

ECONOMIC IMPACT ANALYSIS OF STEWARDSHIP ACTIVITIES IN CANADA

A Review of Selected Case Studies

March 31, 2010

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This contract report was prepared for Environment Canada by the Fur Institute of Canada and the Centre for Environmental Stewardship and Conservation to assist in the Government's habitat and biodiversity programs. The contributing authors are Doug Wolthausen, Lynn McIntyre, Erin Neave and Clayton Rubec (Centre for Environmental Stewardship and Conservation) and Rob Cahill (Fur Institute of Canada).

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By
The Fur Institute of Canada
and
**The Centre for Environmental Stewardship
and Conservation**
for
**Canadian Wildlife Service,
Environment Canada**

Contract Report

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EXECUTIVE SUMMARY

This report provides a preliminary overview of the economic impact of stewardship, including job creation and contributions to rural economic development in Canada. The terms of reference of the project restricted the authors to developing only three Canadian case studies. These go beyond traditional stewardship metrics (e.g. number of participants; area of habitat created, restored or acquired; and total financial investment) to investigate the economic impact of the stewardship sector related to job retention and creation, cost avoidance and the contribution of volunteers.

Existing data was utilized to provide a preliminary impact analysis for a provincially-based program (Ontario Wetland Habitat Fund), a local-scale initiative with federal and provincial funding (the Mixed-Grass Prairie Habitat Stewardship Project), and a national network involved in forest stewardship (the Canadian Model Forest Network). Key economic attributes investigated include: jobs created; income and gross domestic product; habitat protection and restoration costs; economic value of a range of voluntary and in-kind efforts; value of ecological goods and services; net income improvements resulting from implementation of beneficial management practices; and contributions to rural economic development.

The three case studies demonstrate that the fostering of a healthier natural environment has additional economic merit and social values beyond the habitat and wildlife success indicators that are usually reported. The key outcomes of the economic impact analysis for the three case studies are outlined in Table 1. Calculations were based on the best accessible data with some inconsistency in the availability of economic information across studies. A series of assumptions for the analyses have been documented. The results are not directly comparable due to the variation in scale, timing and data for each study. However, they provide information required to develop a framework, illustrate data collection gaps and needs for organizations involved in stewardship, and demonstrate the important economic impact of these programs through their respective applications.

The case studies reveal that the economic contribution of stewardship-based conservation activities may be grossly under-valued unless all factors such as ecological goods and services, carbon capture, voluntary contributions and job creation are considered. For example, a financial investment of \$11 million in the Ontario Wetland Habitat Fund created a combined economic benefit of almost \$100 million over the life of the program.

A series of recommendations relating to public policy needs are presented based on this preliminary review. A key outcome of this work is the call to action for the stewardship community to reform its approach to valuing stewardship and to develop a framework with appropriate indicators to enhance our ability to collect ecological, economic and social information to support conservation programs. This information is critical to building the case to secure additional resources for stewardship and will help the stewardship community to strategically align economic signals and financial rewards with environmental goals.

Table 1. Results of Economic Impact Analysis From Three Canadian Case Studies¹

Economic Variable	Ontario Wetland Habitat Fund	Mixed-Grass Prairie Habitat Stewardship Project	Canadian Model Forest Network
Timing	Duration of program (1997-2008)	2002 to present	October 2007-March 2009
Direct Full-time Equivalent Jobs	70.5	17	57
Indirect Full-time Equivalent Jobs	36	8.5	28.5
Jobs Per Million Dollars in Government Spending	29 jobs per million in federal and provincial government expenditure	17.9 jobs per million in federal government expenditure	Not applicable
Direct Income	\$2.504 million	No data	\$1.417 million
Indirect Income	\$1.252 million	No data	\$0.709 million
Gross Domestic Product	\$2.504 million	No data	\$2.126 million
Landowner Cash and In-kind Contributions	\$18.7 million	\$0.091 million	No data
In-kind Contributions	Advisors' voluntary contribution: \$0.056 million Program management in-kind: \$0.070 million Field office rental: \$0.127 million	No data	\$7.7 million in-kind contribution from partners
Total Federal Investment	\$0.048 million representing 2.0% of the combined federal and provincial government investment	\$0.950 million, representing 47% of the investment by all partners	\$5.4 million through the Forest Communities Program representing about 17% of the total investment
Value of Ecological Goods and Services	Estimated to be about \$4.197 million	Estimated value of \$0.250 million/year using a conservative (low) estimate value, \$0.564 million/year using a best estimate value, and \$0.931 million/year using a high estimate value	No data
Carbon Capture Value	Estimated to be \$5.605 million per year	No data	No data
Habitat and Biodiversity Benefits	21,253 ha (52,517 acres) of wetland habitat secured and enhanced	59 five-year agreements to adopt the twice-over rotational grazing strategy totaling 8,603.8 ha (21,260 acres)	No data

¹ This table is a summary of current available information and is not for comparison purposes.

1.0 INTRODUCTION

The full economic contribution of conservation programs in Canada has not been well documented and thus remains poorly understood. This report presents a preliminary review of a small sample of exemplary stewardship case studies that demonstrate the economic impact, values and importance to Canada of stewardship initiatives in the biodiversity and habitat conservation fields. The case studies profiled in the report provide a picture of investment, value for money in terms of creating economic opportunity for taxpayers and job creation. In addition, the case studies demonstrate that the fostering of a healthier natural environment has additional economic merit and social values when measured against habitat and wildlife success indicators. Lessons learned from the case studies could be used to construct a new framework for stewardship valuation – one that integrates ecological, social and economic metrics. The report was prepared for Environment Canada by the Fur Institute of Canada and the Centre for Environmental Stewardship and Conservation. The report is background information that assists in evaluating the value of Canada’s investments in existing and impending stewardship initiatives and could help in setting future policy and program directions in support of community-based natural resource management. The case studies emphasize the serious need to align economic signals and financial rewards with environmental goals.

Exhibit 1. “Developing our capacity to measure and monitor biodiversity, ecosystems and the provision of services is an essential step towards better management of our natural capital. Providing relevant information in ways accessible to decision-makers will require not only a wider use of valuation but also progress on indicators of biodiversity and ecosystem services and on the integration of natural capital into macro-economic indicators and accounts.”

Source: *The Economics of Ecosystems and Biodiversity for National and International Policy Makers* (United Nations 2009).

Exhibit 2. “Well-designed investments often lead to benefits for employment and social policy objectives: by supporting economic activity, ecosystems support jobs. Indeed natural capital is often a relatively labour-intensive form of investment. This can be seen in the current statistics on jobs linked to the environment, which go way beyond ‘eco-industries’ and pollution management to include a variety of jobs depending directly on good quality environment as an output.”

Source: *The Economics of Ecosystems and Biodiversity for National and International Policy Makers* (United Nations 2009).

2.0 STUDY APPROACH

To undertake the analysis of the economic impact of selected stewardship activities, the information collection phase involved a literature review, web search, review of numerous conference and meeting proceedings such as the series of Global Economy and the Environment Conferences, the 2008 Prairie Habitat Joint Venture (PHJV) Policy Meeting in Saskatchewan, the 2009 Annual Meeting in Alberta of the Alberta Agricultural Economics Association, and the 2009 Latornell Conservation Symposium in Ontario, as well as dialogue with experts in stewardship and ecological economics.

A national net was cast for possible stewardship case studies, representing national, provincial and national non-governmental organization-led local-scale initiatives, which had fortuitously captured and described a range of economic attributes of stewardship initiatives. More than 30 potential initiatives were screened against economic indicators including job creation, income, Gross Domestic Product, economic value of volunteer efforts, values of ecological goods and services, income improvements and in-kind contributions. The Model Forest Network, the Ontario Wetland Habitat Fund Program and the Mixed-Grass Prairie Habitat Stewardship Project captured the best cross-section of financial characteristics and, as such, are showcased in the case studies.

Section 4.0 describes the selected case studies, provides a profile of each case study, illustrates accomplishments and details a range of economic indicators that clearly demonstrate how stewardship serves as a job creator and important contributor to rural economic development. Two reports: *Economic Evaluation of Manitoba Sustainable Development Activities: NAWMP* (MacMillan 1996) and *An Evaluation of the Atlantic Coastal Action Program (ACAP): Economic Impact and Return on Investment* (Gardner Pinfold Consulting Economists Limited 2002) provided sample methodologies to guide the assessment. However, economic modeling as well as balancing the contributions to one given year's dollar equivalents was beyond the scope of this study. A number of assumptions related specifically to multiplier effects (for a definition of this term, please refer to Appendix 1) and projected impacts on indirect/induced employment, income and Gross Domestic Product were made and are outlined in each case study.

In order to better understand the benefits arising from government investment in other sectors and to permit balanced comparisons across business strata, examples of sectoral indicators for job creation were pursued and have been assembled in Appendix 3. In the same mode, the analysis led to recent papers on valuing ecological goods and services and the undervalued contributions of voluntary actions in support of stewardship and conservation. In all cases, where orders of magnitude for a number of values varied, the report has adopted a modest approach. This is particularly true in valuing natural capital and ecosystem services. This approach reflects the fact that the knowledge of all benefits provided by nature is incomplete. The authors have chosen to use a conservative value for wetland ecosystem services (\$195/hectare developed by Professor Nancy Olewiler of Simon Fraser University versus \$14,153/hectare developed by the David Suzuki Foundation) and have not attempted to reflect the worth of individual services for all of the ecosystem functions such as water filtration, flood control, habitat, and recreation. Given growing interest in the value of wetlands as carbon banks, the value of carbon storage for the wetland components of enhancement and restoration initiatives has been assessed where applicable.

Section 6.0 provides several recommendations that offer advice to both the government and the non-government conservation communities on designing a new and enhanced framework for valuing conservation efforts in Canada.

3.0 CONTEXT AND BACKGROUND ON THE ECONOMICS OF STEWARDSHIP

Canada is diverse in many ways – ecologically, socially and culturally. Within this diversity, stewardship in agriculture, forestry, fisheries and wildlife management and other natural resource sectors has been and continues to be a fundamental component of wise use of Canada's natural legacy. Stewardship is also part of the broader voluntary effort in which Canadians share a commitment to improve the quality of life and to foster vibrant, healthy communities.

Stewardship, simply stated, means that Canadians – landowners, private citizens, companies and volunteers – are caring for our land, air and water, and sustaining the natural processes on which life depends (Environment Canada 2002). Over the last 10 years, stewardship has been recognized as a critical element of conservation in Canada. There have been thousands of innovative stewardship activities happening across the country over a much longer period. The merits of these activities are now recognized and have gained prominence in the emerging programs and environmental policy frameworks in the private sector and all levels of government. Despite this recent recognition, the stewardship community continues to face major challenges with respect to long-term funding capacity, a lack of

integration and demonstration of efficacy of programs and tools — as described in the recommendations of the 2009 Fourth National Stewardship and Conservation Conference (<http://www.stewardship2009.ca/public/data/documents/ACF8F8.pdf>).

There is an over-arching objective that the stewardship and conservation communities have in common with the broader environmental and sustainability communities — namely the **Balancing of Canada's Natural Capital Account**. Our

economy, our health and our very identity as Canadians is dependent on our natural capital, but, in many circumstances, we continue to draw it down with little thought to the real costs of our actions.

An outcome of the Fourth National Stewardship and Conservation Conference, *Strengthening Stewardship... Investing at Every Step*, held in July 2009 was *A Stewardship Road Map for Canada* (Centre for Environmental Stewardship and Conservation 2009b). Three critical and fundamental recommendations in the Road Map are the need to:

- Address and assemble a credible economic analysis of the importance of stewardship that can be used for resource trade-off decisions and as a basis for future planning;
- Establish measurable biodiversity and provision of ecological goods and services targets (at a regional landscape scale) and develop a national tracking system; and
- Better understand and consider the social dimension of stewardship and its application to strengthen delivery of programs and activities.

A full analysis of the social, biodiversity and habitat indicators is beyond the scope of this report. However, the authors have noted where economic features overlap with social and ecological attributes.

This report integrates the economic attributes and impacts of the conservation stewardship movement in terms of:

- Jobs Created, Income and Gross Domestic Product;
- Habitat Protection and Restoration Costs;
- Economic Value of a Range of Voluntary and In-kind Efforts;
- Value of Ecological Goods and Services;
- Net Income Improvements Resulting From Implementation of Best Management Practices (BMPs); and
- Rural Economic Development.

Exhibit 3. “There is a need for a comprehensive national tracking framework that integrates social, ecological and economic measurements.”

Source: Recommendations No. 3 and 7 in *A Stewardship Road Map for Canada* (Centre for Environmental Stewardship and Conservation 2009b).

Exhibit 4. “From 1997–2002, volunteer contributions, valued at \$1,493,600 were tracked for projects funded by Environment Canada (only). During the same period, Atlantic Coastal Action Program (ACAP) organizations concluded that the actual value of volunteer contributions ranged from 3–10 times the reported value.”

Source: *An Evaluation of the ACAP* (Gardner Pinfold Consulting Economists Limited 2002).

Exhibit 5. “In a 1992 study of 80 Manitoba farmers in the NAWMP target area who implemented a series of beneficial management practices, an average additional net income of \$13.27 per acre was realized on 47,042 surveyed acres for a total income improvement of \$624,191. This benefit comes from the combination of an increase in revenue of \$5.14 per acre as well as \$8.13 per acre reduction in costs.”

Source: *An Economic Evaluation of Land Use Changes in Southwest Manitoba* (Josephson 1992).

Traditional reportable metrics in the stewardship community have been hectares of habitat created, restored or acquired, wildlife population restoration success, and total financial project investment. Often, these are limited to specific program outputs rather than overall program outcomes. While these are important measurables within the stewardship community, the economic contribution of stewardship activities to the Canadian economy is not well documented and thus poorly understood. To be better understood, programs must demonstrate that, at a minimum, any financial investment in the stewardship sector creates new jobs, retains existing jobs, demonstrates future cost avoidance, and identifies the economic value of voluntary efforts.

