LTA The Land Trust Alliance
Of British Columbia

Safeguarding Canada's Wealth

Bringing Stewardship and Conservation into the Economy

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Including excerpts from Dovetail Consulting, Appreciating the Values, Needs and Potential of the Stewardship and Conservation Sector in Canada: Strategic Directions for Funding and Other Support

With funding support from

THE REAL ESTATE FOUNDATION OF BRITISH COLUMBIA

HABITAT CONSERVATION TRUST FUND

Environment Canada
Canadian Wildlife Service

Environnement Canada
Service Canadien de la faune

Executive Summary

Nature is valued by all societies for its biological, resource, health, recreational, cultural, spiritual and other intrinsic values. Human activities significantly impact nature, drawing on natural resources to achieve development, health, well-being and wealth. Economic valuation methods attempt to quantify this process. Unfortunately, conventional methods fail to use a holistic approach; they do not include a full range of social, economic and environmental values.

The need to include ecosystem values in Canadian economic models is urgent as economic growth is based on the use of ever-diminishing natural resources and ecosystem services. Including ecosystem values in economic models would help assess the most economical use of "natural capital". Forests, for example, have traditionally been assigned value only for the timber they can produce. Forest ecosystem values such as soil stability, detoxification, creation of clean water and air, which are all essential to economic functioning as well as human health, are rarely included in current economic thinking. Assigning economic values to these services would make the preservation of healthy forest ecosystems an economic priority and necessity.

The costs of degrading Canada's ecosystems are extensive and outweigh the costs needed to achieve restoration. It is profitable for society to conserve and preserve ecosystems. Ensuring their health guarantees human health, encouraging appreciation of the full values of ecosystem goods and services upon which all economic activity depends. For example, New York City avoided spending US$6 to US$8 billion to build a new water treatment plant by opting to enhance and protect the upstate watershed. An investment of US$1.5 billion allowed for the purchase of surrounding land to act as a buffer, habitat and recreation zone. While the initial costs of conservation were substantial, they were less than the treatment facility, and the protected ecosystem will provide goods and services such as clean water and air for free, in perpetuity.

In order to provide a substantive view of holistic economic valuation, Safeguarding Canada's Wealth examines conditions and trends in British Columbia and Canada identified in key economic studies and papers produced over the last 10-15 years. The Canada West Foundation's report, Looking West 2004 (February), found that western Canadians continue to rate the environment as one of the top four priorities. There may be no better time to examine how Canada and her citizens can learn to fully value the country's natural heritage and to what extent that heritage ought to be protected to achieve the common good.

1. **Canada's Ratings** - The perception that Canada's environmental record as one of repute and success is waning. This section reviews three reports that identify high pollution levels, poor municipal waste treatment facilities, and high-energy consumption. The evidence shows that in a paradigm of ever increasing interconnectedness between regions of the world, Canada's policies and regulations are outdated.[1] National policy such as the 2003 Federal Budget, separates health care needs from sustaining a healthy environment, thereby overlooking the integral relationship between the health of people and the environment. In order to secure a vibrant and wealthy economy, safeguarding Canada's ecosystems is essential. The true economic value of intact healthy ecosystems and the full cost of their degradation could direct national and provincial policies toward sustaining the resources that support all economic activities.

2. **Corporate Subsidies and Support** - A review of current subsidies both nationally and provincially reveal that government policies favour subsidies for industries with large

[1] See **Appendix 1** and Section 1 regarding the Conference Board of Canada's **Performance and Potential Report.**

ecological footprints. These subsidies are particularly significant in the oil, gas and mining sectors, causing substantial levels of environmental degradation. The federal government's plans for Canadians to become more efficient users and producers of energy partially depend on giving up support systems for destructive practises. If Canada strives to keep pace with international efforts for sustainability and pushes its economy toward renewable resources and reduced pollution, the economic benefits will be massive. Growing public and private demand for environmental protection suggests that Canada ought to redirect or eliminate economic support systems that favour industries that generate the greatest ecological harm.

3. **Public Opinion** - Canadians are showing an ever-increasing awareness of the need to protect the nation's ecosystems and environment. Across the country, recent surveys reveal that people consider health and the environment to be of utmost importance. Safeguarding Canada's Wealth examines several studies that indicate a growing dissatisfaction among Canadians about unsustainable development and industrial practices and an increased priority for protecting the environment. The National Round Table on the Environment specifically promotes strong stewardship and conservation initiatives in its State of the Debate report. The Round Table makes the case for government support for stewardship education and the conservation and protection of habitats and ecosystems. The application of these initiatives will encourage Canadians to become good stewards of the nation's ecosystems..

4. **The Environmental Crisis** - Scientific research documents the increasing threats and significant changes to the health of species, ecosystems and humans. For example, overly exploitive activities are causing forests and water systems to deteriorate rapidly. Climate change, being felt worldwide, affects not only ecosystem health, but also human health and the economy, initially revealed through insurance claims. A brief review of the ecological footprints of the major industrial sectors reveals increased environmental impacts within the oil and gas, forestry, mining and urban infrastructure sectors. Continued reliance on non-renewable resources does not reflect growing public sentiment, yet Canada and British Columbia continue to focus priorities on these industrial sectors.

5. **Economic Valuation Methodology** -Outdated policies and practices shape Canada's economic structure. The full costs of prevailing economic activities are not adequately understood, valued or measured. In order to implement full cost accounting, Canada's economic valuation requires expansion. This section discusses contemporary economic valuation methodology and introduces the work of several researchers and organisations, including Robert Costanza and Paul Hawkens, who have calculated some of the full costs of resource extraction and depletion. The economic values that have been assigned to ecosystem goods demonstrate the extensive services and functions present in healthy ecosystems. A healthy and effective economy is only possible in tandem with thriving ecosystems. Sample studies on the values of trees, parks and wetlands illustrate these conclusions. A healthy and intact ecosystem is estimated to provide 100 times more value than when altered or developed.

6. **Sustainability and the Changing Face of Market Practices in Canada** - Achieving sustainability in this country depends on the health of ecosystems and sustainable human activities. This section of Safeguarding Canada's Future examines various tools suggested by noted researchers and institutions in the context of fiscal and policy reforms. These tools include tax shifting and the transfer or careful adjustment of subsidies to environmentally sustainable industries. The elimination of taxes on donations of land would support the stewardship and conservation sector and accelerate ecosystem protection. These reforms ought to coincide with increased environmental regulation. A more profound change indicates re-evaluation of appraisal methodology, especially given the real economic costs of development and restoration compared to the 100 times more significant value of natural areas left intact. Successful examples of economic and environmental sustainability are examined in Sweden, a country similar to Canada in population and climate. Stewarding and conserving Canada's ecosystem goods, services and functions can be achieved based on an understanding of their

immense values, joined with a commitment to use these suggested reforms to alter policies and practices, thus safeguarding Canada's wealth.

7. **Funding Crunch in the New Millennium** - Over the past decade the stewardship and conservation sector has increased in influence, grown in size and diversified. These non-profit organizations have a broad geographical scope, a proactive, long-term perspective, and have increasing expertise, capacity and activity levels. Taking on work formerly done by government, they are implementing significant economic, social and environmental services directly through hands-on projects. Research has found funding is lacking across the board, negatively affecting the organizational capacity of the NGO's and successful stewardship and conservation on the ground. Rather than working to help alleviate these pressures, governance in Canada does not provide to the conservation and stewardship sector sufficient power, priority, or policy and legislative support. As environmental problems increase and reduced resource pressures mount, the need to significantly increase financial support to the stewardship and conservation sector from government, foundation, and private sources is essential.

8. **Conclusion** - Rapid consumption and resource exploitation practices threaten Canada's economic, social and environmental health and wealth. The basic needs of all Canadians including shelter, health care, food, energy and transportation - all depend on healthy natural systems. Canadian economic foundations and methods, and public policy and regulations need to adapt in order to safeguard and sustain Canada's eco-systems and the communities that depend on them.

Organisations and industries committed to stewardship and conservation particularly require support. They contribute economic, social and environmental benefits to society. They also protect and restore ecosystems thereby ensuring continued production of ecosystem goods and services. Funding is lacking for stewardship and conservation work across the board; there is an immediate need for a shift in public, private and government policies and practices to achieve a level of adequate support for the pressing stewardship and conservation challenges facing Canadians.

Economic methodology and other valuation systems need to expand to include both the internalised and externalised costs of human activities. Canada should embrace full cost accounting and look to other countries for examples of how best to create energy-efficient, waste-reduced economies. Considering the significant environmental crisis we are facing, Canada needs to address the weaknesses in both national and provincial environmental policies and practices. Community, industry and government leaders need to have the courage, commitment and compassion necessary to reorient and align human actions in order to leave healthy and sustainable ecosystems - the natural capital that creates the true health and wealth of current and future Canadians.

Introduction

Nature is valued by all societies for its biological, resource, spiritual, health, recreational, cultural, and intrinsic values. However, there has been an explicit exclusion of ecosystem and natural functions in economic valuation methodologies. The need to include ecosystem valuation in economic models is urgent as the environmental crisis we are facing worsens.

Within economic discourse and resulting policy implementation, it is fundamental to analyze what requires valuation. For example, traditionally forests have been assigned various values only for the timber they can produce. Economic values assigned to ecosystem functions and systems do not include many real and essential values, including the habitats and species that are in dire need of protection, and the natural processes that provide life, such as the detoxification and creation of clean water and air. Furthermore, much contemporary economic valuation does not consider the inherent values of biodiversity. Therefore, what requires valuation needs to be expanded.

Safeguarding Canada's Wealth examines contemporary economics, introduces new ecological valuation methods, and suggests values specific to stewardship & conservation that need to be included. Once economic valuation methods are expanded to include a more holistic view, not only can we approach and discuss the economic values or assets of natural systems, but we can also argue for the inherent need to support activities that steward & conserve nature, philosophically, economically, and financially. Thus human activities will be more sustainable, for we are nature.

There are numerous conditions and trends within Canada, and particularly British Columbia that suggest such analyses are timely. This report will analyse these trends within the following subject areas:

1. Canada and BC's ratings on environmental protection from various political, social and economic entities are dropping;
2. Corporate subsidies and support for industries with large ecological impacts is exceedingly high;
3. Public opinion and demand for increased environmental protection, including conservation and stewardship is growing;
4. We are approaching a significant environmental crisis;
5. There are various methods that suggest ways of incorporating environmental values into economic valuation;
6. Facing the challenge of sustainability through changing economic discourse and practice in Canada;
7. There is an urgent need to increase funding to conservation and stewardship groups;
8. Conclusion

1. Ratings

The interconnections between nations and within smaller political entities are becoming more obvious as the effects of increased international trade and large environmental disasters are felt. Furthermore, international agreements, while still enormously difficult to negotiate, are becoming more commonplace. The dictum that all persons live in a global village has such tremendous force when one considers these interconnections. An introductory look finds that Canada and specifically British Columbia's ratings on environmental protection from various economic, political and social agencies are decreasing.

In the report "Canada vs. Sweden: an Environmental Face-off", the environmental policies and practices of Canada and Sweden are compared by author David Richard Boyd. He

concludes, "Sweden outperforms Canada on nine out of ten environmental indicators."[2] Boyd's analysis responds to the Organisation for Economic Development's (OECD) statistical data on sustainability indicators for its member countries and an index on the quality of life and environments in countries across the world.[3] Out of the ten indicators utilised, including marine, waste and agriculture, Sweden outperforms Canada in nine. Canada does succeed in protecting a higher percentage of lands in parks than Sweden, has managed to reduce air pollution since 1980, but still produces more pollution in total and on a per capita basis than its competitor. The reason the nations were compared is due to their similarity in climate, economy and standard of living.[4] However, it is important to bear in mind the large difference in geographical size between the two nations, and thus the difficulties inherent in the transportation of food and people and other infrastructure services. However, Sweden has achieved success in its movement toward sustainability through the use of innovative and regulated economic techniques. In reconciling ingenuity with sustainability, Sweden has created a climate of improved energy efficiency, less waste, and reduced consumption of natural resources. By rescinding many of its subsidies to ecologically destructive industries and in turn implementing environmental taxes where appropriate, Sweden is proving its commitment to sustainability. Some of the details of these activities will be discussed in **Section Five**.

The Conference Board of Canada, an economic think tank, released a "Performance and Potential Report" for 2003 on the state of Canadian society. The nation's activities and relative successes were pitted against 23 members of the OECD in six categories: environment, the state of the economy, society, education, health and innovation. In terms of environmental health, the paper admonished that Canada needs to "CLEAN UP ITS ACT".[5] "Canada's beauty and awe-inspiring natural resources have lulled us into a false sense of security about the state of our environment".[6] Canada came in 23rd for nitrogen oxide emissions (causing smog) and 24th for CO^2 emissions. Compared to other OECD nations, Canada's performance with regards to water quality, air quality and waste generation and disposal was described as second rate. Overall Canada came in 16th.[7] See **Appendix 1**.

