). This experience in New York State signals an understanding of the value of ecosystem services that can lead to investments and conservation of natural capital.

Other groups in Canada have also placed an emphasis on the value of ecosystem services. For instance, Ducks Unlimited released a series of fact sheets in 2007 that describe what they termed "natural values" (see Table 1, p. 14). These natural values include 14 domains such as freshwater, soil, atmosphere, wetlands, urban natural capital and marine areas. As evidence for these values, the fact sheets point to the well-known work of Robert Costanza and colleagues (1997) who pegged the value of the world's ecosystem services in the trillions of dollars per year. Based on this analysis, the global value of wetlands alone was estimated to be $14,785 per hectare per year.

Within Canada, the work of Anielski and Wilson in 2005 involves a calculation of natural capital within boreal ecosystems. In determining these values, the concept of total economic value (TEV) is operationalized. In this calculation, there are direct use values, ecological function values, and a series of non-use values such as options values, bequest values and existence values. Figure 7 below provides addition details on the definition of these values.
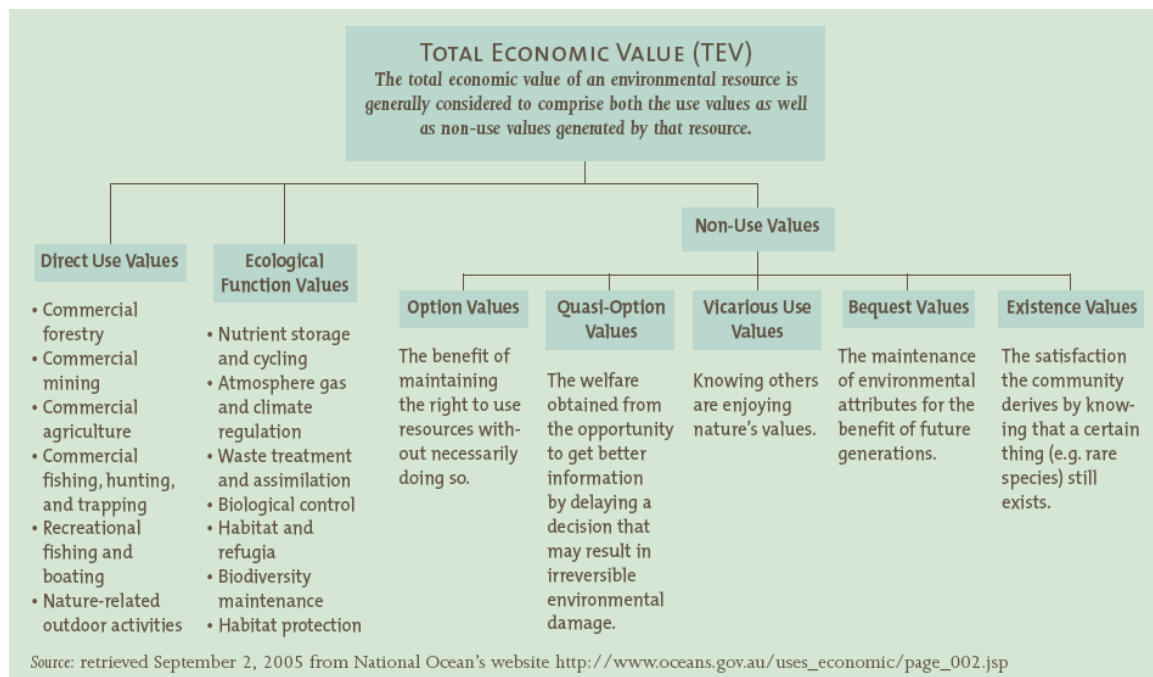

Figure 7: Total economic value of environmental resources (Anielski & Wilson, 2005).

Taking wetlands and peatlands as an example, these authors calculate the stocks of wetlands and peatlands (i.e., 19.6 billion tonnes of carbon stored in peatlands) and then

analyze the flows such as carbon sequestration and the ecosystem services that are derived from these stocks and flows. Ecosystem services are determined to be carbon storage, sequestration of carbon, flood control, water filtering, and biodiversity values. Using a replacement value method, the value of water filtration for instance, is determined to be equivalent to the cost of municipal water treatment in boreal forest communities. Adding all replacement values together, a total figure of $3.4 billion is derived for flood control, water filtration and biodiversity values.

Although these replacement value methods are well documented, they are not without criticism. Debates exist between economists as to the appropriate methods for valuing nature, and many criticize the replacement value approach as being overly arbitrary and subjective. Authors such as Van Dyke (2008) identify ways of thinking about the value of ecosystem services that extends beyond replacement value methods, and focus on the ways in which markets can be extended and regulatory instruments can be utilized. Van Dyke argues that environmental markets are most effective if one or more of the following are utilized: (1) polluter pays principle, (2) precautionary principle (placing the burden of proof on the potential polluter) and (3) polluter pays precautionary principle (making the polluter pay in advance). Given this approach, efforts can be focused on various forms of taxation and subsidies to dissuade or incent polluters or potential polluters into certain behaviours or actions. One incentive along these lines involves environment insurance bonds, where individuals put up, in advance, a bond equal in value to the costs of repairing certain harms, should they occur.

These methods of taxation and incentives through market-based instruments can be an important indicator of the value of specific ecosystem goods and services. Again, however, these methods are limited to market instruments in order to understand value. With this logic, if an ecosystem service is not valued in the markets, if it is not understood to provide any benefits to humans or non-humans, then it has no value.

Using various economic approaches, many authors have attempted to value ecosystem services in different parts of the world. For example, Brainard et al. (2008) derive a social value of carbon sequestration in Great Britain's woodlands. In this article, they state that "the "social value" per tonne (1000Kg) of sequestered carbon can be defined as the benefit in savings from damage avoidance. This benefit is calculated by

observation of compensatory costs to reveal its costs to society, or "shadow price" (p. 1262). DeFries et al. (2004) grapple with methods of understanding trade offs between human needs and ecosystem functions. Brauman et al (2007) provide a useful overview of how to value hydrological services. Value categories include attention to hydrological attributes such as water quantity, water quality, location of water (ground / surface), and timing of water flows. However, this ignores cultural values associated with water (e.g., MacGregor, 2009). In fact, "ecosystems" are described as providing "cultural services." According to the Millennium Ecosystem Assessment (MA, 2005), cultural services are "The non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience, including, e.g., knowledge systems, social relations, and aesthetic values." Since Environment Canada has proposed that one of the major elements of its "valuing nature" research strategy will be a measure of ecosystem services across Canada, and since most of this report is related to what is defined as cultural services, we will not discuss this further at this time. However, it is important to note that these "hard-to-define" services are usually less valued than services that are easily quantifiable. Even the Millennium Ecosystem Assessment had only weak assessment of cultural services provided.

Finally, it is important to note that although most efforts to value ecosystem services are undertaken with economic methods, there are a few efforts to implement alternative approaches. As an example, researchers from Resources for the Future – a U.S.-based research organization – understands the reticence of some academics and policy makers to accept the apparent black box approach that is often utilized within economic valuation. Methodologies that utilize economic techniques, equations and datasets, are beyond the understanding of many reviewers and policy makers. They have problematic assumptions as well. Therefore Boyd (2004) has proposed the use of Environmental Benefit Indicators (EBIs) as a way to move beyond this econometric black box. Indicators in this case are used as proxies for what people really care about within an ecosystem.

> Environmental benefit indicators (EBIs) are a way to illustrate the value of
> nature in a specific setting. An individual EBI might be the presence of
> invasive species or the number of acres under active cultivation. A

collection of indicators about a given area can portray the complex

relationship among habitats, species, land uses, and human activities

(Boyd, 2004, p.21).

In this way, the values of an ecosystem are expressed through indicators without

necessarily translating these values into a monetary framework. Moreover, the indicators

approach can reveal the complexity of values within an ecosystem and identify points

where values may be compatible or in

conflict. It contextualizes the values in

terms of what really matter to people.

Ultimately, this approach has promise

because it supports an objective

approach to valuation while also

promoting opportunities for constructive

dialogue between various publics and the formulation of reasonable policy alternatives.

> Sample Data to collect:
> √ How aware are Canadians of the "natural values" provided by ecosystems?
> √ What is the level of ecological literacy in Canada and how does this affect citizen ability to place a value on the services nature provides?

Aesthetic Values

Aesthetic appreciation is a central indicator of Canadian values of nature (Carlson

& Berleant, 2004). As a "hard-to-define" set of values, it is difficult to assess. Aesthetic value was and may remain the primary justification for wilderness preservation in North

> • Beauty is a primary way Canadians value nature.
> • Many works of art, film, and writing depict the beauty of nature.
> • Spending money to "green" existing or new buildings reveals an evaluation of nature. Aesthetic values impact property values.

America (MacLaren 2007). Land preservation is made much more difficult if the land in

question is dull or perceived as ugly. Pandas and grizzly bears are chosen as icons by

nature-preservation groups because these "charismatic mega-fauna" are aesthetically (as

well as emotionally) appreciated. The aesthetic valuation of nature can be detected in

both the pragmatic and fine arts, and may be operationalized in a variety of ways.

"Finer" Landscape Art

The production, purchase and appreciation of works of landscape art in Canada is one way of measuring how Canadians (especially wealthy ones) might value nature. In the first place, the very fact of engaging in landscape art production (through the act of painting, photographing, sculpting etc.) indicates a certain level of concern for nature. Susan Clare Scott (2006) points out that Daoist landscape art compositions, for example, expressed a particular belief about the sacred balance of nature. Similar belief commitments likely underlie aboriginal and even Euro-Canadian works of landscape art, such as those of the Group of Seven. Bunting and Mitchell (2008) suggest that many Canadians employed in the fine arts relocate to rural communities because of the inherent landscape appeal. Secondly, the number of pieces and the market value of landscape art purchased by Canadians seems a clear means by which to operationalize a significant portion of the aesthetic values of nature in Canada. Valsan (2002) used a hedonic valuation method to determine that Canadian painting is valued less than American paintings, likely, he speculates, because the Canadian emphasis on landscapes appeals to a more limited audience. Third, non-consumptive appreciation of landscape artworks could be determined by counting the number of landscape art exhibitions in galleries and museums across the country, as well as admissions to such exhibitions. For example, an exhibition of photographs from the Arctic National Wildlife Refuge in Alaska was so politically explosive in the American Congress that the Smithsonian National Museum of Natural History almost backed down from showing them at all (Sischy, 2003). Parallels in Canada, even if distant, would be indicative of aesthetic valuations of nature.

Nature and "Moving Pictures"

The phenomenon of nature documentary film seems a more accessible means of nature appreciation than the "haute couture" of landscape painting and still photography. From the nature documentaries of the National Film Board to short "Hinterland's Who's Who" vignettes to "Lorne Greene's New Wilderness," Canadians have been exposed not only to representations of nature but nature advocacy via the medium of television and film (Louw, 2006). Quantifying this sort of programming and viewership would be telling of a certain level of nature valuation. Canadian subscriptions to specialty cable

channels such as "Animal Planet" or "Outdoor Life Network" might even suggest a link between aesthetic valuing and lifestyle behaviours. Similarly, the number of copies purchased in Canada of video series such as the BBC's "Planet Earth" (2006) and "Blue Planet" (2001) would be instructive. Finally, many of the offerings at IMAX theatres have nature themes; attendance at nature films even in standard theatres (like 2009's *Earth* or the award-winning *Manufactured Landscapes*) could also reflect a certain aesthetic value of nature for Canadians.

Nature Writing

Reading takes considerably more effort than watching television or movies, particularly if the literature being read is non-fiction. Nature writing can encompass poetry, narrative, and meditation just as much as description and technical instruction. Arguably the most influential texts in the environmental movement are best categorized as "literature" in the artistic, aesthetic sense: e.g., Thoreau's *Walden,* Leopold's *Sand County Almanac,* Abbey's *Desert Solitaire,* Dillard's *Pilgrim at Tinker Creek.* The land has been a major theme in Canadian literature from Sharon Butela's *The Perfection of the Morning* back through Margaret Atwood and into early Canadian literature. Slovic and Satterfield (2004) and the nature writers interviewed in their work (many of whom were trained scientists) strongly believe that narrative nature writing is an effective way to get ecological information across. That such writing also is aesthetically appealing is valued too. Philosopher Holmes Rolston (1994) argues that science enriches aesthetic experience. Thus, while aesthetic value is subjective and emotion-laden, it is not pure emotion.

While there is an extensive body of "eco-criticism" and an established Canadian network for the study of literature and the environment, at this time there seems to be little published research specifically concerning the operationalizing of values implicit in the act of writing or reading nature-centred literature. Nevertheless, because of the investment of time and attention involved, determining the number of nature-related books purchased in Canada would seem a straight-forward, appropriate and fruitful method of operationalizing Canadian appreciations of nature. Booksellers could be canvassed for this information, and online merchants like Chapters.Indigo.ca or

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Amazon.ca may already have it categorized and ready for access in their databases. It would also be advantageous if the amount of Canadian-authored nature writing (e.g. Bowling, 2007) could be estimated.

Architecture

The field of architecture is both aesthetically and pragmatically motivated, charged as it is with creating both fashionable and functional buildings. Moreover, the "green architecture"" movement, which often makes intentional use of plants and other nature-related features, is gaining increasing traction (Orr, 2006; Israel, 2003; Slessor, 2002, 1996). Architectural theory is even starting to move beyond the philosophy of "sustainability" (McLennan, 2004), which is a theory for maintaining the status quo over the long-term, towards ecological restoration or "regenerative design," which means producing countercultural and proactive artifacts that actually improve the ecological health of the environs (Winter, 2002). From vegetation on roofs (Peck and Callaghan, 1999) to construction materials and techniques, to energy efficiency, to water and waste cycling, to light incorporation and air circulation, and ultimately to critiques of the very idea of cities themselves (Gissen, 2003), the ways in which architecture can exhibit valuations of nature are too many to mention. According to Peck & Callaghan (1999: 43),

> [Company X] comparing its marketing strategies for Canada and Europe, found that Canadians appear to value aesthetics and want 'instant' results. In contrast, Europeans value environmental benefits, encourage the diversity of 'weeds' in their plant mixtures and are prepared to wait for up to 2 years to allow the garden to establish itself.

While an exhaustive accounting of all the various and sundry ways in which Canadian building projects attempt (either genuinely or superficially) to be more nature-oriented or environmentally benign would be highly informative, this is not likely to be within the practical scope of this Environment Canada project. Therefore, a more manageable means of operationalizing architectural valuations of nature might be to attempt an informed estimate of the dollars expended Canada-wide to "green" new buildings or developments, or to "naturescape" Canadian lawns. In this regard, it may be helpful to investigate the cost calculations embedded in the Building for Environmental

and Economic Sustainability (BEES) software, which is targeted at designers, builders and manufacturers concerned to green their practices in a cost-efficient way (Lippiatt and Boyles, 2001). It would be equally informative were the statistics from the Federal Government's Office of Energy Efficiency grants and incentives available for translation into the "value" frame of reference of future Environment Canada projects, for reasons virtually identical to those listed immediately above. These forms of nature-valuing are a clear move away

> Sample Data to collect:
> √ How often do Canadians "appreciate" nature-related popular media and other art?
> √ Are there preferences for this type of art over other types of art?
> √ To what extent do Canadians use nature to aesthetically improve their homes?

from the nature-as-wilderness model that predominated the Canadian imagination, and a move towards a more comprehensive understanding of nature, including increased valuation of the aesthetic and other values of "urban nature." Nature has to be part of ordinary experience to develop personally held values of it.

Valuing Nature in Recreation Parks and /Tourism

That outdoor recreation is declining in Canada has already been noted (Gray et al, 2003), corresponding with a possibly world-wide trend (Pergams &

> • There are many, many forms of recreation in nature.
> • Some forms of recreation are stereotypical "outdoor recreation" but there are many more types of nature-involved recreation.
> • Nature provides valued settings and experiences for other leisure.
> • Parks and protected areas have many values.
> • Commercial tourism benefits from nature.

Zaradic, 2008). While the numbers of Canadians participating in nature-based recreation has increased, the percentage of Canadians involved has decreased (Gray, et al, 2003). It used to be commonly stated that more people visited zoos and aquariums than major sporting events. This data also shows declines in *indirect* nature-based recreational activity such as visiting museums or zoos, or being a member of a nature-related organization. Gray's data ends in 1996 (see footnote 1), and no other research has surfaced. Provincial governments collect data on sports participation, but in the case of

British Columbia at least, this data does not include outdoor recreation or nature-based recreation. Statistics Canada has rarely released reports on leisure activities and not on nature-based/outdoor recreation or tourism. The Canadian Tourism Commission manages the biennial Travel Activity and Motivation Survey (TAMS), which includes general recreation information *if* the activity involved an overnight trip. Clearly, there is a need for systematic data on these topics, particularly as considerable research shows an association of nature-oriented leisure with environmental values.

In the 1996 *Survey* the importance of nature to Canadians was assumed to be recreational. As this report has repeatedly identified, other lifeworld sectors also demonstrate the importance of nature to Canadians. The TAMS includes Canadian Travellers Outdoor Activity Reports for a larger number of activities *while on trips* (Figure 8), and other nature-based recreation, such as gardening or dogwalking in local parks should be included.

The research in leisure and recreation studies long ago moved beyond conceptions of leisure as time (e.g., non-work time) or activity definitions. Instead, recreation is better understood as the experience of the activity and the reasons that motivate it (Manning & More, 2002). For example, taking the children to a playground may be considered leisure by the parent who finds it a relaxing change from the workplace, while it may be just an extension of domestic labour for the stay-at-home parent. Thus, recreation participation cannot be simplified into counts of activity-hours or dollars spent.

* Cross-Country Skiing and Snowshoeing
* Downhill Skiing & Snowboarding
* Exercising and Jogging
* Fishing
* Golfing
* Hiking, Climbing and Paddling
* Hunting
* Ocean Activities
* Participating in Extreme Air Sports
* Participating in Wilderness Activities
* Sailing and Surfing
* Snowmobiling and ATVing
* Swimming and Boating
* Wildlife Viewing
http://www.corporate.canada.travel/en/ca/research_statistics/productknowledge/tams/cnd_outdoor.html

Figure 8: List of nature-based tourism activities *while on overnight trips* included in TAMS.

Understanding recreation according to the meanings people attach to their participation does correspond with the values people associated with nature recreation. This experiential and meaning-based approach has been essential in more effectively providing recreation services, managing

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parks, communicating with users, and supporting commercial recreation opportunities, although it has been harder to quantify for political purposes. Therefore, recreation and tourism providers often report the economic values for recreation and tourism. To this end, travel cost methods have become so prevalent that some research simply implies it is the only means of calculating value (e.g., Outdoor Resources Review Group, 2008), ignoring the other values of recreation and methodologies even in the recreation field (Snyder, et al, 2003). However, a far more holistic comprehension can be had by combining methods, as Hailu et al (2005) did using travel cost methods in conjunction with social psychological variables in a study of sportfishing in Alberta. Higher values for particular sites and recreational experiences were associated with psychological attachment to place. Similarly, using surveys and multi-factorial analysis, Halpenny (2006) found place attachment magnified the effect of visitation to Point Pelee and resulted in higher valuation of the Park and environmental values generally.