The three case studies that are profiled in Section 4.0 reveal the extent of economic contribution of national, provincial and national non-governmental organization-led local-scale initiatives. Each of the case studies assesses the economic attributes of the initiative not only in terms of employment opportunities created or retained and financial incentives, but also by a financial valuation of volunteer and landowner contributions to the projects, the comparative investment in grey versus green infrastructure, the contribution to ecological goods and services, and other emerging and innovative economic opportunities. The following sections discuss the rationale for including these additional metrics in assessing the economic impact analysis of stewardship.

3.1 VOLUNTEER AND LANDOWNER CONTRIBUTIONS

The conservation community relies heavily on the contribution of volunteers to undertake thousands of stewardship projects across Canada. Volunteers contributed 2.1 billion hours of work in 2007, or 1.1 million full-time jobs to the entire non-profit sector. At an average of \$18.50/hour, that was worth \$38.9 billion. The entire sector contributes 6.8% of Canada's GDP or \$86.8 billion annually, almost equal to the values of the contribution of either the Mining or Oil and Gas sectors to our GDP, and more than the full retail sector (Statistics Canada 2005).

Exhibit 6. The in-kind contribution of volunteers and partners at the Eastern Ontario Model Forest is substantial. With 12 Board Members, five Board Advisors, 12 on the Forest Science Committee, 17 in the Certification Working Group, nine on the Wood Centre Steering Committee and many others participating on a variety of other committees and projects, the in-kind contribution is considerable, totaling \$456,306 in 2007-2008, and \$940,072 in 2008-2009.
Source: Holmes, personal communication.

A 2004 Statistics Canada survey defined the size of the environmental sector within the broader non-profit community and its economic contribution to Canadian society (see Appendix 2). It was estimated that over 4,400 groups were active in the environmental sector. It is important to note that this does not include unincorporated or unregistered grassroots organizations and citizen groups such as "Friends of" organizations. It is estimated that there are over 2,000 of these grassroots, all volunteer stewardship organizations that are not generally known outside their immediate communities. The Ontario Environmental Network lists more than 700 such groups in Ontario alone. (Ontario Environmental Network 2000-2001 *Environmental Resource Book*.

Exhibit 7. "During the ten-year delivery of the Ontario Wetland Habitat Fund Program, the average project value was \$8,593 with the Fund contributing 31% of the habitat development costs and landowners contributing on average 69%."
Source: *Ontario Wetland Habitat Fund 1997-2007* (Wolthausen 2008).

Also see the Canadian Environmental Directory at <http://canadainfo.com/environmental.html>). In 2007, Statistics Canada (<http://www.statcan.gc.ca/pub/71-542-x/71-542-x2009001-eng.pdf>) reported that the voluntary environmental sector had grown to 36,666 full-time equivalent (FTE) jobs from 8,707 FTEs in 1987.

Despite this robust growth, the sector is poorly understood and undervalued in terms of its economic contribution to Canadian society. Greater efforts must be made to recognize their value and report on their contribution to the stewardship movement.

Landowners also contribute significantly to conservation programs through their commitment to project objectives, and investment of their own time and money. Programs such as the Ontario Wetland Habitat Fund required the landowner to contribute a minimum of 50% of the total project development costs. The contribution could have been either a financial commitment or an in-kind contribution (e.g. labour or equipment). Landowners have routinely contributed much more over the ten years of the program (1997-2007), supplying 69% of the complete project value. Similarly, through the Ontario Environmental Farm Plan (EFP) Program, farmers invested \$100 million from 1993 to 2006, with an additional \$50 million invested through cost-sharing from program funding partners, representing a leverage ratio of 1:2 of funding partners' investment by farmers (www.omafra.gov.on.ca/english/environment/efp/efp.htm). Two-thirds of Ontario farmers participated in the EFP program over this period, implementing on-farm environmental improvements (www.omafra.gov.on.ca/english/environment/bmp_books.htm). Similar leveraging of investment has been reported in other provinces (e.g. in 2008, the Alberta Environmental Farm Plan Program reported investing \$30 million since 2002, which resulted in an investment of \$45 million by farmers for a total cost-shared investment of \$75 million).

3.2 VALUING NOT ONLY GREY BUT ALSO GREEN INFRASTRUCTURE

During the most recent economic recession, governments around the world invested heavily in infrastructure projects in an effort to stimulate the economy and create or retain jobs. Through Canada's 2009 Economic Action Plan, the vast majority of the spending has been targeted at "grey" or built infrastructure such as roads, bridges or buildings. While this built capital is important, the "green" natural capital infrastructure received negligible stimulus funding. One of the reasons there has been no new investments in the natural capital portfolio as part of the 2009 Economic Action Plan was the conservation stewardship movement has not made the business case to demonstrate that a financial investment will create new jobs or retain existing ones and will save money down the road in cost avoidance. In addition to the standard metrics of hectares of habitat restored or species protected and conserved by the stewardship community, it needs to demonstrate the economic implications and importance of financial expenditure in the sector that exists.

An investment in voluntary stewardship translates to creating long-term job opportunities. Governments have invested heavily in supporting job creation in many sectors through grants, low-interest loans and tax incentives. In 2009, Ontario invested \$32.5 billion in infrastructure, to support more than 300,000 jobs. This translates into over \$108,000 per job (<http://www.fin.gov.on.ca/en/budget/fallstatement/2009/chapter1.html>).

Appendix 3 provides examples of sectoral indicators for job creation supported by government incentive investments. By comparison, financial investment in the stewardship sector by governments through programs such as the North American Waterfowl Management Plan (NAWMP) in 1996 in Manitoba created new full-time jobs at a cost of \$45,455/job (22 jobs/\$1.0 million). The Fisheries and Oceans Canada Habitat Conservation and Stewardship Program (HCSP) (De Goes 2003) created employment at a cost of \$14,465/job. The three case studies in Sections 4.1 to 4.3 demonstrate that cost effectiveness of investing in stewardship creates jobs at a much lower cost than investing in grey infrastructure job creation programs while restoring ecological integrity.

3.3 VALUING ECOLOGICAL SERVICES

For the most part, ecosystem services have been treated as free and virtually inexhaustible. A recent assessment of the Mackenzie River Watershed in the Northwest Territories estimated the non-market value of this boreal area's natural capital as \$484 billion per year or about \$2,800 per hectare. That is 11 times the annual market value of its natural resources, which includes timber, oil, natural gas, minerals, and agricultural soils and non-resource sectors (Anielski and Wilson 2007). Carbon storage and sequestration were estimated to be worth \$250 billion in 2005, which is 56% of the total non-market value of ecosystem services.

In southern Ontario, the Greenbelt, which surrounds Toronto, covering over 728,000 hectares, was designed to safeguard key environmentally-sensitive land, watersheds, and farmlands that provide essential ecosystem services for quality of life in this densely populated area of Canada. The annual value of the ecosystem services provided by the Greenbelt's natural capital is estimated at \$2.6 billion annually; an average value of \$3,487 per hectare. The Greenbelt's wetlands and forests hold the greatest value, worth over \$2.3 billion. Wetlands here are worth an estimated \$1.3 billion per year or \$14,153 per hectare (David Suzuki Foundation, 2008). In the Greenbelt, "Mother Nature does for free what we otherwise have to pay millions to do through technology and infrastructure" said Mr. Jeff Wilson of the Credit Valley Conservation Authority. While there is debate regarding the data and methodology for the valuation and comparison of ecosystem services, there is no dispute around the key finding that ecosystems services are of crucial importance to the economy and humanity. Other preliminary evaluations from across the country have demonstrated similar results.

The economic values of natural capital vary considerably across studies due to variation in the services investigated as well as the methodologies for estimating value. Valuations are based on a range of methods including: investigation of economic damages from loss of goods and services; willingness to pay for goods and services; and willingness to accept compensation for goods and services. But there are few direct valuation studies in Canada. Most of these rely on value transfer and benefit transfer studies that aggregate the best available information from geographically similar areas.

While it is important to recognize the limitations in the emerging science of valuation of ecosystem goods and services, it is equally critical that we begin to demonstrate the benefits of stewardship programs in terms of avoidance and replacement costs for a range of economic, social and ecological values. Two of the case studies in this report utilize conservative values to demonstrate the substantial contribution of individual projects to the protection of ecosystem goods and services.

3.4 HABITAT RESTORATION

Habitat restoration offers benefits that everyone enjoys. Once considered the domain of scientists and environmentalists, habitat restoration has become a growing business that benefits the environment as well as the economy. The United States National Oceanic and Atmospheric Administration (NOAA) Restoration Center recently tallied the annual investments in Humboldt County, California in habitat restoration and the numbers of restoration-related jobs that were created. In the last three years, more than US\$38 million from the federal government came into the county for restoration projects, generating approximately 300 jobs. This included more than 30 projects to restore rivers and open fish passages, helping to hire local heavy equipment operators, manual labourers, engineers, bridge suppliers and trucking companies. "The actual work associated with coastal restoration is also a significant

source of green jobs” said Peter Leigh, an economist for the NOAA National Restoration Center. (http://www.noaa.gov/features/resources_0109/greenjobs.html). This is a growth area that requires greater profile and promotion.

Another benefit not widely recognized in protecting a species at risk and restoring its associated habitat is the economic one in the form of ecotourism. Saving species at risk from extinction pays, not only in terms of healthy intact ecosystems, but also the tourism dollars that are put back into the local community. People want to see wildlife in its natural environment and are willing to spend a great deal of money to do so. Recognizing this, savvy entrepreneurs have started business ventures ranging from operating wildlife tours to organizing community festival events to celebrate rare animals and attract tourism dollars. Local communities in Kings County Nova Scotia, led by farmers, have organized annual eagle watches that now attract visitors on three winter weekends. Eagle numbers have increased partially as a result of implementation of BMPs that have idled some marginal lands, creating habitat for prey species. Salmon spawning festivals attract numerous visitors in both the Atlantic and Pacific coastal communities. Unfortunately, information on the economic benefits of this form of ecotourism is not readily accessible in Canada.

In the mid-1990s, the reestablishment of a population of wolves into areas of the greater Yellowstone National Park area in the United States where they had been previously extirpated has continued to draw wolf enthusiasts from around the world to the park. These visitors account for an additional US\$35 million in spending each year. The city of Issaquah, Washington hosts a fall festival marking the salmon run that draws 200,000 people and reaps a total economic benefit of more than US\$7.5 million per year. Citizens and communities now recognize that protecting, educating and promoting a wildlife species is not only the right thing to do, it also makes economic sense.

Not unlike the contribution of restoration projects to ecotourism, direct landowner income returns can result from habitat enhancements. Effective implementation of many beneficial management practices may stimulate longer-term income impacts for the landowners associated with this investment activity. Similarly, the adoption of adaptive, beneficial management practices in forestry, agriculture and fisheries sectors can result in reduced costs of operation and other economic spinoff returns. Currently, there is a shortage of documented studies that quantify these benefits; however, an economic evaluation of land use in Manitoba (Josephson 1992) did so (see Exhibit 5). These benefits should move beyond anecdotal accounts and should be recognized in valuations. Equally, where there is a recognized cost to the landowner or the economic benefit is low but the ecological benefit is high, the need for incentives and recognition for provision of goods and services should be considered in valuations.

3.5 INNOVATION IN ACTIONS

Success requires that resources be managed on Nature’s terms and at Nature’s scale if they are to be sustained and economically viable in the long term. This means that decisions in each sector, such as agriculture, forestry or fisheries, must be taken with an eye to broader ecological consequences. It also means that we must find ways to manage across boundaries, property lines and political borders to take care of the ecosystem as a whole.

There are examples where action is being taken. The *2010 Intergenerational Report* (Government of Australia 2010) highlights the crucial need to act towards a sustainable future, acknowledging that climate change is one of the most significant challenges to economic sustainability. The Australian Government recently announced the *Caring for Our Country* Environmental Stewardship Program. Investing the equivalent of \$2.10 billion CDN over five years to combat biodiversity loss and threatened habitats. Under this program, the government is entering into contracts for up to 15 years with landowners, freehold managers, leasehold or native title land to manage priority environmental assets on private property. The Program will purchase environmental services from individuals or organizations. Through the program, the government will pay land managers to undertake agreed-upon actions beyond their regulated responsibilities to achieve public benefit environmental outcomes that contribute to the long-term protection, rehabilitation and improvement of targeted environmental assets on private land (<http://www.nrm.gov.au/stewardship/index.html>).

Exhibit 8. Estimated costs and consequences of losing hunting and trapping as a wildlife management tool in the U.S.A. (Figures in US\$).

Human Health and Safety:

- \$3.8 billion in vehicle repair costs.
- \$1.45 billion in health care and disease control costs for Rabies alone.
- \$128 million in additional aircraft damage.

Government Control of Wildlife Populations:

- \$934.2 million to \$9.33 billion of taxpayers’ money annually to control white-tailed deer.
- \$132 million to \$265 million of taxpayers’ money annually to control furbearers (\$16 million to \$32 million just for beaver control).

Agriculture:

- \$3.027 billion in annual damage to US crops and livestock.

Dwellings and Infrastructure:

- \$972 million in damages to homes annually.

Source: International Association of Fish and Wildlife Agencies (2005).

In North America, provincial and state governments use fees from hunters, trappers and sport fishermen for wildlife management and habitat conservation programs. The estimated contribution (see Exhibit 8) in fees of hunters and trappers in the United States in 2002 was US\$659 million (International Association of Fish and Wildlife Agencies 2005). In Canada, Wildlife Habitat Canada invests the proceeds from the sales of Canadian Wildlife Habitat Conservation Stamps in habitat conservation initiatives across the country. Conservation stamps are purchased primarily by waterfowl hunters to validate their federal Migratory Game Bird Hunting Permits. Since 1985, Wildlife Habitat Canada has provided grants of over \$35 million to hundreds of habitat conservation projects. Information provided by hunters is used to regulate the hunting and trapping seasons and set bag limits while providing wildlife managers with information to manage and control wildlife populations in North America. These industries diminish management costs and contribute economically to wildlife management through their fees as well as generating economic activity in local communities. The Association of Fish and Wildlife Agencies, which now has dropped the word “International”, estimates that the cost to control wildlife populations without hunters and trappers would be hundreds of thousands of taxpayer’s dollars annually to local communities.