The Conference Board's report states that the Kyoto Protocol on Climate Change is a cost to the economy. The costs to governments will be via subsidies to consumers to encourage energy-efficient consumption and to firms to encourage energy-efficient investment. Nonetheless, the 2003 federal budget allocation of $1.7 billion over five years will be insufficient as Natural Resources Canada estimates an average of $8.1 billion per annum will be required between now and 2015[8] to meet the Kyoto Protocol. The effect of Kyoto on the economy is calculated to decrease Gross Domestic Product (GDP) by 0.4% from 2005-2015, also calculated as a cost to governments.[9]

The Board's report overlooks important elements. It does credit the Protocol for decreasing costs in other areas such as pollution and health care. However the anticipated financial liabilities omit the very real costs of stewardship, restoration and environmental clean up of a degraded or destroyed ecosystem. The clean-up after the destructive BC forest fires in the summer of 2003 is an example of the enormous financial costs incurred once an ecosystem has been degraded. Furthermore, the Report does not account for the fact that GDP does not include all the environmental and social costs of most economic activity. Finally, the increased

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[2] Boyd, David Richard. 2002. Canada vs. Sweden: An Environmental Face-off. 1

[3] see Prescott-Allan, Robert. 2001. The Wellbeing of Nations: A Country-by-Country Index of Quality of Life and the Environment cited in ibid

[4] 2% of the GDP of both nations derives from agriculture, 27% from industry, and 70% from services, see ibid. 2

[5] Conference Board of Canada. **Performance and Potential Report.** 2003. p. 25

[6] ibid. p. 25

[7] See **Appendix 1**

[8] ibid. p. 25

[9] ibid. p. 130

economic activity generated by alternative fuels and other green technologies are not fully appreciated.

Taiwan is undergoing an "environmental revolution",[10] its success largely due to the promotion of an environmental ethic and government subsidised environmental education.[11] Using the maxim that by going green one can get rich, the program promotes the reality that it is far cheaper to protect healthy ecosystems than to inject money into restoration. The programs are substantiated and sustained through the extensive use of and funding for green technologies and tax incentives. The Taiwanese make concerted efforts to advocate conservation and stewardship through the media. Protected places become photographed, mythologised, frequented by tourists and local politicians, and generally appreciated for the myriad values they imbue. [12]

The demand for corporate practices to become more sensitive to and inclusive of ecological and economic parameters is growing rapidly. For example, administrators and managers of businesses within New York state and New York City, in addition to the treasurers of California, Oregon, Maine, Connecticut, Vermont and New Mexico, launched an "Investor Network on Climate Risk" in November 2003. The hope was to enforce corporate disclosure rules so that the effects of climate change on business could be analysed and recommendations made. As an example, it was concluded that companies within the greenhouse gas-producing sector, such as automobile manufacturing and oil and gas production and refining, should provide corporate reports to their stakeholders detailing the in-house effects of the changing physical, legal and political climates, as well as the costs of non-compliance with greenhouse gas reduction regulations. [13] The meeting's focus signals two most notable trends:

1. Political and business agencies are increasingly redefining their roles in a resource depleted and ecologically sensitive world;
2. There is an increasing recognition of the economic values of using renewable resources.

"Clean technology is a strategic investment whose moment has arrived."
Mr. Phil Angelides, California's treasurer [14]

"Your investments will have a decisive impact on trends in future greenhouse gas emissions, and on our ability to adapt." Kofi Annan, United Nations Secretary-General

In December 2003, over 100 economists[15] from across the United States presented George Bush and the governors of 11 western states with a letter asserting that the protection and restoration of the natural environment would in fact equip communities with increased employment opportunities and higher wages. The economists asked for a recognition of the full costs and benefits associated with contemporary economic, social and industrial development, and affirmed that natural resources should be allocated toward activities that reflect and increase their value. [16]

The Canadian public on the whole does not consider making money through conservation and stewardship. Canadians do not readily appreciate the interconnectedness between a healthy environment and healthy people, or recognise the overall benefit that will

[10] Penn, Briony. 7 January 2004. E-mail from Briony in Taiwan
[11] ibid. The government allocates half a billion dollars every year to environmental education programs.
[12] ibid. 2004
[13] Investor Network on Climate Risk. 2003. http://www.incr.com/news_release.htm
[14] ibid.
[15] The signatories included Nobel laureates: Kenneth Arrow of Stanford University and Robert Solow of Massachusetts Institute of Technology
[16] "A Letter from Economists to President Bush and Governors of Eleven western States Regarding the Economic Importance of the West's Natural Environment" December 3, 2003 Eugene, Oregon. Available at www.econw.com/pdf/120303letter.pdf

result from a healthy environment. Investment in green technologies will have economic benefits. In **Section Two** the subsidies that are given to environmentally destructive industries will be reviewed.

Summary

The perception that Canada's environmental record as one of repute and success is waning. The three reports mentioned above identify high pollution levels, poor municipal waste treatment facilities, and high- energy consumption in Canadian society. The evidence shows that in a paradigm of ever increasing interconnectedness between regions of the world, Canada's policies and regulations are outdated. National policy such as the 2003 Federal Budget, separates health care needs from sustaining a healthy environment, thereby overlooking the integral relationship between the health of people and the environment. In order to secure a vibrant and wealthy economy, safeguarding Canada's ecosystems is logical and essential. The true economic value of intact healthy ecosystems and the full cost of their degradation could direct national and provincial policies toward sustaining the resources that support all economic activities.

2. Corporate Subsidies and Support

Over the last 20 years, significant subsidies have been granted to large-scale industries whose operations have extensive environmental impacts. These costs do not reflect the full costs of extraction and restoration of resources, nor do they reflect the full values they provide to society. Generally these subsidies are given to the forestry, mining, energy supply, agriculture, fishing and aquaculture industries - industries with large ecological footprints. This section will take a brief look at some of the most significant subsidies to the mining, oil and gas, energy, forestry and agriculture industries. A brief commentary on the beleaguered state of wildlife conservation in BC is given to highlight government priorities.

Mining:

In 2003, the federal government passed Bill C-48 provisioning for the following: The mining industry's corporate tax rate would be reduced from 28% to 21% by 2007; a 10% investment tax credit would be introduced to assist companies with their exploration costs; the capital tax will be removed in 2008. These subsidies are calculated to cost the federal government $260 million per year in lost revenue.[17] In 2001, the BC provincial budget introduced sales tax exemptions for mining equipment and machinery, estimated to have provided the industry with a $12.5 million tax relief.[18]

The mining industry is one of the most environmentally destructive industries. It moves more earth than the world's rivers, contributes to air and water pollution, and discards two million tonnes of toxic waste rock and tailings per day in Canada. The World Wildlife Fund of Canada ranks the mining industry fifth in its list of national industries with the highest ecological footprint. [19]

Furthermore, MiningWatch Canada and the Pembina Institute found that despite growing subsidies from the federal and provincial governments, employment in the mining sector has

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[17] MiningWatch Canada. Fall 2003. Newsletter #14. http://www.miningwatch.ca/publications/newsletter_14.html

[18] MiningWatch Canada. 2002. Looking Beneath the Surface: An Assessment of the Value of Public Support for the Metal Mining Industry in Canada. 2. http://www.miningwatch.ca/documents/belowthesurface-eng.pdf

[19] World Wildlife Fund Canada. Nature Audit. http://www.miningwatch.ca/documents/belowthesurface-eng.pdf http://www.wwf.ca/AboutWWF/WhatWeDo/TheNatureAudit/TheNatureAudit.asp?page=0.1

declined by 12% between 1994 and 2001, and the sector's contribution to national Gross Domestic Profit (GDP) fell by 8% and provincial GDP by 12%.[20]

Oil, Gas and Energy:

At a time when global warming due to fossil fuel emissions is the scientific consensus, the 2004 BC provincial Budget has dedicated $29 million over three years to support the province's Oil and Gas Development Strategy. Subsidies in 2003 include:

- In February 2003, the government of BC committed $37 million to building roads for the oil and gas industry. The source of the money will be a 3.5c per litre public gas tax. Paradoxically such taxes are a good incentive to shift money away from environmentally destructive practices. In this case however, the "government will use the gas tax revenue to build more roads of all kinds leading to more driving, more pollution, and more greenhouse gas emissions." [21] Furthermore, increased road density only leads to greater habitat fragmentation and loss, the largest threat to species survival. In 1988 there were 387,000 km of roads in British Columbia, 76% of which are used to access forests for timber and recreation. The remaining 24% are main and secondary highways and other non-forest roads. In 1999, only a segment of the province was re-surveyed, yet trends for 40% of the area covered demonstrate that the total road length increased by 45% (to 277,000 km of roads). These policies tend to encourage increased transportation use.

- In May 2003, the provincial government introduced more subsidies for roads, royalty reductions for "marginal" and "deep" wells, and royalty reductions for summer drilling.

Forestry:

The forest industry in BC has been heavily subsidised for many years. Government subsidies are offered through stumpage, bailouts and handouts, infringement of Aboriginal title and tenure rules.[22] Stumpage fees in BC are continually calculated at rates below market stumpage, only forcing our cut trees to be under-valued[23]. One consequence is that tenure or licenses for companies are in turn undervalued as they respond to stumpage rates.

Provincial and federal forestry legislation requires minimal standards, and the enforcement of environmental protection laws is weak. This allows companies unfair benefits as environmentally destructive practices are often not penalised, and the costs of resource depletion and ecosystem destruction are displaced onto society. These indirect subsidies are estimated to cost $950 million annually.[24]

Furthermore, policy and legislation is increasingly allowing for voluntary compliance on behalf of industries whose activities are monitored by their own staff. Finally, most logging in BC occurs on Crown Land, much of which is claimed as Aboriginal traditional territory; and typically, local bands are not consulted. The degradation of ecosystems, depletion of resources and compensation to First Nations will ultimately have to be paid for; however, this "burden will fall on taxpayers, not the companies who have profited, resulting in a subsidy. In 1999 this subsidy is estimated at between $233 million and $1.163 billion."[25]

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[20] The Green Budget Coalition. 18 June 2003. "Federal Government Proposal Gives Mining, Oil and Gas Industries $260 million/Year Gift at Taxpayers Expense". http://www.greenbudget.ca/media.html

[21] ibid

[22] Green, T and Matthaus, L. 2001. "**Cutting Subsidies or Subsidised Cutting: Subsidies to the BC Forest Industry and the BC Liberals' Commitment to End Them**". Executive Summary

[23] Suzuki, David. www.davidsuzuki.org/forests

[24] Green, T and Matthaus, L. 2001. "**Cutting Subsidies or Subsidised Cutting: Subsidies to the BC Forest Industry and the BC Liberals' Commitment to End Them".** Executive Summary ibid

[25] ibid.

Agriculture:

The number of farms in Canada has decreased dramatically over recent decades, with 60% fewer farms in Canada today then there were in 1951.[26] In Canada, the federal government cut direct spending on agriculture by 48% over the period 1991/2-2001/2. The reduction from $6.1 billion to $3.3 billion has resulted in reduced or cancelled funding to farming programs and reduced direct subsidies.[27] International trade agreements reduce trade barriers that in effect force Canadian farmers into increasingly competitive markets. One repercussion has been a growth of mergers, which helps to explain the aforementioned reduction in farm numbers mentioned in this same national report from the National Farmers Union. Large agribusiness farms very often have a significant negative impact on the ecology of the land, usually through the filling in of wetlands, the altering of water ways and the destruction or interruption of migratory habitat. Furthermore, the Canadian agriculture-food processing industry is increasingly vulnerable to foreign investment and foreign takeover. For example, US-based transnational, Arthur David Midland (ADM), presently owns 47% of Canadian wheat flour milling capacity. In its entirety, the industry is 79% foreign-owned.[28]

Biological Conservation:

According to the World Conservation Monitoring Centre, the total government spending on protected areas such as national parks and reserves is approximately US$3.2 billion per year. Compare this to US President George Bush's 2002 farm bill which places the greatest portion of its $190 Billion toward big agribusiness.[29] The UN Food and Agriculture Organisation estimates that global government spending on fishing subsidies is at least five times the amount spent on protected areas, despite the beleaguered state of global fisheries. Estimates suggest that more than 75% of global fisheries are suffering from over fishing.[30]

British Columbia's disbursement for wildlife protection and law enforcement will, in 2004, be the lowest it has been in over 20 years, stated Calgary wildlife scientist, Brian Horejsi. After accounting for inflation, the allocation has dropped by 50% since 1983. In Alaska, one and a half-times larger in land mass than BC, and one sixth the population, will spend $21.64 per capita on fish and wildlife law enforcement, compared to $2.17 from BC in 2004. In early 2003, eight conservation offices in BC were closed and 22 conservation officer positions terminated. By comparison, Alaska has increased its number of troopers by six % since 1994.[31]

In March 2003, David R. Boyd alarmed Canadians with his article, "Thanks to a tax loophole, corporate crime does pay". A Supreme Court of Canada decision in a 1999 ruling found that "fines and penalties levied for breaking the law are no different than any other costs incurred for the purpose of earning business income." This case set a precedent for institutions all across the country that have since been able to write off fines as tax deductibles. Examples include fines for substandard tires; unsafe working conditions; pollution penalties and other environmental degradations.[32]

Canada's Climate Change Plan:

Initial motions to allocate subsidies that will benefit ecological sustainability can, however, be seen in the **2002 Climate Change Plan for Canada.** The Plan stresses the need for

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[26] National Farmers Union. **The Farm Crisis, Bigger Farms, and the Myths of "Competition" and "Efficiency"** November 20, 2003. p.1. Stats from Stats Canada 2001

[27] Darrin Qualman and Nettie Wiebe. November 2002. "**The Structural Adjustment of Canadian Agriculture**". P.9 Stats from AAFC, Farm Income, Financial Conditions and Government Assistance data Book, various releases. Table C1. www.policyalternatives.ca/publications/agriculture.pdf

[28] Darrin Qualman and Nettie Wiebe. November 2002."The Structural Adjustment of Canadian Agriculture" p.12

[29] Colin Graham. "Looming oil crisis dooms mega-farming, small farmers. 2003. p.30

[30] Claude Martin. It pays to invest in the environment. 16, Feb 2004 http://www.panda.org/news_facts/newsroom/opinions/index.cfm

[31] Brian Horejsi. Vancouver Sun. 2002

[32] Boyd, David Richard. 2003. "Thanks to a tax loophole, corporate crime does pay " in the Globe and Mail. 23 March 2003

Canadians "to become the most sophisticated and efficient consumers and producers of energy in the world and leaders in the development of new, cleaner technologies".[33]

The Plan focuses on five fundamental instruments, including:

"Emissions reductions targets for large industrial emitters established through covenants with a regulatory or financial backstop that would create an incentive for shifting to lower-emissions technologies and energy sources, while providing flexibility for these emitters through emissions trading and access to domestic offsets and international permits."[34]

It is not sufficient however, as the money required to implement Kyoto for example, should be increased to protect our air and water systems.[35] In addition, should governments seek to become world leaders in innovative environmental technology, industry, non-government organisations and educational institutions furthering these goals need financial support.