The benefits-based approach as been one of the most significant developments in understanding recreation. With a casual use of the term "values" these benefits could be so-labelled since they increase the worth and perceived importance of the recreation participation. Recreation meets personal needs in terms of psychological, physiological, health, and relational needs. Recreation provides social and community benefits. It provides economic benefits and environmental benefits. A shorter version of the more extensive list to be found in (DeGraaf, Jordan & DeGraaf, 1999: 9) is provided in Table 3. Most of these benefits have been shown for nature-based recreation also. Personal and social health, social inclusion, environmental protection, personal development and psychological health are among the primary benefits of recreation. The psychological restoration benefits of leisure befit the etymology of the word *re-creation*. These benefits show that recreation is not just beneficial for individuals but is a public good.

Table 3: Sample of benefits of recreation as demonstrated by research, from DeGraaf, Jordan & DeGraaf , 1999.

Personal benefits-Psychological	Personal benefits-physiological	Social/Cultural benefits	Economic benefits	Environmental benefits
Better mental health	Weight control	Ethnic identity	Reduced health costs	Development of environmental awareness
Better mental health maintenance	Increased bone mass in children, elderly	Social support	Increased productivity	Maintenance of public facilities
Mood management	Improved immune system	Social inclusion	Deceased job turnover	Stewardship
Personal Development	Diabetes prevention	Community satisfaction	Reduced on-the-job accidents	Public involvement
Self-reliance	Reduced incidence of disease	Family bonding	Job creation	Preservation of sites
Values clarification	Reduced or prevented hypertension	Sharing/ cooperation	Local and regional economic growth	Improved relationship with natural world
Leadership	Management of menstrual cycles	Volunteering	Contribution to national economy	Understanding human dependence on natural world
Adaptability	Cardiovascular benefits	Community/ political involvement	Environmental friendly economic development	Preservation of culture and heritage sites
Creativity	Respiratory benefits	Support democratic ideal of freedom	Tourism redistributes resources from other regions	Biodiversity
Cognitive efficiency	Prevention of colon cancer	Understanding and tolerance		Ecosystem sustainability
Balanced living	Improved neurophysiological function	Prevention of social problems in at-risk youth		Maintenance of national scientific laboratories
Appropriate competitiveness	Reduced consumption of alcohol or tobacco	Developmental benefits for children		Wildness
Personal Satisfaction	Increased life expectancy	Socialization/ acculturation		
Challenge/stimulation				
Independence/ autonomy				

Early parks movements attempted to redress social ills assumed to be caused by lack of access to nature, as well as for preservation and conservation (Karlis, 2006). Early recreation movements were usually intended to provide for the social well-being of "the less-fortunate" who were locked within the misery of rapidly urbanizing and industrializing 19th century cities. In recent years, the health benefits of "physical activity" have been emphasized.

Nature-based Recreational Activity

It has been difficult to determine actual Canadian outdoor recreation trends, and even more difficult to translate such participation into "values." Often, data on recreational activity, such as that collected by Statistics Canada, does not include nature-based recreation, or aggregates all types of this activity into single categories. The problem with such aggregation is that research in both academic and commercial settings (such as TAMS) show different motivations for different types of activity. Leisure research shows that recreation "specialization" differentiates participants, even within what seems to be a simple category such as birdwatching (McFarlane, 1996). Birders are known to be among the most financially affluent nature-based recreation participants (Smith, 2000), but backyard birding has very different characteristics from those who travel extensively during annual migration. "Serious" birders are much more willing to engage in conservation activities and exhibit different value constellations than moderate or casual birders (Hvengaard, 2002; Martin, 1997). Some birders even give up a portion of their Christmas to participate in the Christmas Bird count. Birding is non-consumptive, which may mean that participants hold different values than consumptive users like hunters (Boxall & McFarlane, 1993); more serious birders participate more in conservation efforts (McFarlane & Boxall, 1996) – although hunters have also been at the forefront of many Canadian conservation efforts (Loo, 2006). Canada hosts nationally known birding spots like the raptor migration in Kananaskis Country in Alberta, and Point Pelee in Ontario (Hvengaard, et al, 1989), and regionally significant ones like the Brant (British Columbia) Wildlife Festival and Tofield (Alberta) Snow Goose Festival (Hvengaard, Jenner and Manaloor, 2005) which attract thousands of participants. Birders also often enjoy scientific value from the "professional" involvement as amateur scientists whose data contributes to ornithological studies (Cooke, 2003). Other values are also part of birdwatching, or, birdwatching can be used for other values; Pinder (2007) reports on an ethnographic study on birdwatching with mental health patients as part of a British study on the therapeutic benefits of nature.

Statistics Canada has reported declines in participation in organized sports (Ifedi, 2008), but increases in overall active leisure between 1992 and 2005 (Hurst 2009). Most of the increase was in "fitness" with some in informal (contrasted to organized) sports. In

2005, 2.2% of Canadians participated in "outdoor expeditions" (hunting, fishing, camping, and boating), up from 2% in 1992 – a marginal increase compared with the overall 4% increase in activity between the benchmark years. Another 1% bicycle as leisure, which may be considered by some as "outdoor" activity. The report also made distinctions between cycling as commuting and as leisure, although a nonscientific cycle-commuting study by the Edmonton Bike Commuters Club showed that one of the perceived benefits of cycling to work was "being outdoors; seeing nature." Allison et al (2007) shows declines in physical activity among age 14-18, while the two Statistics Canada studies involved only adults. Another Statistics Canada report shows Canadian families spending much more on recreation overall, with the majority going to electronic diversions (Kremarik, 2002). Again, this study does not include nature-related spending.

Numerous studies have focused in different ways on most of the activities listed in Figure 8. Hiking, camping and adventure pursuits have such extensive bodies of research that a full review is beyond the scope of this report; much of the literature is outside of the Canadian context, often American. While that literature may have relevance, as always, national differences may affect comparability of the results. Canadian research is needed to assess how values and nature-based recreation relate. Less research has focused on energy-intensive outdoor pursuits like ORVing, snowmobiling or RV (recreational camping vehicle)-related nature recreation. Management of outdoor recreation opportunities is usually based on a spectrum of opportunities ranging from developed to primitive to wild; presumably the values for nature associated with these different spectrum placements will differ. However, in all cases, developed recreation will have higher direct economic figures unless other values are factored in. Alpine resort skiers will spend more money than backcountry skiers, although ski industry surveys indicate that both skier specializations report high values for experiencing nature. The economic and value orientations of snowmobilers are likely to be different yet. Reinforcing the importance of values, the particular values may explain conflict among uses – such as hikers and mountain bikers – of natural recreation environments (Carothers, et al, 2001). Besides birding, other forms of wildlife viewing have been studied. According to research wildlife value orientations can be placed along a continuum from biocentric (i.e., nature-centered view), to anthropocentric (i.e., human-

centered, utilitarian view of the world) (Christensen, et al, 2007; Donnelly & Vaske & Donnelly, 1999; Kellert, 1978). The Canadian Tourism Commission (CTC, 1995) reported that whale-watching had more participation days than all other forms of wildlife viewing combined, with over one million participants annually on commercial and self-directed trips in Canada by 2000 (Garrod & Fennell, 2003). Wildlife photography and consumptive uses like hunting and fishing have also been researched, along with organized aspects like wildlife festivals and fishing derbies. We discuss these latter aspects in the section on tourism.

Hunting is usually described as a "consumptive" use of nature. This is simplistic. Both activities also have specializations and variability in the values that participants hold and that shape their behaviour. Aboriginal peoples in Canada have fought to restore rights to hunt or fish; treaties often included provisions for "making living off the land" which has now become part of battle over subsistence hunting and fishing or mild levels of income. Even among Canadians, hunting is a value-laden activity as battles over animal rights, grizzly hunts in Alberta, black bear hunts in Ontario and other events have shown. In many parts of the country hunting is on the decline, leaving provincial hunting federations striving to show the benefits of hunting.

Recreational hunting and fishing can be activity indicators of Canadians valuing nature. Both these types of foraging bring human beings into the relatively wild outdoors and (if successful) into immediate proximity with wild animals, demonstrating a kind of valuing nature. The number of persons involved in hunting and fishing is monitored by provincial wildlife ministries through license issuing, and engagement intensity levels of persons in hunting and fishing has often been approximated by such means as travel cost methods (reviewed above) and attitude surveys.

However, the valuing of nature done by hunters is ambiguous and may not be discernable by the means suggested above. In a 1978 study which remains relevant today, Stephen R. Kellert distinguished between three kinds of American hunters: utilitarian/meat hunters (43.8% of surveyed population), nature hunters (17.7% of surveyed population), and dominionistic/sport hunters (38.5% of surveyed population).[13] Kellert finds that utilitarian hunters view prey animals as resources to be harvested, valuing them only in a basic, instrumental manner. Moreover, dominionistic hunters

actually *disvalue* the prey species, valuing rather a sense of *mastery over* nature. Only so-called nature hunters value "close contact with nature as the primary reason for hunting" (p. 414). How Kellert's hunter framework relates to other values of nature has not been studied. Environment Canada could expand its methodology to find out how many Canadians would identify themselves as either utilitarian, nature or dominionistic hunters, and how these hunting paradigms relate to other values of nature.

Kellert's research points to the *meaning* of hunting being important, in ways that relate to values associated with nature. Trophy hunting is a significant tourism business; but hunting has other values. For example, the controversy over black bear hunting in northern Ontario pitted northern hunters and southerners in a dramatic value conflict eventually solved in terms of powerful value-interests in Southern Ontario (Dunk 2004). Historians show that Canadian wildlife management has been "about the values that should govern humans' relationships with nature ... and the values that would come from conserving it" (Loo, 2006, p. 7; Sandlos, 2007). In fact, Sandlos (2007) shows that early 20th Century wildlife management regimes were specifically designed to restrict native hunting because of different cultural construction of the landscape and hunting as sport or subsistence. In an ironic reversal, white Northern Ontario hunters have aligned themselves with a reading of Aboriginal identity as hunters. Masculine identity was also at stake. The ending of the black bear hunt fuelled even more northern alienation as well as antagonism to "Southern" nee "environmental" values.

The extensive literature on wilderness and both soft and hard adventure recreation shows numerous values. Most all of this literature is American-based; Canadian scholars usually frame their research as "North American."[14] Among the few differences that we could discern were that Canadian researchers paid a different sort of attention to ethnic diversity – chiefly by (occasionally) pointing out that research needed to carefully consider that dominant social notions of nature and recreation were ethnocentric and did not pay attention to Canadian multicultural diversity. Wilderness programs are often focused on activities and travel, which may, perversely, weaken the attention to nature (Haluza-DeLay, 1999). Ethnographic researchers have occasionally reported locals sitting on the riverbank shaking their heads at the recreationists so intent on their journey they barely notice the land around them (personal communication, Michael Heine, April,

1994; Raffan, 1993). And as Vander Kloet (2009) shows, even the largest retail outlet for self-propelled outdoor recreation gear and clothing reinforces consumer values in its literature while using nature in commercial appeal. Dyck et al (2006) surveyed environmental values among Banff mountaineers, showing that specific nature values/attitudes (e.g., value for low-impact camping) but not general environmental attitudes were increased as climbing competence increased. Nevertheless, nature-based recreation is often positively correlated with environmental values.

Other values are also relevant. Frohlick's (2006) observational research among mountaineers in Banff showed that mountaineering values were gendered, particularly around motherhood but not parenthood. Although Frohlick did not so speculate, this finding has some correspondence to ways that gender and nature are similarly devalued according to ecofeminist and political ecology research (Reed, 2003). Means-ends laddering is a method of moving backwards from attributes of an experience to the values the participant holds. It uses semi-structured interviews, and is based on personal-construct theory. Hallett (2005) used a means-ends laddering methodology to understand the personal values and motivations of backpackers in Banff National Park. Solitude is a value that many people have for their nature-based recreation experiences (Stefanovic, 2002). It is a value that is endangered in many settings but which may be undervalued by land managers, as research on places like the Ottawa River, Lake Ontario Waterfront Trail, Banff National Park, and the St. Croix Waterway in New Brunswick shows (Stefanovic, 2002; Hallett, 2005; Stacey, 2005). There is valuable social capital formed through adventure outdoor recreation clubs (Glover, 2004, 2005; Burnett, 2006). Harshaw (2005) demonstrated that membership in outdoor recreation clubs – from snowmobiling to backpacking – significantly contributed to social capital formation and participation in land-use planning exercises in British Columbia. Social values and nature values overlap.

Recreational vehicle use is expanding in Canada, as are softer forms of nature-oriented travel. These trends owe to complicated changes in society and aging demographics. Fourteen percent of Canadians own recreation vehicles, which they often use to go to natural areas and parks. The top activities for RVers in the Rocky Mountain Parks were sightseeing (88%) and day-hiking (77%), according to a 2008 study by Parks

Canada. This study also showed that there are different types of RVers in terms of their interests in nature, but that less than half were aware of their environmental impacts or taking steps to reduce their activity impacts.

Lu & Campbell (2008) found that the importance and use of the Trans-Canada trail near Winnipeg differed among those classified as "current participant," "uninterested non-participant," "potential participant," or "ceasing participant," indicating likely different value structures as well as constraints to participation. Stefanovic (2002) engaged the value of the Lake Ontario Waterfront Trail from Niagara to Trenton for hikers in a phenomenological study. Using photographs, interviews, and ethnographic observation with adults and children, she identified a number of values for hikers. Chiefly, hikers valued being close to home or a sense of home, and compared it to the traffic and other stresses of going to Ontario's "cottage country." Also highly valued was the ecological diversity encountered on the trail. Many were former wilderness travellers who were fascinated by the mix of urban nature. Even built-up areas were valued and used in a complicated mix of nature and urban leisure behaviours. Children usually valued the natural encounters, but had more difficulty distinguishing "natural" nature and manicured nature (like mowed lawns). Despite these values attributed by participants, municipal conservation has been difficult. Most conservation takes place at the provincial level so other levels of government and non-profit conservation organizations have been reluctant to participate (ARPA, 2009).

Volunteering is also a leisure activity. Many people volunteer for nature-based organizations on a vacation basis. Interviews with Ontario residents on 3 to 17-day working holidays with Volunteer for Nature described their attitudes and values regarding nature (Halpenny and Caissie, 2003). In particular, volunteers conceptualized nature in four different ways: "nature in crisis," "nature as it should be," "nature as outside or something different," and "nature as nurturing." Following the Stern (2000) model, biocentric concerns were cited as important but not ascribed greater value than the egoistic or altruistic concerns. For example, as many of the volunteers were older, "protecting nature for my grandchildren" was an important value that is both altruistic and egoistic. Zealand (2005) showed that since many trails traverse private lands trail maintenance workers – whether paid or volunteer – have essential roles in easing the

value-conflict between landowners, trail users, and the governmental authorities that may have authorized the trails and see wider benefits for the trail's existence. Others volunteer in nature-protective activities more locally, which is part of an understudied form of engaging with nature that can be termed "eco-leisure" (Ron, et al, 2008) and will be discussed below (page 89).

Nature photography (Lemelin & Wiersma, 20076) has been studied among Polar bear watchers in Churchill Manitoba, showing how it gives additional values in some way to the experience, while detracting from other aspects. Wildlife viewing has economic values, but also nutritional, ecological and socio-cultural values (Chardonnet et al, 2002). Wildlife was valued by 76% of visitors to one national park (Elk Island, Alberta) who reported seeing wildlife as memorable experiences (Chapman, 2003). Whale-watching can have environmental education values as Russell and Hodson (2002) have studied in Eastern Canada. Garrod and Fennell (2004) indicate that another value of whale watching is increased commitment to conservation. Malcolm and Duffus (2005) identified six types of specialization among whale watchers on the West coast with different value systems relating to the experience of this aspect of nature. Value orientations differ among whale watchers (Christensen, et al, 2007).

In conclusion, the importance of nature-based recreation is not only in travel to places removed from participants' home environments. Most recreation activity research uses the term "benefits," in the casual sense of value as importance, but this can be construed as demonstrating the many values of nature-based recreation participation (DMS Consulting, 1995). By expanding the conceptualization of nature-based recreation, and understanding it as experiential and meaning-driven for the participants, and that recreational participants differ even in what appears to be the same activity, the non-market values associated with recreation can be highlighted. However, any such research must pay attention to the different values embedded within leisure by various social divisions and cultures that are part of the Canadian mosaic. While there has been much research by Gordon Walker on Chinese-Canadian leisure, there has been much less on other ethnic groups (Karlis, 2004). Nor is there much Canadian research on the multicultural values of recreation, leisure and nature-based recreation (Fox, 2008; Stodalska & Walker, 2008) and the nature recreation opportunities for people with

disabilities. Regarding the latter, both Goodwin and Staples (2005) and Mecke and Hutchison (2005) note that Canadian social values tend to limit inclusion, and devalue the participation of people with disabilities with the outdoors.

Parks

Protected areas such as parks are talked about extensively in terms of values.

> Society establishes protected areas with the expectation that they will deliver certain values to society that would not be forthcoming without these areas. The essential indicators of progress would be whether protected areas are delivering those values in an effective and timely manner. (Dearden, 2008:1)

Professionals in this field have listed innumerable values for parks, most of which correspond to lists of value categories such as represented in Table 2 or Table 5. Heritage values and valuing parks as a form of environmental justice are also sometimes mentioned (on the latter, see Smale &McLaren, 2005; Gilliland, 2006). The World Commission on Protected Areas lists eleven values for parks (Figure 9; Harmon, 2004), including *peace values*, which corresponds to increasing valuation of parks as explicit instruments of conflict resolution and peacemaking (Ali, 2007). It would be interesting research to find out how Canadians value their parks – national, regional and local.

The history of parks protection has been a history of changing value priorities (Dearden & Rollins, 2002; Sandilands, 2009). Early natural areas designations were often a function of conservation of game for the landed classes or hunting elites. Later, provision of scenic tourism value took precedence; eventually general recreation value was added. Later came nature protection for primarily aesthetic, spiritual and experiential values and most recently for ecological protection. This history emphasizes wildland parks. Urban parks were established for different reasons, often as a way of alleviating the presumed misery of urban industrial living.

| Recreation values |
| Therapeutic values |
| Spiritual values |
| Cultural values |
| Identify values |
| Existence values |
| Aesthetic values |
| Educational values |
| Artistic values |
| Scientific research and monitoring values |
| Peace values |

Figure 9: World Commission on Protected Areas values for parks.