4.0 CASE STUDIES

An economic impact analysis traces spending through an economy and measures the cumulative effects of that spending. It is necessary to estimate the proportion of employment and spending that will occur in order to accurately predict what the impact will be. There are four fundamental concepts related to an economic impact analysis that are important to understand. *Direct impacts* are the initial, immediate economic activities (i.e. jobs and income) generated by a project or development. *Indirect impacts* are the production, employment and income occurring in other businesses in the community that supply inputs to

the project. *Induced impacts* are the result of spending by the households in the local economy as a result of the direct and indirect effects from the project. An economic impact assessment is based on the concept of the multiplier. The *multiplier (employment and income)* is an estimate of how much additional economic activity will result from an investment in the economy. It is called a multiplier because total impacts are larger than the initial, direct impacts. For the purpose of this assessment, and in the absence of a current economic model and regionally-sensitive multipliers, the authors have chosen to use a conservative employment and income multiplier of 1.5 (based on the farm industry employment/income multiplier from the United States Bureau of Economic Analysis) for its calculations of the “ripple effect”.

The three case studies – the Ontario Wetland Habitat Fund Program (Section 4.1), the Mixed-Grass Prairie Habitat Stewardship Project (Section 4.2), and the Canadian Model Forest Network (Section 4.3) – reveal the extent of economic contributions made by national, provincial and a national non-governmental organization led local-scale initiatives. In each case study, a profile, program achievements, economic impact and significance are discussed. The case studies assess the economic attributes of each program not only in terms of employment opportunities created or retained and financial incentives, but also by financial valuation of the volunteer and landowner contribution to the projects, the comparative investment in grey vs. green infrastructure, the contribution to ecological goods and services and other emerging and innovative economic opportunities. Where data is available, biodiversity and social achievements are noted. It should be stressed that the lack of focus on these reportable accomplishments does not minimize their importance as stewardship communities strive to improve measurable targets and establish a new era of valuing ecological infrastructure and the biodiversity benefits that are accumulated over time.

There are four additional case studies that the authors strongly recommend be examined. These have relied heavily on building an evaluation structure. These studies were ahead of their time, and should be revisited in light of this review. They include specifically:

- *Economic Evaluation of Manitoba Sustainable Development Activities: NAWMP*. Report prepared for the NAWMP Joint Venture Partners by J.A. MacMillan, Department of Agricultural Economics and Farm Management, University of Manitoba. Winnipeg, Manitoba. February 1996.
- *An Evaluation of the Atlantic Coastal Action Program (ACAP): Economic Impact and Return on Investment*. Contract report by Gardner Pinfold Consulting Economists Limited. Halifax, Nova Scotia. July 2002.
- *An Economic Evaluation of Land Use Changes in Southwest Manitoba*. Report to the Manitoba Habitat Heritage Corporation by R.M. Josephson, Department of Agriculture Economics and Farm Management, University of Manitoba, Winnipeg, Manitoba. November 1992.
- *Habitat Conservation and Stewardship Program Resource Contributions from Third Parties*. Report by L. De Goes, Canadian Wildlife Service, Environment Canada. Delta, British Columbia. September 2003.

4.1 ONTARIO WETLAND HABITAT FUND PROGRAM

4.1.1 Profile

In 1996, faced with declining provincial funding and abandonment of traditional extension programs, the Ontario Wetland Habitat Fund (OWHF) was created to address the urgent need to restore wetland habitats in the developed landscapes of southern Ontario. The Program was designed as a multi-stakeholder, community-led initiative to support landowners and land managers in their on-the-ground actions to conserve, enhance and restore wetland habitats and waterfowl populations.

The OWHF Program was a long-term, landowner-based wetland conservation program delivered under the North American Waterfowl Management Plan (an agreement between the governments of Canada, United States and Mexico) under the auspices of the Eastern Habitat Joint Venture. The Program was delivered between 1997 and 2008 across southern Ontario by Wildlife Habitat Canada in financial partnership with the Ontario Ministry of Natural Resources, the United States Fish and Wildlife Service, other cooperating and supporting agencies such as the Canadian Wildlife Service, and private landowners. The OWHF Program operated through the work of OWHF field representatives, working from as many as nine regional host offices (see Appendix 5 for map of the OWHF Delivery Regions), who liaised with farmers, rural landowners, and resource management agencies throughout the region, to promote ecologically sound land and water uses that met the needs of waterfowl, wetland wildlife, and people. In the process of securing wetland agreements and developing enhancement projects, the OWHF field representatives provided a broad range of program extension services (i.e. technical support and financial assistance) to support landowners in their efforts to conserve and enhance existing wetlands on private lands. The OWHF Program representatives successfully encouraged landowners to adopt best management practices such as riparian planting and restricting livestock from wetlands via fencing that benefited wildlife habitat, and thereby had a positive influence on how landowners managed their properties.

Landowners participating in the OWHF Program developed their own wetland conservation plan, submitted project proposals to one of eventually nine Regional Advisory Committees, implemented habitat projects, provided matching funds for conservation project work, and maintained and managed their projects over the long term. Landowners received up to 50% of the habitat enhancement costs to a maximum of \$5,000 per project from the OWHF Program. The landowners contributed the remaining cash and any in-kind contribution costs for the project. The landowners' wetland conservation activities were confirmed by, and subject to, written and signed 10-year conservation agreements with Wildlife Habitat Canada.

4.1.2 Program Achievements

The success of the OWHF can be assessed in some measure by the jobs created and the support delivered to the people, communities and businesses in southern Ontario. The Wetland Habitat Fund also had a positive impact in the areas of wetland habitat creation and enhancement, and abundance of wetland wildlife despite the latter being anecdotal and lacking rigorous monitoring (see Exhibit 9). The OWHF field staff assisted landowners in devising practical, cost effective habitat management or restoration projects including planting or protecting vegetation buffers around wetlands, creating small water control structures to restore wetland hydrology, restricting livestock access, creating alternate watering systems and rehabilitating degraded wetlands by managing vegetation and runoff. Through the life of the OWHF Program, 21,523 hectares of wildlife habitat were restored or enhanced by way of 1,107 secured landowner stewardship agreements.

Exhibit 9. Biological Impact of the OWHF Program

Despite having an informal monitoring program that the majority of the landowners participated in, observations of the biodiversity and water quality impacts of the projects lacked technical rigour. Measurement of the effects of OWHF projects on waterfowl populations was left to government waterfowl population surveys as required and regulated under the *Migratory Birds Convention Act* and Regulations. Stabilization or increases in populations of Ontario's waterfowl could be assigned to the contributions of improved wetlands and wetland habitats accrued from the conservation, enhancement and restoration initiatives.

Source: *Ontario Wetland Habitat Fund 1997-2007* (Wolthausen 2008).

It has been recognized that not all forms of stewardship can be measured, such as aspects of programs related to Canadian social values. Activities such as changing attitudes and practices based on contacts or

partnerships and community building and enjoyment and educational experiences can only be considered in terms of the numbers of individuals, organizations and businesses contacted. These activities result in valuable side benefits or means to ecological ends. Efficacy of messages and receptiveness to programs is not easy to measure. Past evaluations have demonstrated that the OWHF Program provided value in excess of that captured in the calculation of the cost per hectare, employment and income. It provided exceptional extension service to landowners. These program assessments have concluded that landowner participants in OWHF projects were motivated to maintain ongoing implementation of good stewardship practices on the rest of their property and many have become ambassadors of beneficial environmental management practices in their communities, thereby making an important contribution to social values in local communities.

4.1.3 Economic Impact

The OWHF Program expenditures are associated with employment and income impacts, contribute to the Gross Domestic Product, and support regional economic development. The economic impacts of the OWHF Program are assessed on the basis of the purchase of goods and services, and the payment of wages and salaries. This analysis also recognizes the value of volunteer and in-kind contributions, landowner income returns from OWHF expenditures, contributions to rural economic development and the estimated net value of the ecosystem services provided by the wetlands and associated uplands that have been protected, restored and enhanced.

A. Employment and Income Impacts²

Annual employment and income impacts are associated with expenditures in Ontario over the life of the Program. The expenditures are associated with jobs and income originating directly from the OWHF payroll, indirectly in sectors that supply goods and services to the habitat development construction activities, and household purchases in sectors that result from income generated directly or implicitly.

Employment:

The OWHF Program delivery was facilitated by between six and nine field representatives supported by a program coordinator and occasional administrative assistance. The OWHF total impact over 11 delivery years amounts to 70.5 full-time equivalent positions that were directly engaged by the OWHF initiative. Most of the jobs required university levels of education and a small percentage were classified as administrative. On an aggregate basis, if only direct jobs created under the OWHF Program (e.g. 70.5) are counted in relation to the total expenditure of \$2.416 million (that is comprised of \$2.368 M from the Province of Ontario and \$0.048 M from Environment Canada), then a ratio of 29 direct jobs per million dollars in government expenditure results in \$34,269 per job.³

² “includes direct payments of salaries, wages as well as office rentals” to provide comparable information compatible with the Economic Evaluation of Manitoba Sustainable Development Activities: NAWMP 1996.

³ the calculation of the number of jobs per million dollar investment has a caveat specifying that the estimate is a function of government funding only. This allows comparison with civil grey infrastructure approximations.

Assuming a conservative employment multiplier for OWHF activities (to account for spin-off impacts) is 1.5 (see Exhibit 10) (each OWHF job generates an additional 0.5 jobs to the Ontario economy), a total of 106 full-time equivalence positions were created in Ontario by OWHF operating activities over the 11-year period, directly, indirectly (employment created in sectors supplying materials to OWHF activities), and induced (employment created in Ontario sectors associated with consumption purchases generated by OWHF activities).

Exhibit 10. Multiplier Values for Employment

In a 1996 economic evaluation study of the impacts of NAWMP in Manitoba, the employment multiplier for NAWMP activities was established to be 2.36, far greater than our assumed OWHF employment multiplier of 1.5. Source: *Economic Evaluation of Manitoba Sustainable Development Activities: NAWMP 1996* (MacMillan 1996).

Income:

The total OWHF budget (excluding leveraged investment from landowners) of \$11,745,310 generated economic impacts on the Ontario economy in two ways. First, \$9,240,837 of the budget is used for operating purchases of goods and services from suppliers. Second, the budget creates direct income payments in the form of wages and salaries (\$2,504,473). These direct income payments (see Glossary of Terms, Appendix 1) to Ontario households are spent on consumption goods and services, investments and taxes. The direct income payments received from OWHF operations are spent by Ontario households thus generating indirect economic activity in Ontario.

Assuming a conservative income multiplier for OWHF activities is 1.5 (see Exhibit 10 above and definition in Glossary of Terms, Appendix 1), each dollar of OWHF income generates an additional \$0.50 in Ontario. The OWHF direct income payments of \$2,504,473 from the delivery of the program generated an additional \$1,252,237 in Ontario.

Gross Domestic Product (GDP):

The GDP in Ontario is the annual sum of income payments to households in terms of wages and salaries, net income of businesses and returns on investments. It is assumed in the impact analysis that the total direct income payments in the OWHF budget, \$2,504,473, represent a contribution to GDP in Ontario. The Ontario assumed conservative GDP multiplier for OWHF activities is 1.5 (see Exhibit 10) indicating that the direct GDP under OWHF generates an additional 0.50 dollars of GDP in Ontario. The Ontario direct GDP contribution by OWHF is \$2,504,473 and total GDP generated in Ontario by OWHF was \$3,756,710.

B. Other Economic Values

Landowners' Cash and In-kind Project Contributions:

Landowners were required to match the funding provided by the OWHF, but routinely exceeded with their required financial commitment, typically supplying equipment, materials and supplies equivalent to close to 69% of the complete project value. The habitat development expenditures detailed in Appendix 5 account for on average only 31% (\$8,399,164) of the comprehensive project costs. The OWHF Program leveraged government's investment through the 1,107 landowners' \$18.7 million in labour, equipment and materials exclusive of on-going maintenance, monitoring and recapitalization expenses over the lifetime of the program.

Value of Ecosystem Services:

Incremental destruction of the natural landscape and the loss of valuable services provided by natural capital continue at an increasing pace as a result of land use changes, urban and industrial development and are exacerbated by changing climate impacts. Unfortunately, current accounting systems rarely account for nature. However, emerging measurements of the value of ecosystem services will help society to make better decisions about land use combined with economic activity.

In case studies from the agricultural landscape, the estimated net value of conserving or restoring natural areas has been gauged at \$195/ha/yr in the Grand River Watershed in Ontario (Olewiler 2004). This pales in comparison to recent estimates of wetland values in Ontario: the Greenbelt — \$14,153/ha/yr (David Suzuki Foundation 2008), the Lake Simcoe Watershed — \$11,172/ha/yr (Wilson 2008), Southern Ontario — \$15,171/ha/yr (Troy and Bagstad 2009), and the Credit River Watershed — \$31,682/ha/yr (Kennedy and Wilson 2009).

The OWHF Program enhanced and secured 21,523 hectares of wetlands and associated uplands primarily in the working agricultural landscapes in Ontario. If we use the most conservative values, those of Olewiler's estimated net value of conserving and restoring natural areas in the Grand River watershed in Ontario, the value for the OWHF wetland area enhanced accrues to \$4,196,985/ha/yr (low). The speculative value of the OWHF wetland area enhanced, using the Credit River watershed natural services value, would increase to \$681,891,686/ha/yr (high).

Value of Wetlands as Carbon Banks:

Wetland benefits include flood control, water filtration, erosion control and sediment retention, removal of nitrogen and phosphorus, habitat, recreation, aesthetics carbon storage and uptake. Values for each of these ecosystem services have recently been determined for each wetland ecosystem type (open water, bog, marsh, swamp, and fen) for Ontario's Greenbelt.⁴ Despite the disparity between the Greenbelt study findings and those from Olewiler (2004), carbon storage values have been estimated for the wetland restoration and enhancement area declared by the OWHF (13,066 wetland hectares of the 21,523 hectares of wetlands and associated uplands). Based upon the lowest carbon storage value for swamps, set at \$429 per hectare, the annual non-market value of carbon storage in wetlands influenced by the OWHF Program arrives at \$5.605 million annually.