Summary

A review of current subsidies both nationally and provincially reveals that government policies favour subsidies for industries with large ecological footprints. These subsidies are particularly significant in the oil, gas and mining sectors, causing substantial levels of environmental degradation. The federal government's plans for Canadians to become more efficient users and producers of energy partially depends on giving up support systems for destructive practises. If Canada strives to keep pace with international efforts for sustainability and pushes its economy toward renewable resources and reduced pollution, the economic benefits will be massive. Growing public and private demand for environmental protection suggests that Canada ought to redirect or eliminate economic support systems that favour industries that generate the greatest ecological harm.

3. Growth in Public Opinion

The public's awareness of environmental degradation is growing gradually as the effects of altered or destroyed ecosystems are well documented in research and reported by the media.

The National Round Table on the Environment and the Economy (NRTEE) is an independent advisory panel, its members representing the business, labour, academic, environmental and First Nations sectors of the country. As such, the NRTEE 2002 Report has voiced its support for conservation initiatives. The Report calls for the federal government to allocate $1.3 billion on environmental projects over the course of the next five years. This amount is not much less than the $1.7 billion the federal government has allocated to implementing Kyoto.

NRTEE suggest the money be allocated as follows:
$500 million for a national oceans strategy; $300 million for improvements to existing parks and to new national parks; $250 million for a national conservation fund; $175 million for more wildlife and bird sanctuaries and $50 million for a coastal mapping program.[36]

From a government perspective, Natural Resources Canada's Executive Summary for 2002, drawing on 2001/2 poll, states that although the Canadian public's opinion regarding

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[33] Government of Canada. Climate Change Plan http://www.climatechange.gc.ca/
[34] ibid.
[35] See **Section One**, footnote 1
[36] National Round Table on the Environment. http://www.nrtee-trnee.ca/eng/main_e.htm

the natural resource sector has not undergone a fundamental change over the previous five years, Canadians are generally giving lower priority to the resource sector, especially forestry, mining and agriculture.[37]

According to the report, the forestry industry, in particular, is tarnishing its positive public image largely due to its reliance on old-fashioned methods.[38] In addition, the public is expecting the sector to contribute less to the national economy over the next ten years. 43% of the responders thought that the forestry industry is causing environmental damage through its activities, especially through clear-cutting and over-cutting. Many people agree that such practices are the single greatest threat to the country's forest resources.[39] The public is losing confidence in the ability and commitment from the resource industries to reduce the ecological damage involved in their operations. There is, however, a division between those who feel such repercussions are acceptable given the economic benefits such industries provide, and those who don't.

The conclusions go further to point out that there persists a misconception that certain industries operate according to environmental standards, especially the energy industry. Furthermore, the fundamental connection between benefits in one economic realm and costs or debts incurred in another is not made. For example, more stringent regulations regarding cutting boundaries near a stream will have economic benefits via clean water systems and human health, healthy fish habitat and increased fisheries and increased biodiversity.

62% of respondents agreed that the use of automobiles incur significant environmental damage. 65% expressed a desire to see government and industry provide more options for alternative energy, especially wind, solar and hydro-electric power sources. Such preferences have been met in other countries such as Denmark where, in 2001, 15% of its electricity was generated from wind power. In fact, over the years 1998-2001, worldwide use of wind power multiplied fourfold, an increase equaled only by the computer industry.[40] The most important indicator however, is the cost of energy. Most people are unwilling to change personal behaviour patterns unless the economic benefits are immediate and obvious, or if environmental shortage dictates. [41]

The Canada West Foundation, a non-profit, public policy research institute, conducted a survey in the four western Canadian provinces to gauge public opinion on the following issues: the lowering of taxes; improvements to the province's health care system; improving the Kindergarten to Grade 12 education system; improving the post-secondary education system; investing in and modernising transportation infrastructure; supporting rural industries; increasing funding to social services; attracting more immigrants; diversifying the economy; protecting the environment; employing and stimulating young people to keep them in communities for longer, and ensuring the province has safe, healthy and interesting cities. The 2001 survey included the opinions of 3,256 people. [42]

Across the four provinces, the top priorities were:
Improving the health care system (74%); keeping young people in communities (67.6%); protecting the environment (64.1%); supporting rural industries (61.9%) and improving the K-12 education system (59.5%).

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[37] Natural Resources Canada. 2002. **Canadians' Attitudes Towards Natural Resources Issues**. Executive Summary. P. 3. http://www.nrcan.gc.ca/inter/pdf/cdnatt2002_e.pdf
[38] ibid. p. 3
[39] ibid. p. 4
[40] Brown, Lester. Eco-economy: Building an Economy for the Earth. 2001. 98
[41] Natural Resources Canada. 2002. Canadians' Attitudes Towards Natural Resources Issues. Executive Summary. http://www.nrcan.gc.ca/inter/pdf/cdnatt2002_e.pdf
[42] Ian Bailey. **National Post** April 25 2003. The report is written by Canada West Foundation and is titled 'Looking West 2003' (see also the Looking West 2004 report, which interviewed 3200 Western Canadians –www.cwf.ca).

In BC specifically, the rankings are as follows, with 1 being the most important.
1 Safeguarding and improving the healthcare system: 77.6%
2 Keeping the youth in communities for longer: 67.3%
3 Protecting the environment: 66.1%
4 Rural industrial development: 65.1%
5 K-12 education: 62.5%

In Alberta:
1 Safeguarding and improving the healthcare system: 70%
2 Protecting the environment: 63.6%
3 K-12 education: 61%
4 Keeping the youth in communities for longer: 60.6%
5 Rural industrial development: 57.4%

Summary

People across the country are showing an ever-increasing awareness of the fundamental need to take measures to protect our ecosystems and environment. Governments need to respond by enforcing environmental regulations on individuals and industry, by creating and supporting opportunities for stewardship through education, and by conserving and protecting habitats and entire ecosystems. In this way, they will secure public support and confidence. People across the country consider health and the environment to be of utmost importance. The response should be to ensure the long-term health of ecosystems and hence long-term human health.

4. Environmental Crisis

" A great change in our stewardship of the Earth and life on it is required, if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated." World Scientists Warning to Humanity

Scientists world-wide have documented and warned that the world's ecosystems are at risk. The 15 warmest years on record have occurred since 1980, and NASA scientists reported that in 1998 the Earth's temperature was the highest ever recorded, exhibiting the largest annual increase, setting "a new record by a wide margin";[43] threats to our air, water and human health through global deforestation continues; global resource use is increasing; water quality is deteriorating and its supply waning; world fish stocks are dramatically declining; biodiversity is being lost; world temperatures are increasing; and polar ice caps are melting. In effect, the ability of our ecosystems to fully provide for healthy food, air and water for human populations and habitats for all species is being compromised.

The costs of restoration of degraded ecosystems essential to provide life-giving functions such as detoxification of air, water and soil are not understand or included in public or economic discourse. As the Taiwanese government communicates to its citizens, stewardship and conservation is far cheaper than restoration of contaminated or exploited natural areas. Specific evidence about the costs of restoration is included in **Section Five.**

Forests:

Forests, covering approximately two-thirds (59 million hectares) of the landmass within BC, function as carbon sinks, water filtrators, dwellings, tourist destinations, and sources of products and thus employment.[44] There is significant evidence (see **Section Five**) that there is

[43] Alabama State Board of Health, Bureau of Environmental Services 23 December 1998, "Rules of State Board of Health Bureau of Environmental Services Division of Community Environmental Protection, Chapter 420-3-1.
[44] ibid.

more value to a standing tree than to one that has been cut and processed. These values include a forest's function as a carbon sink and water filtrator. Forests also provide habitat for thousands of species and recreational values within protected forests. As the effects of climate change are increasingly felt; these forest values or assets become all the more obvious. The sustainability of forests requires that its structure, function and diverse composition are maintained, and that forest goods and services are distributed equitably within the community.[45] The long-term sustainability of Canada's forests is significantly compromised by current clear-cut logging practices and ensuing habitat destruction and stream and watershed alterations. Presently in BC, the number of jobs and value generated from a felled tree is lower than the rest of Canada and the world's major timber-producing countries.[46]

Climate Change and its Indicators:

All communities across the world are feeling the effects of climate change, as extreme weather events become common, temperatures shift, habitats alter and sea levels rise. The effects are becoming so widespread that places and specific ecosystems and species face extinction.

Australia's Great Barrier Reef is one of the most vulnerable ecosystems to warmer oceanic temperatures. A recent study projects a 95% loss of coral by 2050. Furthermore, the two-year study estimated a cost to the Australian economy of Australian $8bn (CAN$8.27 billion) and more than 12,000 jobs by 2020 via decreases in the fisheries and tourist industries. The estimated recovery time for healthy coral is 100 years.[47]

The following two examples demonstrate the approach BC and Canada have adopted toward climate change when compared to other countries.

In early February 2004, the BC Provincial Government signaled their non-compliance with requirements for energy sustainability by announcing that it will be spending $17 million over the next three years to support offshore oil and gas development.[48]

In contrast, United Kingdom energy minister Stephen Timms announced a two-fold government-sponsored program to encourage planners and industry to orient their focus toward investment in renewable energy. In addition, subsidies will be made available for a wave hub, an undersea device into which manufacturers of floating electricity generators using wave power can plug their machines. In effect, the government will defray the expenses of manufacture and installation, while space is rented to developers who can in turn test their designs in situ. Furthermore, the government has allowed developers to sell generated electricity to the national grid. Preliminary government estimates for the cost of wave industry electricity are approximately 4p per unit, compared with the 7.5p that consumers currently pay through their meter. This power could provide upward of 10% of Britain's energy requirements.[49]

The chief scientific advisor to the Government of the United Kingdom, Sir David King, is forthright in saying that "…climate change is real. Full stop. Not, maybe. Not, sort of' Real.[50] And in BC, the Provincial government opposes the ratification of the Kyoto protocol.

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[45] Sierra Club of Canada. **"The State of Ontario's Forests: A Cause for Concern"**
[46] Suzuki, David. www.davidsuzuki.org
[47] Kathy Marks. 23 February 2004. "Warmer Pacific Ocean threatens to wipe out coral on Great Barrier Reef within 50 years".
http://news.independent.co.uk/world/environment/story.jsp?story=494192
[48] Bill Keay, CanWest News Service
[49] The Guardian. 17 February 2004. "Breaking with tradition: Using waves to generate electricity has long been dismissed as uneconomical"
[50] Recounted by Anderson, David. 2004. Economic Club of Toronto, Toronto. Feb.20/04.
http://www.ec.gc.ca/minister/speeches/2004/040220_s_e.htm

The Government of Canada's Climate Change Plan acknowledges that the nation is already experiencing the effects of climate change via:

- An ever-increasing number and intensity of heat waves and the related health problems;
- Great Lakes have declining water levels;
- Significant changes in fish migration;
- Gradual melting of the polar ice cap;
- Insect infestations in British Columbia's forests;
- Warmer summers and higher levels of smog in major urban centres; and
- More extreme weather events such as droughts on the prairies, ice in eastern Canada, flooding in Manitoba and Quebec.[51]

Over the period 1990-1999, Green House Gas (GHG) emissions across Canada increased by 15%. The Province of BC estimates that should current trends in BC continue, between 1990-2010, GHG emissions will increase by 38% - one of the largest in Canada. This figure is exceeded only by Saskatchewan and Alberta. Between 1990-1999 – BC's **per capita** GHG emissions actually decreased by 6.3%. However, during this time, population increased by 29% from 3.1 million to just over 4 million.[52] While population growth does account for some of this figure, the increased emissions from the transportation sector, (including more vehicles on the road that are less fuel-efficient and travel longer distances) exceed population growth rate. Transportation is the single largest source of GHG emissions in the province accounting for 42% of total emissions.[53]

The 1990's became the warmest decade in 140 years in Canada.[54] The average temperatures demonstrate that most areas within Canada are experiencing warmer temperatures, with the Mackenzie Basin experiencing the largest climate change, an increase of 2°C over the last 50 years. Northern Quebec and Labrador are actually 1.5°C cooler. Changing daytime temperatures affect plant growth, while differentiating nighttime temperatures affect the times of frosting. In addition, more frequent freeze cycles will threaten the durability of some building materials.[55]

Climate change will increase the potential for disease in humans, including: heat-related illness; respiratory illness; water-borne disease; vector-borne disease; water contamination and weather-related incidents.[56] The worsening health condition of many of the world's ecosystems will continue to result in the demise of many species. As temperatures change, the possibilities for extreme weather events rise. Natural disasters are increasing in number and scale, threatening incomes; damage to property and most significantly, lives. Insurance claims are not readily considered as costs within economic accounting systems. However, recently documented facts and figures demonstrate the immediate crisis within the insurance industry:

"[On a global scale] Natural catastrophes have accounted for 82.5% of all insurance losses in 1990"

"[In 1990] storm damage totaling $13 million accounted for 76% of total damage…$10.1 billion is attributable to a series of eight storms in Western Europe"

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[51] Government of Canada. Climate Change Plan http://www.climatechange.gc.ca/
[52] Ministry of Water, Land and Air Protection. In 1999, total GHG emissions were 63.5 megatonnes of CO2 equivalent, an increase of 10.8 megatonnes or 20% since 1990.
[53] Ministry of Water, Land and Air Protection http://wlapwww.gov.bc.ca/soerpt/993contaminants/troutglance.html. The Province of British Columbia released a report in 2002 titled 'Indicators of Climate Change'. In 1999, 16 tonnes of greenhouse gases were produced per person in BC. The burning of fossil fuels in the transportation and industrial sectors was largely responsible.
[54] Canadian Council of Ministers of the Environment. 2003. Climate, Nature, People: Indicators of Canada's Changing Climate. 5
[55] ibid. 20
[56] Ministry of Water, Land and Air Protection. Indicators of Climate Change for British Columbia. 2002

"Typhoon Mireille, hitting Japan, had cost a staggering $5.2 billion." September 1991
"Hurricane Bob, in the US, had cost $620 million." August 1991.