These values are an important part of visitor's experiences; visitor expectations are often based upon what

they value, and the experience is based on this subjective perception of discrepancy between value and what is encountered. Thus, parks managers, increasingly managing for visitor experience (Jager et al. 2006), are also increasingly managing for particular values. For instance, Légaré and Haider (2008) show that visitor valuation of the experience varied with perceived characteristics like crowding. They used data from three different years and recommend both experience sampling methods and the need to attend closely to context and place. But visitor values and the values established by legislation or professional expertise may not be aligned well. For instance, recreation values may not be consistent with ecological management values. (Manning and More, 2002). Thus, parks professionals find themselves in a position of trying to "educate visitors" about parks values, ergo, changing visitor values.

Dearden (2008) argues that protected areas are a means to an end, specifically, a means to preserving certain values that do not fare well against market values. Protecting nature is one of those ends. Another benefit of perceiving parks as only one means to an end is that the history of parks as a form of preservation is also a history of exclusion of other values. This is part of the reason for opposition to park establishment. One example is the Dene opposition to a national park between Great Slave Lake and the Thelon Game Reserve (Ellis, 2008). Another important value of parks as preservation is what Kahn and Kellert (2002) call "generational amnesia." Each succeeding generation takes as its baseline their early (childhood) experience of nature; as more development occurs, albeit contested, the new condition of nature becomes the baseline for the next generation to base its perception of untrammelled nature against. Thus, parks as protection form something of an alternative baseline against this perceptual creep. Park designation may signal "natureness", as evidenced by increased visitation to U.S. Parks after changes in designation from National Monument to National Park.

However, in the analysis of many researchers, protected areas such as parks are being swamped by the pace and scale of degradation outside their boundaries. More worrying, in Dearden's (2008) analysis, there is an increasing encroachment of market values into protected areas, with the risk of weakening the value of protection of nature. The increasing need to educate visitors about the value of protected areas is one measure of this. Other researchers measure the rise in user fees, lowered support for general

revenues from public taxation to fund protected areas, and increased commodification. It is unclear the extent to which certain non-market nature values (labelled as "protected areas values" in Figure 10) are diffusing into the general population or being run over by penetration of market values into protected areas.

It would be of great benefit to have a better understanding of how Canadians view parks and the relationship of parks, protected areas, recreation, preservation

Figure 10: The changing "valuescape" of nature protection (Dearden, 2008).

and other value types. Placing this information in the context of other values, beyond the typical visitor counts, would be helpful in assessing the degree to which parks are being successful at delivering values of nature to Canadian society.

Tourism and Commercial Recreation

Many forms of tourism may illustrate valuing nature. Places of scenic beauty are some of the most popular destinations. Sites like gardens and aquariums are among the featured attractions of cities. Ecotourism is one type of tourism with an obvious nature orientation. But other forms also exhibit valuation of nature.

A tremendous literature has quickly grown up around the concept of ecotourism. According to The International Ecotourism Society (TIES, 2006), ecotourism is "responsible travel to natural areas that conserves the environment and improves the well-being of local people." There is a deliberate value-orientation here; in fact, ecotourism fits into a category of "value tourism" wherein people are deliberately choosing certain forms of travel on the basis of their values (although it is difficult to deny that all travel is chosen at least partly because of values such as valuing family time, getting away, new experiences and so on). The values associated with ecotourism can be

easily studied, and would be a welcome enhancement to the specific dollar and days calculations of the 1996 *Survey of the Importance of Nature to Canadians.*

Other forms of tourism also have substantial valued nature components. Wildlife watching is the most popular activity on vacation farms in Saskatchewan (Fennell & Weaver, 1998). In rural tourism the land and culture are valuable assets (MacDonald & Jolliffe, 2003). These researchers report that wilderness and cultural landscapes are valued by tourism providers and tourists. However, it seems that active farming is not an asset. MacDonald & Jolliffe emphasized that it appears that the appeal is the represented values of rural life. Daugstad (2008) reported that when discussing landscape types, physical features are often not identified.

> It is not clear whether they are referring to a modern production landscape or an ''old-fashioned'' landscape of pasture land and meadows, or whether the landscape under discussion is perceived more as ''nature'' (abandoned from farming or remnants of natural landscape). (Daugstad, 2008, p. 420)

Lutz et al, (1999) used surveys to understand rural and urban B.C. residents' attitudes about wilderness. Switching to photo elicitation, it became clear that the two populations responded to the questionnaire on the basis of a different understanding of what constitutes wilderness, the meanings and values mattered. In a narrative approach using scenarios, Lewis (2008) asked local Aboriginal and non-aboriginal community members to describe the factors that affected their evaluations of alternative landscape management scenarios. He reported "participants provided lengthy commentaries on the cultural appropriateness of particular landscape conditions, and conceptions of landscape care or 'visible stewardship'." Hinch (1998) showed how Aboriginal views on land and nature diverge from other Canadians and affected tourism provision.

The Communities in Bloom website promotes "horticultural tourism" from a "values perspective: "Value means quality, a quality experience." Lemelin & Wiersma (2007) took a narrative approach to assessing valued perceptions of polar bear tourists in Churchill Manitoba. Elsewhere, Lemelin used a Wildlife Values Orientation Survey from which he concluded that all polar bear tourists do not share the explicit values of ecotourism (Lemelin, Smale and Fennell, 2008).

Because of its reputation as a "green" province, we paid especial attention to the ways that British Columbia represents its tourism or has studied the values associated with it. Besides the economic measures, the provincial government argues that tourism also contributes to the emergence of new forms of culture by bringing people together at events such as expositions, concerts, and the Olympic Games. The British Columbia Wilderness Tourism Association (2005) produced a report on commercial tourism in the province (http://www.wilderness-tourism.bc.ca/docs/Characteristics_of_ Tourism.pdf). The report's focus is strictly on the economic effects – $1 1.55 billion in direct and spin-off accounts. The following statement shows that even this calculation is limited by particular conceptions of nature:

> By definition, this project **does not** describe characteristics of frontcountry nature-based experiences such as downhill skiing or golfing, or expenditures by individuals participating in non-commercial nature-based activities such as self-guided hiking and kayaking. Tourist expenditures before and after visiting nature-based tourism businesses and that of locals (nontourists) that use nature-based tourism businesses are not included in the economic impact figures.

For example, this calculation does not include such "nature"-based tourism as tours of the grape growing Wine Country in the Okanagon. It therefore, under-represents both the economic value of nature to tourism in the province and other values of other types of nature. On the website of the B.C. ministry responsible for tourism, of the 1035 Festivals & Events listed, 45 are listed under "Science, Nature & Animals."

Rollins and Delamere (2007) have worked to develop a scale measuring the impact of festivals. It provides for a more complex understanding because this scale measures not only the importance or value that individuals place on the festival, but also their beliefs or expectancies about the festival. In other words, the actual experience and the expected experience are part of the personal valuation. The cost of this complexity is that the scale ends up being twice as long as simpler scales, but Rollins and Delamere argue that the richness of the results is worth it. Their results are consistent with our argument all along about the need for more complex conceptualization of both the topic under study – the values of nature - and effective assessment methods.

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Recreation and Nature-Values

As described above and listed in Figure 8 most attention to nature and recreation has involved activity in which people travel and do things. Recently, an article in the journal of the Canadian Leisure Studies Association argued for the need to reconceptualise certain types of nature-based activity as "eco-leisure" (Ron, Shani and Uriely, et al, 2008). With insight from the conceptualization of some forms of tourism as eco-tourism, these colleagues argued that some types of leisure are not recreation-focused but "ecologically- oriented activity" and should be treated as such. They define "eco-leisure" as:

> An outdoor activity, related to the theme of nature, practiced by individuals and groups in their free perceived time, involving an environmental-ideological motivation, which is integrated into a routinized way of life and aimed at contributing to both physical and human surroundings. (Ron et al, 2008:53)

Backyard birding, naturescaping one's yard, joining a voluntary cleanup, and even gardening are examples of this values-driven type of leisure. As noted, participants in some of these activities are willing to spend extensive amounts of money on these pursuits. More importantly, such leisure pursuits represent deliberate valuing of nature, based on acknowledging that leisure is a product of meaning-oriented interpretation of personal experience.

Despite the significant amount of research into birdwatching – only a portion of which we identified above – there is little research on "backyard birding" (see McFarlane & Boxall, 1996 for research on the unusualness of the Edmonton Christmas bird count which tries to organize casual birders in urban counts). This surprising gap lends support for Ron and colleagues' claim

> Sample Data to collect:
> √ How do people recreate in nature?
> √ How much is close-to-home?
> √ What do they do? What is the experience? What benefits does it provide?
> √ Which of the listed values do people have for parks?
> √ Do people consider protected areas as a public value or primarily as a recreational and individual value?

that there has been almost no research into eco-leisure. It seems ripe for possibilities for exploring values of nature; Environment Canada could contribute greatly with significant

attention in its research program into the everyday ways that people value nature in their ordinary activities.

Resource Management

Most frameworks for managing natural resources in Canada include some idea of sustainability. How this idea of sustainability is operationalized depends on the sector (e.g., mining or forestry) and the agencies involved in establishing the management framework. Agriculture, oil and gas extraction, and mining are all examples of extraction of resources which we utilize that nature provides. We focus

- Resource sectors vary considerably making the values associated with them contingent on the sector assessed.
- *Forest values* have been extensively studied in Canada.
- Some research shows common value orientations among different stakeholder groups, while other research shows very different orientations.
- Values around resource management are very likely to be pluralistic.
- There is a risk that industry groups may be better positioned than other groups to produce resource management decisions that result from their particular values but that may exclude other values or stakeholders.

strategically here on the Canadian forest sector as it demonstrates some of the challenges of addressing multiple values in one particular resource sector. There has been much research on the *social values* of forests, which needs to be coordinated with the ecosystem values and economic values (as well as recreational, aesthetic and cultural diversity values that also impact forest decisions).

The Canadian forest sector has developed a set of criteria and indicators of sustainable forest management. This national framework is sponsored by the Canadian Council of Forest Ministers (CCFM) and is adopted by many provincial resource management agencies and other non-government agencies as a general framework for "thinking about what matters" when it comes to the management of forest.

The framework includes six criteria (biological diversity, ecosystem condition and productivity, soil & water, global ecological cycles, economic & social benefits, and society's responsibility). Under these criteria are a set of more detailed indicators. For instance, under the criterion of biological diversity there are more specific indicators of

ecosystem, species, and genetic diversity. Each of these indicators is assessed at regional and national scales. This particular approach to managing natural resources has evolved from earlier versions of forest management that focus on the sustainability of a single forest value – fibre – or a limited range of values such as fibre plus recreation. These narrow management objectives have broken down under more recent recognition of the increasingly diverse values and benefits that are derived from Canada's vast public forests.

Management frameworks such as the CCFM criteria and indicators are inherently an expression of what is valued about forest landscapes and how well these values are being sustained over the long term. They are expressions of contemporary values that are also dynamic and changing over time. They also reflect a kind of best practice with regard to sustainability sciences. This management framework is not only an expression of what we value, however, but within the details of the criteria and indicators framework, there is a mandate for public values to shape the forest management process. In this sense, there exists a strong current of scientific management that is combined with democratic impulses to include public values and understanding of what matters.

Element 6.4 of the framework addresses the issue of fair and effective decision making. In the introduction to this element, the following statements are made.

> In Canada, much effort is devoted to produce science-based information and identify social values of the forest in the on-going development and improvement of sustainable forest management (SFM) strategies and practices. Forest practices that are not perceived to reflect social values cannot be considered as effective means to achieve SFM. Increasingly, therefore, the various institutions responsible for forest management and forest resource allocation have encouraged public involvement in their decision-making processes through a variety of approaches. Involving the public leads to the incorporation of the full range of social values into decisions and to quicker responses to changes in these values over time. However, cultural differences, conflicting economic interests, and differences in risk tolerance can complicate decision making, and affect the stakeholders' perceptions of its effectiveness (CCFM 2005).

Democratic participation is clearly valued in this statement. Therefore, the specific social values referenced in this statement are "nested" in value orientations that extend beyond natural or environmental values (Leiserowitz, et al 2005).

Given this mandate for the inclusion of public values in forest management, a number of scholars have undertaken diverse methods to elicit value statements in the context of forest landscapes and then find ways of incorporating these values into management practice.

Kant and Lee (2004) for example, develop a method of examining forest values that attempts to move beyond the limits of economic valuation techniques and cost-benefit analysis. This method involves a non-market oriented stated preference technique to identify forest values amongst various stakeholder groups. Based on a standard categorization of forest values (e.g., economic, environmental, nature, societal, traditional, etc.), these values were then elicited through survey research techniques within four different stakeholder groups: industry, Aboriginal, government (OMNR), and environmental organizations (ENGO); results are expressed in Table 4.

Group preferences (ranks) for the ten aggregated forest values in North-western Ontario									
Group	Economic	Environmental	Nature	Societal	Personal	Traditional	Educational	Aboriginal	Tourism	Recreational
Forest industry	1	2	1	2	3	4	5	5	4	1
Aboriginal	2	1	2	4	4	3	4	1	4	2
OMNR	3	1	1	3	3	5	4	6	5	2
ENGO	4	1	1	4	2	4	3	5	4	2

Table 4: List of forest values for 4 forest stakeholder groups (Kant & Lee, 2004).

A major finding from this study was that value categories of Environment, Nature and Recreation were ranked highly by all four stakeholder groups. Also, it was found that many similarities existed across groups with regard to their value sets. For instance, there were no significant differences between the values of government representatives and members of environmental organizations. This research lends support to the idea that value clusters are held in common across different groups within society and provide a basis for dialogue and the development of shared goals and outcomes. However, in the same region of Ontario, McFarlane & Hunt (2006) have found differences in values based on an individual's social position relative to forest industry. Egri & Herman (2000)

found that values of British Columbia leaders of environmental non-governmental organizations and for-profit environmental businesses were significantly different than the value sets of managers of other organizational types. They used the Schwartz value inventory. Environmental managers were more ecocentric and valued leadership styles that were more transformational and transactional than the other managers. Salazar & Alper (2002) used interviews to investigate the relationship between environmental and political values of environmental activists in British Columbia. Factor analysis enabled them to identify four clusters of values among these respondents (which they labelled as Ecocentrics, Communitarians, Preservationists, Egalitarians).

In the context of natural resource management in Canada, national research on the importance of nature to Canadians can provide important insights into current and future values as they relate to forest landscapes or other important natural areas (urban or rural). This work can point to ways in which an understanding of deeply held values can lead to shared understandings between stakeholders, mutual respect, and progress toward the resolution of difficult resource management conflicts.

Given that social values or forest values are abstract categories or expressions of what is considered to be good or right, some readers might question the utility of such abstract ideas within the highly precise business of resource management. In response to this concern about the abstract qualities of values with regard to forests or nature in general (and the utility of such concepts as a building block for public policy development), the work of Manning, Valliere and Minteer (1999) is seminal (Table 5). In his research on the national forests of Vermont, Manning and colleagues directly take on this question of how values can link to more specific issues such as attitudes towards national forest management. Based on values categories from the work of Rolston (1988; Rolston & Coufal, 1991) and others, specific values were measured (e.g., ecological, aesthetic, spiritual, moral, economic and scientific). These values were then compared with specific attitudes toward forest management (e.g., management of the forest should emphasize production of timber and lumber products). A key outcome from this study was that environmental values and ethics explain approximately 60% of the variation in attitudes toward national forest management.

Table 5: Human values of nature (Manning, Valliere & Minteer, 1999).

Value	Statement
Aesthetic	The opportunity to enjoy the beauty of nature
Ecological	The opportunity to protect nature in order to ensure human well-being and survival
Recreation	The opportunity to camp, hike and participate in other recreation activities in nature
Education	The opportunity to learn more about nature
Moral/ethical	The opportunity to exercise a moral and ethical obligation to respect and protect nature and other living things
Historical/cultural	The opportunity to see and experience nature as our ancestors did
Therapeutic	The opportunity to maintain or regain physical health or mental well-being through contact with nature
Scientific	The opportunity for scientists to study nature and ecology
Intellectual	The opportunity to think creatively and be inspired by nature
Spiritual	The opportunity to get closer to God or obtain other spiritual meaning through contact with nature
Economic	The opportunity to get timber, minerals, and other natural resources from nature

This work is important to show how abstract and more deeply held values are linked to specific attitudes and preferences for certain types of resource management options, public policies, and so on. Manning's work also illustrated the importance of a particular kind of value – namely non-material values (i.e., aesthetic, stewardship). Authors conclude from this research that "national forests should be managed to support multiple benefits, especially those that are nonmaterially oriented" (Manning et al. 1999: 434). This finding is consistent with other work in this field such as Tarrant et al (2003) who refer to *use* and *non-use values*.

Much of the research in this field of natural resource management is focused on some variations of the work described above. Typically researchers are focused on a particular forest, resource management region, national or provincial park, and value orientations are elicited from key stakeholders in the region. These value orientations are used to identify points of similarity and divergence within the constellation of public values related to a particular management area. Researchers such as Kant and Lee (2004) point to the possibility of values research leading to overlapping interests and mutual understanding. Other researchers – such as Tindall's (2003) interviews with British Columbia residents on their forest values (ecological, recreation and outdoor experience,

aesthetic, community sustainability, cultural, economic, work, science and education, equity values) – showed how world views can be inherently conflictual and therefore stakeholder values can be fundamentally at odds with one another. Given these deep differences between stakeholders, it may be impossible to make the majority of people happy with regard to the management policies of a discrete landscape. Reviewing the history of forest management in the province of British Columbia, Vernon (2007) called these "incommensurable values." Social groups use different standards when assessing value (see the earlier section on values pluralism, page 38). A limiting factor is the extent to which social groups are constrained by political-economic systems beyond their decision-making. Vernon (2007) recounts how provincial governments were more attentive to industry values than citizen values of the forest.

Research by McFarlane and Boxall (2000) also show how forest values expressed by members of the general public are often inconsistent with the values of industry and government. The campers and hunters surveyed were strongly supportive of protection of nature and not supportive of economic or timber development strategies. Their values were strongly related to their attitudes but not to socio-demographic characteristics. A later study compared value orientations across four groups – the public, registered professional foresters, environmentalists and forest industry public advisory groups – with similar results (McFarlane & Boxall, 2003). McFarlane and Hunt's (2006) survey of forest values in Northwest Ontario showed that forest industry dependence was an important factor in values, which then affected environmental and nature-oriented activity. This research leads to questions about the legitimacy of public land management when public values are not adequately represented within management and public policy processes. Parkins (2002) showed that the deliberations of forest advisory groups in Alberta, presumably representing all stakeholders, have been shaped by the sponsoring forest companies, with the result that the values for the natural environment of one particular stakeholder have become dominant. These studies demonstrate that political beliefs and the political and other contexts are an inherent part of the means by which nature is valued.