Landowner Income Returns:

Effective implementation of beneficial management practices stimulates longer-term income impacts associated with investment activity. For the first eight years of the OWHF Program, about 60% of the landowners were full-time or part-time farmers and the remainder were rural non-farm landowners. The last years saw a rise in rural non-farmers to more than 55% of the program participants. The adoption of land use modifications (conversion of cultivated marginal land to permanent cover, zero till, rotational grazing, alternate watering systems), can yield farm income improvements as a result of improved crop and livestock yields. The benefit comes from the combination of increased revenue and reduction in costs. Unfortunately, the current analysis does not consider these investment returns. However, precedents have been set from economic studies of land use modifications such as the evaluation of land use changes in southwest Manitoba (Josephson 1992) and should be considered as reportable values when applicable.

⁴ Wetland ecosystem service values range from a low \$676.59/ha/year for swamps to a high of \$1,360.35/ha/year.

Volunteer Contributions:

Volunteerism is a hidden asset that has not received its rightful recognition and position on our economic balance sheets. It is rarely accounted for due to limitations in clerical capacity and if acknowledged, the value of volunteer work is grossly underestimated. The OWHF Program was successful in leveraging significant amounts of private and public sector voluntary and in-kind support for every dollar provided to the OWHF Program. These contributions came from landowners, advisors, and through program management as follows:

- Landowners: Ongoing maintenance costs were not included in the landowner investment calculation for the OWHF. In 2000, a sample of 52 landowners, who participated in a monitoring program, reported spending a total of \$10,192 and 1,772 hours on project maintenance per year. If this benefit estimate is assigned to the 1,107 landowners, one could anticipate an annual contribution of \$215,600 and 37,400 hours (4,675 eight-hour days) or 2.5 full-time equivalents simply to maintain the green infrastructure developed through this initiative. If one assumes an estimated value of pay at \$18.50 per hour (Statistics Canada 2005), the annual voluntary contribution to maintain and monitor habitat development projects on their land is conservatively estimated to \$691,900.
- Professional Advisors: As many as nine regional Advisory Committees provided local contributions, as well as review and technical input on the quality and cost effectiveness of proposed initiatives. Committee members included representatives from farm organizations, provincial stewardship coordinators and staff from Conservation Authorities, the Ministry of Natural Resources and the Canadian Wildlife Service. There were 21 advisors providing two days per year of professional advice for the first six years of the program and 32 advisors providing a similar level of support for the final five years of the OWHF Program. This effort translates into an average value of approximately 10 days per year at a value of \$5,600 per year.
- Program Management: The OWHF was administered by a Steering Committee (salary costs not included in the in-kind project management cost estimate) – an association of a Director, Wildlife Habitat Canada and a senior manager, Ontario Ministry of Natural Resources. The Steering Committee was the conduit between the Eastern Habitat Joint Venture and the on-the-ground delivery of the wetland and waterfowl program. It is conservatively estimated that the average annual contribution from the partner agencies in terms of office space, administrative and financial support was equal to \$47,000 per year.
- Host agencies' technical support: Host agencies provided technical support to field representatives when special expertise was needed to advance habitat development projects. These costs were never accounted for during the life of the program.
- Regional Office and Administrative Support: Host agencies also provided program support to administer funds and to provide administrative services and office space. Host agencies received a small amount of interest revenue to cover some of their administrative costs. The estimated office rental equivalent for three field offices (not accounted for in Appendix 5) has been modestly assessed to be \$4,233 per office, totaling \$12,700 per year.

C. Contributions to Rural Economic Development

Rural communities throughout Ontario can grow and prosper: however, they must respond to the fact that rural economies are changing and demands and expectations exemplified by wise and environmentally-friendly land management are becoming a societal expectation. Strong and adaptive rural economies attract and retain investment, provide stable employment as well as social, cultural, tourism and recreation

services. The OWHF was woven into the social, cultural and economic fabric of the host rural communities. The Fund has supported rural economic development and has stimulated innovation and adoption of beneficial management practices that help build robust rural communities, but also satisfy collective expectations of Ontarians. A substantial contribution to Ontario regional development has resulted from the adoption of a regional delivery system (please refer to Appendix 5 for additional information) and the distribution of expenditures is indicated as follows:

- 1) Southwestern Region, \$1,879,249;
- 2) Western Region including Northern Sub-region, \$1,174,531;
- 3) Cambridge Region including London Sub-region, \$1,291,983;
- 4) Peterborough Region, \$2,231,607;
- 5) Quinte Region, \$3,053,780; and
- 6) Southeastern Region including Ottawa East Sub-region, \$2,114,160.

When land management income benefits, rural regional development impacts and the habitat benefits are considered in addition to job benefits, then the OWHF Program is clearly an exemplary sustainable development project (green infrastructure program).

4.1.4 Significance

It is difficult to quantify the full economic value of the OWHF and the overall environmental and social impacts in terms of income benefits, cost avoidance and beneficial land management practices. To provide some context, a helpful text is “Economic Benefits of Nature-Related Activities for Residents of Ontario in 1996” published in *The Importance of Nature to Canadians: The Economic Significance of Nature-Related Activities* (Environment Canada 1996). This report attests to the fact that residents of Ontario derived significant economic value equivalent to \$807.1 million annually from their participation in nature-related recreation. Despite not being able to account for OWHF’s Program contribution to this economic activity, it is certain that habitat development activities and wetland development expenditures under OWHF have played a small part in these nature-related activities.

However, this report (see Table 2) demonstrates the following specific benefits over the life of the program:

- 70.5 full-time equivalent (FTE) jobs directly
- 36 additional FTE indirectly
- Direct income of \$2.504 million
- An additional \$1.252 million in indirect income
- Gross Domestic Product of \$2.504 million
- Landowner cash and in-kind contributions to the habitat development equal to \$18.7 million
- Advisors voluntary contribution \$56,000
- Program Management in-kind assessed at \$70,000
- Field office rental estimated at \$127,000
- The review was unable to uncover the value of the in-kind support received from host agencies contribution of technical and administrative support

Over the ten year delivery period, the economic benefit aggregates to the equivalent of 106.5 full-time equivalent jobs, direct and indirect income of \$3.756 million and supplies and services outputs of \$18.953 million.

In addition, the analysis has captured the following annual benefits (see Table 1) arising from the program:

- Landowner maintenance activities equal to \$692,000 for maintenance and \$216,000 for supplies and equipment
- The review was unable to assess the landowners income return based upon economic returns from implementing beneficial management practices
- Value of ecological goods and services estimated to be in the order of \$4.197 million
- Carbon capture value estimated at \$5.605 million per year

Combined annual benefits approach \$10 million. Social benefits have not been assessed and the program’s endowment to habitat and biodiversity objectives can only be measured in the 21,523 hectares of wetland and associated habitats secured and enhanced.

Table 2. Summary of Economic Attributes of the OWHF Program (1997-2008)

1.0	Employment and Income	OWHF (M = millions)	Notes
	1.1 Employment	70.5 (FTE) \$2.416 M Government investment for 10 years \$34,269/job	Full-Time Equivalent (FTE) is defined as 2080 hours of work per year. Statistics Canada values volunteer work at \$18.50/hr Government investment consists of provincial (Ontario Ministry of Natural Resources – \$2.368 M) and federal (Environment Canada, Canadian Wildlife Service – \$0.048 M)
	1.2 Direct Income Payments	\$2.504 M	Salaries and wages (\$2.428 M plus office rental \$0.076 M)
	1.3 Gross Domestic Product (GDP)	\$2.504 M	
2.0	Other Economic Values		
	2.1 Landowner Cash and In-kind Project contributions	\$18.7 M	
	2.2 Landowner Income Return	Unknown	
	2.3 Volunteer Contributions		
	<ul style="list-style-type: none"> • Landowner Equipment/Supplies • Landowner Maintenance • Professional Advisors • Program Management • Host Agency Technical Support • Host Office Rent/Admin Support 	\$216,000/yr \$692,000/yr \$5,600/yr \$7,000/yr Unknown \$12,700/yr	-- Estimated @ \$18.50/hr Estimated @ \$50.00/hr
	2.4 Ecological Goods and Services	\$4.197 M/yr	Based on \$195/ha/yr for the Grand River Watershed (Olewiler 2004)
	2.5 Carbon Capture	\$5.605 M/yr	Based on \$429/ha/yr for swamps in the Ontario Greenbelt (David Suzuki Foundation 2008)

4.2 MIXED-GRASS PRAIRIE HABITAT STEWARDSHIP PROJECT

4.2.1 Profile

The Mixed-Grass Prairie Habitat Stewardship Project is funded by: the federal Habitat Stewardship Program for Species at Risk (Environment Canada, Fisheries and Oceans Canada and Parks Canada Agency); Manitoba Conservation; the Manitoba Critical Wildlife Habitat Program (a cost-shared program between governments, local and national conservation agencies); and, the Manitoba Habitat Heritage Corporation. The project promotes agricultural activities that incorporate wise land stewardship and biodiversity conservation. This is accomplished through five-year agreements with private landowners that include incentives to implement twice-over rotational grazing on native grasslands. The project first established demonstration project sites for the twice-over rotational grazing system in the mid-1990s and has actively sought out co-operative grazing agreements with landowners on an annual basis since 2002.

Dr. L.L. Manske, of North Dakota State University, developed the twice-over rotational grazing system utilized in this project (www.grazinghandbook.com). The system uses three to six pastures. Each pasture is grazed for seven to 17 days during the first period (from June 1 to July 15). During the second period, each pasture is grazed for double the number of days it was grazed during the first period with livestock removed from the pastures in mid-October. The rotational grazing strategy improves plant health and stimulates growth, which can help restore degraded ecosystems as well as maintain livestock performance later in the season.

The Mixed-Grass Prairie Habitat Stewardship Project has documented positive financial benefits to livestock producers who participate in the project. With the majority of mixed-grass prairie lands in Manitoba in private ownership, this program is critical to maintaining the health and abundance of these areas.

4.2.2 Program Achievements

The Mixed-Grass Prairie Habitat Stewardship Project is being delivered on a landscape level to conserve and enhance native mixed-grass prairie. In southwestern Manitoba, grassland area has decreased to less than 18% of what was present historically. The loss and degradation of native prairie habitat is one of the contributing factors to the decline of grassland bird populations and many other endemic species. The mixed-grass prairie in southwestern Manitoba is a critical area for some grassland bird species including those on the northern edge of their range. These include several species at risk such as the Burrowing Owl, Sprague's Pipit, the Loggerhead Shrike, the Chestnut-collared Longspur and Baird's Sparrow. Through the Mixed-Grass Prairie Habitat Stewardship Project, landowners with native prairie lands are encouraged to maintain their lands in a natural state.

The project hosts an annual spring tour to established sites and a three-day fall workshop to provide background on the twice-over grazing system, a proven agricultural methodology with demonstrated benefits to native grasslands and to livestock performance. Since the start of the project in 2002, project staff has signed 59 five-year agreements to implement the twice-over rotational grazing system with a total area of 8,604 hectares (21,260 acres).

Benefits to the native prairie under these landowner agreements are currently being assessed using the Manitoba Conservation Data Centre grading guidelines for Upland Mixed-Grass Prairie Communities. Benefits to producers are being assessed and demonstrated through a weighing program to document

livestock performance. Results are provided to producers, but are not available for the program at this time.

4.2.3 Economic Impact

A. Employment and Income Impacts

Employment:

Over the eight years of the project, partner funding (Table 3) has helped to support two full-time contract staff annually. A third part-time staff member has also worked on the project in the last two years. This represents approximately 17 full-time equivalent positions. With a total budget of approximately \$1.85 million of government, government-NGO partnership and Crown corporation spending over the eight-year project (including the first four contributors in Table 3), this represents an approximate value of 9.2 jobs per million dollars in partnership spending and 17.9 jobs per million dollars in federal government spending. Using a conservative employment multiplier of 1.5 (as defined in the OWHF case study), it can be assumed that each Mixed-Grass Prairie Stewardship Project job generates an additional 0.5 jobs in the Canadian economy, increasing the number of full-time equivalent positions to 25.5.

Landowner Incentives:

Since 2002, a total of 59 five-year agreements to implement the twice-over rotational grazing system have been signed with landowners, encompassing a total area of 8,604 hectares (21,260 acres). Individual producers are paid based on the acreage of the agreement:

- 64.7 ha (160 acres) have been valued at \$1,250;
- 129.5 ha (320 acres) have been valued at \$2,500; and,
- the project has paid up to \$5,000 for 259 ha (640 acres) or more.

B. Other Economic Values

Partnership Contributions:

Investment in the Mixed-Grass Prairie Habitat Stewardship Project comes from four key partners: the Habitat Stewardship Program of the federal government, Manitoba Conservation, the Critical Wildlife Habitat Program, and the Manitoba Habitat Heritage Corporation. In the last two fiscal years, the University of Manitoba has also contributed to the project. Landowners also make a significant contribution to the project through their own investment of time (in-kind) and money into their grazing systems. Landowner investment is valued at \$91,131 over the eight years of the program representing 4.5% of the total investment. Landowner contributions have been variable over the duration of the Program, presumably due to variation in the number of participants enrolled in the program over time (see Table 3).

The Federal contribution to this project through the Habitat Stewardship Program is \$950,318 representing just over 47% of the total investment.

Table 3. Mixed-Grass Prairie Habitat Stewardship Project – Funding from Partners (CA\$)

Agency	2009-2010*	2008-2009	2007-2008	2006-2007	2005-2006	2004-2005	2003-2004	2002-2003	Total
Habitat Stewardship Program (Federal)	170,000	160,723	107,295	121,465	79,145	119,790	100,600	91,300	950,318
Manitoba Conservation	66,400	62,192	62,871	71,539	69,366	69,743	57,446	62,042	521,601
Critical Wildlife Habitat Program	42,680	57,266	32,054	25,833	16,479	20,505	21,187	13,272	229,279
Manitoba Habitat Heritage Corporation	26,600	22,000	17,000	19,737	20,550	18,000	16,000	8,000	147,888
Landowners	6,150	23,203	20,101	10,827	2,050	11,283	11,714	5,800	91,131
University of Manitoba	30,750	31,079	N/A	N/A	N/A	N/A	N/A	N/A	61,829
Total	342,580	356,463	239,321	249,401	187,590	239,321	206,947	180,414	2,002,046

*Budgeted, not final allocations – to be determined at year-end.