"Cyclone Gorky, hitting Bangladesh…$80 million in a relatively uninsured area of the world. But it had left 10 million people homeless. It had left 140,000 dead." April 1991[57]

The legal and economic ramifications of ecosystem disasters can truly be debilitating. An ecosystem creates, stores and saves wealth. Legal systems presently in place rarely invoke an economic penalty on external costs. Hence, damage to an ecosystem usually gets ignored as there is no financial burden on those who may be responsible for damages to it. Insurance companies, through the public, will pay the bulk of the ensuing cost. However, as the environmental crisis worsens, it is our children and other wildlife and species who will pay the price of economic short-sightedness. There is an urgent need to appreciate the long-term internalisation of often hidden environmental and social costs.

A Look at Traditional Industries and their Environmental Effects

> "for every person who's employed in the goods sector (resource and non-resource-based), there are three British Columbians who have jobs in service industries". "The two biggest industries in the service sector- retail and wholesale trade and health and social services-together employ more people than all of the goods-producing industries combined".[58]

See **Appendix 3: Resource industries are becoming less prominent. They currently employ about 11% of British Columbia's work force. (Source: Labour Force Survey)**

The export of forest products is the province's most lucrative export commodity, accounting for 52% of exports in 1999 ($15 billion). However, job growth in this industry has increased by only 9% between 1984 and 1999, (compared to employment growth of 53% in all industries). In addition, over the same time frame, the industry's GDP increased 14%, as opposed to an aggregate growth of 58% in all industries. From 1990-1999, unemployment rates within the logging component have remained in the double-digits, (averaging nearly 17% from 1990 to 1998). This statistic is almost double the 9% jobless rate witnessed in the entire country.[59]

The following looks at some of the economic indicators in BC for the last decade. British Columbia follows Ontario and Quebec as Canada's third largest province, home to 13% of the country's population. Furthermore, it produces approximately 12% of the nation's GDP. For the purposes of this report, three trends affecting the BC economy of particular significance are:

> -The shifting nature of the population base - Over the past 40 years, an increasing number of women have joined the formal work force; fewer than 40% of the population are under the age of thirty, indicative of an older population; immigration into the province is high;
> -Primary goods production no longer commands the market;
> -The increasing role of the manufacturing industry – There is an increase in the variety of goods and services that did not feature as prominently 40 years ago.
> -Growing concentration of population, jobs and industrial activity in the Lower Fraser Valley and Southern Vancouver Island, for example, reveal the impacts of urbanization

[57]Reiss, Bob. 2001. The Coming Storm: Extreme Weather and Our Terrifying Future.
[58] Hallin, Lillian. A Guide to the BC Economy and Labour Market.
http://guidetobceconomy.org/chap3/chap3.html; http://www.bcstats.gov.bc.ca/pubs/bcbi/bcbi0201.PDF
[59] ibid

from increased real estate development and transportation infrastructure.[60]

Despite alarming environmental impacts, destructive development activities continue unabated. This section mentions only a few ecological and social repercussions of these industrial practices. The reason for this is three-fold. Firstly, the ecological damages committed are so large that only a few need to be recalled. Secondly, the intent is to call into question the values assigned the ecosystem goods, services and functions. And finally, the question is raised, are these values an accurate reflection of the true cost of what is being practiced.

The World Wildlife Fund of Canada has developed a procedure for appraising the ecological footprint of various industrial practices within the country, termed the Nature Audit. It employs an interactive map interface together with a detailed analysis of its findings.

The study has ranked the nation's top five industries, with 1 having the heaviest footprint.
1.Transportation and Urban Development
2. Forestry
3. Large Dams
4. Oil and Gas
5. Mining[61]

Presently, the number of jobs and value generated from a felled tree in BC is lower than the rest of Canada, the U.S. and the world's major timber-producing countries. "The solution? Add more value to every tree we cut – from logging, to sorting, to processing. This will allow us to cut fewer trees and maintain the forest ecosystem, as well as providing a livelihood for the people in our coastal communities ".[62] Neither mining nor forestry, two recipients of large government subsidies, has promising economic outlooks. In both, the availability of employment is decreasing, as are the non-renewable resources they rely on. Furthermore, public opinion is in favour of healthier and more-efficient industry activities, as is the preference for manufactured commodities.

Furthermore, the aforementioned study by MiningWatch Canada and the Pembina Institute found that despite growing subsidies from the federal and provincial governments, employment in the mining sector has declined by 12% between 1994 and 2001, and the sector's contribution to national Gross Domestic Profit (GDP) fell by 8%.[63] Reasons for the continual decrease in jobs available in the resource industry are myriad, but may include the following:

-Resources are depleting in this province and around the world
- Resource sector industries are gradually losing popularity among the Canadian public - Gradual investor demand is shifting away from traditional reliance on non-renewable resources
-The changing nature of the increasing population base is beginning to demand more manufacturing and service industries
-The export of raw products has meant an increasing number of jobs are moving elsewhere

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[60] **"Liveable Region Strategy"** from the Research Department of the Greater Vancouver Regional District
[61]World Wildlife Fund.
http://www.wwf.ca/AboutWWF/WhatWeDo/TheNatureAudit/TheNatureAudit.asp?page=0.1
[62] Suzuki, David. http://www.davidsuzuki.org/Forests
[63] The Green Budget Coalition. 18 June 2003. **"Federal Government Proposal Gives Mining, Oil and Gas Industries $260 million/Year Gift at Taxpayers Expense".** http://www.greenbudget.ca/media.html

Fishing:

Once the primary food source of First Nations, particularly coastal communities, the fishing sector has suffered enormously over recent decades. The downturn in the fishing and fish processing industry can be appreciated through its low contribution to GDP. In 2001, the industry generates less than half a percent of the province's total GDP[64]. The figures for the industry's share of employment are similarly low. Aquaculture has been increasing as wild fish stocks are declining. "Because the commercial fishery, fish processing and sport fishing industries depend on a resource stock that varies from year to year, the fisheries and aquaculture sector displays considerable volatility…in recent years the sector has faced significant challenges as the decline in the salmon fishery and uncertainties related to resource management issues in the sport fishing industry adversely affected the sector's performance in the late 1990's"[65]

A January 2004 front-page article of **The Globe and Mail** read:
"Salmon farming industry reeling, Canada's $700-million Atlantic salmon farming industry has been handed a sharp blow". The article quoted a newly released U.S. study disclosing the perils of eating farm-raised Atlantic salmon. The evidence of the fish being laced with PCB's prompted researches to state that the fish should be eaten rarely, given the risk of cancer. Not only did the report make front-page news in Canada, the U.S., Denmark and Scotland, but it was also published in the journal **Science**.[66]

Nonetheless, the study only examines one documented repercussion of fish farming, overlooking various implications for ecosystem health, such as contamination of other species such as oysters, clams and seals, near the farms. These include the degradation of habitat through sewage outflows from farms; rapid sea lice infestation killing wild fry near the farms; mixing of the gene pool between wild and farmed Atlantic salmon, and other effects which are still uncertain, yet potentially devastating in the long term.

Summary

Scientific research documents the increasing threats and significant changes to the health of species, ecosystems and humans. For example, overly exploitive activities are causing forests and water systems to deteriorate rapidly. Climate change, being felt worldwide, affects not only ecosystem health, but also human health and the economy, initially revealed through insurance claims. A brief review of the ecological footprints of the major industrial sectors reveals increased environmental impacts within the oil and gas, forestry, mining and urban infrastructure sectors. Continued reliance on non-renewable resources does not reflect growing public sentiment, yet Canada and British Columbia continue to focus priorities on these industrial sectors.

5 Economic Valuation Methodology

The economic/societal paradigms that provide a framework for contemporary economic systems are outdated. When they were initially developed, global human populations were far smaller; resources were in greater abundance and spaces uninhabited by humans more prevalent. It is incongruent to sustain policies that arose at this time, for present conditions have altered substantially. The arguments for an evolved economic system are compelling given the economic, social and environmental crises now facing us.

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[64] BC Stats. 2002. **"British Columbia's Fisheries and Aquaculture Sector".** P. 20. Available at http://www.bcstats.gov.bc.ca/data/bus_stat/bus_ind.htm

[65] ibid. p.21

[66] Kennedy, Peter. January 8, 2004. in The Globe & Mail

One of the root causes of resource depletion, ecosystem degradation and human suffering is due to the repercussions of contemporary economic models of consumption. These models do not appreciate the full cost of the goods, services and functions provided by ecosystems. The GDP is wielded as a measurement of a country's success. However, it should be reconsidered as it sums all production without differentiating between costs and benefits.[67] Furthermore, it is a reflection of select contemporary value systems that should be expanded to account for a more inclusive array of ecosystem assets and their values.

Triple bottom line accounting considers the environmental, economic and social costs of an activity. However, difficulties arise in reconciling values with triple bottom line or full cost accounting, as environmental and social costs do not necessarily accrue a visible economic impact. Full cost accounting identifies the internal and external costs of a product or activity. Private costs relate to the actual economic debts accrued that affect the bottom line. These include labour costs and capital costs. Externalised costs involve the environmental and social repercussions of an activity. The social implications of a town's major employer re-locating, or the environmental costs of polluted air in a region downwind from a mill are examples of such costs. These costs do not necessarily cause any financial burden unless the company has disobeyed a pollution law etc. Instead, costs are displaced on the rest of society for generations.

Herman Daly and John Cobb have attempted to adjust GNP to account mainly for depletions of natural capital, the effects of pollution and resulting income distribution. Daly and Cobb attribute monetary values to the natural capital we consume and the costs of ecological restoration. The result is an "index of sustainable economic welfare (ISEW)".[68] In reference to **Appendix 2**, it is clear that income cannot be sustained through current consumption. Figure 1 shows the ISEW index compared to GNP between 1950-1986. GNP rose, but ISEW remained relatively unchanged since 1970. If the costs of the loss of farmland, wetlands and health costs resulting from increased pollution are accounted for, the economy has not improved at all.

Economic literature typically distinguishes between use and non-use values when identifying goods, functions and services. Use values include direct use value, such as recreation, tourism etc; indirect use-values include ecological functions such as watershed protection or services such as habitat for pollinating insects. Indirect use-values are largely unmeasured by contemporary markets, including option values, or the possibility of utilising something or some place in the future.

Non-use values are those that are not associated with actual use. For example, catching fish from the ocean to consume would be a use value, as would appreciating the ocean for its recreational possibilities etc. A non-use value would be protecting a good, service or function for future users (bequest value), and the knowledge that part of the natural environment will continue to exist even if the individual holding this value never contemplates using it (existence value).

Economic systems assign market value by gauging human preference. Goods and services presently traded on the market reveal some of these values. Difficulties arise within economic discourses where market measurements do not exist for certain values. There are various generally accepted approaches to estimating values held by people for both market and non-market values. These include: Market Price Method; Productivity Method; Hedonic Pricing Method; Travel Cost Method.

[67] Costanza,Robert. 1997. Frontiers in Ecological Economics. 45
[68] ibid. 45-46

1. Market Prices – Revealed Willingness to Pay (WTP). The values of some ecosystem goods or services are measured using market prices. Other ecosystem services, such as clean water, are used as inputs in production, their value measured by their contribution to the overall profits from the final good. Some ecosystem or environmental services, like aesthetic views or many recreational experiences, may not be directly bought and sold in markets. However, the prices people are willing to pay in markets for related goods can be used to estimate their values. For example, people will pay higher prices for real estate with a view of the ocean. Willingness to Pay (WTP) can be problematic however, as people aren't all well informed about the myriad values that can be assigned things or places. For example, many people may pay little to save intertidal and estuarine plants such as eelgrass as they are not aware of the integral function these plants perform within their ecosystems. Furthermore, such priorities are not necessarily expressive of the desires of future generations.

2. Hedonic pricing evaluates existing markets, such as housing or labour markets. It is surmised that values within the market embody a number of benefits of which an environmental good is but one. The challenge lies in recognising this good. Quayle and Hamilton, in their research of the impact greenways will have on the real estate value of property, ascertain that greenways provide a long economic edge by bordering smaller adjacent properties, thereby boosting property values through expanding the aesthetic value. Furthermore, they acknowledge that "greenways...have become one of the most 'rapidly growing conservation initiatives".[69]

The contingent valuation method is particularly attractive, as it allows for possibilities of gauging people's willingness to pay (WTP) for a good or service and people's willingness to accept (WTA) for its loss. The evaluations are articulated through surveys and experiments. Empirical studies have shown that people will place a higher value on preserving something or a place that exists and will offer less to compensate for its loss or damage.[70] The direct application of this model will become relevant again through the course of this report.