It is clear that Environment Canada's mandate does not encompass natural resource management, but to the extent to which contemporary resource management

paradigms encompass sustainability sciences, inclusion of broader themes in environmental valuation and management cross over into the resource management field of research and policy development. Moreover, contemporary resource management paradigms call for the inclusion of public values into management decision making. At a minimum, the inclusion of public values simply means public comment on predefined management plans. Increasingly, however, this minimalist approach to public inclusion is inadequate and a more systematic approach to public values assessment is required. Toward this end, a survey of the comprehensive importance of nature to Canadians can feed the growing appetite for systematic public values assessment in concert with the management of public lands and publicly owned natural resources. A system of value categories, such as one of those presented in Table 2 can provide solid information about the diverse range of values in operation.

One operational approach to this objective includes the scaling up of work undertaken by scholars such as Kant and Lee (2004), Tindall (2003) or Manning et al. (1999) to a national level. Numerous studies are undertaken every year at the regional level, partly because research budgets do not allow for national level assessment. Environment Canada can fill a gap here with a national level assessment that can, over time, lead to important insights into the trends in underlying environmental values and a national discussion about how these trends might vary by region (e.g., east coast versus west coast) and by category of citizen (e.g., ethnic minority or newcomer to Canada) and might affect public policy with regard to natural resources in Canada. This scaling up process would have the advantage of providing a national picture of environmental values in Canada that is currently lacking.

A second operational approach to this objective includes scaling up of spatial models that McIntyre et al (2008) or Beverley et al (2007) have undertaken in northwestern Ontario and central Alberta (discussed in more detail on page 60). With recent technology developments that utilize web-based participatory mapping tools, this approach has the advantage of

Sample Data to collect:
√ Which values for resources are held most strongly?
√ How do these values shape resource management decisions, or, how are they de-valued?
√ How do people make judgements between values such as jobs and sustainable resources and recreation or aesthetics?

spatially representing nature values within a larger regional geography as well as a more intimate urban or even suburban geography. Given the highly spatial aspects of natural resource management regimes, and the contextual – including place-based (Baldwin, 2004; Hannon & Norton, 1997; Snyder, et al, 2003) character of values, the mapping components of this method are highly relevant to research in this regard.

A third approach, which is something of a hybrid of spatial mapping and narrative inquiry, involves a method that is commonly known as "photo voice" (Glover et al, 2008). In this method, instead of asking research participants to place dots on maps that symbolize a particular value, research participants are invited to photograph places that have meaning to them, and the researchers use these interviews as a basis for personal interviews and deeper insight into the specific meanings of that place. In this way, values are elicited initially through photographs and then further developed through personal narratives. In addition to building depth of understanding about nature values, photographs can also be geo-referenced and mapped. Hybrid approaches like this third way have the advantage of bridging more quantitative and technologically advanced methods with the quality, depth, and insight of qualitative methods.

Cultural Diversity and Values

Resource management has found it increasingly necessary to take culturally diverse values into consideration. It is all the more important, therefore, that the studies proposed by Environment Canada take stock of socio-cultural differences in the ways in which various elements of the Canadian multicultural mosaic value nature.

- Significant differences between Aboriginal Canadian, Euro-Canadian and non-European Canadian cultural understandings of nature will affect how survey questions are understood and answered.
- Cultural differences should be tracked and even intentionally targeted with appropriate methods; otherwise "Canadian" valuations of nature will end up as culturally biased results.
- The Canadian imagination includes beliefs about nature as part of national identity.

Aboriginal Values of Nature

Because the socio-cultural landscape of Canada is dominated by Western or European perspectives, the most obvious locus of 'other' value sets is those whose aboriginal ancestry pre-dates European

contact. There has been extensive writing on this topic. Leanne Simpson (2002) points out that the superior health and sustainability of pre-colonial landscapes and societies (respectively) is a testament to the values, knowledge, and respectful way of life practiced by the members of Indigenous Nations. How can these Canadian (or pre-Canadian) values of nature be operationalized?

Fikret Berkes (1999) points out four layers of "traditional" or aboriginal knowledge that should be accounted for in resource management. First, there is local, firsthand, survival-value knowledge of plant and animal species, soil and landscapes. Second, the larger network of traditional management tools and practices must be analysed. Third, this complex of practices must be understood in the context of aboriginal social arrangements which, fourthly, are encapsulated and made meaningful by a worldview which provides both observational and conceptual order. This corresponds with our recommendation to include narrative methods in future Environment Canada projects. Nature even has impact on Aboriginal concepts of justice and jurisprudence (Koschade & Peters, 2006; McGregor, 2009).

Traditional ecological knowledge (TEK) tends to understand the human relationship with nature as *kinship* and non-separable from community relations (Berkes, 1999; Nelson, 2005; Parlee, 2007). Nelson tries to explain how this makes it difficult to commodify TEK and use it as mere knowledge outside of its original context (Huntingdon, 2000). While this contrasts with the dualistic tendencies in Western or European paradigms, others argue that TEK converges with contemporary scientific approaches to nature. In sustainable forest management there have been numerous attempts to categorize aboriginal forest values. In Canada, the International Institute for Sustainable Development (2000) used the method of "Appreciative Inquiry" to integrate aboriginal values (arguably equivalent with TEK) into Manitoban land use and resource management. This process was designed to empower local communities and holistically include as many value categories as possible. The Aboriginal Forest Planning Process (AFPP) developed in British Columbia is similar in that it relies on analysis of "community interview transcripts, traditional land use documentation, and secondary sources…" (Karjala et al., 2004). These emphases cast doubt on the adequacy of non-narrative methods for capturing aboriginal values of nature. Davis (2009), Page (2007)

and Braun (2002) all show how difficult it has been for industry, government and environmentalists to accept Aboriginal cultural values and valued practices.

Beyond planning discourse, unique aboriginal values can be reflected in the area of health. The general relationship between health and the value of nature for Canadians will be discussed in a later section of this document, but Parlee et al. (2007) demonstrate that the Dene of the Northwest Territories define health as their own traditional culture's way of life. Indicators of this First Nations standard of health were ascertained through "semi-structured interviews with individual community members" (Parlee et al., 2007:1). Another way in which aboriginal land and identity values can be recognized is in land-skills training courses for aboriginal youths, such as Inuit (Takano, 2005), or the Rediscovery programmes in Haida Gwai'i (Henley, 1996) and elsewhere. In such programmes, self-, cultural-, and place-identity are intimately integrated. Fox (2007) summarizes what is known about patterns of Aboriginal peoples' leisure, and Hinch (1998) shows their views on land and nature diverge from other Canadians and affect the way economic and tourism provision occur in Aboriginal communities. Even time was perceived differently than the Euro-Western cultural manner (Goehring and Stager, 1991), so nature and identity are likely to be valued differently also. Like others, Fox emphasizes the difficulty for non-ethnographic methodologies to capture the depth of values of nature in Aboriginal traditional cultures. Furthermore, Aboriginal cultures are not homogenous, nor are gender relations static. Men and women in Aboriginal communities can hold differing value sets (e.g., for Cree, see Martin-Hill, 2007). Women are "keepers" of the water and nature-culture traditions in Anishnaabe societies (McGregor, 2009). Aboriginal conceptualizations and valuations of nature – and the ways that values vary – should not be neglected in a Canada-wide study of the topic.

Canadian Heritage Values of Nature

It is difficult to reconcile aboriginal frameworks for valuing nature with culturally dominant non-aboriginal frameworks (Huntington 2000; Usher 2003; Koschade and Peters 2006). In Canada, the dominant frameworks are Western or European at base, recently informed by cultural contact with supposedly pristine "wilderness." Indeed,

"nature" – i.e., wild nature, Canadian Shield nature – is part of the enduring mythos of the nation of Canada, and deeply associated with the fur trade (McGregor, 2007; Taras & Rasporich, 2001). It is a different frontier than that of the United States, and shapes the Canadian "imaginary," Northrop Frye argued. Canadian cultural historian Catriona Sandilands (2009) explains that Canadians have long held that "wilderness, or our views of wilderness, make us distinctive" and that Frye's ideas about wilderness in Canadian identity held an anti-U.S. nationalism: "There is much to be learned about nature in the Canadian consciousness from this debate – and, earlier, from the simultaneity of the rise of nature-based nationalism with the Group of Seven's attempts to create a distinctly Canadian art movement based on the impressionist representation of wilderness landscapes" (Sandilands, 2009: n.p.). Part of Pierre Trudeau's appeal was the image of him canoeing, and he wrote an essay on the topic in 1947 (Trudeau, 1970).

Many commercial ads make appeal to this Canadian identity-nature link. For example, Molson Canadian and Kokanee beers have long included stereotypical depictions of "Canadians," albeit without racial diversity. Discussing The Molson ads, one set of commentators write, later commercials "featured a more familiar 'wild Canada' setting, for instance showing yet another attractive young man tapping a tree, and, rather than maple syrup, receiving Molson Canadian. Other ads also tapped the wilderness motif, albeit in an ironic way, featuring a beaver trapping a trapper with a bottle of Canadian for bait" (Millard, Seigel & Wright, 2002: 25). Canadian environmental historians have developed more detailed analyses of the nation-building and nature-making project (e.g., Loo, 2006; Hessing, Raglon & Sandilands, 2005). There is value of nature for Canadians in this imaginary as well as in material forms such as national parks and resource extraction. Regional identities can also be shaped by particular valuations of nature, as Dunk's (1994, 2004) research on male identity in North-western Ontario has shown. Although we are not aware of any research on it, anecdotally, there is a sort of pride in Northern Canadians about handling and even flourishing in fierce winters.

Ways of operationalizing this "heritage value" of nature for Canadians are many, ranging from beer consumption or advertisement (Millard et al. 2002) to membership in Mountain Equipment Co-op (Vander Kloet 2009) to registration of land trusts (Hanson,

2009) to canoe expeditions (Raffan, 1999) to national park use (MacLaren 2007) to stated pride in the Rocky Mountains (Ferguson 1997). Nature in Canadian and regional identities can be a form of existence value or brand value. It is not clear from the literature surveyed, however, that these and similar methods will be equally adequate proxies for estimating the (hard to measure) value of nature for Canadian identity.

Most of these analyses address the land and nature as constructs of the Canadian imaginary, which is predominantly Euro-American in style. Other analyses point out the racialized character of the typical Canadian perceptions of nature (Cole, 2006Peake & Ray, 2001;). Multiculturalism is a pillar of the state-sanctioned construct of Canadian identity, but it is rarely coupled with another such pillar: wilderness (Baldwin 2009; Jafri, 2009). In fact, Sandlos (2007) shows that early 20th Century wildlife management regimes were specifically designed to restrict native hunting because of different cultural ideas about the landscape and valuing hunting as sport vs. subsistence.

Non-European Immigrant Values of Nature

The aforementioned understanding of "Canadian" identity may exclude ethnically non-European Canadians who are also non-aboriginal. Selected research suggests that comparatively recent immigrant populations may have differing "wildland leisure" patterns than stereotypically (and mythologically) white Canadians and Americans (Johnson et al. 2004; Stodolska and Walker, 2007).

Some research has been done, for instance, on Chinese-Canadian environmental values in comparison with Anglo-Canadians (Deng, Walker & Swinnerton, 2006). This study suggests, among other things, that the Chinese have acculturated selectively to Canadian society. The Chinese word for "nature" is the bland and general term *zi-ran,* meaning "self-thus," whereas the word for "open country" is *ye,* having illicit connotations of bastard children and prostitution (Snyder 1992). Parks Canada

> Data to collect:
> √ What are the cultural variations in conceiving of "nature"?
> √ How do Canadians of different cultural backgrounds value nature differently?
> √ How do Canadians of different cultural backgrounds interact with nature?
> √ Do new immigrants value or conceive of nature in similar or different ways than same-ethnic group members who have been in Canada longer?

is concerned that new Canadian populations visit the national parks at a much lower rate than their proportion in the population. But we know very little about cultural variation in concepts of nature, and the ways that it may be valued. These facts require that future research not only watch for ethnic variation in results, but also be explicitly attuned to cross-cultural differences in conceptualizing both "values" and "nature" not likely to be captured by standard empirical forms of measurement.

Religious and Spiritual Values

> • There are many associations of nature with spirituality and religion.
> • Religion is heavily laden with value, and may be the predominant way in which Canadians understand values.
> • Assessing religious or spiritual values of nature may therefore tap into a major source of non-use values of nature for Canadians.

Contrary to much popular perception, spirituality is an important dimension of life for many Canadians which can exhibit a valuing of nature. Across the millennia, nature (or creation) has always been an element of worship regardless of faith perspective, although the understanding of nature relative to spiritual forces or divine beings has been variable. Religious institutions have paid increasing attention to the environment in the past few decades. Religion is often associated with culture and ethnicity. To what extent are the values of South- or East-Asian Canadians (Deng et al, 2006) shaped by ethnicity or religion? For Aboriginal peoples religion is inseparable from other aspects of life (addressed more in the section on cultural diversity and values page 97). According to Statistics Canada, 76% of the Canadian population identifies with a Christian denomination and 7% identify as Muslim, Sikh or some other non-Christian faith tradition (16% claim no adherence.) Approximately 30% of Canadians attend religious services monthly or more frequently. Land can be valued for spiritual reasons, and these values oppose other values, as in Horborg's (1994) study of Mi'kmaq organizing against a quarry in Cape Breton (see also Mackenzie and Dalby, 2003).

Relatively little research has been done on faith-based environmental organizing and none in Canada, although recent decades have seen the explosion of so-called "eco-theology." Public interest in this topic is high, however, with a growing popular press literature on "greening religion." Religious institutions have moved from vague and

general statements about the value of nature to specific statements about human responsibilities to "be at peace with creation" and posing analyses that question such Canadian development projects as uranium mining and oilsands expansion (Canadian Conference of Catholic Bishops, 2008). The recent visit of church leaders to the Alberta oilsands and the ensuing controversy shows value-conflict. The visit also surfaced many views that religion should "keep to the moral matters" and stay out of the specifics of something like oilsands development.[15] This is a particular notion of the relevance of spiritual values to practice and society. Assuming that faith-values are private and subjective (Taylor, 2004) contributes to resource development proceeding with little interrogation of broader social questions (Hiemstra, 2009).

Religious valuations of nature are notoriously and even paradigmatically hard to measure. For the past one hundred years, the study of religious experience has used the descriptive categories articulated by philosopher and psychologist William James (1902/1985). James stressed the priority of lived and felt experience in religious practice rather than cognitive or theological dimensions. James described religious/spiritual experiences as having the characteristics of *ineffability* (the experience cannot be adequately described in words), *noetic quality* (providing insights into deeper truths or transcendent realities), *transiency* (the experience passes), and *passivity* (the sense of being carried along, that the experience is not the result of one's own effort, although it may have been provoked through meditation or other behaviours). Other researchers usually emphasize spirituality as that which gives meaning to one's life at a deeper than intellectual level. Given these characteristics, it is not surprising that Driver et al (1996) emphasized them as "hard to define" values! They settle for a descriptive rather than definitional approach. Such values are

> feelings, thoughts and values that are ethereal and intangible and, therefore, hard to define and measure. While these abstractions were useful for structuring [our] thought, they provided little guidance for making recommendations about how managers of the public lands could do a better job of providing opportunities for spiritual renewal. (Driver et al, p. 5)

As important as they are to people, land managers have a hard time using these values in their work, partly owing to the difficulty in measuring them. These spiritual

values may also be called psychological, as Mayer and Frantz (2005) do in their "connectedness to nature" research. Although some empirical scales have been devised to measure connectedness or religiosity, it is likely that narrative methods are far better able to capture the meaning of the values that people have and use, particularly around the equally difficult to define concept of "nature."

Existing studies of religious values of nature have mostly been conducted in the United States with little research in Canada. Most research has focused on "environmental" values rather than "nature." This research has taken three basic forms. Much of the research has involved surveys of individuals and attempts to correlate the role of religion in individual environmental attitudes, behaviours or values (see Hitzhusen, 2007 for a recent assessment). The measures usually do not take substantive beliefs and strength of beliefs and values into account. For example, most surveys report "religiosity" on the basis of number of times attending services, or belief in God or a higher power, or biblical literacy or whether the person prays. These are simplistic measures. Most importantly, this literature treats religious values as if they were only a function of the individual and are not influenced by the collective group. Haluza-DeLay's (2008) study of environmental education in Canadian churches showed that the formation of new values about nature and the environment could only be understood as a process shaped by the characteristics of the congregational setting. Roman Catholic and Mennonite groups needed to encounter the material in different ways, but congregations with existing abilities to discuss and engage in some disagreement were more able to develop environmental values and practices such as nature-based prayer.

Rasmussen (1991) lists seven types of perspectives toward nature within the Christian tradition. *Dominion* types would value nature entirely in terms of what it provides for human use. *Sacramental* types would also value what nature provides – as a sign of god's bountifulness – but more highly value how nature provides evidence of and connection to a Creator. This shows that even one religion does not have a uniform approach, making it more challenging to understand the spiritual values of nature. Nor does this typology indicate how these general values are operationalized in an adherent's life. Values and attitudes must be "accessible" – when they are weakly held, they do not matter and need to be "activated" to shape behaviour (Biel & Nilsson, 2005): "Self

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awareness made central values more accessible and increased the likelihood of value-congruent behaviour" (p. 181). In addition, religious values are affected by social values in the surrounding society. Even a person holding to a perspective that sees humans as coequal other parts of nature will have to live and operate in ways that may not valorize nature on an equal basis with human beings.

The second strand relies on case studies. While helpful in understanding how values are formed and put into practice, only with numerous case studies can this line of research build into a comprehensive assessment of the topic. From such research the tabulation of the values held can be used to develop a better range of valuation tools that can be more generalizable, or simply to understand the complexity of the Canadian population's spiritual values related to nature and their importance relative to other values. The third strand of existing research is discourse analysis. While such studies show a sophisticated understanding of substantive religious beliefs, they usually do not examine how such understandings are being used in religious practice.

Canadian literature is even more limited (Dalton, 2004; Eaton, 2005; Haluza-DeLay, 2008; Spaling and Wood, 1998). Coward & Weaver (2004) point to the role of religious values in educating about climate change, but places them at the level of the individual person only. Spaling & Wood (1998) showed the impact of differing value orientations in conflicts over land use in Edmonton, Alberta. Religiously oriented farmers with stewardship values and environmental groups with eco-centric values were not able to shield prime farmland from the econocentric values of the City Council. In an extremely limited study based on 80 undergrads from an Ontario university in a cross-national sample, Schultz, Zelezny & Dalrymple (2000) concluded Christian religiosity yielded anthropocentric values. We did not find any studies of other religious adherents in Canada (often, research on these values are embedded in other research, so not readily discerned through searches.)