Livestock Performance:

As part of the project, a weighing program has been introduced to document changes in livestock performance in response to adoption of the twice-over rotational grazing system on native mixed-grass prairie. Cows and calves are weighed when they are put on the pasture and then again when they are taken off. Currently, 13 producers are participating in this program. The overall weighing data was not available for this analysis, and has not been analyzed by the project partners at this time. The data is being used as a monitoring tool for producers to ensure they are comfortable with how their animals are doing under the grazing system. Preliminary results show the key outcome of the program from the producer's perspective; the demonstration that weight gains are good under the twice-over rotational grazing system for a longer period of time than the cattle would typically have on pasture, and that the pastures consistently produce these results even through dry years (Westhorpe, personal communication).

Other projects in the region have demonstrated measurable benefits to landowners participating in similar stewardship programs. In an economic analysis of the impacts of the Manitoba Habitat Heritage Corporation's Green Banks Program on one farm in western Manitoba, it was found that grazing and watering changes associated with riparian areas and native pasture led to a net weight gain of 60.3 kg per hectare (53.8 lb per acre) and a net economic gain of \$50.50/year per cow (\$3,535/year for the herd) (Sopuck undated). The net present value of the \$1,800 investment (over 10 years at 7% interest rate) was estimated to be \$23,029 with a payback period of 0.6 year (Sopuck undated).

Similarly, in a survey of cattle producers in Manitoba known to have undertaken riparian area management and rotational grazing practices deemed to be beneficial to the environment (Chorney and Josephson 2000), producers were asked to rate their new production systems against the last year of operation with their old system (which in most cases were season-long grazing with free access to water sources). Changes in livestock performance observed by the 346 producers were significant:

- 91% reported greater pasture forage quantity;
- 88% reported greater pasture forage quality;
- 88% reported an increased overall net return for the operation;

- 85% reported greater labour and management requirements;
- 84% reported an increased overall net return per animal;
- 80% reported greater average weight gain;
- 52% reported that the overall production cost per animal decreased (24% stayed the same); and
- 30% reported lower herd health costs (60% reported no difference).

Producers surveyed suggested barriers to adopting managed grazing and watering were financial (73%), labour requirements (63%), management requirements (59%), lack of water supply (59%), lack of information on economic benefits (29%), and lack of management information (26%) (Chorney and Josephson 2000; Sopuck undated). Projects such as the Mixed-Grass Prairie Habitat Stewardship Project are critical in providing the financial and technical incentives to realize these types of benefits in terms of both economic return to producers through livestock gain and improvements to habitat for grassland species including many species at risk.

Value of Ecosystem Services:

Recent studies on ecosystem goods and services have provided some initial indication of the value of natural systems in providing services to the greater population. Olewiler (2004) provides an estimation of the value of a range of ecosystem services in the Upper Assiniboine River Basin in southwestern Manitoba and southeastern Saskatchewan. The benefits (\$/ha/year) are shown in Table 4 with an estimated net value of conserving or restoring natural areas estimated as \$29.15/ha/year (low), \$65.67/ha/year (best estimate), and \$108.25/ha/year (high).

During the eight years of this project, 59 landowner agreements have been signed with a total area of 21,260 acres (8603.6 ha). Using Olewiler's values in Table 4, the Natural Capital value of the current area under Mixed-Grass Prairie Habitat Stewardship Project agreements accrues to \$250,795 per year (low), \$564,998 per year (best estimate), and \$931,340 per year (high).

Table 4. The Value of Conserving Natural Capital in the Upper Assiniboine River Basin (Olewiler 2004)

Benefit	High Value (\$/ha/yr)	Best Value Estimate (\$/ha/yr)	Low Value (\$/ha/yr)
Saved government payments	19.25	12.83	6.42
Saved crop insurance payments	5.27	3.51	1.76
Improved water quality – decreased sediment	9.34	4.62	1.34
Water-based recreation	1.37	0.91	0.46
Reduced wind erosion	4.01	2.67	1.34
Reduction in Greenhouse Gas (GHG) emissions	14.07	9.38	4.69
Carbon sequestration	29.40	19.60	9.80
Increased wildlife hunting	19.11	10.71	5.36
Increased wildlife viewing	6.45	4.16	2.08
Gross benefits	108.27	68.39	33.25
Program administrative costs	(1.04)	(2.08)	(3.12)
Wildlife depredation compensation	(0.32)	(0.64)	(0.96)
Net benefits	106.91	65.67	29.17

4.2.4 Significance

This stewardship project demonstrates the importance of integrating ecological values (improved management and health of native mixed-grass prairie) with economic values (demonstrating potential for increase in weight gain and pasture productivity). The initial investment of producer time and partner money is critical to establish this kind of change in management practice.

Over the life of the project so far, the specific economic benefits demonstrated in this case study include:

- 17 full-time equivalent (FTE) positions directly;
- An additional 8.5 FTE indirectly;
- Landowner incentives of \$1,250 for 64.7 ha (160 acres), \$2,500 for 129.5 ha (320 acres) and up to \$5,000 for 259 ha (640 acres) or more for a five-year agreement to participate in the program and implement the twice-over rotational grazing system;
- Landowner cash and in-kind contributions of \$91,131;
- A federal investment through the Habitat Stewardship Program of \$950,318, representing 47% of the investment by all partners.
- A potential for increased yearly weight gain for cattle, and a gain over a longer grazing period with results supported by a pilot weighing program and other projects in the region;
- An estimated ecosystem goods and services value for the 8,603.6 ha (21,260 acres) of \$250,795 per year using a conservative (low) estimate, \$564,998 per year using the ‘best estimate’ value, and \$931,340 per year using a high estimate value.

4.3 CANADIAN MODEL FOREST NETWORK

4.3.1 Profile

There are 14 Model Forests in Canada that were created with the goal of bringing partners together to develop, test and share solutions to local challenges in sustainable forest management. Each Model Forest is a not-for-profit organization. Partners, including aboriginal groups, industry, landowners, communities, universities, parks and scientists, work collaboratively to determine priorities for regional sustainability. Through these partnerships, the Model Forests have adopted a stewardship role, working with a range of stakeholders to maintain the integrity of forests and associated ecosystems.

Model Forests were first established in Canada in 1992, bringing together grassroots organizations, community leaders and forest stakeholders to address a number of concerns within the forest community. Federal funding from the Canadian Forest Service of Natural Resources Canada was provided through the Model Forest Program, which lasted for 15 years and helped bring together hundreds of partners and leverage additional funding from a wide variety of other sources and stakeholders. In 2007, the Forest Communities Program was launched by Natural Resources Canada with a focus on helping forest-based communities develop the tools, approaches and strategies needed to respond to the challenges facing Canada’s forest sector. Eleven Model Forests are receiving this multi-year funding (2007-2012), and three others remain in operation utilizing other funding sources.

A national link between the Model Forests is provided by the Canadian Model Forest Network (CMFN), which was initially facilitated through Natural Resources Canada, and subsequently established as a non-profit in 2007 with Natural Resources Canada as a partner. There are currently 14 Model Forests Members in the Canadian Model Forest Network representing a range of forest types and forest-based communities from across the country (Table 5). The CMFN coordinates a series of strategic initiative that

pull together a national perspective through partnerships with individual Model Forests and other groups, facilitating knowledge transfer and information development.

Table 5. Members of the Canadian Model Forest Network

Model Forest Member	Province	Objectives*
Clayoquot Forest Communities	British Columbia	<ul style="list-style-type: none"> • Demographic change in forest-based communities • Strong regional institutions and collaborative partnerships • Diversification of local economy and innovation in ecosystem-based management
Resources North Association	British Columbia	<ul style="list-style-type: none"> • Building capacity in forest-based communities • Integrated multi-sector approaches based in science to address community transition • Rural forest-based opportunities
Foothills Research Institute	Alberta	<ul style="list-style-type: none"> • Develop innovative science and knowledge for integrated resource management on the forest landscape through diverse and actively engaged partnerships
Prince Albert Model Forest	Saskatchewan	<ul style="list-style-type: none"> • Develop capacity and governance models for forest-based communities • Assist communities in transitioning forest-sector economy, develop new forest-based opportunities
Manitoba Model Forest	Manitoba	<ul style="list-style-type: none"> • Develop a diverse economy through local level participation in Sustainable Forest Management with an emphasis on aboriginal involvement and planning • Development and adoption of innovated forest stewardship practices, systems and tools
Northeast Superior Forest Community	Ontario	<ul style="list-style-type: none"> • Forest community governance systems for engagement in forest resource management • Value added products, energy and biomass fuels and non-timber forest products • Develop an eco-industrial business cluster
Lake Abitibi Model Forest	Ontario	<ul style="list-style-type: none"> • Building and communicating knowledge of sustainable resource management • Community involvement and expanded partnerships
Eastern Ontario Model Forest	Ontario	<ul style="list-style-type: none"> • Work with communities and stakeholders to develop forest-based opportunities • Work with communities to pilot ideas, conduct research and develop integrated multi-sector approaches to respond to a forest sector in transition
Cree Research & Development Institute	Quebec	<ul style="list-style-type: none"> • Bring together western science and Cree traditional knowledge for resource management • Integrating traditional cultural land use into forest planning through a consultation and land-use mapping process
Le Bourdon Project	Quebec	<ul style="list-style-type: none"> • Optimize production capacity from a Sustainable Forest Management perspective while respecting biodiversity at the landscape scale • Increase economic benefits of forest and recreational tourism sectors • Share tools with partners and communities to enable response to issues and opportunities associated with forest environment resources
Lac Saint Jean Model Forest	Quebec	<ul style="list-style-type: none"> • Sustainability of forest-based communities • Sustainable and integrated management of forest resources • Share information and tools through networking
Fundy Model Forest	New Brunswick	<ul style="list-style-type: none"> • Develop tools for use by communities to analyze status, identify opportunities and adapt to change • Develop innovated approaches to sustainable resource management in the Acadian forest and work with stakeholders to diversify the bio-economy
Nova Forest Alliance	Portions of Nova Scotia and Prince Edward Island	<ul style="list-style-type: none"> • Pilot ideas, conduct experiments and develop models to assist forest-based communities; share sustainable forest management practices and tools • Develop multi-sector approaches to address community transition and develop new forest-based opportunities
Model Forest of Newfoundland and Labrador	Western Newfoundland	<ul style="list-style-type: none"> • Strengthen forest-based communities to meet transitional challenges • Facilitate governance options to build community ownership and accountability in the forest sector • Create awareness of science-based solutions promoting accountability • Establish capacity to explore new opportunities in the forest sector

*Adapted from Canadian Model Forest Network (2009).

4.3.2 Program Achievements

The Canadian Model Forest Network recently completed an inventory of 2007-2008 projects of the member Model Forests (Table 6). The focus of each Model Forest varies depending on location, partners and priorities. While “stewardship” is only mentioned directly under one theme (private land stewardship), as a group, the stewardship role of these organizations is substantial. Model Forests in the Network have projects relating to: biodiversity, the boreal forest, climate change, resource management, private land stewardship, water, wildlife, ecological goods and services, and a variety of other social and economic issues. The members of the Network are dedicated to advancing sustainable forest management on Canadian landscapes and the sustainable development of communities that rely on forests. Through partnerships, the Network is connected to more than 800 stakeholders across the country delivering programs, conducting research and sharing information on sustainable use. Table 6 provides a summary of the types of projects and the associated Network Strategic Initiative activities. From 1992 to the present, most Model Forests will have had projects relating to all of these themes.

Table 6. Summary of 2007-2008 Model Forest Projects and Activities by Project Theme

Project Theme	Definition	Number of Model Forests with Current Projects	Theme coincides with Network Strategic Initiative?
Aboriginal Partnerships	Activities partnering with aboriginal communities and/or representatives	7	Yes
Biodiversity	Activities relating to biological diversity in the forest (flora and/or fauna), species at risk	3	No
Boreal Forests	Activities specific to the boreal region	10	Yes
Climate Change	Activities addressing climate change	6	Yes
Communities	Activities that include community participation as well as addressing their values and needs from the forest	11	Yes
Criteria and Indicators	Activities that work to develop criteria and indicators to address forest management issues	6	Yes
Ecological Processes	Projects that incorporate how ecological processes play a role both for forestry and the functioning of the natural ecosystem	1	No
Education	Projects that address education of the public, programs for adults and/or children (either in the school setting or otherwise) up to the end of high school	9	Yes
Forest Practices	Activities specifically related to forestry, timber harvest and management for wood products; also includes reference to GIS-related management activities	5	No
International Linkages	Programs that have cooperation and information sharing between Model Forests in Canada and Model Forests internationally.	7	Yes
Private Land Stewardship	Programs that work to develop private landowner stewardship of their forests and woodlots	3	No
Water	Projects that address water quality and quantity issues, watershed level issues and considerations	5	No
Wildlife	Projects that study wildlife	5	No
Bioenergy	Projects that look at the potential for bioenergy development and those that refer to forest biomass reserves	5	Yes
Ecological Goods and Services	Projects that put value on ecological goods and services from the forest	3	Yes
Resource Management	Activities that look at forest resources, not specifically related to timber harvesting; also includes references to adaptive resource management (e.g. Integrated Resource Management, Agro-Forestry, Protected Areas and Non-Timber Forest Products)	11	Yes
Total		97	

*Draft summary provided by the Canadian Model Forest Network.

4.3.3 Economic Impact

As with the OWHF, an attempt has been made to investigate economic benefits from this national program (see Section 4.1.3 for a discussion of the components of an economic impact study). Information on revenues and expenditures was collected from a variety of sources including: Annual Reports, Yearly Work Plans and Five-Year Strategic Plans. Where information was available from Annual Reports, it was used as the preferred source, representing the most accurate accounting of partner contributions and spending. Projected revenues and expenditures from work plans were utilized to fill gaps when Annual Reports were unavailable. Model Forest web pages and other reporting mechanisms provided additional information to fill gaps on staffing, volunteers, partners and associates.