Commonly Accepted Methodologies

As described in the previous section, "values" are attempts to measure how important ecosystem goods, functions and services are to people. "Functions" include the physical, chemical, and biological processes or attributes, for example the provision of wildlife habitat. "Services" are the beneficial outcomes resulting from healthy ecosystem functions, for example the harvesting of animals or plants. Services and functions are valued for their physical, chemical and biological roles within ecosystems; for their spiritual, cultural, social or economic reasons; they are valued by how much they cost to produce, restore or extract; and they have intrinsic values.

Paul Hawkens and Robert Costanza, leading researchers in ecological economics, have enumerated and discussed many of the ecosystem values and functions that are most often excluded from economic parlance. **Table 1** includes a list of ecosystem services adapted from Hawkens[71].

[69] Diamond and Noonan in Quayle and Hamilton. 1999. P. 6, 7. Corridors of Green and Gold: Impact of Riparian Suburban Greenways on Property Values

[70] International Union of Conservation for Nature and Natural Resources, (IUCN) and the World Commission on Protected Areas. Guidelines for Protected Areas Managers. P.19

[71] The Academy of Natural Sciences. Adapted from: Hawkens et al. http://www.acnatsci.org/research/kye/KYE8tab.html

Table 1: A List of Important Ecosystem Services
- Fixation of solar energy and conversion into materials -Production of oxygen -Bio/genetic diversity -Purification of water and air -Storage, cycling and distribution of freshwater -Regulation of the atmosphere -Migration and nursery habitats for wildlife -Decomposition, sequestration and detoxification of human and industrial waste -Genetic library for human applications -Natural pest and disease control -Management of erosion and sediment runoff -Flood prevention/ regulation of runoff -Protection against cosmic radiation -Regulation of chemical composition of the oceans -Regulation of climate -Formation of topsoil/maintenance of fertility -Production of grasslands, fertilisers and food -Storage and recycling of nutrients

Difficulties arise in evaluating the economic costs of sustained disturbances to ecosystems. Numerous researchers around the world have addressed the effects of such disturbances on ecosystems, and reports have been published detailing such diverse ecosystems as coral reef preservation and wetland conservation.

The American Association for the Advancement of Science published a report stating that conservation of an ecosystem is 100 times more economically profitable than its exploitation. This figure is based on seminal research done by Costanza et al. Ecosystem goods and services, such as water filtration and climate regulation, were included in the estimate. The costs incurred through the restoration of these ecosystems were also included in the cost of exploitation. Final estimates suggest that the worldwide loss of natural habitat costs approximately US$250 billion every year. Furthermore, once the damage has been done, this loss compounds new debt and repeats itself in perpetuity.

For the purposes of the study, five real-life examples were examined: logging in Malaysia; small-scale agriculture in Cameroon; mangrove swamp conversion for shrimp farming in Thailand; drainage of marshlands for agriculture in Canada and the destruction of coral reefs for dynamite fishing in the Philippines. The report revealed that the economic benefits of maintaining an ecosystem far supersede the profits made from its conversion through jobs or sales. The values were determined by recording the economic flows within surrounding habitats where sustainable development and resource use practices were upheld. The report also suggested that outright preservation of ecosystems or the practice of sustainable management plans also lend themselves to more equitable profit sharing within communities.

This report establishes two very important facts:

a. An intact ecosystem is worth 100 times its value than that of a developed area;
b. Ecosystem goods, services and functions were attributed economic values in the equation[72]

Robert Costanza estimated the following values of select global ecosystem goods and services: (In trillion $US)

Table Two **The Value of the World's Ecosystem Services and Natural Capital**
Soil formation 17.1 Recreation 3.0 Nutrient cycling 2.3 Water regulation and supply 2.3 Climate regulation (temperature and precipitation) 1.8 Habitat 1.4 Flood and storm protection 1.1 Food and raw materials production 0.8 Genetic resources 0.8 Atmospheric gas balance 0.7 Pollination 0.4 All other services 1.6 **Total value of ecosystem services 33.3**[73]

The total value of US $33.3 trillion is considered a minimum value; appreciating the fact that ecosystems worldwide are understudied. Furthermore, as supplies of goods and services decrease, the values will increase. Costanza assigned values to ecosystem functions in terms of their provision for human needs. The sum of all measured ecosystems became the $33 trillion figure, a number larger than the sum of global GNPs in 1997. **In effect, the value of what was external to the market was greater than that measured within, serving to elucidate Costanza's argument that external costs, many of which are ecological in scope, need to be included within current accounting services.** In a survey on the economic value of wetlands, Robert Costanza utilises the WTP method together with the energy analysis (EA) method to assign monetary values to complement other values attributed to ecosystems. The EA method measures solar energy captured by ecosystems as a way of quantifying and articulating value, in this case largely determined by biological and chemical function. This value becomes Gross Primary Production, (GPP) or the amount of solar energy captured and stored in plants. It is then correlated to an economic value by determining how much energy from fossil fuels it would take to produce the same energy. [74]

Additional studies have been conducted around the world wherein economic values are allotted to ecosystem goods, services and functions through creating hypothetical markets to read the public's WTP. WWF Canada reported on the economic values of wetlands, largely through recognised valuation methods including WTP. They also made use of the Travel Cost Method, measuring distance costs in gaining access to an environmental good, time cost for the person traveling, and any applicable entrance fees, such as to a park.[75]

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[72] Balmford, Andrew et al. 9 August 2002. **'Economic Reasons for Conserving Wild Nature'**. Science 2002 297
[73] Adapted from R. Costanza et al., **"The Value of the World's Ecosystem Services and Natural Capital,"** Nature, Vol. 387 (1997), p. 256, Table 2. Viewed at Sustainable Development Information Service. 'Valuing Ecosystem Services' http://www.wri.org/wri/trends/ecoserv.html
[74] Costanza, Robert. 1997. **Frontiers in Ecological Economics**. 48
[75] World Wildlife Fund Canada. rest of reference

Another methodology commonly employed measures the cost accrued once an ecosystem has been altered. For example:

-$484-$707 million: the estimated annual cost of soil erosion in Canada[76]

-New York City avoided spending US$6 to US$8 billion to build a new water treatment plant by opting to enhance and protect the upstate watershed. An investment of US$1.5 billion allowed for the purchase of surrounding land to act as a buffer, habitat and recreation zone[77].

Once a parcel of land or water is secured, the services of ecosystems are free, and the economic, ecological, social and spiritual benefits that accrue over time are enormous.

Activities, such as restoring riparian zones engage people as stewards of their surrounding natural environment. The following reflects definitions and values of the stewardship and conservation sector.

Stewardship & Conservation Assets and Values

1. **Stewardship** - the care of our environment, practiced by all citizens or entities including: landowners – farmer, urban dweller; businesses such as auto industry practitioner – educator; biologist; conservation scientist; volunteer or corporate entity (care of product full cycle to ensure sustainability)

2. **Parks** – the protection of areas including both land and water generally open to the public. The functions and services that are hence safeguarded include:
   a. recreation
   b. health
   c. filtration/clean water
   d. clean air (carbon sink)
   e. biodiversity and wildlife habitat & species protection
   f. eco-tourism
   g. educational & spiritual – essential connection with nature

3. **Conservation of private lands and ecological reserves:** in most situations, this land is of particular ecological significance both because of its high biodiversity and because it is often in highly impacted areas. Some of the ensuing values include:
   a. increased land values of parcels surrounding protected land;
   b. provision of corridors for parks, protected areas or trails;
   c. preservation of biodiversity;
   d. protection of species and habitats, including aquatic ecosystems;
   e. protection of clean water supplies;
   f. provision for eco-tourism and other services, such as hunting and fishing

See **Appendix 4**, the **Summary of Protected Values**, for an example of the myriad types of assets protected through stewardship and conservation practices. The table represents some of the data collected by members of The Land Trust Alliance of BC. (www.landtrustalliance.bc.ca)

[76] ibid

[77] Richard M. Stapleton, Protecting the Source: Land Conservation and the Future of America's Drinking Water (The Trust for Public Land, San Francisco, 1997), pp. 5-6.

What follows are some examples of studied species and ecosystems that have been assigned various economic values within this growing practice of ecological economics.

Trees

The value of a standing tree has been documented by the Center for Urban Forest Research. The argument concludes that there are higher values for the plantation and/or protection of large trees over smaller ones. Large trees in urban areas serve to "mitigate an urban heat island and cool parking lot; reduce storm water runoff, extend life of streets, improve local air, soil and water quality, reduce CO^2, create habitat, increase property values…".[78] In most areas in the United States, a large tree can be planted and cared for in a community for an economic cost of US$13. The report suggests that each tree provides, on average, US$65 in return. The return includes money saved through energy conservation, air and water purification, and increased property value.[79] If these approaches/values were configured into land assessment practices, land would not be valued solely for what could be built on it, or the value of removed timber.

Parks

The economic benefits of parks are enormous, some of which have been documented by the BC Ministry of Water, Land and Air Protection. Their analysis has shown the following:

- 1999 expenditures related to parks approximate $533 million;
- 90% of these expenditures were a result of visitor spending. Every dollar invested by government is met with $10 from a visitor;
- Almost one third of expenditures are committed by out-of-province residents;
- Parks generate $219 million in tax revenues for the federal and provincial governments;
- The economic benefits enjoy wide distribution throughout the province[80]

This analysis acknowledges that there are values associated with parks that exist outside of the contemporary economic classification, and that the significance of these qualitative values should not be ignored.

Wetlands

"They [wetlands] are neither firm `lands' in the conventional sense nor bodies of open water; hence they occupy a transitional position between land and water. The ecosystems that develop on such lands are dominated by the persistent presence of excess water. Wetland is defined as `land that has the water table at, near, or above the land surface or which is saturated for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic vegetation, and various kinds of biological activity that are adapted to the wet environment'." [81]

Wetlands are some of the most traditionally misunderstood and yet ecologically replete ecosystems we have. Canada's role in the protection of wetlands should be acknowledged given that over 24% of the world's wetlands lie in Canada. In turn, it is estimated that only 10% of the nation's wetlands are in protected areas. Wetlands offer permanent habitats to a myriad of species, as well as temporary destinations for a number of migratory birds. Given the constant presence of water, wetlands perform functions integral to the survival of surrounding locales. They are known to store, filter and clean water that flows through them. Many of the plants peculiar to wetlands can absorb and hold potentially toxic compounds. "These imperfectly

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[78] The Center for Urban Forest Research. "**The Large Tree Argument: The case for large trees vs. small**". Fall 2003. p. 1

[79] ibid. p. 2

[80] Ministry of Water, Land and Air Protection. "**Economic Benefits of British Columbia's Provincial Parks**". 2001. p.3

[81] Tarnocai in "**Protecting British Columbia's Wetlands – A Citizen's Guide**." 1996. p. 3

understood processes can immobilize, transform and fix contaminants, preventing a high proportion of them from flowing out or entering groundwater or the food chain. The efficiency of heavy metal removal varies from twenty to one hundred percent." [82]

In addition, wetlands are able to transform nutrients and even filter toxins. Their filtration capabilities have been employed as sites for sewage treatment.[83] Wetlands can "fix and render harmless viruses, coliform bacteria and suspended solids normally left after secondary sewage treatment." [84] With the abundance of wildlife and striking beauty, wetlands have also become a popular tourist destination, such as the Reifel Bird Sanctuary in Ladner, B.C.

Total value (US$) per hectare per year	
Estuaries	**22,382**
Seagrass/algae beds	**19,004**
Coral reefs	**6,075**
Tidal marsh/mangroves	**9,990**
Swamps/floodplains	**19,580**
Lakes/rivers	**8,498**

[85]

Summary

Outdated policies and practices shape Canada's economic policies and practices. The full costs of prevailing economic activities are not adequately understood, valued or measured. In order to implement full cost accounting, Canada's economic valuation requires expansion. This section reviewed contemporary economic valuation methodology, introducing the work of several researchers and organisations, including Robert Costanza and Paul Hawkens, who have calculated some of the full costs of resource extraction and depletion. The economic values that have been assigned to ecosystem goods demonstrate the extensive services and functions present in healthy ecosystems. A healthy and effective economy is only possible in tandem with thriving ecosystems. Sample studies on the values of trees, parks and wetlands illustrate these conclusions. A healthy and intact ecosystem is estimated to provide 100 times more value than one that is altered or developed.

6. Sustainability and the Changing Face of Market Practices in Canada

Canadian Minister of the Environment, David Anderson, in addressing the concept and application of sustainable development, said "…during the past 15 years in particular, we've seen a growing recognition that environmental issues are linked to economic issues, and to social issues, which is why the term sustainable development and a broader understanding of environmental issues have become more common."[86]

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[82] Maltby. p. 64 in Nowlan, L & Jeffries, B. "**Protecting British Columbia's Wetlands – A Citizen's Guide**": 1996 http://www.wcel.org/wcelpub/1996/11580/11580_what.html;

[83] See BCWETNEWS #5

[84] ibid, p. 64

[85] Adapted from Ramsar, http://www.ramsar.org/values_intro_e.htm, in turn *Taken from Costanza et al.1997. The value of the world's ecosystem services and natural capital. Nature 387, 253-260.

[86]Anderson, David. 16 February 2004. National Press Club Newsmaker Breakfast. Ottawa

"What are we aiming for – for our children's children, based on our natural resources and our industrial base? How will we match the energy options of a continually growing economy and a continually rising standard of living, with the environment that our citizens want and deserve?"

"DuPont Chemicals for example, will have cut its greenhouse gas emissions by 65% from 1990-2010, increasing output by 35% over the same period.[87] "It makes good economic sense to take action on efficiency and productivity, even without the climate change imperative".[88]

In **Section Four**, the nation's five most ecologically destructive industries were listed.[89] In terms of sustainability, these industries and their practices need to be altered. Industries with the largest ecological footprint are associated with transportation and urban development. This sector determines how and where people and goods are transported. If economic systems were to account for wastefulness, excessive un-renewable energy use, habitat destruction or alteration, pollution, effects on human health, and so forth, current practices would not be seen as economically viable. Instead, these industries should focus on renewable energy, less waste, full cost accounting practices and the protection of natural systems, including biodiversity. Thus, initial costs to adapt business practices would result in healthy environments, offering more long-term stable economic benefits. The following cases make the point.