Carolyn Egri (1999: 70) points out that neopagans and Buddhists participate in environmental education and activism, while Jews and Christians have "endeavoured...to translate their theology into practice and policy for ecological change at local, national and multi-denominational levels." Many denominational bodies have engaged environmental concerns but only a few independent organizations have formed in Canada,

(e.g., *A Rocha, The Canadian Forum on Religion and Ecology,* and *Faith and the Common Good*). Canada has a much less developed independent organizational, religious environmental sector than the United States, although it is possible that organizations devoting energy to multiple social issues have stepped into this gap. These groups include Kairos (ecumenical), Development and Peace (Roman Catholic), The Primate's World Relief and Development Fund (Anglican), Mennonite Central Committee (Mennonite) and others. At the very least, membership in and financial donations to groups like those already mentioned can be empirically measured. Privately, environmental activists and ecumenical workers concede that Christian organizations are considerably ahead of most other faith traditions in thinking about and implementing practical action on the environment. Subjective perceptions of the spiritual value of nature are rarely empirically assessed.

The importance of spiritual/religious values in people's lives is not often articulated by social scientists. While listing "ecospirituality" as one of nine major environmental discourses among environmental organizations in the United States, Brulle (2000) did not elaborate how these value discourses were applied in social practice, nor articulate the diversity of spiritual /religious approaches to the human-environment relationship. Subsequent research has shown a rapid increase in the numbers of U.S. religiously-based environmental organizations in the last 15 years (Brulle *et al*, 2007), leading us to label it an "emerging social movement sector." These values can be very significant. Some analyses observe that among the few opposing forces to transnational economic globalization and consumerism are religious and environmental worldviews (Sklair, 2000).

Spirituality need not be institutional religion. While three-quarters of the Canadian population identify with the Christian religion, less than one third of Canadians participate regularly in religious rituals. This may be due, at least partially, to the common understanding that "spirituality" is more broadly encompassing and individually attuned than "organized" or "institutional" religious expression. It seems likely that more Canadians would articulate a "spiritual" evaluation of nature rather than a "religious" evaluation attached to an established faith tradition. Empirical research by University of Ottawa scholar Paul Heintzman (2003: 31) verifies that a "majority of wilderness visitors

perceive spiritual benefits from their wilderness experience." Hill and Johnston (2003: 22) point out that "Taking responsibility for preservation and restoration of the earth's health and integrity is a spiritual act that rejuvenates our full humanity." However, these spiritual evaluations are not easily quantified, consistent with their "hard-to-define values" character (Driver, et al, 1996). In fact, rather than emphasizing ways for operationalizing these values, Heintzman (2002) suggests that land managers improve their understanding of spirituality to better meet the programming needs of nature recreationists. The further problem is that such programs may be viewed as "commodifying" nature, and spiritually-attuned recreationists tend to oppose wilderness commodification (Heintzman 2003). While levels of spiritual values of nature are unclear in the Canadian population, achieving some baseline data through surveys would be productive. Given the hard-to-define character of these values, any results must be seen as tentative and followed by narrative studies. Religious and spiritual values are strongly held, so regardless of their prevalence, they need to be better understood.

Another way in which religious valuation of nature could be operationalized is through data on the purchase of "Greening Sacred Space" kits from www.faith-commongood.net. The website displays ten faith communities of different religions in Ontario that attempted to "green" their worship space (e.g., energy efficiency), thus providing evidence of a religious valuation of nature. The amount of money spent on such renovations would also be of interest for quantitative analyses.

However, the majority of literature is either concerned with theoretical and non-operationalized issues, or else recommends "nonpositivistic" qualitative research methods (Mazumdar 2005). How congregational-level bodies have responded to the value of nature and the degree of change and targets of organizational programmatic activity can be ascertained by interviewing the leaders of targeted organizations; analysing organizational documents, websites, promotional material, etc. can supplement interview data. To elaborate the ways that Canadian religiously-based valuation of nature is expressing itself, a sample of religious periodicals could be analyzed. There are over 100 regularly produced Christian religious periodicals in Canada across a range of Roman Catholic, mainline and evangelical Protestant and non-denominational / ecumenical organizations. When coupled with the publications of other faith groups, data

on how spiritual values are expressed could be collected through the articles, editorials and letters to the editor.

Furthermore, specific cases could be selected for site visitation and focus groups. The Sikh group in Edmonton organized the healing garden at the University of Alberta hospital. Ahmadiyya Muslims seem to be theologizing the environment more than other Muslims at present. Data from such field cases would provide the means of assessing how religious and spiritual valuations of nature intersect at personal and collective levels, and the contribution of religiously oriented nature values to a more comprehensive valuation of nature in contemporary Canadian society. This research area is ripe for expansion in Canada, and the majority of operationalizing tools surveyed above confirm our emphasis on narrative methodology for future projects by Environment Canada.

> Sample Data to collect:
> √ What sort of spiritual and religious values are actually held by Canadians?
> √ Who holds such values?
> √ How do they interact with other values?
> √ Are there special places in nature that are more likely to be spiritually valued?
> √ How do spiritual values rank compared to other values of nature?

Valuing Urban Nature

Nature is being valued in new ways in human-dominated environments such as urban areas. Ecosystem services, quality of life, aesthetics, and social benefits are among the values presented. Eighty percent of the Canadian population now lives in cities.

> • Cities have usually been conceived as not-nature.
> • Since 4 of 5 Canadians live in urban environments, finding out how these Canadians conceive of and value nature is important.
> • There are many ways people have sought to "bring nature back" to cities.
> • Citizen action and municipalities governments are interested in the "natural capital" of urban environments.
> • Policy on urban natural spaces is important.
> • Access to parks and natural areas may not be fairly or equitably distributed.

If all people benefit from access to nature, then it follows that nature should be "nearby," a line of reasoning that has led to more attention to nature in cities and neighbourhoods. Much of this attention is directed by municipal planning departments and citizen action.

The Federation of Canadian Municipalities (FCM) and the Evergreen Foundation have also been extremely active.

As cities industrialized, they were often perceived as sites of blight, filth and misery. Ron, Shani and Uriely (2008) describe four historical solutions. The first solution was simply to leave, including temporary vacations. An historical analysis of cottage country in Ontario showed how values about the experience, including nature, changed as cars enabled more and different people to go there. (Stevens, 2008). The second solution was the development of urban parks. The third solution was the development of a variety of "garden city," regional cities, or "cities of light" movements; "Cities in Bloom" is a contemporary example, as are other efforts to

> Watershed alliances
> Urban forestry
> Parks
> Farmer's markets
> Local foods initiatives
> Resurfacing creeks
> Design with nature (naturescaping,
>   eco-landscaping, xeriscaping)
> Backyard habitat, permaculture
> Sustainable urban agriculture
> Green rooftops
> Community gardens

Figure 11: Examples of bringing nature back into the city.

"bring nature back in" to urban environments. These collective actions are in contrast to but also a result of the fourth "solution" proposed by Ron, Shani and Uriely. "Eco-leisure" is the everyday but individualized activities of citizens to engage with nature (discussed above, page 89). A short list of individualized and collective actions to facilitate nature in urban environments is included in Figure 11. Only some of this extensive work is discussed in this report. While these actions are certainly informed by nature values, little research has been conducted on such efforts in regards to the values of nature they may represent. Furthermore, much less research has been done on people's values of nature outside of cities.

Cities were often assumed to be independent of nature, places where it was assumed that we had complete control over natural process. As Keil and Graham (1998) put it in their analysis of the urban metabolics of Toronto, "cities are built in nature, but often appear to be external to nature." Cities are patently not separable from their environment. They have an ecological footprint – and an impact on nature – that extends far beyond their borders (Anielski & Wilson, 2004; Rees, 2003).

Urban Greenspace Policies

Natural areas and greenspaces are not synonymous.[16] Greenspaces can include urban parks, sports fields, public lawns, and specialty areas such as community gardens (but not private golf courses); most of these are not also natural spaces or high in biodiversity. Also potentially valuable for ecosystem and experiential opportunities are lands such as abandoned industrial lands, ravines, rail lines, and "vacant lots."[17] Generally, summary reports provide information on municipal lands, but greenspaces can include lands owned by other entities, such as schools or hospitals. More importantly, private lands are rarely included in inventories although some, for one example, 80% of Toronto land is privately held; cities have generally done a poor job in requirements for maintaining greenspace or trees on private lands unless a clear public benefit can be demonstrated. Clear public benefits are usually flood or other disaster related, and rarely considered in light of the other forms of ecosystem services that nature in the city provide.

Much of this attention to urban nature is presented in two ways: the ecosystem services and the economic benefits provided for the city. Nearby parks and nearby natural areas increase property values (ARPA, 2007; Crompton, 2007; Environment Canada, n.d.). This is called the proximate principle, and has been used since mid-19th century to advocate for municipal parks. Ecosystem services are often calculated in terms of the economic valuation, primarily through the price of the service if provided by built infrastructure (substitutability) (Duerksen & Snyder, 2005). In the rest of this section, we report on research in other areas than these two dominant approaches. Summaries of the economic and ecosystem service benefits of nature in cities are widely available (Hudson, 2000; Duerksen & Snyder, 2005). Likely, however, regular citizens are unaware of these benefits, which brings up the question of how value can be applied to something of which one is unaware.[18] Assessing citizen awareness of these benefits of nature in urban environments would be a beneficial component of Environment Canada's research on how Canadians value nature. It would help to reduce the belief that nature is primarily beneficial in aesthetic terms, and points out flaws in methods such as willingness-to-pay (one is likely not willing to pay much for a service that one does not know is worth valuing); following a comprehensive summary, James et al. (2009) declare that better methods for assessing the complex valuing of urban nature is needed. In its quality of life

indicators, the Federation of Canadian Municipalities (FCM) includes a measure of environmentally significant land that is protected as one indicator. Other indicator systems also exist, such as the Canadian Biodiversity Indicators Network (http://www.cbin.ec.gc.ca/enjeux-issues/urbain-urban.cfm?lang=eng). Methods that would combine spatial and ecosystem analysis could be profitably combined with social research on citizen values of nearby nature.

There have been numerous reports on amounts of greenspaces or natural spaces and on municipal policies (with some attention to policies of other levels of government that impact municipal capabilities). The Canada West Foundation has produced several reports on natural capital and urban land stewardship in the major western Canadian cities. These include

- ► *Looking West, 2007*, a survey of people's values in western Canada (Berdahl, 2007);
- ► *The Lay of the Land: An Inventory of Federal and Provincial Land Stewardship Policy in Western Canada* (Rae & Beale, 2007). The report provides a good summary of existing government policies on protecting land and ecosystem services and identifies gaps.

The Canada West Foundation issued other reports from a project on natural capital that are also available (http://www.cwf.ca/V2/cnt/proj_natural_capital.php).

The Evergreen Foundation has an extensive range of studies and resources on its website, and has conducted case studies and analyses across the country. Three key reports that it produced are

- ► *Cities in Nature: Case Studies of Urban Greening Partnerships* (Hudson, 2000), articulating the benefits of urban nature;
- ► *Green Space Acquisition and Stewardship In Canada's Urban Municipalities* (Evergreen, 2004) questionnaire sent to 24 cities around Canada to collect information in four key areas: 1) legislative framework for municipal parkland dedication; 2) meeting community green space needs; 3) finance and acquisition; 4) protection and stewardship;
- ► *The Nature of Cities: A Summary Report on Urban Green Space in the Georgia Basin* (Evergreen, n.d; surveyed twenty-nine municipalities in the

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Georgia Basin to examine what policies were currently in use to manage and/or protect green space)

In preparation for the upcoming 4th Natural Conference on Stewardship in July 2009, two reports have been produced, funded by Alberta Environment, but scanning the nation.

► *The State of Stewardship in Canada* (Neave, 2009a). This report provides an overview of the state of "stewardship" in Canada. The 64 page report places the value of nature in terms of the economic values of ecosystem services, calculations of land managed under sustainable forest strategies, and assessment of progress after previous conferences on stewardship. The aim is to build a framework for moving toward a national stewardship strategy.

► *A review of Stewardship Programs & Activities in Canada's Provinces and Territories* (Neave, 2009). This 94 page document provides a review of provincial and territorial initiatives. It refers to biodiversity values, economic and social values (unspecified) and "public values" (also unspecified).

Within individual provinces, parks associations have been active on greenspace protection, urban policy development, and encouraging children and nature connections. The Alberta Parks and Recreation Association (ARPA) is a good example. Its advocacy for increased investing in community parks and open space goes by the name "Healthy by Nature" showing "health" as the dominant frame by which social values and nature intersect. ARPA has produced several relevant documents:

► *Municipal Green Space Allocation* (ARPA, 2005) which surveyed 28 Alberta municipalities (city, town and rural municipality) on many of the same policy instrument questions as noted above.

► *Children in Nature* is the report on a recent conference for the Child and Nature Network, with recommendations for many sectors of society about how to reduce "nature-deficit" in Alberta (ARPA, 2008).

► Together with the Alberta Real Estate Foundation, the ARPA has produced a lengthy report on the increase in property values from nearby nature (ARPA, 2007).

The Alberta Urban Municipality Association has also produced reports, and now supports regional sustainability coordinators for municipal districts. Clearly, the active attention to these issues by many groups, associations, and government agencies demonstrates recognized importance of nature.

Social Benefits of Urban Nature

Nature provides social benefits as well (Kaplan, 2007; Hudson, 2000). Numerous field experiments in the United States – many from Kuo, Taylor and colleagues from the *Landscape & Human Health Laboratory* at the University of Illinois-Champagne – show positive benefits of trees, greenspaces and natural spaces. They reduce crime, reduce anti-social behaviour, provide meeting and socializing spaces, attract shoppers, improve worker productivity, increase social ties & neighbourliness, and more. What University of British Columbia architect Moura Quayle calls "hybrid landscapes" – combining natural and built environment features – generates neighbourhood attachment and other neighbourhood values that non-nature does not (Quayle & Driessen van der Lieck, 1997). Community greenways are an example; they connect people and increase social-psychological benefit in ways that roads, sidewalks or other connective features do not; Quayle (1995) discusses the *public* value of greenways in a Vancouver planning process. The work that people did in Vancouver to recreate a local ditch as a "healthy" stream created valued social capital, ecological literacy and new restorative environments (Lee & Roth, 2001: 315). Edmontonians value the North Saskatchewan River Valley, often taking pride in the largest urban greenspace in North America, just as Torontonians do with the Don River Valley and Vancouvites do with Stanley Park. Edmontonians also take pride that *Coyotes Still Sing in My Valley* (Wein, 2006) with one contributor labelling wild urban spaces as "green hospitals." The collection of essays was commissioned to show in narrative fashion how Edmontonians valued biodiversity. Balram, et al, (2003) used GIS and surveys to discern citizen values of urban greenspace in Montreal. Manuel (2003) surveyed residents of Halifax for how they valued neighbourhood wetlands. Despite limited ecological knowledge, residents valued the wetlands as distinctive characters of their neighbourhood, as well as for biodiversity,

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habitat value and aesthetic reasons. Manuel emphasized the cultural processes involved, with variation in impact from such factors as broad societal (non)valuation, environmental awareness, neighbourhood engagement: "How and why we respond to wetlands—and hence value them—underlies our willingness to accept and advocate wetland protection" (Manuel, 2003: 922). Retirement communities in the Kitchener-Waterloo area are marketed on the basis of an assumed closeness to nature (Lucas, 2002). The history of suburbs is partly an escape from the cities into more rural, bucolic life. Lucas' content analysis demonstrates implicit values in the words used to describe the nature-oriented elements – "oasis," "peaceful retreat from city life," and pictures of trees and butterflies and grandchildren playing among them, and names such as "Pond View."

A carefully nuanced alternative view of urban nature is that it may be taking place as a sort of "museumification" of nature (Gobster, 2007) wherein restoration of landscapes fits pre-conceived cultural notions and social values about "what nature should be." The same process was evident in the Vancouver stream restoration (Lee & Roth, 2001: 315): "remaking the creek by engineering it to conform to the configuration of a 'healthy' stream'." This leads to a "Disneyfication" of nature, where the standards that Disney sets in the management of its park environments become the standards against which all environments are judged (Borrie, 1998; Wilson, 1991). Stefanovic (2002) reports that youth thought ill-kempt wild grasses were less attractive than manicured park lawns along the Lake Ontario Waterfront Trail. In this light, it becomes even more important to attend to the conceptions that people have about "nature."

Trees in urban areas may be touted for their role in biodiversity, cooling the urban heat island, wind abatement, conservation of water, contribution to energy efficiency, uptake of carbon dioxide and exhalation of oxygen, reduce air pollution, and more. Yet trees are not just a biological issue since they are highly valued by the public, even having spiritual values (Dwyer, et al, 1991; Heynen, 2003). Using mapping that followed interpretation of aerial photographs, followed by on-the-ground assessment, Nowak (2005) interpreted that Canadian cities seem to have more tree cover than typical US cities. Twenty-three Canadian cites are listed with the Canadian Urban Forest Network (http://www.treecanada.ca/programs/urbanforestry/cufn/cufn.html) as having municipal urban forestry programmes and there are seven provincial/regional networks. These

positions are often threatened by budget cuts, as the value of urban forests is poorly appreciated[19]. Although there has been extensive research on "forest values" held by Canadians, there has been minimal research on values and urban forests other than research related to property values.

While arguing that land and nature protection in the Oak Ridges Moraine north of Toronto can create forms of valued citizenship, and that "nature" can be a cornerstone of growth and regional planning (Wekerle et al, 2007), Wekerle and her colleagues also argue that it has privatized nature, and commodified it (Wekerle, et al, 2009; Logan & Wekerle, 2008; Keil & Graham, 1998). The values of nature she describes are extremely complicated: private landowners, in participation with environmentalists, have excluded others for the benefit of the wildlife and ecosystem health but in ways that enhance existing privilege and exclude others.

Access to "nearby nature" becomes increasingly difficult as societies urbanise. The sky is perhaps one of the last places urbanites can access relatively easily nature as transcendent or wild. Therefore, it may be worthwhile to look at ways in which Canadians, especially urban Canadians, value nature as "big air" (Heavy, 2009). There are organizations dedicated to improving air quality in cities which could be an indicator of this appreciation of nature, but as Heavy suggests, this valuing may be better measured by the purchase (and use) of items such as kites. Flying a kite is a purposeful engagement with air and the airborne. Motorcycles may be another kind of recreational purchase which might exhibit a valuation of the nearby nature of air, as this mode of transportation removes the insulating shell of standard automobiles and exposes the rider to the smells and touch of rushing air, as well as airborne insect components of nature. Other flying items such as remote-controlled airplanes are less likely to reflect an appreciation of nature so much as the appreciation of controlling a machine. Close, intentional contact with air and the airborne may indicate a valuing of nature worth taking into account.