The Model Forest Program funding from federal sources was discontinued in 2007 after 15 years and transitioned to the new federal Forest Communities Program (FCP) (Natural Resources Canada – Canadian Forest Service). There has been considerable change from past activities; under this new funding arrangement there is a greater focus on developing tools, approaches and strategies to help communities respond to the range of recent challenges facing Canada’s forest sector.

This economic impact analysis focuses on the activities of the Canadian Model Forest Network over the period from October 2007 to March 2009. The time frame represents the first two transitional years of the Forest Communities Program, a period of interest identified by the Canadian Model Forest Network partners providing data for the case study.

Eleven of the 14 member Model Forests received funding under

FCP (Table 7). The other three, Foothills Research Institute, Cree Research and Development Institute (formerly Waswanipi Model Forest), and Lake Abitibi Model Forest remain in operation using other partnership funding. It was the intention to include all 14 Model Forests in this analysis. However, data

Table 7. Information Available for Economic Impact Analysis

Model Forest	FCP * funds	Available Information		Data for income analysis	Used for impact analysis
		Oct 07-Mar 08	Apr 08-Mar 09		
Clayoquot Forest Communities	Yes	Workplan	Workplan	Yes	Yes
Resources North	Yes	Annual Report	Annual Report	Yes	Yes
Foothills Res. Institute	No	Annual Report	Annual Report	No	Yes
Prince Albert MF	Yes	Annual Report	Annual Report	Yes	Yes
Manitoba MF	Yes	Workplan	Workplan	Yes	Yes
Northeast Superior	Yes	Workplan	Workplan	Yes	Yes
Lake Abitibi MF	No	No data	No data	No data	No
Eastern Ontario MF	Yes	Annual Report	Annual Report	Yes	Yes
Cree Research and Dev. Inst.	No	No data	No data	No data	No
Le Bourdon Project	Yes	Annual Report	Annual Report	Yes	Yes
Lac Saint Jean MF	Yes	Strategic Plan	Strategic Plan	No	Yes
Fundy MF	Yes	Annual Report	Strategic Plan	Yes	Yes
Nova Forest Alliance	Yes	Annual Report	Strategic Plan	Yes	Yes
MF of NL	Yes	07-09 Workplan	07-09 Workplan	Yes	Yes
Total of 14 members	11			10	12

*Forest Communities Program.

from annual reports and workplans was only available from the Canadian Model Forest Network for 12 Model Forests at the time of this study (Table 7).

Various assumptions were made to aggregate the information across the 12 Model Forests over this time period. The Forest Communities Program started in October 2007, half way through the fiscal year. Most Model Forests provided reporting consistent to this time frame. However, the Foothills Research Institute reported on the full year (April 2007 to March 2008). In this case, expenditures and revenues were halved to make the values comparable to other Model Forests in the analysis. Similarly, on rare occasions in other Model Forests where some elements were reported over the fiscal year as opposed to the first six-month period of the Forest Communities Program (e.g. salary dollars in the Eastern Ontario Model Forest), a similar assumption was made and values were halved to give an approximate value for this analysis.

Due to the variability in reporting structures between Model Forests and the assumptions outlined above, values utilized in this study should be considered as an estimate only – a first approximation – of the potential economic impact of the Canadian Model Forest Network on forest-based communities in Canada.

A. Employment and Income Impacts

Employment:

Data regarding the payments for wages and salary was only available for 10 of the 14 Model Forests (Table 6). The total value reported is \$1,417,977 over the 18-month period from October 2007 to March 2009. This is associated with an estimated 39 full-time equivalent (FTE) positions (an additional 18 FTE are reported in the two Model Forests with no data reported specific to wages and salary (Foothills Research Institute and Lac Saint Jean Model Forest). Using the total value for the 10 model forests and 39 FTE positions, an approximate value of 27.5 jobs per million dollars in partnership investment is estimated under this program. Using the conservative employment multiplier (as defined in the OWHF case study of 1.5), it can be assumed that each Model Forest job generates an additional 0.5 jobs in the Canadian economy, increasing the number of full-time equivalent positions to 58.5 for the 10 Model Forests reporting on wages and salary (another 27 FTE can be added if data is included from the other two Model Forests, totaling 85.5 full-time equivalent positions).

There are other employment benefits from the investment of partners in the Canadian Model Forest Network that are not apparent in this figure. Many contractors, associates and consultants are hired using project funding. This is an additional investment in employment income that is not directly reported in this figure.

Income and Gross Domestic Product:

The proportion of expenditures used for operating purchases of goods and services in each Model Forest is assumed to be the Administrative budget minus the direct expenditures for wages and salary. The total administrative budget across the 10 Model Forests that are reporting wages and salary was \$4,011,073. The expenditures on goods and services also have an indirect economic impact on the communities associated with these Model Forests across Canada, providing income to other businesses and stimulating the local economy. Using a conservative income multiplier of 1.5 (see OWHF Case Study, Section 4.1), it can be assumed that each dollar spent on wages and salary for the Model Forest Network will contribute an additional 0.5 dollars to the Canadian economy. Under this assumption, the payments of \$1,417,977

will generate an additional \$708,988 in income. This translates to a direct and indirect contribution to Canada's GDP of \$2,126,965.

B. Other Economic Values

Partner Cash and In-kind Project Contributions:

Total revenue for the Canadian Model Forest Network's 12 member Model Forests with data over the first 18 months of transition to the Forest Communities Program is presented in Table 8. The federal contribution through the Forest Communities Program was an investment of over \$5.4 million in the first year and a half of the new five-year funding program. This investment was complemented by an additional monetary investment of over \$18.6 million by a range of partners that include: provincial sources, forest industry and other industrial sectors, non-government organizations, academic institutions, and other federal sources. In-kind contributions by partner organizations exceeded \$7.7 million. As a first approximation, it appears that the federal investment in the Canadian Model Forest Network through the Forest Communities Program represents about 17% of the total investment by partners. With an average of 30.5 partners contributing to each Model Forest, the leveraging value of the federal investment to forest-based communities through this program appears to be high.

Volunteer Contributions:

In-kind contributions are of substantial value to the members of the Canadian Model Forest Network. These contributions range from technical support from professional staff, to office space and sharing of equipment and resources. Volunteers also play a large role in many of these organizations. Each Model Forest has a Board of Directors, many of whom donate their time to the success of the organization. There is an average of 15 Board Members per Model Forest.

For example, the Eastern Ontario Model Forest relies heavily on volunteers for both its Board of Directors and a range of committees. There are 12 Board Members and five Advisors to the Board. Excluding staff, there are 12 members of the Forest Science Committee, nine on the Communications Committee, five on the Equity Committee, 15 on the Certification Working Group, 47 on the Wood Centre Technical Advisory Group, nine on the Wood Centre Steering Committee, and seven on the Wood Centre Implementation Team. The committees are populated with a range of expertise from government workers, to individual woodlot owners. In-kind contributions for the Eastern Ontario Model Forest totaled \$456,306 in 2007-2008 and \$940,072 in 2008-2009 with individual contributions of time valued between \$500 and \$40,000.

Contribution to Rural Economic Development:

Canada's forest sector and forest-dependent communities have faced unprecedented challenges due to rising energy costs, a strong Canadian dollar, new international competition and reduced availability of timber. The cumulative impact of these challenges on communities has been significant. Changes in the

Table 8. Estimated Total Revenue for 12 Members of the Canadian Model Forest Network from October 2007 to March 2009

Revenue	Value*
1.0 Forest Communities Program	\$5,413,450
2.0 Partner contributions	
Cash	\$18,673,785
In-Kind	\$7,722,463
A. Average no. of contributing partners per Model Forest	30.5
B. Total no. of member partners and associates reported	583
Total Estimated Revenue	\$31,809,698

*This is a first approximation based upon a variety of sources.

demographics of rural communities in Canada reflect this impact. A recent review of population change in Canada's Model Forests (based on Census Community Profiles for 1996-2006) reports that one half of the communities located within Model Forests are shrinking. For some areas the percent decrease in population over 10 years is substantial (e.g. Northeast Superior Forest Community at 23.5% and Manitoba Model Forest at 48.8%). Lake Abitibi Model Forest (11.7% decrease), Lac-Saint-Jean Model Forest (11.2% decrease) and the Model Forest of Newfoundland and Labrador (10.3% decrease) also show considerable change. The continued investment of the Forest Communities Program (Natural Resources Canada) and other partners in jobs and research into approaches and strategies to respond to challenges in the forest sector will be critical to help sustain many of these rural communities. In other regions such as Foothills, Alberta (+22.9%) and Eastern Ontario (+7.3%), populations are increasing. This is likely not an indication of the health of the forest industry however, as these areas have other development pressures that influence population change and often conflict with long-term stewardship goals on the forested landscape.

C. Model Forest Social and Economic Impact Studies

Individual Model Forests have conducted a range of economic and social impact studies, providing additional information on regional economic impacts. These include:

- Assessing the market and non-market benefits flowing from the forested landscape through a natural resource accounting study in the Foothills Model Forest (Patriquin, Spence and White 2004).
- Quantifying economic relationships associated with various industries and activities in the Resources North Association (formerly named the McGregor Model Forest) including employment and income. Industries and activities of interest included forestry, fur trapping, sport fishing, guide outfitting and commercial recreation (Deloitte and Touche Consulting Group 1996).
- Use of a computable general equilibrium model to investigate the socio-economic impacts of market and policy changes on a forest-dependent community in New Brunswick. Variables investigated include: Annual Allowable Cut, GDP, household income and employment (Atnafe and Lantz 2002).
- The development of an economic impact assessment model to provide an analytic framework for investigation of direct and secondary impacts of proposed economic change in the Prince Albert Model Forest Region (Siemens and Kulshreshtha 1995).

Table 9. Comparison of Employment and Employment Income by Sector in the Resources North Association (formerly the McGregor Model Forest)

Industry Sector	Employment Coefficient (jobs/\$million in sales revenue)	Employment Income Coefficient (\$/person/year)
Forestry	8.8	49,348
Commercial Recreation	24.6 to 26.9	24,703 to 33,000
Guide Outfitting	23.1 to 25.3	10,980 to 43,000
Trapping	30	9,583
Sport Fishing	40.4 to 44.2	N.A.

Source: Deloitte and Touche Consulting Group (1996).

Of particular interest in these studies is the economic value of a range of non-forestry activities in these communities relating both to employment and income, and the recommendation for integrated planning and stewardship of a broad range of values.

4.3.4 Significance

It is difficult to accurately quantify the full economic impact of the Canadian Model Forest Network due to the variability of data sources available for each of the individual Model Forests as well as the variability in reporting structures utilized. However, based on a first approximation of the data available for 12 of the 14 members of the Canadian Model Forest Network, the following economic benefits have been estimated over the first 18 months of the Forest Communities Program:

- 57 Full-time equivalent FTE jobs directly (for the 10 identified members);
- 28.5 additional FTE indirectly (for the 10 identified members);
- Direct income of \$1.417 million (for the 10 identified members);
- An additional \$0.709 million in indirect income (for the 10 identified members);
- Gross Domestic Product of \$2.126 million (for the 10 identified members);
- Total investment by the federal Forest Communities Program (Natural Resources Canada) of over \$5.4 million in the first 18 months of this program; representing approximately 17% of the total investment in the 12 identified members of the Canadian Model Forest Network;
- Investment from other partners including: provincial sources, forest industry and other industrial sectors, non-government organizations, academic institutions, and other federal sources of more than \$18.6 million in cash and \$7.7 million in-kind for the same 12 members.

Individual Model Forests have conducted a wide range of economic studies that provide a more detailed picture of the values and benefits linked to both forestry and non-forest activities in various regions. These studies also give a variety of tools for further investigation of the impacts of the ongoing changes to forest-based communities.

5.0 LESSONS LEARNED FROM THE THREE CASE STUDIES

Overall

- Data collected by each of the programs was highly variable and if the stewardship community intends to look at either the ecological, social or economic impact of a range of programs in the future, it will be important to develop a framework for natural capital data collection that includes appropriate indicators. We also need to look at indicators that are used by the business sector, such as job retention, job creation and the multiplier effect on the local economy, in an effort to build the economic arguments for investment. See Public Policy Recommendation No. 1.
- This framework should consider the range of economic measures investigated in the three case studies as well as integrating measures of ecological impacts as well as social and cultural values.
- It was difficult to assess the economic impact of established programs when data was not necessarily collected directly for this purpose.
- Given the variability of scope and scale of the three case studies, the details of each do not lend themselves to comparative analysis. However, attributes of all three will help to guide what is needed in the future.
- Valuation of ecosystem goods and services is still a relatively new science and a range of values appears in the literature as described in the OWHF Case Study. The Olewiler (2004) study was used for a conservative estimate in the OWHF Case Study and the Mixed-Grass Prairie Habitat Stewardship Project to give an indication of the potential value of the land conserved through these programs. The Olewiler (2004) study confirms that values must be considered on a regional

basis to be relevant, with estimates relying mainly on market proxies or substitutes for the goods and services provided by natural capital. See Public Policy Recommendation No. 4.

- Ecotourism was not a direct or indirect objective of the three case studies selected for review. However, the literature review suggests that programs that protect species and habitats can also have added economic benefits as a result of ecotourism in the form of jobs and rural economic development. There is a shortage of documented studies that capture these economic benefits in Canada (or worldwide).
- Effective implementation of many beneficial management practices may stimulate longer-term income impacts for agriculture landowners and woodlot owners associated with investment in habitat enhancement activities. Similarly, the adoption of adaptive, beneficial management practices in forestry, agriculture and fisheries sectors can result in reduced costs of operation and other economic spinoff returns. Currently, there is a shortage of documented studies that quantify these benefits. See Public Policy Recommendation No. 6.