Reducing waste and inefficiency within the construction sector would ensure clean air and water and reduced energy use. The following sample projects equipped select buildings with more efficient energy systems. In every case, the installation costs of retrofitting were accounted for within a few years, and the economic benefits via reduced energy consumption have become enormous.

Alberni School District (SD70): Retrofit measures cut electricity use by more than 40%

Sooke School District (SD62): First school district in British Columbia to undertake a performance contract, reduces annual energy bills by more than 30% since 1996

St. Paul's Hospital: Utility costs reduced by 21% annually and dramatic improvements to indoor air quality and ventilation in operating rooms[90]

In order to create and maintain greater sustainability, subsidies, policies and legislation should be adjusted directing future practices in this country. Various tools have been suggested by noted researchers and institutions including David Richard Boyd, Paul Hawken, the National Round Table on the Environment and the Economy, The Green Budget Coalition and Ecotrust Canada. Included in these fiscal reforms are: tax shifting, investment and insurance alternatives, increased education and the shifting of subsidies. Some of the key market drivers in the Canadian economy include the costs of energy, and government incentive programs. The latter includes subsidies, regulatory and voluntary incentives.

In the aforementioned report comparing Canada's environmental record to that of Sweden, some of the tools the Swedish government has employed are worth noting. The premise to these changes is Sweden's overarching commitment to sustainability – their goal is to achieve national sustainability within a generation. Sweden is moving toward full cost accounting using instruments such as environmental taxes and transfer of subsidies. These instruments are used concurrently with 15 environmental quality goals, including: clean air; high quality groundwater; flourishing wetlands; sustainable forests; and a protective ozone layer. These are not just ideas but policies that are regulated through timelines and targets

[87] Anderson, David. 2004. Economic Club of Toronto, Toronto. Feb.20/04. http://www.ec.gc.ca/minister/speeches/2004/040220_s_e.htm
[88] ibid
[89] See WWF **Canada Nature Audit**
[90] http://www.greenbuildingsbc.com/retrofit/case_studies.html

enforced by law. Taxes have been placed on waste, sulphur content in fossil fuels, pesticides, motor vehicles, and energy use. Sweden makes $10 billion per annum from these taxes. With 3% of its GDP dedicated to environmental protection, (1% of Canada's GDP) and with the money retrieved through taxes, Sweden's prospects for sustainability look promising[91].

The National Round Table on the Environment and the Economy's **Report on Ecological Fiscal Reform** has explored various techniques for realigning taxation and expenditure programs on a national level. The advisory remarks that this is because "the federal government has made sustainable development an overarching policy objective, but has only employed to a very limited degree its single most powerful policy instrument-fiscal policy-to achieve that objective…The reality is that Canada has not consistently used fiscal policy in an integrated, coherent, and strategic fashion to promote the achievement of environmental policy objectives."[92]

The Report examines three specific environmental concerns as examples of how tax and expenditure shifting can assist with Ecological Fiscal Reform (EFR)[93].

1. Agricultural Landscapes

As mentioned previously, traditional, large-scale agricultural practices have often altered or destroyed natural ecosystems, especially wetlands and riparian zones. The implementation of an extensive education program within farming communities is suggested. This program would expose farmers to the ecological and economic benefits of ecosystem-based planning and practices. Incentives to change from current practices would include:

- a municipal property tax credit - offered for land preserved in addition to or rather than land dedicated to agricultural productivity
- direct incentive payments - offered to farmers who implement conservation and stewardship practices. [94]

These policies could complement tax incentives, such as Canada's Ecogift program, already in place for landowners who dedicate land to conservation through conservation easements or covenants. The incentives should however be more pronounced and offer the elimination of capital gains tax on donations of land to conservation. Furthermore, changes to appraisal valuation methods should be made so that land will be appreciated for all its ecosystem functions and not merely for the value of potential development.

2. Chemical Substances

The EFR proposals discuss how voluntary initiatives, tax shifting and tradable permits can be implemented as incentives to encourage more ecologically sensitive use of chemicals.

3. Cleaner Transportation

Three initial reforms include:

- The implementation of an accelerated capital cost allowance - awarded to refineries that increase production and move away from the use of sulphur diesel fuels;
- The implementation of a differential tax on low-sulphur diesel (or biodiesel) at the gas stations (reaching consumers directly) - to encourage purchase of cleaner fuel;
- A policy of encouraging retrofitting of older vehicles, as well as encouragement to purchase newer vehicles with more efficient engines – this may be achieved through fee bates or tax cuts[95]

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[91] Boyd, David Richard. 2002. **"Canada vs. Sweden: an Environmental Face-off"**. P 15

[92] National Round Table on the Environment and the Economy. "Ecological Fiscal Reform". http://www.nrtee-trnee.ca/eng/programs/Current_Programs/EcologicalFiscalReform/EcologicalFiscalReform_e.htm

[93] Policies that allow for economic growth concurrent to sustainable development. Taxation incentives are one example.

[94] ibid. Executive Brief. "Ecological Fiscal Reform in Canada". p. 1

[95] ibid. p. 3

The summary does not detail many alterations to infrastructure that are fundamental to the changes needed to provide alternate consumptive options. Furthermore, it should be noted that these reforms are part of a need for massive infrastructure and social changes wherein tax and expenditure shifting are but one aspect.

Paul Hawken, Amory and Hunter Lovins write of the New Natural Capitalism: Creating the Next Industrial Revolution. Some of the fundamental tenets include:

- increased productivity of natural resources – this would encourage less wasteful and hence more profitable activities;
- a shift to 'biologically inspired' production models and materials, allowing for a possible elimination of waste (especially toxic)
- a move to a service and flow business model whereby quality as opposed to quantity will determine happiness and satisfaction
- the need to reinvest in Natural Capital – including the increased funds for environmental protection and restoration [96]

The Green Budget Coalition separates its 2004 budget recommendations into four key categories:

1. Ecological Fiscal Reform – including the shifting of gasoline taxes – This provides for the allocation of revenue from the 'federal deficit reduction tax' on gasoline sales (1.5 cents/litre) to a Green Transportation Fund, (local governments can use this to help fund alternative transport).[97]
2. Clean Air and Climate Change – including wind power production incentives
3. Healthy Communities and Toxics Cleanup
4. Protecting Canada's Natural Capital – including the infusion of more money to protected areas strategies, (marine and terrestrial); increase the funding to the Ecological Gifts program[98]

EcoTrust has developed a detailed description and analysis of what they call the 'Conservation Economy'. Details on economic and social policy adjustments are explained, providing a comprehensive and effective exemplar of a "new" economy. In the same vein as the aforementioned groups and individuals describe tax-shifting techniques, Ecotrust also mentions "development impact fees". These are intended to assume the costs of new infrastructure and development, such as those provincially funded retrofitting programs described above. Another example, the Oregon Office of Energy offers a 35% tax credit on state taxes if renewable energy, recycling, energy efficiency, and alternative transportation projects are implemented. Ecotrust also calls for the recognition and support of bioregional economies. Such decentralised systems are more diverse and would focus on value-added, sustainable exports and reduced imports. Integral to such economies is a greater recognition of environmental, social and natural capital.[99]

Canada needs need to become more inventive and more committed in its our approaches to economic and environmental sustainability. In addition, investing in social capital will increase the value Canada places on human ingenuity. Prime Minister Paul Martin said, "Over the course of the next generation, China and India are going to become massive economic superpowers. And, in fact, if they do so in the way we became strong economies, then the cost

[96] Lovins A, Lovins H. & Hawken P. Natural Capitalism – Creating the Next Industrial Revolution. 4-6
[97] Green Budget Coalition. Greening the Canadian Economy. http://www.cnf.ca/about/gbc_1.html
[98] ibid
[99] Ecotrust. The Conservation Economy, a project of Ecotrust. http://www.conservationeconomy.net/

to nature and the cost to the planet are simply going to be catastrophic…The development of new technologies, much of which I hope comes from here, is going to be absolutely key."[100]

Canada is unique with its rich natural heritage and educated population base. Recognising this capital, (human and natural) is as important a precursor to sustainability as is the need to safeguard natural capital for all people through time. In late February 2004, the UN Convention on Biodiversity was held in Kuala Lumpur, Malaysia. The world's governments agreed to establish a network of global protected areas, (a terrestrial network by 2010 and an oceanic by 2012) that includes approximately 40% of the Earth's surface, the oceans with its sea mounts and cold-water reefs.[101]

The need for a greater diffusion of government subsidies and other support mechanisms to stewardship and conservation is fundamental. The Environmental Non-Governmental Organisations (ENGO) carry out significant stewardship and conservation activities in Canada and BC, and yet find themselves in a situation wherein their funding requirements are far from met. This will be examined in the next section.

Summary

Achieving sustainability in this country depends on the health of ecosystems and sustainable human activities. This section examined various tools suggested by noted researchers and institutions in the context of fiscal and policy reforms. These tools include tax shifting and the transfer or careful adjustment of subsidies to environmentally sustainable industries. The elimination of taxes on donations of land would support the stewardship and conservation sector and accelerate ecosystem protection. These reforms ought to coincide with increased environmental regulation. A more profound change indicates re-evaluation of appraisal methodology, especially given the real economic costs of development and restoration compared to the 100 times more significant value of natural areas left intact. Successful examples of economic and environmental sustainability are examined in Sweden, a country similar to Canada's in population and climate. The UN Convention on Biodiversity held in Kuala Lumpur in 2004 signals an effort to assign greater value to biodiversity conservation. Stewarding and conserving Canada's ecosystem goods, services and functions can be achieved based on an understanding of their immense values, together with a commitment to use these suggested reforms to alter policies and practices. Thus safeguarding Canada's future health and wealth.

[100] Paul Martin, cited by David Anderson. 20 February 2004. Economic Club of Toronto, Toronto. Feb.20/04. http://www.ec.gc.ca/minister/speeches/2004/040220_s_e.htm

[101] Greenpeace News Release. 20 February 2004. Kuala Lumpur, Malaysia

7. Funding Crunch in the New Millennium

Stewardship and conservation organizations, in addition to governments, are key players in building public awareness and support for directly protecting and stewarding nature, providing sustainable solutions to our current crisis. The following contains direct quotations from and references to an extensive commissioned research piece from the 2003 Stewardship & Conservation in Canada conference, **The Leading Edge.** Undertaken by Dovetail Consulting in Vancouver, BC, it surveyed NGOs across the country, and is titled **Appreciating the Values, Needs and Potential of the Stewardship and Conservation Sector in Canada: Strategic Directions for Funding and Other Support.**[102]

Ecological, Social and Economic Services to Society

Over the past decade the stewardship and conservation sector has increased influence, has grown in size and diversified, has a broader geographical scope, and is adopting a more proactive, longer-term perspective. Groups have increasing expertise, capacity, and activity levels, are taking on work formerly done by government, and are implementing measures directly through hands-on projects.

The environmental contributions of the stewardship and conservation sector include:

- awareness raising;
- public and community engagement;
- policy and legislation improvements;
- innovation and management advances toward sustainability;
- restoration and protection of land, air and water;
- promotion of stewardship practices on private land;
- research;
- provision of information, knowledge and tools; and
- building partnerships

The social contributions of the sector include:

- community building and cooperation;
- education and awareness-raising;
- health benefits of a clean environment;
- quality of life, including recreation;
- increasing community debate and engagement; and
- cultural and spiritual benefits.

The economic contributions of the sector include:

- preventing costs to society and the government – now and in the future;
- protecting/restoring environmental services;
- protecting/restoring the resource base;
- doing work on a volunteer or lower cost basis than government;
- providing a basis for recreation and tourism;
- spending on conservation measures;
- spending by stewardship and conservation organizations; and
- attracting population and higher property values.

These extensive, highly important contributions of the sector are largely under-appreciated by Canadian society – the work is valued, but not to the degree it deserves. This is largely because of inadequate public awareness of the importance of stewardship and

[102] ***Appreciating the Values, Needs and Potential of the Stewardship and Conservation Sector in Canada:*** **Strategic Directions for Funding and Other Support**, Dovetail Consulting, Julia Gardner, Catherine Sherlock, Garvin Hunter, Leading Edge Collection, June 2003.

conservation, especially in relation to economic pressures: when environmental priorities are perceived to compete with economic ones, short term economic forces come out ahead. . Another societal trend that is unfavourable to the sector is declining participation in volunteer activities.

Forces Affecting Successful Stewardship & Conservation

Currently, negative economic forces such as the downturn in the stock market present a number of challenges for the conservation and stewardship sector. There is less wealth in the hands of foundations and individual donors, and international, political-economic issues compete with environmental priorities for attention. Donors are demanding increasing accountability in the spending of their smaller and fewer grants by NGOs. Motivating behaviour change and commitment to stewardship and conservation among private landowners, companies and individuals becomes more difficult as the need to find more support requires more of the time formerly taken by on the ground projects, and as the focus moves more toward to the "unconverted." Landowners need more incentives to practice stewardship on their property. At the same time, pressures on ecosystems and resource scarcity add to the urgency and workload of conservation and stewardship groups.

Rather than working to help alleviate these pressures, governance in Canada does not provide to the conservation and stewardship sector sufficient power, priority, or policy and legislative support. Power and influence in our political system work against stewardship and conservation groups, and government does not place a high enough priority on conservation and stewardship. Furthermore, government policies, environmental laws and regulations need improvement to better protect the environment.