Access to nature in urban areas is unequally distributed. A project combining spatial analysis and urban forest cover with citizen values could begin to assess if nearby nature is linked to particular valuations of nature, access to nature, or other socio-economic inequalities. Smale &McLaren Smale (2005) found that parks were not well distributed across Toronto, and schoolyard greening in Toronto was affected by

socioeconomic status (Dyment, 2005). Gilliland et al (2006) found that parks in Montreal were not inequitable according to socio-economic status but that some children in poorer areas did not have access to formal play spaces. Also in Montreal, Castonguay and Jutras (2009) discerned natural spaces lacking in poorer areas of town and Coen and Ross (2006) show parks in poorer health locales were of poorer quality. Teelucksingh (2002, 2007) has also shown that natural areas and brownfields are poorly located relative to immigrant and poorer communities in Toronto. The ecological footprint of cities has been calculated (Anielski & Wilson, 2004). Although usually represented in terms of averages, that footprint is larger for higher economic levels (Mackenzie, Messinger and Smith, 2008), meaning all residents do not contribute to the impact of cities in the same ways, nor experience the same benefits of urban natural space.

WHY THIS MATTERS
  Residents of a neighbourhood in Edmonton awoke one Saturday to earthmovers removing a grove of trees. Gone was the sound buffer between them and a major highway. Gone was the habitat for wildlife. The construction company explained that they had to eliminate the trees to get at the soil underneath to use in building a highway overpass the next year. It wouldn't be the environmentally-responsible thing to truck the dirt in from a distance, the spokesperson added, without irony. (Kent, *Edmonton Journal*, 2009)

The prevalence of nature in the city is shaped by social forces that go far beyond particular values held, even if those values are collectively held. After a thorough listing of the ecosystem and social benefits of urban trees, Heynen (2003) explained that landowners pay more of the costs of maintenance although many of the benefits are public. Since externalized costs are not commensurate with the value of developing land, trees are threatened despite their aggregate contribution to general quality of life in the city. Living trees are thus inequitably distributed according to socio-economic status, at least in Indianapolis, Indiana from where Heynen's data comes from – poorer neighbourhoods generally have fewer trees because of the costs associated with their maintenance and lack of politician capital to ensure their protection during new construction. Heynen directly relates this to various value-conflicts over trees: "Because of their commodification and their externality effects, urban trees fall victim to the forces of capitalism as something to be consumed, thus making them unevenly distributed" (p.

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985). In other words, their use-value can be easily commodified by cutting them down, but leaving them in place requires other values, including public discipline to regulate these other values. The ongoing fight over agricultural lands in urban areas is another example of conflict over values to assign to nature. Spaling and Wood (1997) demonstrated that Edmonton City Council decisions about the unique fertile farmland in the North East section of the city were a function of their *econocentric* value orientation that simply was not commensurate with either the *theocentric* (espousing stewardship) and *ecocentric* values of the two main coalitions opposing built development. That conflict remains ongoing although there have been no new updates on whether values are shifting.

These examples highlight that the importance of nature increases as the availability of nature decreases. Put another way, as natural capital is converted into built capital (which is usually financial capital for some – an example of public nature being converted into private wealth), intact nature can be valued more highly for its scarcity. As Canadian cities have been developed and pockets of natural space eliminated, municipal authorities have paid more attention to the natural spaces that remain. However, as biodiversity and ecosystem loss occur net ecosystem service value also diminishes. Such complications are among the intersecting themes of urban greenspace research and policy. According to James, et al, (2009), there are five key themes in this area: 1) The physical character of urban greenspace; 2) The experience of urban greenspace; 3) The valuation of urban greenspace; 4) The management of urban greenspace; and 5) The governance of urban greenspace. Interesting reach could be conducted to see how Canadians value urban nature under each of these themes.

The experience and valuing of "nearby nature" – nature in the human-dominated places were most people live – is under-researched. However, for ecosystem services, ecological literacy and conservation attitudes, regular contact with nature is important, so nearby nature is key. It would be very beneficial for research to develop an

Sample, data to collect:
√   How far are people from natural areas? What are those natural areas like?
√   What do people do in "nearby nature"?
√   Are there different values and attitudes about nearby nature than faraway nature?
√   How many people try to do something to bring nature to their homes?
√   How do people understand each of the 5 themes identified by James et al?

understanding of people's access to nature in their everyday lives.

Social Inclusion

In this report we have repeatedly asserted that social context matters in the way nature is valued. One of those forms of social context is the exclusionary aspects of Canadian (or any)

> • Forms of social exclusion are part of Canadian society and affect access to nature.
> • Poverty is one example.
> • Fears for safety are another.
> • Social exclusion can take many forms, each of which may have limitations on encounters with nature, and the possibility of valuing nature.

society. Social inclusion has been defined as "the active participation in society and broad equality of access to opportunities to develop individual talents, capacities and capabilities" (CCSD, 2001, p. 5). It is a broad rubric for explaining and redressing the marginalization of diverse "excluded" peoples (immigrants, women, people with disabilities, youth, racialized persons, etc). Social inclusion requires active removal of barriers to participation, as well as deliberate investment to bring about attitudes and practices that result in genuine inclusion and acceptance, particularly of diversity in all its manifestations.

Castonguay and Jutras (2009) elicited children's appreciation of outdoor places in poor neighbourhoods using photographs the children took. The children valued places that included vegetation. However, it was not a high characteristic, perhaps because natural elements were simply not as present in poor neighbourhoods compared to wealthy neighbourhoods. Thus, they conclude that the relative scarcity of nature in the environs limits the ability of the children to value it. Given the benefits of access to nature and the negative ways that lower income degrades health, education and life chances, Castonguay and Jutras conclude "Unfortunately, it appears that the children who might benefit the most from nature are the ones who live where it is glaringly missing" (p. 107). Although the authors do not use the term, this is a case of *environmental (in)justice.*

Environmental justice (EJ) is concerned with the unequal burdening of environmental risks or the poor distribution of environmental benefits. While there is an extensive EJ literature, research programme and social movement in other countries –

and the federal environmental agencies in both the United States and United Kingdom are mandated to consider EJ issues in their programmes – there is little attention to the inequalities in environmental aspects in Canada. The recent collection by Agyeman, Cole, Haluza-DeLay and O'Riley (2009) is one of the few comprehensive examinations of the issues in Canada. A recommendation is for Environmental Canada to include environmental justice dimensions in its work to a greater degree.

Canadian values of equity, social inclusion, fairness, and equal opportunity are diminished by examples of environmental injustices. In the Castonguay and Jutras example, poorer children have diminished experience of nature. Other forms of exclusion and injustice may also shape values associated with nature. Smale &McLaren (2005) found that parks were not well distributed across Toronto. Dyment (2005) found that schoolyard greening was affected by socioeconomic status (SES). Access to funds and the skills of volunteer adults are a function of SES. More significant may be the perception of the importance of green schoolyards – nature is still considered a "frill" by many. An Edmonton immigrant-serving agency built housing for refugees but included only a bare concrete platform for the children to play on. Funders would not pay for even a playground, much less a space of greenery and agency staff did not value it. Unequal exposure to other environmental problems has been identified by other Canadian researchers.

Strife and Downey (2009) have produced the most comprehensive review of the benefits of access to nature for children and the existing American literature on inequalities in access. The research shows that nature is not a frill. However, access is often a function of whether or not families or individuals have sufficient personal resources as public opportunities have decreased and market instruments increased. Development in urban areas has reduced undesignated greenspaces. Among the results of the environmental justice movement is recognition that nature should be urban as well as wilderness. We know contact with nature is a determinant of values and attitudes about the importance of nature. However, in Canada we have extremely limited understandings of how contact with nature is related to Canadian population characteristics and demographics, neighbourhood location and so on. Another lack in our knowledge is how other characteristic features of social inequality – such as those known as the social

determinants of health – are related to access to nature, nature values and related deficits (Eyles, 2009).

Other factors of social inclusion are relevant to the study of values of nature. Throughout this report the point has been made that some values are socially approved and privileged, especially economic values. Marginal groups in Canada have different values, constructions of nature, and nature experiences. Aboriginal people are a classic point. Numerous studies have pointed out that Aboriginal groups[20] valuing of nature has been marginalized or ignored (for a summary and discussion, see Haluza-DeLay, et al, 2009). Chambers (2006; Chambers & Blood, 2009) write about "the land as teacher" and the land as central to Aboriginal identity, as do Wilson & Peters (2005) in regard to Aboriginal peoples living in urban centres. Although non-Aboriginals may also describe the land in similar ways (see Raffan, 1993, and much writing in outdoor experiential education; there are many literary and research works on land-based identity in rural writing although less in urban studies), denigration of cultural knowledge and land values is at the root of much environmental and cultural conflict, particularly regarding Aboriginal peoples. The history of Canada also matters. The ongoing effects of colonialism shape valuations of nature in Canada. For example, Ellis and Enzoe (2008) explain how Lutsel K'e Dene distrust of the federal government has kept the East Arm of Slave Lake from becoming national park.

These cultural conflicts are often value conflicts, going as deep as fundamental paradigms about "what is nature?" and "what is to be valued?" Dene distrust was partly because nature was a place for subsistence livelihoods, but also because governmental interactions had often been forceful expressions of power over them. Braun (2002) shows how as instrumental rationality – as in forest management – becomes the preeminent value and is expressed by government, industry and environmentalists, other values and value expressions are devalued. Repeatedly in this report we have emphasized how understanding the large and small scale process of valuing and value formation are essential to understanding how Canadians value nature. Values of nature are embedded in these social processes of legitimation. These caveats make the process of assigning value to nature far more complicated, with the unfortunate result that the easy route of simply calculating monetary value is often taken (Robertson, 2006).

Social inclusion is part of the valuing process in other ways too. Newberry (2003) used a narrative method to examine the value of the outdoors for a person of disability in an Ontario canoe expedition. There is much research on outdoor experiences in therapeutic recreation also. The top tier journal *Local Environment* devoted a special issue to disability and the environment in 2007.

Nature is a gendered place for many reasons that have been extensively discussed elsewhere. This literature is often empirically based but seems philosophical to many, showing how subtle values can be taken for granted, even if they have direct implications for lives. Reed (2003) analyzed gender in rural forestry communities that included attention to the values that shaped both the corporate forestry production, but also the forestry labour (and how forest workers "bought in" to the value-laden practices of the timber companies, although these values and practices were not necessarily in their or their families or communities' best interests), and women's labour, whether in workplaces or at home (see also Rahder, 2009). A key aspect of natural spaces is that they may be seen as unsafe, that is, a place in which women can be attacked. It can also provide women a place to socialize and exercise (Krenichyn, 2006). In this study, nature stimulated the senses and restored mental capacities, highlighting the frequently made link between recreation, health, and the outdoors. MacGregor (2006) interviewed women active in organizations improving quality of life in urban Toronto. Their work – mostly volunteer – was heavily value-oriented.

Quality of life included air and water quality, parks and playspaces, but none of these women considered themselves environmentally active. MacGregor argued that this work should undermine lingering assumptions that women have a special orientation towards "caring for nature." She argues that both men and women are shaped by their social contexts (rather than a sort of gendered essence). Nevertheless, in any research conducted

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Sample Data to collect:
- √ How does the experience and valuing of nature follow patterns of social inequality in Canadian society?
- √ What social forces that contribute to exclusion also affect contact with nature?
- √ Are values for nature secondary to values for inclusion by either potentially excluded Canadians or by "mainstream" Canadians?
- √ How is nature (gardens, excursions, etc) being used to improve social inclusion and generate bridging social capital?

by Environment Canada, differences in value orientation by generalized characteristics such as gender, occupation, geographic location, personal experiences, ethnicity, immigrant status and religious faith may help us understand the value clusters of Canadians as they relate to nature and the environment.

Values of Nature for Health

On one level, all health is natural, since human beings are biological beings. Therefore, it is difficult to distinguish how "nature" is valued for mental and physical health. On the other hand, there are many types of nature-based therapies, with varying philosophies and evidence bases. There are

- There are many health values for contact with nature.
- Nature provides psychological benefits, and it provides physical or physiological benefits.
- What is "nature" is particularly complicated because our bodies are presumably "natural" so it is difficult to separate what is external and internal nature.
- Horticultural therapy and healthy places are among the nature-based health therapies in use in Canada.

philosophical and definitional questions here. Often a distinction is made between "Western" medicine (sometimes called "allopathic") and "traditional" medicine or "homeopathic" medicine. But Western medicine is traditional, in the sense of being the tradition of societies developing from the European Enlightenment and attempting to be based on legitimized knowledge claims (scientific evidence) for treatment.[21] Some forms of healthcare in the conventional "Western" sense have used evidence drawn from controlled scientific studies to develop nature-based therapies in the treatment of disease, injury, mental illness and general healthiness. Other forms of healthcare are often called "alternative therapies" and based on philosophies of health that are considered as more holistic or otherwise different than western medicine. Increasingly, they also highlight scientific evidence of the effectiveness of these therapies.

The controversy over echinacea is one example of the difficulty of determining the relationship between "natural" products and health. Advocates of this herbal product tout it as effective in reducing the frequency or severity of colds. There have been many experimental trials of echinacea. Positive results are used by advocates as evidence of

Echinacea's efficacy. But there have been negative and ambiguous experimental results also, so the best that can be said is that the evidence is still out.[22] This does not stop over $300 million being spent on the product annually. Whether conventional medicine or alternative therapy, "circulating metaphors and beliefs can create an environment in which particular biomedical treatments make cultural sense, even if they seem to be ineffective or are associated with unpleasant side effects" (Jenner & Scott, 2008: 197). Nature-based health believers are also more likely to reject vaccinations, which health authorities argue puts the health of the population at risk.

On the other hand, many argue that human beings – at least in the modern world – have developed a profound disconnect from the natural world that negatively impacts mental and physical health (Van den Berg, et al, 2004; Kellert & Wilson, 1993). As the world urbanizes, some have argued that we are not evolutionarily adapted to city life. Others have suggested that the scientism of the modern world replaces real means of health with artificial drug and technological artifices to our detriment. Holistic medical advocates – whether alternative therapy practitioners, or hospital chaplains and pastoral care providers – often point to worldviews that separate mind-body-spirit. Partially in recognition of these things, University of Western Ontario's School of Medicine established an Ecosystem Health programme to bring together human health and the healthy functioning of ecosystems (Rappaport & Mergler, 2004). Since it competes with established paradigms of health, the programme has not done well.[23] The Canadian government's International Development Research Centre (IDRC) has an ecosystem health program, but admits that although "Ecohealth has become a more widely accepted approach…yet we're still the only program in the world that exclusively funds this kind of research" (December 2008; http://www.idrc.ca/ecohealth/ev-135059-201-1-DO_TOPIC.html). The approach of ecosystem health is particularly useful for Aboriginal peoples as it corresponds to the typically strong association between land, community and people as integrated (Stephens & Darnell, 2007). Social determinants of health and environmental health risks are strongly correlated (Eyles, 2009).

Valuing nature for health benefits is impossible without attention to the different belief structures people have about what is nature or natural, and what effects people believe nature to have on health. In the realm of nature-based therapy, ecotherapy, pet

therapy, animal assisted therapy, horticulture therapy, gestalt therapy, wilderness and adventure-based therapy are but a few of the potentially lengthy list. The value of generalized contact with nature has also been promoted (Louv, 2005; Maller, et al, 2006). Specific healing places, therapeutic landscapes, naturopathic medicine, and healing gardens are also part of valuing nature for its healing effects. But the notion that conventional medicine also values the body's healing nature should not be discounted and an artificial binary be set up. Furthermore, nature is also a health threat, as SARS (which entered human populations from civet cats), avian flu, lime disease, Ebola and other diseases show. Nature is also a place of malaria, leading some to advocate mosquito eradication programmes – whether by chemical spraying, biological controls, bat houses, or swamp (nee wetlands) draining. And natural disasters such as floods, hurricanes, blizzards, or heat waves are also threats to human health.

Restorative Effects of Nature

Research into the restorative effects of nature amounts to hundreds of studies. Even merely viewing natural looking landscapes, or landscape pictures, can have therapeutic effects. A review of the literature merely on *The Health Benefits of Contact with Nature in a _Park_ Context* (emphasis added) provided to the State of Victoria (Australia) amounted to 72 pages (Maller, et al, 2002). Often, however, this contact is diffuse, performed as a function of individual actions in ordinary life. We could find no comprehensive studies on the amount of contact with nature that Canadians have.

With this in mind, Environment Canada's research could identify patterns of contact with nature, as a way of providing information that is a precursor to calculating nature's health value to Canadians. It would be useful to have studies employing *experiential sampling techniques* to determine the amounts of time spent in contact with nature, the types of nature encountered, the context of encounter including whether these were solitary or happened with others, and subjective states of attentiveness, restoration and other emotional aspects. University of Ottawa psychologist Elizabeth Nisbet has developed a "Nature-Relatedness" scale (Nisbet et al, 2008). While environmental psychologists have developed other scales – connectedness to nature (Mayer & Frantz,

2004), new ecological paradigm, implicit connections with nature (Schultz, et al, 2004) and values-attitudes research – Nisbet's assesses the affective, cognitive, and experiential aspects of individuals' connection to nature. A problem we note is that the experiential component is measured, in part, through preferences for wilderness settings, which means that it measures a particular construction of "nature." A benefit is that the scale is said to correlate better than other scales with tests of well-being.

Nature-based Therapy

Contact with animals is thought to produce greater levels of empathy in children. But a survey of 137 children from Windsor Ontario presented contrary results (Daly & Morton, 2003). Animals themselves may be affectionate, leading to improvements in mental health among elderly, children, and other individuals. Companion animals can help the elderly as research in Wellington, Ontario showed (Raina, et al, 1999). Dog owners in Victoria simply got more exercise than non-owners (Brown & Rhodes, 2006). Horse riding associations for people with disabilities is another example. When these approaches are called "therapy," certification or accreditation bodies are usually involved.

A clinical practice in Nanaimo, which offers a range of clinical approaches including standard cognitive therapies, describes its offering of nature-based therapy thus:

> The concept of offering healing work in nature is not new. Sometimes referred to as eco-psychology, it is particularly helpful in moderating the effects of the fast paced technological time in which we live. Valuing natural systems as our primary teacher expands healing possibilities beyond traditional office based practices. This work deepens each person's connection to self, others and the earth and invites innate healing. Reconnection with nature is important for the natural world as well as for the well being and happiness of people. Non-intrusive and respectful, NBT is very suited to trauma therapy, stress and burnout recovery and life style re-assessment, depression and anxiety treatment and addiction recovery. (http://www.marshallcounselling.ca/programs_therapies.asp)

Even in situations of natural disaster, "reconnecting with nature" may be beneficial. Several University of Victoria faculty members were involved in a project to accomplish that purpose in the aftermath of the 2004 tsunami that wreaked havoc in the Indian Ocean (reported in *University Affairs,* February 14, 2005, and at http://communications.uvic.ca/edge/tsunami.html). Dr. Philip Cook's work is funded by Save the Children Canada. The staff at Acorn Gardens in Winnipeg use nature-centred approaches in peacebuilding and conflict resolution, and to help war-affected refugee children (http://www.acorngardens.ca/).[24] Occupational therapists, physical therapists, nurses, social workers have used nature-based therapeutic approaches. Even speech therapy can benefit from nature-based approaches (Lundgren, 2004). We could find no associations of practitioners of "nature-based" therapies, although a horticultural therapy association exists in Canada.