Ontario Wetland Habitat Fund (OWHF)

- Since this case study had several long-term funding partners requiring different reporting criteria and financial data, the fund had more comprehensive and robust financial information to build the economic analysis.
- Despite extensive financial data, the lack of both short- and long-term monitoring data for the impact on wildlife species makes it difficult to determine how effective the financial investment has been. See Public Policy Recommendation No. 4.
- Land value across the province varies dramatically, due in large part to urban pressure. This has a direct impact on the economic value of the ecological goods and services provided, making it difficult to establish a provincial average for ecological goods and services across the province. See Public Policy Recommendation No. 4.

Mixed-Grass Prairie Habitat Stewardship Project

- This case study highlights the importance of demonstrating an economic return to producers to improve buy-in to a beneficial management practice with high conservation value.
- The initial investment of financial and technical incentives for the five-year agreement is critical to demonstrate the impact on livestock gain and pasture performance. The benefit to grassland species, including many species at risk, is being monitored using the Manitoba Conservation Data Centre's grading guidelines for Upland Mixed-Grass Prairie Communities. Monitoring of biological outcomes and the impacts of the program on management practices should continue over the long term. See Public Policy Recommendation No. 3.
- Given the high value of these properties (defined through the ecosystem goods and services analysis), there may be an opportunity to enhance the longevity of landowner agreements using new stewardship tools associated with payments for ecological goods and services. See Public Policy Recommendation No. 4.

Canadian Model Forest Network

- Data collection was variable between individual Model Forests making it difficult to accurately assess economic impact. Values presented were a first approximation based on existing data sources. If the Canadian Model Forest Network is interested in further analysis of economic

impacts, it would be useful to generate a standard reporting mechanism for annual reports to enable aggregation of data. See Stewardship Community Recommendation No. 1.

- Employment and income impacts were undervalued in this case study due to the lack of data on values associated with contractors, associates and consultants hired using project funding. This is an additional investment in employment income that could be considered under a reporting framework. See Public Policy Recommendation No. 5.
- In-kind contributions by partners were substantial across the Canadian Model Forest Network. Further information could be collected in the future to investigate the nature of contributions (e.g. technical support from professional staff, administrative support, volunteers, etc.). A reporting framework with appropriate indicators could be tested through this established network. See Public Policy Recommendation No. 3.

6.0 RECOMMENDATIONS

The three case studies presented in Section 4.0 set out to gain insights into the key challenges and opportunities of valuing conservation actions and to improve our knowledge and understanding of the range of economic values that can be attributed to investments in biodiversity and habitat programs. The lessons learned challenge us to “think outside the box” beyond the current practices related to monitoring, measuring and reporting. An important outcome of the research is that new approaches are necessary to sustain and grow funding to maintain our natural capital. The case study research suggests that there is an urgent need to get serious about aligning economic signals and financial rewards with environmental goals. Lessons learned from the case studies should be used to reform the existing framework and additional research is required to construct a new framework for stewardship valuation.

In order to address the economic value and the importance of stewardship, based herein on analysis of the economic impacts of three case studies, the authors present eight Recommendations. These include: six Public Policy Recommendations in Section 6.1 and two Stewardship Community Recommendations in Section 6.2. These should be addressed in future work on stewardship valuation. In addition, the authors feel that it is important to acknowledge that it is not only the various levels of government that have a role to play in building a new framework for stewardship valuation. The stewardship and conservation community must also collect information on the economic values of their efforts and communicate their contributions to conservation to the broader public. Two specific recommendations address this opportunity.

6.1 PUBLIC POLICY RECOMMENDATIONS

At the present time, there is incomplete baseline data for most environmental stewardship initiatives, insufficient economic information, and inadequate monitoring of results in both short- and long-term outcomes. While respecting regional variations and needs in program objectives and delivery, the ability to do economic analysis is constrained by a lack of standardized or common data and a lack of access to such information. Research is needed into what kind and how much information is necessary for effective analysis. It is important that both scientific (physical and social) and economic aspects are integrated into these analyses and assessments. As well, this research is necessary to feed into effective policy development. The authors put forward the following six Public Policy Recommendations to encourage more reliable inputs for future economic impact analyses and to improve comparison and evaluation of the non-traditional benefits provided by habitat and biodiversity investments.

1. **Document and develop a more comprehensive framework with standardized data collection to allow the comparison of stewardship programs across the country.** It is necessary to integrate economic reporting metrics within the environmental sector in order to develop robust economic arguments to justify the financial investment in the stewardship community.
2. **Organize a workshop on the value of Canada's existing public investment in stewardship involving key governmental players, beneficiaries of Habitat Stewardship Program Funding, and recipients of nature and biodiversity-related project funds such as the Nature Conservancy of Canada, Nature Canada, Ducks Unlimited Canada, the Canadian Biosphere Network, Wildlife Habitat Canada and other organizations.** The results of this workshop will help to inform and develop a new federal reporting framework that captures the social, biodiversity and economic values of conservation programs and expands access to additional case studies.
3. **Select, adopt and agree upon a series of indicators for capturing voluntary and in-kind contributions to provide practitioners and policy makers with more effective evaluation and assessment tools.** This will further research on the range of social, biodiversity and habitat and economic indicators that is needed.
4. **Develop a standard valuation protocol pertaining to the quality and quantity of ecological services or Nature's values within the range of landscape types across the country.** This will provide practitioners and policymakers with greater clarity and confidence in the information being produced. There is a need to demonstrate that long-term conservation and stewardship is a preventative action that will reduce costs over the long term by preventing species decline, reducing the need for habitat restoration, and encouraging abatement of environmental impacts.
5. **Develop a standard protocol for determining spin-off economic benefits and a common formula for establishing regionally sensitive multipliers in order to improve confidence in economic impact analyses.** Determination of indirect and induced economic benefits depends upon having regionally specific "multipliers". It is thus necessary to better determine the effects of employment and income on increased spending, additional income and consumption that are greater than the initial amount spent.
6. **Document the economic benefits of adaptive, beneficial management practices (BMPs) and programs for the protection of species and habitats.** Currently, there is a shortage of studies quantifying these benefits as is commonly done in the forestry, agriculture and fisheries sectors. Implementation of BMPs has been demonstrated to reduce the costs of operation and provide additional economic spinoff returns.

6.2 STEWARDSHIP COMMUNITY RECOMMENDATIONS

For the stewardship community to better promote and communicate their contribution to conservation to the broader public, two additional recommendations are presented:

- 1. The stewardship community must demonstrate the synergy of their projects and programs in terms of ecological recovery and restoration of Natural Capital to illustrate how their work feeds into a larger vision for conservation stewardship as well as the broader economic objectives of all levels of government.**
- 2. The stewardship community needs to speak with a standardized message similar to that of business and trade associations that highlight the benefits of their work to all Canadians.**

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APPENDIX 1: GLOSSARY OF TERMS

- Benefit Transfer – The benefit estimated for one or more sites or policy proposals is used to assign benefit or value to other comparable sites or policy proposals.
- Direct Income Payments – include disbursements for wages and salaries, land purchases, leases and agreements (if applicable) as well as office rental.
- Economic Impact Analysis – Analysis of the effect of a policy, program, project, activity or event on the economy of a given area:
 - The impact area can be a neighbourhood, community, region or nation
 - The economic impact is usually measured in terms of changes in Economic Growth (output or value added); and associated changes in jobs (employment); and income (wages).
- Full-cost Accounting – The process of collecting and presenting a complete set of economic, social and environmental costs and benefits for proposed alternatives when a decision is necessary.
- Full-time Employment – of persons who usually work 30 hours or more per week at their main or only job. (Statistics Canada).
- Job Equivalent – Part-time or full-time job equivalent is a value used to characterize impacts of investments and expenditures on the work force.
- Multiplier Effect/Spin-off Impacts – Includes indirect impacts of induced expenditures, consumption impacts of direct income payments, indirect employment from sectors that provide goods and services, etc.
 - Indirect impacts are those gained by firms or organizations supplying goods and services to support delivery agent’s organizational activities.
 - Induced impacts are those attributable to income and employment generated by consumer spending at the direct and indirect impact stages.
- Natural Capital – The stock of resource and environmental assets, including the flows of ecological services that exist in a region at a given point in time.
- Natural Capital Valuation – The process of assigning value to the market and non-market goods and services provided by ecological systems.
- Part-time Employment – Persons who usually work less than 30 hours per week at their main or only job. (Statistics Canada).

APPENDIX 2: DEFINING THE CONSERVATION STEWARDSHIP COMMUNITY

The conservation stewardship community relies heavily on the contribution of volunteers to undertake the thousands of stewardship projects across Canada. Stewardship, simply stated, means Canadians – including landowners and other individual citizens, private companies and volunteers – are caring for our land, air and water, and sustaining the natural processes on which life depends (*Canada's Stewardship Agenda*, Environment Canada 2002). There have been a number of national initiatives over the past several decades, which have built a profile for the conservation stewardship community within the environmental nonprofit and voluntary organizations sector in Canada (<http://www.statcan.gc.ca/pub/13-015-x/13-015-x2004000-eng.pdf>). The “environment” category is defined as follows: natural resources conservation and protection, wildlife preservation and protection, animal protection and welfare, environmental beautification and open spaces, pollution abatement and control and veterinary services.

Notably, there have been two major national surveys of volunteering in Canada conducted by Statistics Canada. The 2004 Statistics Canada survey (http://www.givingandvolunteering.ca/files/giving/en/csgvp_highlights_2004_en.pdf) was a milestone in knowledge development in Canada's nonprofit sector. It provides estimates of the economic contribution of the nonprofit sector, as well as the size, scope and nature of a key sector of Canadian society that performs a multitude of activities in local communities and engages millions of Canadians. It should be noted that Statistics Canada is among the first statistical agencies in the world to report on non-profit institutions and volunteering.

The *National Survey of Volunteer Activity*, a report that was completed in 1987 (<http://www.statcan.gc.ca/bsolc/olc-cel/olc-cel?catno=89M0011X&lang=eng>), estimated that there were 8,707 full year, full-time equivalent (FTE) jobs and volunteer opportunities created in the environmental sector. Because nonprofit institutions rely heavily on volunteers, standard economic measures are extended to account for replacement cost value of volunteer work, allowing for a more complete valuation of their economic activity.

In 2007, Statistics Canada (<http://www.statcan.gc.ca/pub/71-542-x/71-542-x2009001-eng.pdf>) reported that the sector had grown to 36,666 FTE jobs, an increase of 76% from 1987.

The report entitled *National Survey of Nonprofits and Voluntary Organizations* (NSNVO), conducted in 2003, (<http://www.statcan.gc.ca/pub/61-533-s/61-533-s2005001-eng.pdf>) provided groundbreaking research on the financial and human resource characteristics of the environmental nonprofit and voluntary organization sector. The report estimated that 4,424 groups were active in this sector in 2003; this represents 2.7% of the total number of all nonprofit and voluntary organizations (161,227) in Canada. It is important to note that the NSNVO **does not include** unincorporated and unregistered grassroots organizations and citizen groups. The report also estimated that there are over 2,000 of these grassroots, all volunteer environmental organizations not generally known outside their communities. The Ontario Environmental Network lists more than 700 such groups in Ontario alone.

As noted in the NSNVO Report, in Canada there are more unpaid staff in the environmental sector than any other sector of the voluntary movement. In environmental organizations, 69% have no paid staff while the average for the entire nonprofit sector is 54%. The environmental sectors represent only 0.7% of the approximate two million paid staff by nonprofit organizations and are much younger than other nonprofit and voluntary organizations in Canada. Almost 30% have been in operation for less than 10 years, and a further 33% of the groups are 10 to 19 years old. This compares to 22% under 10 years and

26% from 10 to 19 years old for all nonprofit organizations. The young age of the sector may explain why the conservation community has not received its financial share relative to, or profile enjoyed by, others in the volunteer movement.

The Report also reveals that in terms of geographic area served, 57% of environmental organizations are local in scope, serving their neighbourhood, city, town or municipality. In addition, over 27% of the groups are regional in scope, serving a region within a province or territory. The remainder serves one province (10%), more than one province (2%) or is national in scope (3%).

**APPENDIX 3: EXAMPLES OF SECTORAL INDICATORS FOR JOB
CREATION SUPPORTED BY GOVERNMENT INCENTIVE
INVESTMENTS**

Sector	Cost/Job	Data Source
Other		
Wind Turbine Construction	Ontario government invests CA\$437 million, promises 1,440 new jobs as part of leveraged package. This means <u>CA\$303,000/job</u> excluding all other contributions and in kinds.	News story (April 2010) based on Press Release by Government of Ontario and Samsung Canada
ReNew Ontario 2007-08 Infrastructure investment in highways and roads	CA\$30 billion investment to preserve 85,000 jobs and create more than 100,000 jobs. This translates to <u>CA\$162,000 /job.</u>	http://www.fin.gov.on.ca/en/budget/fallstatement/2009/chapter1.html
Government of Ontario 2009 Infrastructure Investment	CA\$32.5 billion to support more than 300,000 jobs. This translates into over <u>CA\$108,000/ job.</u>	http://www.fin.gov.on.ca/en/budget/fallstatement/2009/chapter1.html
Stewardship		
National Oceanic and Atmospheric Administration (NOAA) Green Jobs Creation	Coastal habitat restoration saw US\$38 million invested, creating 300 jobs in Humboldt County, California in 30 projects. This would be <u>US\$126,667/job.</u>	NOAA National Restoration Center Press Release (NOAA 2009) http://www.noaa.gov/features/resources_0109/greenjobs.html
North American Waterfowl Management Plan (NAWMP) investments in Manitoba agricultural stewardship 1990-1994	144 full-time jobs in Manitoba for \$6.54 million over four years, equalled <u>CA\$45,423/job</u> or 22 jobs/million dollars of government investment. NAWMP agricultural stewardship was seen to be a significantly better job generator versus the Canada-Manitoba Infrastructure Work Program with 22 versus 15 jobs created per million dollars of investment.	Manitoba Habitat Heritage Corporation Report for 1990-1994 (Macmillan 1996).
Fisheries and Oceans Canada (DFO) Habitat Conservation and Stewardship Program (HCSP) 1999-2002	107 positions, DFO investment of \$1.547 million = <u>CA\$14,465/job.</u> excluding all other leveraged investments here, a leverage value of 1:6.4	Pacific Fisheries Adjustment and Restructuring Program Evaluation (De Goes 2003)

Background on Some of the Above Examples

NOAA Green Jobs: “It is cost effective to hire a local crew” said Mr. Peter Leigh, an economist with the National Oceanic and Atmospheric Administration (NOAA) at the United States National Restoration Center. Local equipment operators, labourers, engineers, bridge suppliers and trucking companies benefited from these job opportunities. NOAA indicates coastal habitat restoration helps create cleaner water and air, more resilient coastlines, more abundant fish and shellfish, but also financial benefits to local communities. A study was done in Humboldt County, CA on “Green Jobs” related to coastal habitat restoration projects. It found that in the last three years, more than US\$38 million came into the county for restoration projects, generating approximately 300 jobs. Refer to Appendix 4 for more details and see NOAA (2009).