The Problem – A Crisis

As the need for restoring, maintaining and protecting wildlife, ecosystems and other natural values has increased, funding for non-profits, from both public and private sources, has become scarce and more restricted.

The Dovetail Report summarizes the following associated problems:

- Generally, funding is insufficient for the non-profits who provide stewardship and conservation services that provide restoration and protection at cost.
- As funding from foundations and government decreases, competition for resources increases, so too many groups are chasing too few dollars.
- Funders are adopting an increasingly targeted approach to funding.
- There has been a marked shift away from a core-funding model that funds organizations to pursue their mission. The new model is project-based and is characterized by contracts that give funders increased control over what the organization does and how it does it.
- Funders are reluctant to fund administrative costs that cannot be directly tied to a project or program.
- Funding is being provided for shorter periods of time, and is increasingly unpredictable.
- Reporting requirements have increased.
- Funders are increasingly requiring organizations to make joint submissions with other project partners and to demonstrate that they have secured funding from other sources – either financial or in-kind contributions – before extending their support.

A second national funding research project undertaken in 2003 also, titled, **Funding Matters, The Impact of Canada's New Funding Regime on Nonprofit and Voluntary Organizations,** by Katherine Scott[103], identifies similar problems and outlines some disturbing results:

- Volatility – As organizations struggle to diversify their funding sources, they can experience huge swings in revenue. This volatility undermines an organization's stability and its capacity to provide consistent, quality programs or services, to plan ahead, and to retain experienced staff.
- A tendency to "mission drift" – As organizations scramble to qualify for narrowly prescribed program funding or to win government contracts, some are being pulled away from their primary mission, which is their long-term purpose and the source of their credibility within the community.
- Loss of infrastructure – With the move to project-based funding and the tightening of restrictions on administrative costs that will be covered by funders, some organizations are losing their basic infrastructure. They are becoming a series of projects connected to a hollow foundation.
- Reporting overload – Many smaller organizations are losing heart as they face yet another round of short-term contracts, short-term hiring and letting-go of program staff, all the while pursued for multiple reports from multiple funders with multiple forms and requirements.
- House of cards – Because funders often now require financial or in-kind contributions from other sources, the loss of one contract or the end of one partnership agreement can bring down the whole interlocking structure. A service that is thriving one year can collapse the next. Organizations despair of arrangements in which funders will not commit until other funding partners are on-side, the last one standing being the preferred position.
- Advocacy chill – When organizations must cobble together different projects and partners in order to survive, being seen as an outspoken advocate on behalf of one's client group can be regarded as too risky, despite the justice of the cause. Some organizations may not want to have their name in the media when their next funding submission comes up for approval. In effect, advocacy organizations have been effectively marginalized over the past 10 years.
- Human resource fatigue – People, both paid and volunteer, are stretching themselves to the limit to meet the new challenges and yet remain faithful to their mission and to the citizens and communities to whom they feel responsible.
- To the victor go the spoils – Because of the limited funding, granting bodies often dispense their funds to limited number of large well connected and well organized agencies leaving small and mid-level agencies grasping for crumbs.

Solutions

The Dovetail Report lists specific sectoral actions for systemic change to support the long-term sustainability of the conservation and stewardship sector:

Actions for government

- Governments across Canada, at all levels, should place a higher priority on funding the stewardship and conservation. In addition to continuing environmental programs that provide financial support, they should assess the potential for tax- or fee-based sources of funding for the stewardship and conservation sector.
- On-going funding and endowment programs should be used to the greatest extent possible and governments should continue to support standing Funds.

[103] Funding Matters: The Impact of Cnada's New Funing regime on Nonprofit and Voluntary Organizations, Canadian Council on Social Development, 2003, Katherine Scott.

Actions for grantors (foundations and government grant programs)

- Project funding should be accompanied or supplemented by core funding that allows for effective implementation of projects and long-term capacity-building.
- Funders should provide more multi-year grants and support applications for continuing as well as new projects.

Actions for conservation and stewardship groups

- Stewardship and conservation organizations should build strong linkages with the local community, including diverse social and business communities;
- Business and stewardship/conservation groups need to educate themselves about each other's activities, and stewardship groups need to emphasize messages about a sustainable landscape both ecologically and economically in order to be better received by business and the general public;

Inter-sectoral actions

- All those involved – including government agencies, conservation and stewardship organizations and the private sector – need to connect the value of stewardship with its benefits to society and local communities, including its function in protecting the foundations for life;
- All sectors – government, private sector, and the conservation and stewardship sector – need to increase their communications and coordination;
- To support stewardship and avoid duplication, governments at all levels and national, provincial and territorial and local stewardship and conservation organizations should harmonize efforts to promote program integration and the effective and efficient use of financial resources;
- Local groups and local governments should cultivate closer working relationships to increase support for the work of the groups and increase its effectiveness.

The powerful potential of a sector working at full capacity

Increasingly, Canadian communities are depending on the expertise of the non-profit organisations as they provide extensive services in the areas of stewardship and conservation.. Recent research has found lack of funding for stewardship and conservation work across the board. Consequently, these organizations require financial and economic support from government, foundation and granting agencies and the public in order to continue contributing valuable economic, social and environmental benefits to society.

A conservation and stewardship sector working at full capacity would:

- do more work with greater ease and quality, at a faster pace and with a broader scope;
- have credibility because of its track record, and the public would recognize and
- appreciate the work of the sector;
- prompt improvements in government's approach to protecting the environment;
- have a positive impact on public awareness and engagement in stewardship and conservation;
- more effectively protect the environment "on the ground": more land would be protected, more landowners would adopt stewardship practices, environmental quality - would be improved, and there would be progress towards sustainability;
- continue to build much needed expertise and maintain a focus on emerging needs in the stewardship and conservation sector.

Summary

Over the past decade the stewardship and conservation sector has increased in influence, grown in size and diversified. These non-profit organizations have a broad geographical scope, a proactive, long-term perspective, and have increasing expertise, capacity and activity levels. Taking on work formerly done by government, they are implementing significant economic, social and environmental services directly through hands-on projects. Research has found funding is lacking across the board, negatively affecting the organizational capacity of the NGO's and successful stewardship and conservation on the ground. Rather than working to help alleviate these pressures, governance in Canada does not provide to the conservation and stewardship sector sufficient power, priority, or policy and legislative support. As environmental problems increase and reduced resource pressures mount, the need to significantly increase financial support to the stewardship and conservation sector from government, foundation, and private sources is essential.

8. Conclusion

Rapid consumption and resource exploitation practices threaten Canada's economic, social and environmental health and wealth. The basic needs of all Canadians including shelter, health care, food, energy and transportation - all depend on healthy natural systems. Canadian economic foundations and methods, and public policy and regulations need to adapt in order to safeguard and sustain eco-systems and the communities that depend on them.

Canadian government, institutions and economic agencies, as well as the public, recognise that present economic accounting and its related business and land value systems fall short of considering all the internalised and externalised costs of our activities. Canada could embrace full cost accounting and look to other countries for examples of how best to create energy-efficient, waste-reduced economies. Considering the significant environmental crisis we are facing, Canada should address the weaknesses in both national and provincial policies and practices.

The most widely accepted economic methodologies do not include all ecological values. Ecosystem goods and services such as clear air, water, forests, soil, provision of wildlife and recreational habitat are necessary for healthy life. While these ecosystems functions have proved difficult to value, methods have been proposed by Costanza, et al that should be examined and applied in the Canadian context. Moreover, the long-term costs of resource depletion, environmental degradation, pollution and the repercussions on human health need to be considered in economic equations, policies and attitudes. Economists have estimated that an intact ecosystem is worth 100 times more than when it is developed or impacted. Markets are comprised of natural and human capital. Recognising the interdependencies of these will ensure that one sector or generation will not enjoy short-term benefit at the expense of another.

Government subsidies largely favour industries with destructive ecological footprints. Support should be shifted to environmentally sustainable industries, and stewardship and conservation organisations, as they safeguard natural assets and ecosystems through conservation and stewardship. They contribute economic, social and environmental benefits to society. They also restore ecosystems thereby ensuring continued production of ecosystem goods and services. Funding is lacking for stewardship and conservation work across the board, and thus an immediate shift in public, private and government support needs to occur. This change would allow all Canadians to incorporate stewardship into their daily activities and make it easier, desirable and economically viable to protect our natural ecosystems – Canada's true wealth.

It is economical profitable for community, industry and government leaders to understand natural values; then have the courage, commitment and compassion necessary to reorient and align actions in order to leave healthy and sustainable ecosystems - the natural capital that creates the true health and wealth of current and future Canadians.

APPENDIX 1

Table 4
Environment Indicators

	Land Use Indicators				Biodiversity Indicators			Water Quality Indicators		
Rank	Major protected areas—% of total area	Nitrogenous fertilizer use	Pesticide use	Use of forest resources (harvest/ growth)	Threatened species—mammals	Threatened species—birds	Threatened species—fish	Waste water treatment—secondary and tertiary treatments	Water Poverty Index	Per capita abstractions of water for public supply
1 Denmark	G	G	G	S	S	G	G	G	B	G
2 Sweden	B	G	G	B	S	S	G	G	S	G
3 Austria	G	G	G	B	S	S	S	S	G	G
4 France	B	G	G	B	S	G	G	n.a.	S	G
4 Germany	G	S	G	G	B	S	S	G	B	G
6 U.K.	S	S	B	B	S	G	G	G	S	G
7 Japan	B	G	B	G	S	G	G	B	B	G
7 Switzerland	S	G	G	S	B	B	S	G	S	S
9 Finland	B	G	n.a.	B	G	G	G	S	G	G
10 Norway	B	G	G	S	G	G	n.a.	B	G	B
11 Italy	B	G	G	G	B	G	n.a.	B	B	S
11 Netherlands	B	B	B	S	G	S	B	G	S	G
16 Canada	**B**	**G**	**G**	**S**	**B**	**G**	**G**	**B**	**G**	**S**

	Air Quality Indicators			Waste Indicators						
Rank	Emissions of carbon dioxide per unit of GDP	Emissions of sulphur oxides per unit of GDP	Emissions of nitrogen oxides per unit of GDP	Municipal waste generated per capita	Municipal waste recycling	Hazardous waste production per unit of GDP	Gold	Silver	Bronze	Weighted count
1 Denmark	S	G	S	B	S	G	9	5	2	23
2 Sweden	G	G	S	G	G	n.a.	9	4	2	22
3 Austria	S	G	G	S	B	S	7	7	2	21
4 France	G	S	S	S	G	n.a.	7	5	2	19
4 Germany	B	G	G	S	S	B	7	5	4	19
6 U.K.	B	B	S	S	G	G	6	6	4	18
7 Japan	B	G	n.a.	G	G	n.a.	8	1	5	17
7 Switzerland	G	G	G	B	B	B	6	5	5	17
9 Finland	B	S	B	G	B	B	7	2	6	16
10 Norway	B	G	B	B	S	S	6	3	6	15
11 Italy	S	B	S	S	n.a.	G	5	4	5	14
11 Netherlands	B	G	G	B	B	S	5	4	7	14
16 Canada	DNP*	DNP	DNP	**S**	**S**	DNP				

Note: G = gold; S = silver; B = bronze
*Did not place: Canada's performance was worse than the 12th-ranked country.
Source: The Conference Board of Canada.

APPENDIX 2

46 *Frontiers in Ecological Economics*

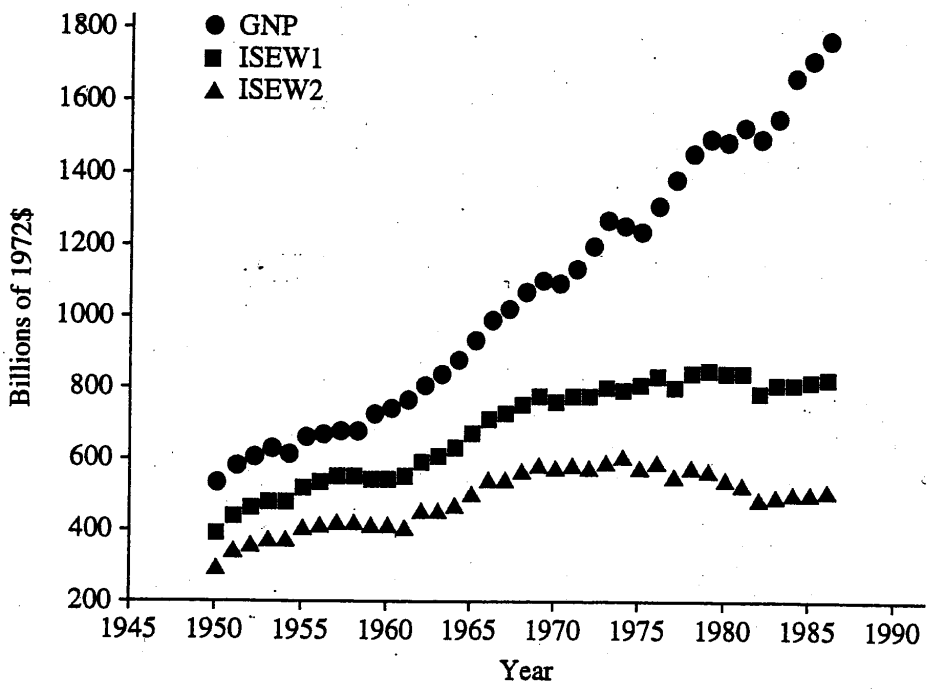
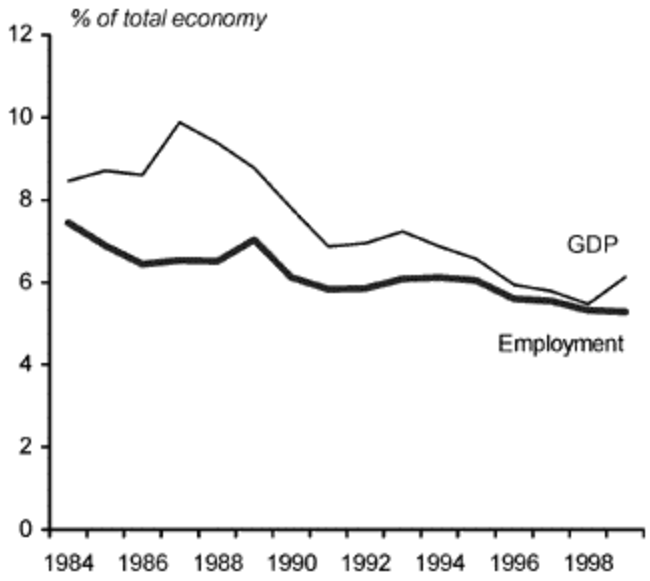


Figure 1: Herman Daly of the University of Maryland and John J. Cobb of the Claremont School of Theology calculated an 'Index of Sustainable Economic Welfare' (ISEW) that adjusts GNP to account for pollution effects, environmental services and other ecological factors. A second version (ISEW2) also includes adjustments for depletion of non-renewable resources and long-term environmental damage. By this adjusted measure, Americans are much less 'wealthy' than they seem.