Ecotherapy

Many approaches go under the terms *ecotherapy and ecopsychology*. Clinical psychologist Howard Clinebell (1996) published a well-respected book on the subject. Ecotherapy is similar to the nature-based approaches described above. It goes further, however, in its assumptions of a fundamental need for connection with the earth as a central part of being human. The eco-therapeutic assumptions do fall in line with sociological analyses of the disenchantment with modernity that run from Weber and Durkheim to the contemporary. In an overview article, Smyth (2005) makes the interesting observation that most asylums were located in rural areas in past centuries, as an effort to correct what many believed were the causes of many ailments – urban living. Maller et al (2006) report on a number of benefits of contact with nature that have varying levels of theoretical explanation, empirical research, or anecdotal evidence in support of them. The research in this area is in its infancy as it challenges certain reductionist characteristics that dominated science in the 20th century. But scientific evidence is not what people typically use to believe in the value of eco-therapeutic approaches. In fact, health beliefs are an important part of well-being and healing. Environment Canada could contribute by collecting data on these subjective beliefs and the evidence people give for believing in the efficacy of nature-based therapies.

Healing Nature: Places

Making a distinction between psychology and physical health is an artificial one. The psychological effects of nature and the potential to heal mental illness or provide restoration are important parts of the physical healing values of nature. Nature has been used to provide healing – as when physical therapists use gardening to help patients improve mobility – and nature provides healing – as in healing places, healing gardens, and the field of therapeutic landscapes. In the review that follows, we do not discuss *environmental health* despite the well-recognized evidence that "sick places" can kill or cause disease. The evidence on toxins distributed throughout the environment is well rehearsed; for a summary of current thinking and an argument for greater attention to the social dimensions of environmental health see Eyles (2009). In assessing health and nature, there is a complicated literature in medical fields such as epidemiology which we cannot review. Nor did we address the literature in health economics that may investigate the link of health and nature.

Canadians are active contributors to a journal called *Health and Place.* Alison Williams at McMaster University has been among the most active researchers, employing a concept called "therapeutic landscapes" (Williams, 2007). These landscapes do not need to be natural; the focus of the research is on the ways that places become known as sites of health or unhealthiness, and how places contribute to the health of people. Wakefield and McMullan (2005) discerned this process in Hamilton, Ontario. Research has been conducted on breast cancer survivors, showing that while nature is valued, domestic social relations in a satisfying home are the primary landscape of healing (English, Wilson and Keller-Olaman, 2008). The research repeatedly shows that it is people's perceptions of place that matter most, but that these perceptions are shaped by social context, including dominant social messages. Gastaldo, Andrews and Khanlou (2004) demonstrate this clearly in extending the concept of place-based therapeutic landscapes to the travel and settlement of new immigrants to Toronto. What this research shows is that it is not possible to establish an objective value for nature and healing without attention to the subjective perceptions.

Specific places have become known as healing sites, what Smyth (2005) categorizes as *therapeutic places* in her review of much recent research. These may include particular mineral springs, or religious shrines like Lourdes, France. The annual pilgrimage to Lac Ste Anne in north-central Alberta brings around 30,000 Aboriginal Christians in July each year. Many miraculous cures have been claimed. The pilgrimage site is almost carnivalesque with crowds and merchants, but since it is the spiritual magic of the waters that brings people, the pilgrimage and place could be claimed as a sign of valuation of nature for health. Lac Ste Anne was declared a National Historic Site in 2004. The economic impacts of the pilgrimage have been studied, but there are many more values operating here.

Another type of healing nature is what Smyth (2005) categorizes as *therapeutic spaces.* Such "healthy places" are designed so as to create more healthiness. These spaces go beyond the landscape and architecture aesthetics identified above (page 72). A great deal of research has focused on what makes places emotionally and physically healthy. Plants are often touted as a means of cleaning the air. The improved aesthetics and emotions are touted as generating higher health outcomes. Many hospitals are including indoor plants and even atriums. Some have gone further to install "healing gardens" (Cooper Marcus & Barnes, 1999; Gerlach-Spriggs, 1998). Research on the efficacy of these therapeutic natural spaces is needed. While we found a great deal of attention to environmental design and healing environments, almost all of that was directed at built systems, such as ventilation systems (although tropical plants can have air purification qualities also). An exception was a qualitative study of gardens at a psychiatric facility in Canada (Perkins, in Cooper Marcus, & Barnes, 1999). While "access to nature" and inclusion of interior gardens are mentioned, there was little research – experimental, phenomenological, anecdotal or otherwise – attached to those mentions. Smyth (2005) asserts that most of the research – in medical geography at least – pays more attention to the constructed spaces than to the natural elements.

The lack of attention to the healing potential of nature is further demonstrated by the fact that every single book we discovered on topics such as "healing nature" and "healing gardens" was only available in the Northern Alberta higher education library system at one place – the Olds Agricultural College. Cooper-Marcus observes that she is

aware of over 100 hospital gardens in the US, UK, Canada and Australia (personal communication). The University of Alberta Hospital's new cardiac treatment centre, the Delta Hospital in British Columbia, and Upper River Valley Hospital in New Brunswick are only the latest examples. Cooper-Marcus pointed us to the Therapeutic Landscapes Database, but too late for this report (http://www.healinglandscapes.org/index.html) Clearly, there is a need for further research – and public health promotion – in this area, as the potential for access to nature to have physical health benefits has been demonstrated by some research but is being included in actual medical practice in very limited ways.

Healing Nature: Therapy

Finally, nature has been used deliberately as part of the therapeutic process. Horticultural therapy is one example (Haller & Kramer, 2007; Simson and Strauss, 2003). As the name implies, horticultural therapy "uses plants and the natural world to improve the social, spiritual, physical and emotional wellbeing of individuals who participate in it" (Canadian Horticultural Therapy Association [CHTA] http://www.chta.ca/). CHTA is a network of over 250 practitioners across the country, providing a registration (not certification) process. Horticulture is used in many settings, with an entire issue of an housing journal devoted to horticulture therapy with patients with dementia (Schwarz & Rodiek, 2007).

However, the research is limited. A search on Pubmed yielded search 64 references in traditional medical journals on *horticultural therapy,* while adding *Canada* reduced that number to one reference. Adding "valu*" to the 64 references yielded zero hits. There are more references in an alternative medicine database, but the focus is providing evidence for the efficacy of treatment, not in assessing why or how people value these alternative treatments, particularly if they conceive of them as "natural." That scholarly journals such as *Evidence-based Complementary and Alternative Medicine* and the *Journal of Alternative & Complementary Medicine* have developed is an indication of the general importance of health practices like horticultural therapy.

Healing Nature: Natural Products

Natural health products (NHP) seem to be popular in Canada, but what this says about "values of nature" is undetermined. The Natural Health Products Directorate (NHPD) is the division of Health Canada responsible for registering and monitoring natural health products. Currently, NHPD reports $2 billion dollars spent by Canadians on NHP in 1997. A 2005 survey conducted by NHPD found that 71% of Canadians take NHP, with vitamins (55%) and Echinacea (15%) topping the list (NHPD, 2005). Fifty-two percent think that NHPs are safe because they are made from natural ingredients. NHPD maintains a research programme, available at the website. Again, there are weaknesses in the evidence for the efficacy of NHPs. To enhance the evidence basis, the Natural Health Product Research Society of Canada (NHPRS) was formed (Ghuyar, 2008; Koren, et al 2008). Again, it is unclear what usage of "natural health products" indicates about values of nature but this could be part of Environment Canada research on the topic.

It is possible to examine other health-related programmes that may give some indication of being associated in the minds of Canadians as "natural." Yoga and naturopathy come to mind. They are undoubtedly important to Canadians, albeit in unspecified ways. However, given the paucity of research on values associated with the practices reported above, we did not pursue research on each of the specific modalities associated with complementary and alternative medicine.[25] Partnerships with Health Canada or professional groups like NHPRS, or CHTA are also recommended.

Nature and Health Conclusions

What items and practices are considered to be "natural" is a function of social perception. There are many ways that nature is associated with health and valued and that could be included in this review. Natural childbirth is another example. Following the principles of *feng* shui is another. So might be marijuana use. We do not mean to support marijuana use, and neither do University of British Columbia health researchers Moffat, Johnson and Shoveller (2009). Marijuana has quite the history, moving from

acceptability to deviance, and now to some level of acceptance as a medical aid (Jones & Hathaway, 2008).

Moffat, Johnson and Shoveller conducted an ethnographic study to understand the context and culture of youth marijuana use. Unexpectedly, they discovered that "Using marijuana in nature seems to be an important aspect of the culture of marijuana use among many teens" (p. 93). These teens generally were living lives that we would otherwise call healthy, active lives, including the active lifestyles that are promoted in these days of youth obesity and inactivity. But nature was valued, not merely as a place to smoke pot. In some ways, marijuana was an excuse to get in nature, much as with rural hunters and fishers whose activity is an excuse to walk around the woods (Dunk, 2004). Nature was valued for characteristics such as the sense of freedom, relaxedness, leaving the familiar, which are reminiscent of the characteristics of nature valued by the teens on a wilderness trip (Haluza-DeLay, 2001). Moffat, Johnson and Shoveller (1993: 93) conclude that

> Although one might easily dismiss these stories and simply argue that youth avoid using marijuana altogether, we must better understand the role it plays in their lives and consider ways to open the gateway to nature without the use of marijuana.

The value of nature was for its own characteristics, not necessarily for the use that the teens were putting it to. People do many things in nature.

It was extremely difficult to find specifically Canadian research on the psychological and physical health benefits of nature and the ways these were valued by Canadian institutions and individuals.

The disciplines of psychology and the health sciences tend toward a universal view of the human being, with the assumption that what is discovered through research in one nation (or people group) is likely applicable for all humans. On the other hand, much of what has been discussed elsewhere in

> Sample Data to collect:
> √ How does nature help people feel restored.
> √ Can ask about the sorts of things nature makes them feel.
> √ What do people identify as the health benefits?
> √ How much have they sought to use "nature" or "natural" things for health purposes?
> √ Does lack of contact with nature have any perceived health disadvantages?

this report (e.g., sections on recreation, and urban nature) has clear relevance to psychological and physiological health benefits of nature for Canadians. People value the general characteristics of interaction with nature. There is a growing body of evidence on the physical health benefits of nature, even in merely viewing natural scenes (virtual nature). There are also specific psychological and psychotherapeutic interventions using various forms of "nature-based therapy." Any research into the valuing of nature for health aspects needs to be more specific in what nature is under consideration. One public health expert considers the evidence strong enough to claim "people benefit so much from contact with nature that land conservation can now be viewed as a public health strategy" (Frumkin & Louv, 2007: 3).

Schools, Children and Nature

A recent report by the Canadian Council on Learning (2006) argued that play and play outdoors is important for children's development, irrespective of the learning benefits. But there is an increasing array of tendencies in our society that limit such play – such as commercialization,

- Nature has been shown to have cognitive benefits, improving learning.
- Some people's forms of intelligence are nature-oriented.
- Schools are a social institution responsible for children during large parts of the day.
- Schools are well-situated to counteract "nature-deficient disorder."
- There are institutional and cultural factors at work against including more nature in schooling.

eradication of small but undesignated places, fears about abduction and children's safety in general, litigation and fear of litigation, changing lifestyles such as "videophilia," organized activity and dual-working parent families (Rivkin, 2006). That outdoor play is declining does not necessarily say how valuable it is.

Some Canadian schools have greened their school yards through deliberate effort to add native plant habitat[26]. The Evergreen Foundation (in conjunction with the Toyota Evergreen Learning Grounds Program) has been at the forefront of supporting this movement through research, funds, and support for schools and parents. Research on a national scale has not been conducted, i.e., determining how many school districts support schoolyard greening, or how many school yards have what types of greening.

Under the auspices of the Evergreen Foundation, both Bell and Dyment have conducted research in the Toronto District School Board (TDSB). TDSB supported production of a glossy coffeetable book to "celebrate nature and school gardens" (Houghton and Christie, 2003). Of particular interest is a survey of educators at 59 schools across Canada on aspects of schoolyard greening (Bell and Dyment, 2006). One focus was on what they termed the "school cultural factors" which influenced success or failure in school greening utilization (Figures12 & 13). These cultural aspects were directly related to implicit and explicit values around children, nature,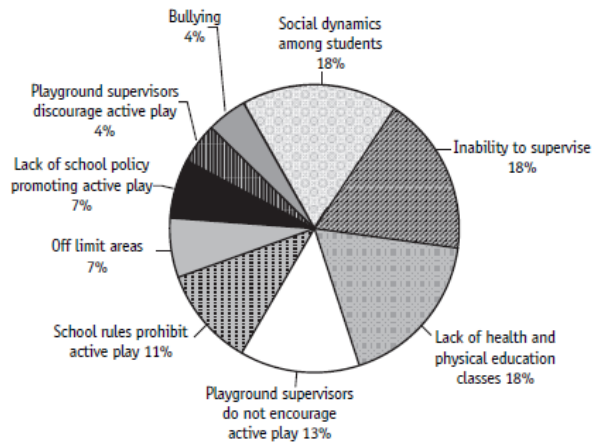 play, fairness, control and so on (Bell and Dyment, 2006). Attention to context is crucial for understanding the ways that nature is valued or the ways that valuation can be expressed. Also of interest is the way this report shows confusing use of the idea of values. The participants articulated their subjective perception of the value of greened schoolyards, as well as a number of values that enhanced or detracted from the ability of schools to green their grounds.

Figure 12: Factors inhibiting schoolyard play (Bell & Dyment, 2006: 48).

Across Canada, there are efforts to green schoolyards and other places. The Naturescape Alberta programme has a section for certifying schools and the Calgary Zoo touts itself as a leader in supporting schoolyard greening. However, the Naturalization Working Group (1997), in a report tabled with Edmonton City Council, still asks the very important question: "Are these locally driven initiatives a short lived phenomenon or indication of our changing values in society?"
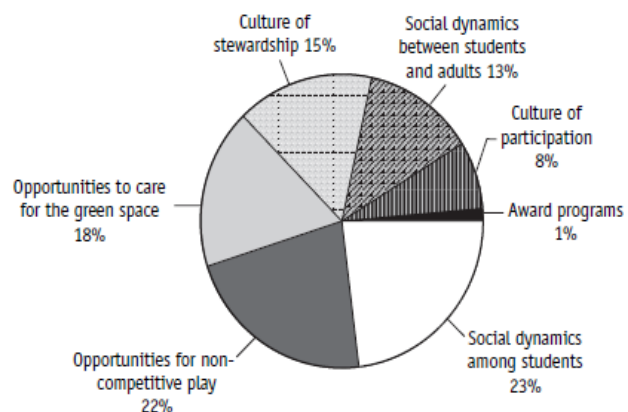

Figure 13: Factors enhancing schoolyard play (Bell & Dyment, 2006: 48).

Children's experiences are varied, so nature and the experience of it cannot be conceived as a singular thing (Spencer & Blades, 2006; Stine, 1997). This means also that the values associated with nature will be equally varied. Some of this variability is along socio-economic lines (Dyment, 2005). Experiences of caring for animals or gardens will also affect values and benefits. Experience in nature shapes spatial capacities, adventurousness as well as cognitive abilities, leading to concerns about the "extinction of experience" (Pyle, 1991; Louv, 2005). An entire network of researchers, teachers, parents and other concerned citizens has developed, with specific journals like *Children Youth & Environments;* the *Child &Nature Network* has affiliates in at least 4 Canadian provinces. The psychological benefits are discussed above.

These observations lead us to discuss environmental education. Although these other factors are important, one more value stands out. A recent research summary supported by such Canadian notables as Robert Bateman, Thomas Homer-Dixon, and David Suzuki concluded that "Outdoor, environmental education directly exposes children and youth to the natural environment in ways that develop powerful, knowledgeable and lifelong connections essential for a healthy and sustainable future" (Foster & Linney, 2007). While surveys show that people value environmental education (ACEE, 2009), it is unsupported or poorly supported by provincial and federal ministries. Without ecological literacy we cannot know how to reverse global trends of environmental degradation (MA, 2005).

> Data to collect:
> √ How many people believe that nature provides cognitive benefits? (Beneficial to include some of the research and see if it makes an impact on perception.)
> √ How many schools are "greening" their grounds? Churches, businesses or other institutions?

6   CONCLUSION

How do Canadians value nature? An answer to this question will be shaped how the question is understood by Canadians and the research methods that are utilized. This review is one answer in itself – Canadians do value nature a lot, and in a lot of different ways for a lot of different purposes. And some of these ways conflict with other ways. Nevertheless, this review provides a basis to select from and query further about the values of nature for the country as a whole.

The size of this review is owing to three key reasons.

- ► <u>Nature</u> can be many things – from backyard gardens, to wilderness areas, to the oil extracted from deep underground, to the evolutionary basis of the human species, and even more.
- ► The term "<u>values</u>" is used in many – and divergent – ways by different publics and different academic disciplines.
- ► <u>Canada</u> is a diverse and populous country, with a history, with many cultures, and all with individual experiences that shape what we see, know, imagine, and value.

A well constructed research program will carefully determine its conceptualizations of these issues. Without careful conceptualization, and a theoretical framework in which to situate the research, the research becomes a monumental task, a mere compendium of a lot of varying material.

Concepts of nature and values are briefly discussed in Section 2 of this report. Section 3 details how five sample disciplines or focuses – conservation science, economics, psychology, philosophy and socio-cultural approaches to human behaviour – conceptualize values, valuing and valuation. This section also reviews the major ways that these five disciplines have tried to assess the values of nature. Section 4 of the report details specific methodologies in social research that have been used for this topic. Since social processes influence people's values and are necessary for activating the general abstractions about how one should act or what good goals to pursue – ergo, values – methodologies that show awareness of this reality should be chosen. That could involve surveys that do include contextual narrative or allow spatial mapping or photo elicitation.

Section 5 delved specifically into certain particular sectors that are part of the lives of Canadians. Because the 1996 *Survey on the Importance of Nature to Canadians* focused on recreation, that section is detailed – what constitutes recreation should be expanded to better correspond to professional understanding of the topic and capture more of the value of nature-oriented recreation. Similarly, because four out of five Canadians live in urban areas, a conceptualization of nature that includes urban natures is important. Additionally, values differ among a diverse and multicultural Canadian population. The importance of nature to Canadians will also differ, and care must be taken in the ways that data on this topic is gathered or powerful parts of that diversity will be ignored. Section 5 contains bulleted boxes as samples of data that could be collected. Other aspects of each of these life sectors could easily be culled from the discussion.

This report concludes with some key issues. As every researcher knows, it is vitally important to measure the right things in the right ways.

► A key conceptualization issue: What is "Nature"? This question leads toward numerous methodological considerations:

- Who sees nature and in what way?
- How to account for the tremendous personal and cultural variations of "What is nature?"
- How do people interact with what they see as nature?
- How do their conceptualizations and their experiences shape their "values"?