NAWMP PHJV Projects in Manitoba: A study in 1992 of the economic value of North American Waterfowl Management Plan (NAWMP) Prairie Habitat Joint Venture (PHJV) investments in 80 farm-based best management practices habitat enhancement projects in Manitoba was conducted. All Manitoba NAWMP projects constitute on average about 18% of all NAWMP investments nationally. The study gave some indication of how important to the economy these NAWMP projects could be. It was concluded that net income increased by \$2.08/ha (\$5.14/acre) with a parallel reduction of \$3.29/ha (\$8.13/acre) in costs, a total of \$5.37/ha (\$13.27/acre) of net benefit. If projected over the 19,037 hectares (47,042 acres) evaluated, this was a net economic benefit of \$624,000 to the 80 farmers involved. The total amount of government supported incentives to these farmers was \$90,000; thus a net income multiplier of about 6:1 was achieved for the government incentives. This strongly demonstrated the value of investing in stewardship and conservation-based farming. There would have been a reduction of use of materials from local suppliers (items such as fertilizer), but overall the benefit to these communities of this stewardship program was substantial. Source: *An Economic Evaluation of Land Use Changes in Southwest Manitoba* (Josephson 1992).

NAWMP Value to the Economy: NAWMP was seen in a study published in 1996 to be beneficial to the economies of Canada’s three western provinces: improving farm incomes, resulting in direct employment, and causing secondary economic benefits through the purchase of goods and services in Manitoba and nationally. A study over the 1990-1994 period looked at the impact of NAWMP on job generation in Manitoba. In total, 340 jobs were created on a full-time basis, for a \$35.1 million investment. Some 86% of the NAWMP investment stayed in the local rural economy, significantly contributing to Manitoba’s GDP. The Manitoba investment over 10 years was projected to increase all Manitoba farmers’ net income by \$2.461 million per year. On a national basis, if 18% of NAWMP is focused on Manitoba, these NAWMP investments would be equal to 1,889 jobs or a net farm income increase of \$13.7 million. Source: *Economic Evaluation of Manitoba Sustainable Development Activities: NAWMP* (MacMillan 1996).

DFO Habitat Conservation and Stewardship Program: From 1999-2002, the Habitat Conservation and Stewardship Program (HCSP) hired 107 steward positions; 84 non-Fisheries and Oceans Canada (DFO) positions and 23 positions inside DFO. For each dollar HCSP invested from DFO, over five dollars was contributed back to conservation (40% of which is not from other levels of government.). Many of the stewards that were engaged worked in rural and economically depressed communities, further providing employment training to community members. The value of any employment in such communities is very high relative to more economically advantaged communities. The 84 hired non-DFO positions worked with 4,447 volunteers, (totalling 128,176 volunteer hours), and engaged 787 groups. A

DFO investment of \$1,547,750 resulted in leverage of \$10,065,563. Source: *Habitat Conservation and Stewardship Program Resource Contributions from Third Parties* (De Goes 2003).

Other Notable Examples

State of Stewardship: In the report *The State of Stewardship in Canada* (CESC 2009c) for 4th National Stewardship and Conservation Conference, it is noted that there are over 1,000 stewardship organizations in Canada with about one million stewardship volunteers and 5,000 staff combined. If one assumes an average stewardship volunteer contributes at least five hours per week, they might donate 200 hours per year in 40 weeks (and also assuming that at least one week a month they don't do anything for stewardship). Thus, they could collectively donate 200 million hours of work a year. At \$18.50/hour, this is worth \$3.7 billion per year. That would equal 9.5% of the total value of 1.1 million full-time job equivalents that Statistics Canada calculated in 2007 are derived from the Voluntary/Non-Profit Sector. Thus, the "Stewardship Sector" would be accountable for an estimated 104,500 full-time job equivalents plus 5000 direct jobs, or 109,500 full-time jobs across the sector. Source: CESC (2009c).

Statistics Canada: Non-profit institutions account for a 2,073,032 full-time equivalent workforce or 12.1% of Canada's economically active population (this equals the entire Canadian manufacturing industry). So volunteers are important. Volunteers within the broader non-profit voluntary sector contributed 2.1 billion hours of work in 2007, or 1.1 million full-time jobs. At an average of \$18.50/hour, that was worth \$38.9 billion. The non-profit sector contributes 6.8% of Canada's GDP or \$86.8 billion annually, almost equal to the values of the contribution of either the Mining or Oil and Gas sectors to our GDP, and more than the full Retail sector. Source: Statistics Canada 2005 and 2007.
<http://www.statcan.gc.ca/pub/61-533-s/61-533-s2005001-eng.pdf>.

Credit Valley Watershed: The Credit Valley Watershed (on the western edge of Greater Toronto) provides over \$371 million in benefits to watershed residents annually. If natural filtering systems for water and air are lost, this will cost at least \$237 million each year to replace. Source: Kennedy and Wilson (2009).

Lake Simcoe Basin's Natural Capital, The Value of the Watershed's Ecosystem Services: This study quantifies the natural capital value of the ecosystem goods and services provided by Lake Simcoe's watershed, a section of which is located in Ontario's Greenbelt. At a minimum estimated worth of \$975 million per year, the services provided by the watershed are worth \$2,780 to each of the 350,000 permanent residents annually. The most highly valued natural assets are the forests and wetlands, worth \$319 and \$435 million per year, respectively. Source: Wilson (2008).

Ontario's Wealth Canada's Future: Appreciating the Value of the Greenbelt's Eco-services: The Greenbelt, which covers over 1.8 million acres, was designed to safeguard key environmentally sensitive land, watersheds, and farmlands that provide essential ecosystem services for quality of life in this densely populated area of Canada. This report quantifies the value of the ecosystem services provided by the Greenbelt's natural capital, revealing the annual value of the region's measurable non-market ecosystem services at an estimated \$2.6 billion annually; an average value of \$3,487 per hectare. The Greenbelt's wetlands and forests hold the greatest value, worth over \$2.3 billion. Wetlands are worth an estimated \$1.3 billion per year (\$14,153 per hectare). Source: David Suzuki Foundation (2008).

APPENDIX 4: RESTORING NATURAL RESOURCES CREATES “GREEN JOBS”

Habitat restoration offers benefits we all enjoy, such as cleaner water and air, more resilient coasts, and more abundant fish, birds and other animals. It also provides financial benefits to local communities. Once considered the domain of scientists and environmentalists, habitat restoration has become a growing business that benefits the environment as well as the economy. The United States National Oceanic and Atmospheric Administration’s (NOAA’s) National Restoration Center is helping lead the way by restoring coastal habitat across the U.S.A.

- At NOAA, the Community-based Restoration Program and the Open Rivers Initiative have demonstrated many successes working with local organizations and communities to quickly and effectively implement habitat restoration projects of all sizes.
- Through the Restoration Center’s Open Rivers Initiative, NOAA and its partners have helped fund the removal of dozens of obsolete dams and culverts, often employing local demolition crews and engineers. Its Community-based Restoration Program employs local crews to restore wetlands and estuaries, oyster reefs, mangroves and even clear marine debris – nearly 24,280 hectares (60,000 acres) restored in the last 10 years.
- “It’s well recognized that restored coastal habitat provides new opportunities for businesses, cleaner water for our municipalities, healthier and more diverse native fish, wildlife and plant communities, and a clean and healthy environment. And the actual work associated with coastal restoration is also a significant source of green jobs,” said Peter Leigh, an economist for the NOAA Restoration Center.
- Restoration requires a variety of people working over an extended period of time ranging from early planning and assessment to long-term monitoring of restored sites. It employs those with a diverse set of skills, including labourers, restoration design engineers, restoration ecologists, landscape architects, hydrologists and botanists who work in nurseries that provide local seedlings and other plants for wetland and coastal restoration.
- California’s Humboldt County recently tallied the annual investments in restoration and the numbers of restoration-related jobs that were created. In the last three years, more than US\$38 million came into the county for restoration projects, generating approximately 300 jobs. During this time, NOAA contributed more than US\$2 million to Humboldt County for more than 30 projects to restore rivers and open fish passages, helping to hire local heavy equipment operators, manual labourers, engineers, bridge suppliers and trucking companies.

Source: NOAA (2009): http://www.noaa.gov/features/resources_0109/greenjobs.html.

**APPENDIX 5: SUMMARY OF ONTARIO WETLAND HABITAT FUND
(OWHF) EXPENDITURES 1997-2007**

Summary of OWHF Expenditures 1997-2007

Direct Income Payments	Amount
Wages and Salaries	\$2,428,087
Office Rental	\$76,386
Subtotal	\$2,504,473
Project Costs - Operating Purchases from Suppliers	
Habitat Development *	\$8,399,164
Communications	\$385,173
Business Services	\$140,139
Office Supplies	\$207,165
Travel and Other	\$109,196
Subtotal	\$9,240,837
Total	\$11,745,310

* Habitat development expenditures do not include landowner direct contributions

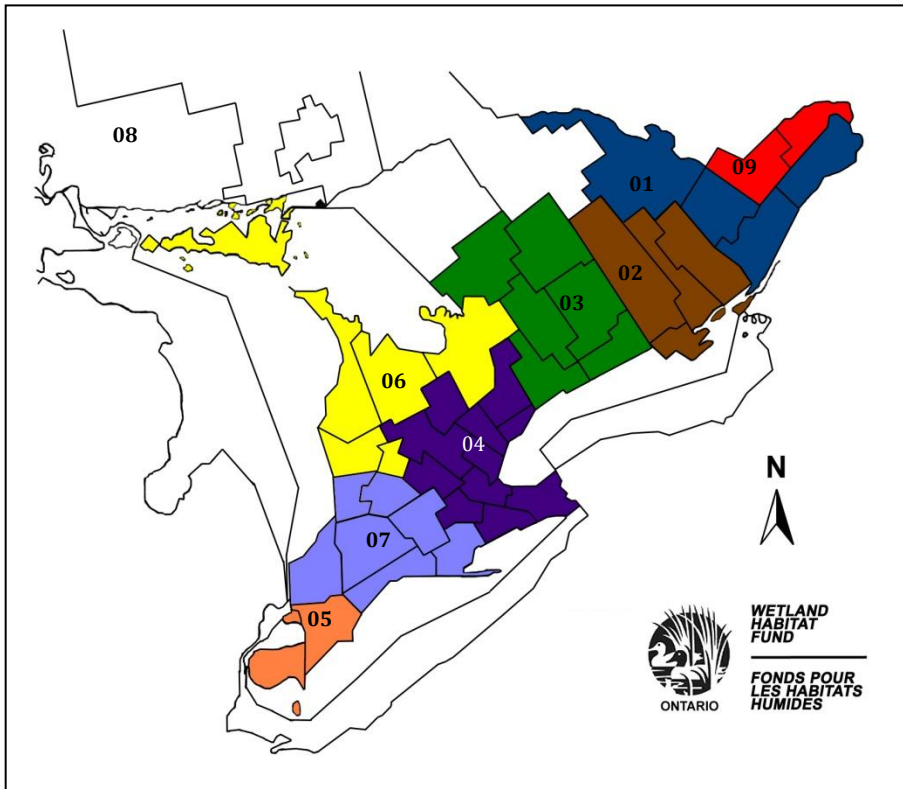
Source: Adapted from OWHF Performance Reports, North American Wetlands Conservation Act Grant Agreements and United States Fish and Wildlife Service Reports

OWHF Expenditures by Delivery Region 1997-2007

	<i>South-western Region 16%</i>	<i>Western Region Including Northern Sub-region 10%</i>	<i>Cambridge Region including London Sub-region 11%</i>	<i>Peterborough Region 19%</i>	<i>Quinte Region 26%</i>	<i>South-eastern Region including Ottawa East Sub-region 18%</i>	<i>Total</i>
Direct Income Payments							
Wages and Salaries	\$388,494	\$242,809	\$267,089	\$461,336	\$631,303	\$437,056	\$23,428,087
Office Rental	\$12,222	\$7,639	\$8,402	\$14,513	\$19,860	\$13,750	\$76,386
Project Costs – Operating Purchases from Suppliers							
Habitat Development	\$1,343,866	\$839,916	\$923,908	\$1,595,841	\$2,183,782	\$1,511,851	\$8,399,164
Communications	\$61,628	\$38,517	\$42,369	\$73,183	\$100,145	\$69,331	\$385,173
Business Services	\$22,422	\$14,014	\$15,415	\$26,626	\$36,436	\$25,226	\$140,139
Office Supplies	\$33,146	\$20,716	\$22,788	\$39,361	\$53,863	\$37,291	\$207,165
Travel/Other	\$17,471	\$10,920	\$12,012	\$20,747	\$28,391	\$19,655	\$109,196
Grand total for direct income payments and project costs	\$1,879,249	\$1,174,531	\$1,291,983	\$2,231,607	\$3,053,780	\$2,114,160	\$11,745,310

Source: Adapted from Performance Reports, North American Wetlands Conservation Act (NAWCA) Grant Agreements and from United States Fish and Wildlife Service (USFWS) Reports

OWHF Delivery Regions Within Southern Ontario



*Ontario Wetland Habitat
Fund Delivery Regions
within Southern Ontario*

Legend:

- 01 - Southeastern Region
- 02 - Quinte Region
- 03 - Peterborough Region
- 04 - Cambridge Region
- 05 - Southwestern Region
- 06 - Western Region
- 07 - London Region
- 08 - Northern Region
- 09 - Ottawa East Region