Source: Daly and Cobb, 'For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future'; Beacon Press, Boston.

APPENDIX 3

Resource industries are becoming less prominent. They currently employ about 11% of British Columbia's work force. (Source: Labour Force Survey)



Hallin, Lillian. **"A Guide to the BC Economy and Labour Market."**

http://guidetobceconomy.org/chap3/chap3.html

APPENDIX 4

Summary of Protected Values

Protected Values:

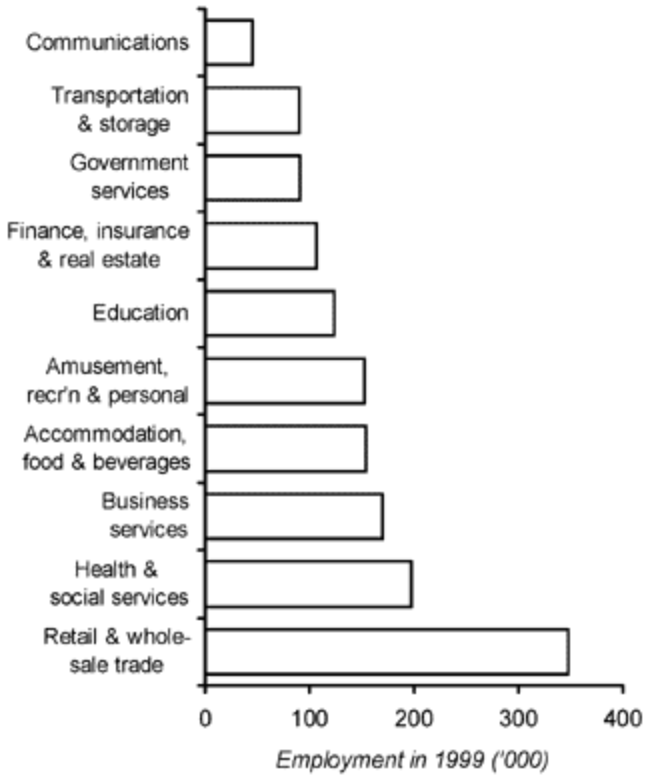
#	ha	Protected value	#	ha	Protected value	#	ha	Protected value
14	1,450.50	Aesthetic	3	652.17	Agricultural	84	15,747.42	Biodiversity
22	2,160.04	Bird Nesting Site	1	0.90	Bird Viewing	2	910.00	Cliffs
17	2,374.63	Coastal	1	14.20	Coastal Douglas Fir	41	1,850.77	Corridor
5	3.59	Cultural	1	1.62	Educational	2	18.08	Endangered Ecosystem
1	0.30	Endangered Ecosytem	12	551.36	Fish Habitat	1	9.40	future Old growth forest
4	91.10	Garry Oak	1	17.00	Garry Oak grasslands	4	706.01	Grasslands
1	9.00	Headwaters	1	2.00	Heritage River	5	3.11	Historical
2	0.73	Horticultural	16	1,152.76	Migratory Bird Habitat	4	9,279.90	Migratory Habitat
1	8,944.00	Montane	1	1.00	Native vegetation	1	313.50	Off-channel habitat
21	2,645.68	Park/Reserve Extension/Buffer	1	0.40	Protected Forest in Urban Area	1	97.00	Ranchlands
11	1,844.86	Recreational	1	16.90	Research	16	2,550.50	Riparian Habitat
17	2,497.66	Species at Risk Habitat	10	978.56	Spritual	1	28.33	sustainable forestry
9	3,157.43	Watershed	43	2,695.74	Wetlands	1	21.00	Wildlife Habitat
1	1.80	Woodland						

[General Stats | Protected Values | Protected Species]

Source: **BC Lands in Trust**, General Stats Registry of Protected lands by BC's land trusts, www.landtrustalliance.bc.ca

APPENDIX 5

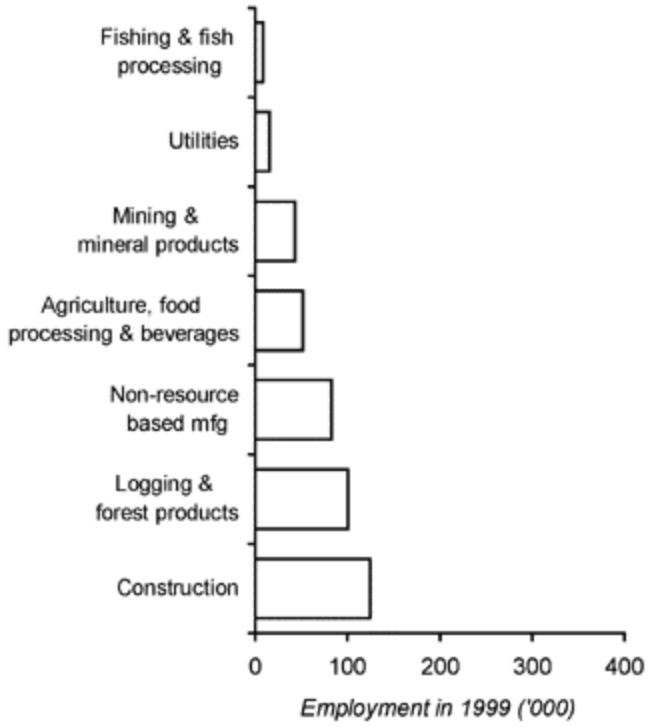
One in four service sector jobs in British Columbia is in retail and wholesale trade.



Hallin, Lillian. **"A Guide to the BC Economy and Labour Market."**
http://guidetobceconomy.org/chap3/chap3.html

APPENDIX 6

In the goods sector, construction and forestry are the biggest employers.



Hallin, Lillian. **"A Guide to the BC Economy and Labour Market."**
http://guidetobceconomy.org/chap3/chap3.html

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Appendix 7

Resources on Economic Ecological Valuation available from The Land Trust Alliance of British Columbia

Resources on File at LTABC office (digital)

Building a Supportive Economic Platform for Stewardship, Diana Imbeault, previously with Wildlife Habitat Canada This paper is available with permission of the author, from the Leading Edge, Stewardship & Conservation in Canada Conference, July, 2003.

Economic Benefits of BC's Parks, Ministry of Water, Land and Air Protection, BC Government, 2001 (see park economics).

Economic Value of Open Space Project: Evergreen, 2003 – bibliography of resources on economic studies relative to BC

Economic Values of Protected Areas, Guidelines for Protected Area Managers, World Commission on Protected Areas, Best Practice Protected Areas Study, Volume 2, Adrian Phillips Series Editor, Cardiff University, 1998.

It pays to invest in the environment, by Claude Martin* WWF Director, Switzerland, summary of some economic valuation methods and amounts needed to protect biodiversity, and sample amounts spent on subsidies to other areas. February, 2004.

Securing Canada's Natural Capital: A Vision for Nature Conservation in the 21st Century, National Round table on the Environment and the Economy, March 2003-LTABC office

Urban Forest Research, Centre for Urban Forest Research, Pacific Southwest Reserach Station, USDA Forest Service, Fall 2003 "The Large Tree Argument, The Case for Large Trees versus Small Trees"

Valuing Green Space in Canada: Creating a Toolkit for Land Trusts, Proposal for funding from Evergreen, 2003 LTABC office

Working with Nature – Case Studies of Nature Conservation, Employment, and Local Economies, Mathew Rayment, Rural Economist, The Lodge, Sandy Bedfordshire, UK SG19DL Tel: 01767 680551

In LTABC Library – hard copies available for loan

Author(s)	Year of Publication	Subject	Title	Abstract	LE Category	Place of Publication	Publisher
Lerner, Steve and William Poole	1999	Economic Benefits	The Economic Benefits of Parks and Open Space: How Land Conservation Helps Communities Grow Smart and Protect the Bottom Line	This casebook presents data and examples that can help make the economic case for parks and open space	Economic Incentives…	San Francisco, CA	The Trust for Public Land
Realbase Consulting	2001	Economic Benefits	Greenway Proximity Study: A Look at Four Neighbourhoods in Surrey, BC: 1980-2001	This 20 year study supports the notion that most green space borders will increase the value of single-family property	Economic Incentives..	Surrey	Realbase Consulting
Quayle, Moura and Stan Hamilton	1999, April	Economic Benefits	Corridors of Green and Gold: Impact of Riparian Suburban Greenways on Property Values	This study indicates that property values are positively affected by proximity to a greenway and residents value the greenway above many other features of their neighbourhood	Economic Incentives..	Vancouver	Faculties of Agriculture Sciences and Commerce, and Business Administration, UBC
Zegarac, M. and Muir, T.	1998	Economic Benefits	Rising Property Values on Hamilton's West Harbourfront: Effects of Environmental Restoration on Real Estate Prices	This brochure draws conclusions from real estate transactions over a 14 year period	Economic Incentives…	Vancouver	Environment Canada (pamphlet)
Zegarac, M. and Muir, T.	1996	Economic Benefits	Community Greenspaces Are Worth Money: An	This brochure describes how a study of 3 urban	Economic Incentives..	Toronto	Environment Canada (pamphlet)

Author(s)	Year of Publication	Subject	Title	Abstract	LE Category	Place of Publication	Publisher
			Economic Argument for Parks, Natural Areas and greenways	greenbelts shows that the closer properties are to natural areas, the higher their value			
M.Nelder Management Services	2000, February	Economic Benefits	Economic Impact Analysis of the Proposed Nature Reserves on the Niagara Escarpment of Manito	This study concludes that creation of a nature reserve on Manitoulin will result in economic benefits for the island	Economic Incentives..	Mindemoya, Ontario	The Escarpment Biospher Conservancy

On-Line and Other References

Cost of Community Services Studies: Making the Case for Conservation is an evaluation of 83 studies conducted in 19 states that compare the net fiscal contribution of different land uses. The studies have found that on average, residential development generates significant tax revenue, but requires costly public services that surpass its tax contributions. In contrast, farm, ranch and forest lands consistently generate tax surpluses.

Cost of Community Services Studies: Making the Case for Conservation can be purchased for $16.95 by calling 800-370-4879. An order form is also available on American Farmland Trust's Publications page. Contact rmillar@farmland.org for a copy.

This new White House report looks at the costs and benefits of major environmental rules in the US. The conclusion is that the benefits appear to exceed the costs by several times. The Office of Management and Budget examined a sampling of major rules and found that the total benefits were at least triple the costs.

The 233-page report examined 107 major regulations issued from 1992 to 2002. The annual costs were calculated at $36.6 billion to $42.8 billion where the annual benefits were $146.8 billion to $230.9 billion. **For every dollar spent on implementing the regulations, the public got at least three to eight dollars in benefits.** http://www.whitehouse.gov/omb/inforeg/regpol-reports_congress.html

Wildlife Brings £4.8 Billion to the UK Economy – Study See: http://www.iucn.org for the news release and the link to the actual study... A wide range of species are used for consumptive and non-consumptive purposes, including health, nutrition, construction, and leisure, accounting to a minimum contribution of £4.8 billion (US$8.1 billion) to the UK economy and supporting 35,000 jobs. Excerpt: 70 billion worth of freshwater resources at risk annually
According to a new WWF report, US$70 billion worth of goods and services from freshwater resources could be at risk annually if governments fail to manage their wetlands sustainably. The report, The Economic Values of the World's Wetlands, is the first comprehensive overview of the economic values of the world's wetlands. It analyzes the 89 existing valuation studies and uses a database covering a wetland area of 630,000 km², putting the annual value of

wetlands at a very conservative US$3.4 billion. WWF International See: http://www.panda.org/news_facts/newsroom/press_releases/news.cfm?uNewsID=10965

Ecosystem Valuation
A very informative and important website:
http://www.ecosystemvaluation.org/ and http://gis.americanforests.org/dc/

Green building investments yield high returns, Capital E group, Lawrence Berkley Laboratory, By GreenBiz.com WASHINGTON, D.C. — Investments in green buildings pay for themselves 10 times over, according to a new study for 40 California government agencies. The study — by the Capital E group, Lawrence Berkley Laboratory, and participating California state agencies — is the most definitive cost-benefit analysis of green building ever conducted.

Humanity Loses $250 Billion a Year in Wild Habitat, from ENN NEWS Washington DC, (copyright) August 2002 Links to: http://biodiversityeconomics.org/valuation/ http://biodiversityeconomics.org/valuation/links-603-00.htm

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