► How will "values" be conceptualized? Again, this leads to numerous methodological considerations. Will they be treated as objects that people hold, or as processes that people use in specific contexts?

- It is easier to treat values as extant objects held by people.
- But this review shows that processes of valuation can be as important to identify.
- Even treated as objects, values change (which reinforce that values may be better understood as contextually-activated processes, rather than objects).

- It may be equally as important to assess why values are changing as it is to assess objectified point-in-time "held values."

► Valuing of nature will be intimately associated with people's concepts of nature.

► Valuing will be shaped and influenced by:

- Culture – including historical development of modernity, land-based cultures (e.g., Aboriginal peoples) and mobile cultures (where places are more exchangeable-substitutable), Canadian identities and the multiculturalism of the Canadian population.

- Individual biography and personal socialization, as well as social location (even such basic divisions as rural-urban, income, or experiences of particular natures).

- These factors generate divergent dispositions toward nature and personal values about nature.

► Identifying pluralism in values acknowledges that there may be *incommensurability* where tradeoffs between values are not possible. The research must account for this pluralism.

Moving Forward to a New Survey

There are several social goals that might shape research on How Canadians Value Nature. First, there are efforts to generate a single calculation, a single monetary value. The 1996 *Survey on the Importance of Nature to Canadians* generated such values, but only by looking at the dollar value of a limited set of outdoor recreation and tourism activities. The dollar value would be much higher if many of the other activities listed in this report were added to the calculation. However, it may not be reasonably possible to arrive at a calculation because of inherent difficulties in drawing boundaries as to what "nature" is being valued, and that various values have inherently different processes of valuation. This latter problem may be a fatal flaw – how does one calculate spiritual values and compare them to the value of forest products, for example? A total tabulation could not be done by somehow tallying all the ways we value nature. Some of the valuations would cancel out others. Nevertheless, a comprehensive survey of Canadians

can assist in understanding different types of metrics about Canadian values of nature. At present, there is no reasonably comprehensive and systematic research on the ways that the Canadian population values nature and a national survey can help to construct this understanding of nature values and how they differ across the country.

A second potential goal might be to develop a value gradient – what are the most important values of nature that Canadians hold? Doing so would help generate an overall picture of the values. The decisions we make about nature *imply* application of values – valuation in some method or another, consciously or otherwise (Costanza, 2003). But, contra to theories of rational decision-making which propose that some values can be "traded off" against other values, people make their decisions in highly contextual situations that mobilize held values. Even in a values hierarchy, some values are "protected" (Baron and Spranca, 2002). Gaining understanding of the values and value systems that Canadians have about nature will help in overall policy development. It might be a means of developing a theoretical framework for more specific research or practical application in specific cases. But this overall system would not provide a unitary set of value priorities for specific cases, which will all have their unique circumstances.

A third goal would be to generate information on already existing values of nature that will enable the country to move toward conservation and enhancement of these particular values. This is clearly goal-directed. However, the data indicates that locally, regionally and globally nature is understood as a major public concern. Data on Canadian values of nature can generate the information to communicate the values-oriented need for more environmental sustainability, and enable better communication and policy instruments to be developed because of knowledge of current values of nature among the population. Devries and Peterson (2009) provide a model that seems particularly suited to this purpose. With sustainability as a goal, the task becomes figuring out existing values and how they fit (or don't fit) into movement toward that goal.

Since there is no reasonably comprehensive data on Canadian values of nature, such data needs to be collected. Such a strategy will be multi-faceted, but it will certainly contain a survey of individual Canadians. Such a survey will be of individual values, which are not the same as collective values. Individuals do not aggregate into a society – that society is a collective construction that is something different than the same as the

sum of its parts. Nevertheless, understanding individual values is a step in identifying key values of nature for Canada.

This survey will provide baseline data on Canadian values, perceptions and activities about nature. It can be an expanded version of the 1996 *Survey*. It can use a set of value categories (like Manning Valliere and More (1999, Table 5) which has been successfully used in Canadian contexts). Using such a value set will help improve comprehensiveness, and provide opportunities to link Environment Canada survey data with other datasets in North America and around the world. One presumes that a 2010 survey can be repeated periodically. Well conducted research would help answer question posed by the Edmonton group in 1997 in their report on naturalization to Edmonton City Council: *Are current values, activities and initiatives short lived phenomena or indication of our changing values in society?* We do not know how Canadian values about nature are changing.

A new *Survey* should recognize what we know about values and provide some context for the elicitation of people's values and valuing processes. A narrative method could be used for a portion of the survey to make the situation in which respondents values are being sought more concrete. For example, short paragraphs about different types of natural settings could be described, and questions about each could be standardized. Narratives could be about pristine national parks, a summer beach with loads of people, a pocket park in a busy urban core, sparrows in the backyard (Haluza-DeLay, 1997). Narratives could ask about activities – gardening, walking, canoeing, watching frightening thunderstorms, facing floods. Alternatively, if a mail or internet survey was conducted, photographs or even short video or audio clips could be used with much the same content and purpose.

This sort of methodology would improve the internal validity as all respondents would have more similar imagined circumstances from which to respond. It would also help ecological validity (that research results match natural behaviour) since value activation does not happen in the decontextualized vacuum that a survey can create.

Finally, a theoretical framework should be included in the project. Respected research teams like Leiserowitz et al (2005) or Dunlap and colleagues (2000; Dunlap & Jones, 2002; Dunlap et al, 2008) criticize most research on nature values or

environmental values for not being theory driven, therefore being capable of describing trends only. Theory provides testable explanations. Using tested scales – such as the New Ecological Paradigm, or the values-norms-behaviours system based on the Schwartz value inventory, or the connectedness-to-nature scale – would provide a skeleton upon which to drape the activities and perception components of the improved survey. Using one of the above scales would also provide comparability with other research. As a national data set, it would be unique, and provide primary data for considerable secondary research by academics or agency staff.

Using Values Data for Promoting Sustainability

Devries and Peterson (2009) have developed a procedure that demonstrates the necessary incorporation of values into nature-protection and environmental sustainability, and then "plots" the resulting value orientations to understand productive strategies for the general goals of sustainability. Based on extensive research and policy engagement in the Netherlands, they summarize this process as follows:

> [Our] starting point is that a sustainability assessment should investigate the ability to continue and develop a desirable way of living vis-à-vis later generations and life elsewhere on the planet…. The first step, therefore, is to analyze people's value orientations and the way in which they interpret sustainability problems… The next step is to translate the resulting worldviews into model-based narratives, i.e. scenarios. The qualitative and quantitative outcomes are then investigated… (Devries & Peterson, 2009: 1006)

Devries & Peterson locate values in a central place in their model (Figure 14). The model in the figure is more detailed than necessary for this report but provides an overall picture of how values may fit into a bigger picture of sustainability. In their model, values are a mediating influence between capabilities (the combination of ecosystem characteristics and technological adaptations) and social behaviour (individual, and collective/societal or governmental). Values and interpretations of the world (i.e. what is nature? What should I do?) constitute worldviews. Worldviews are subjective, gestalt-like orientations and general understandings, forming the backdrop for dispositions and action.

Devries and Peterson show from Dutch research how survey-based value data can be plotted into a "valuespace" (Figure 15). In Figure 15 the aggregation of data from individual respondents is plotted onto a grid with two axes – beliefs about social progress (progression – stagnation) and orientation toward others (individual – collective). Other grids could be developed. There are several different value clusters identified. The remainder of their article shows how this information on value-based orientations are being used in scenario-driven policy development and

Figure 14: How values mediate ecological capabilities and behaviour (Devries and Peterson, 2009).

communication strategies. One such example is the Intergovernmental Panel on Climate Change. IPCC researchers have articulated four potential scenarios. Each of these value clusters, or worldviews, is likely to respond differently to the various scenarios.

Identification of the values held by the Canadian population is an essential step in identifying responses to nature-protection scenarios. Devries and Peterson (2009: 1017) conclude their analysis by describing the benefits
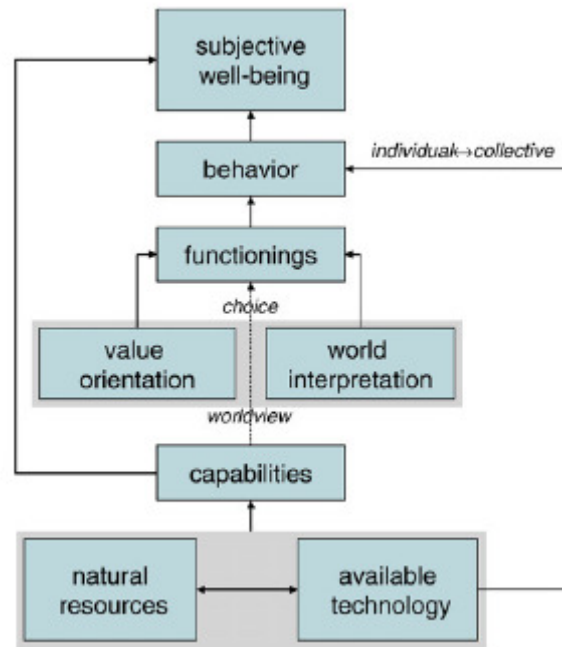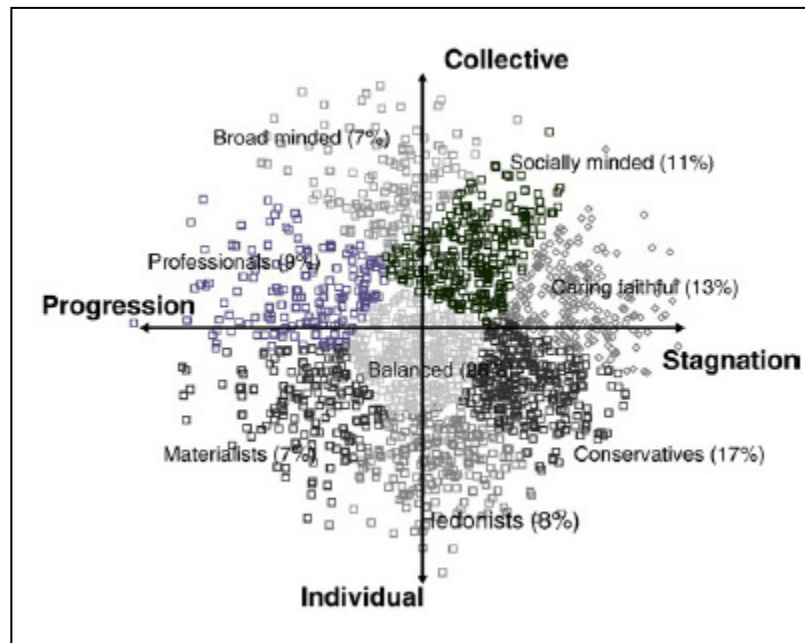

Figure 15: Value orientations in the Dutch population. Each dot represents one individual (Devries & Peterson, 2009:1110, from Aalbers, 2006).

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of this values-cognizant approach:

> The combination of value orientations and cognitive maps which make up worldviews in this scheme provides the basis for the construction of scenarios, that is, model-based narratives…. In incorporating explicit values and 'facts', one may hope that respect for diverse views and interests increases and irresponsible simplifications of the complex challenges ahead do not gain support. In our view, these are the preconditions for adequately facing the sustainability transition that lies ahead of us.

Worldviews are a form of cultural representation. Other researchers and think tanks have also moved toward acknowledging cultural dimensions of environmental sustainability. The Carnegie Institute on Ethics has asked the provocative question *Can Cultural Values Save the Environment*? (Rosenthal, et al, 2006). Environmental values should be seen through a cultural lens (Milton, 1996; Thompson, 2000; 1997). Values are a crucial component of culture, along with norms, language, institutions and so on. It may take a form of culture change to make sound steps toward genuine sustainability.

We hold high hopes that Environment Canada can initiate a similar programme with this project. It is an exciting endeavour, which considerable research (represented in this review) demonstrates is a fruitful direction for evidence-based policy and programme implementation.

[1] That social context matters even on the very large scale is demonstrated in Xiao & Dunlap's (2007) research showing differences in the demographic and political ideology influences on environmental concern between U.S. and Canadian samples.

[2] Costanza (2003) argues that social fairness and ecological sustainability are at least as important as "allocative efficiency" (markets). On the integration of social fairness and ecological sustainability as "environmental justice" see Agyeman et al (2009).

[3] Thanks to Ralph Mathews for this example.

[4] The "Great Transition Scenario" is one of three categories of possible futures as described by the Global Scenario Group (GSG), a scientific working group trying to envision pathways to sustainability in light of the increasing evidence of global environmental degradation (Devries & Peterson, 2009). The other two categories are "Conventional Worlds" (similar to the present value sets and institutions) and "Barbarization" (a descent into civilizational collapse). The data used by GSG suggests that the current pathways make Conventional Worlds doubtful, while Barbarization is clearly not preferable. Therefore, their conclusions led them to articulate various forms of transition, involving substantive value changes and institutional transformation. See Great Transition: The Promise and Lure of the Times Ahead, retrieved Jun21, 2009 from http://www.gtinitiative.org/documents/Great_Transitions.pdf.

[5] In the philosophical/grammatical vocabulary of linguistic-conceptual analysis, values are thus "abstract nouns" (Frankena, 1967; 229).

[6] Thus in linguistic-conceptual terminology, this view considers values to be "concrete nouns," used to refer to "what is valued" or "judged to have value," going even as far as "what *has* value or *is* valuable, ...as opposed to what is *regarded* as good or valuable" (Frankena, 1967; 230; original emphasis).

[7] Similarly, experiences of blueness are generated by optical encounters with light of a certain wavelength. Even though we attribute the blueness to the object itself, scientifically speaking neither the object nor the wavelengths of light it reflects are actually blue.

[8] See http://www.albertabrand.com/default.htm; retrieved 14 April 2009.

[9] The Canadian scholar Allen Carlson is a (if not *the*) founding father of contemporary environmental aesthetics. He has written numerous books and articles on the subject, including two very helpful online encyclopedia articles: http://plato.stanford.edu/entries/environmental-aesthetics/ [Stanford Encyclopedia of Philosophy] and http://www.rep.routledge.com/article/M047 [Routledge Encyclopedia of Philosophy].

[10] In this sense, the monetary metrics of neoclassical economics could be understood as a woefully simplistic form of values monism.

[11] In this sense, neoclassical economic monetization of apparently incommensurate values could be considered a kind of values pluralism.

[12] Although termed "environmental values" this is a misnomer and the study actually assessed cognitive models-in-action of such citizen types as political office staff, drycleaners, forest workers and environmentalists.

[13] This categorization seems flawed, as *all* people who hunt electively rather than out of necessity are characterized by definition as engaging in recreation or "sport." Furthermore, there is nothing to preclude "nature hunters" from hunting for meat. Indeed, it is illegal in Canada to hunt an herbivore or gamebird and let the meat go to waste.

[14] Despite this, one of the recent Canadian Congresses on Leisure Research thematized its triennial meeting as "The two solitudes," specifically querying whether there was a difference between Canadian and American leisure research.

[15] In May 2009, the ecumenical organization Kairos (www.kairos.ca) organized a tour of 10 Canadian church leaders along with 2 international observers and a First Nations leader to view the Athabasca oilsands in northern Alberta and visit with local, first nations, environmental and business representatives. The tour was well reported, and media websites had extensive comments in response, with views including such statements "church leaders are meddling" to "the oilsands are a serious moral issue," to "it's just economics, churches should stick to morality." For one example, which clearly indicates the value conflict, see the response to Graeme Morton (2008, May 29). "Canadian church leaders urge long-term oilsands policy" Calgary Herald. http://www.calgaryherald.com/Life/Canadian+church+leaders+urge+ long+term+oilsands+policy/1642010/story.html.

[16] One of us participated in a city-wide consultation process in which large-group processes were used. The facilitators heard that citizens wanted "natural spaces" throughout the city. In their report-backs the facilitators repeatedly reworded the recommendation as "greenspaces" to the increasing consternation of citizens at this event. Greenspaces may be large lawns and sports fields – which are common in parts of Edmonton – but this was not what the participants meant by "natural" spaces.

[17] "Vacant" lots are particularly interesting. They are usually considered vacant merely because they do not have built development, but such spaces may be high in biodiversity, or for amenity values such as open space. Nabhan and Trimble (1995) summarize the research that shows children need unfettered playspace for creativity development (e.g., places they can alter according to their own creative whims, or that can become the raw materials for imagination and role-playing) and argue that vacant lots in neighbourhoods often provide such places in ways that constructed parks simply cannot.

[18] This wouldn't be a problem if the position is held that values are more than just projections of a subject. Value objectivists don't have this theoretical difficulty.

[19] A paper on urban forests won the Canadian Mortgage and Housing Association's 2007 housing Studies award (Engel-Yan , 2007; http://www.tcf-fca.ca/programs/urbanforestry/cufn/Resources_Canadian/CMHCThesisSummaryEngel-Yan.pdf). A Canadian Urban Forest Strategy has been developed as a peripheral part of the Canadian national forest strategy (http://www.tcf-fca.ca/programs/urbanforestry/cufn/Resources_Canadian/CUFS.pdf). The strategy specifically recognizes that urban forests have social dimensions although it emphasizes biological and urban engineering.

[20] Aboriginal cultural diversity is more extensive than the cultural diversity of the European continent according to the Royal Commission on Aboriginal Peoples (1995). The diverse Aboriginal societies should not be treated as unitary.

[21] This way of stating the cultural aspect of modernity will be criticized as follows: the European Enlightenment and the modern scientific project explicitly deny any authority whatsoever to "tradition." Modernity is the attempt to be "free of tradition" (which, as we now know, is self-refuting).

[22] A review of research in *Clinical Infectious Diseases* applying criteria of experimental soundness found that none of the studies reporting positive effects met all of these criteria. See http://news-service.stanford.edu/news/2005/march9/med-echinacea-030905.html.

[23] Nor, for that matter, have Population Health approaches, although the evidence for social determinants of health is solidly established. Curative rather than preventative, and individualized treatment rather than public health approaches are far better funded and institutionally entrenched.

[24] See also the Gnome Project in Australia, which is founded by an active clinician who is now doing doctoral work on the effectiveness of nature-centred approaches to peacebuilding (http://the.gnome.project.org.googlepages.com/home).

[25] The website naturalhealthcare.ca lists as natural therapies: "Acupuncture, Aromatherapy, Ayurveda, Chiropractic, Detoxification, Energy Work, Massage, Nutrition, Reflexology, Reiki, Osteopathy, Naturopathic, Natural Childbirth, Stress Management, Supplements, Wellness, Yoga."

[26] Greening varies, but typically involves transforming lawn and hardened (concrete/asphalt) school grounds into spaces with natural diversity, possibly including trees, shrubs, native plant habitats, floral or vegetable gardens, water features, butterfly and bird habitat.

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