

Prevention is Key to Stewardship

"It costs less to provide education and encourage prevention than it does to fix environmental degradation after it happens." Jo-Anne Rzdaki, Stewardship Program Coordinator

Evaluation of the Economic Benefits of the Hamilton-Halton Watershed Stewardship Program

A healthy environment can mean different things to different people: a clean lake to swim in, healthy fish to eat, uncontaminated water to drink, unpolluted air to breathe. Most people would agree that these are goals we should be striving for. In an ideal world these factors in their own right would be considered in every major policy decision.

In reality, however, prices, taxes and monetary incentives continue to provide the primary cues for the actual behaviour of businesses, consumers and government. Due to this reality, the costs to clean up environmental harm are often studied and analyzed, but the benefits of preventing pollution and degradation are not.

Did you know that...

- **Restriction of livestock from streams prevents bacterial contamination**
- **Buffer strips prevent sediment from entering waterways**
- **Wetlands prevent flooding**



Hamilton Harbour Watershed Stewardship Project

The Hamilton-Halton Watershed Stewardship Program (HHWSP), with funding from the Government of Canada's Great Lakes Sustainability Fund, works with landowners to consider the effect their land management practices have on the health of the watershed. Projects undertaken with landowners include fencing cattle from creeks, constructing manure storage facilities, establishing riparian buffers and controlling erosion.

Landowners are also encouraged to protect and conserve existing natural areas and riparian buffers. Those who voluntarily agree to become Watershed Stewards receive a gate sign in recognition of that

commitment. These types of activities can be viewed as projects aimed at preventing environmental damage instead of fixing it after the fact. By the end of 2002, over 3,800 volunteer hours have been devoted to the program, more than 219 landowners have undertaken rehabilitation projects, 350 have made voluntary verbal agreements, and a further 900 are conservation-minded.



Hamilton-Halton Watershed Stewardship Program Highlights

Since the program began in 1994:

- 12 kilometers of riparian habitat and almost 46 hectares of upland and wetland habitats have been rehabilitated
- 120 km of riparian habitat and 2,900 hectares of significant wetland and upland habitat are protected under voluntary stewardship agreements
- More than 38,000 native trees and shrubs have been planted
- Hamilton-Halton Watershed Stewardship Program received the 2003 Countryside Canada Award, a recognition program of Wildlife Habitat Canada's Countryside Canada, Agriculture Canada and the Canadian Federation of Agriculture.

Economic Evaluation

In order to put a dollar value on the prevention of environmental degradation, an economic evaluation was undertaken to assess the Hamilton-Halton Watershed Stewardship Program. Cost savings and monetary benefits were calculated for the conservation practices undertaken by the Stewardship Program.

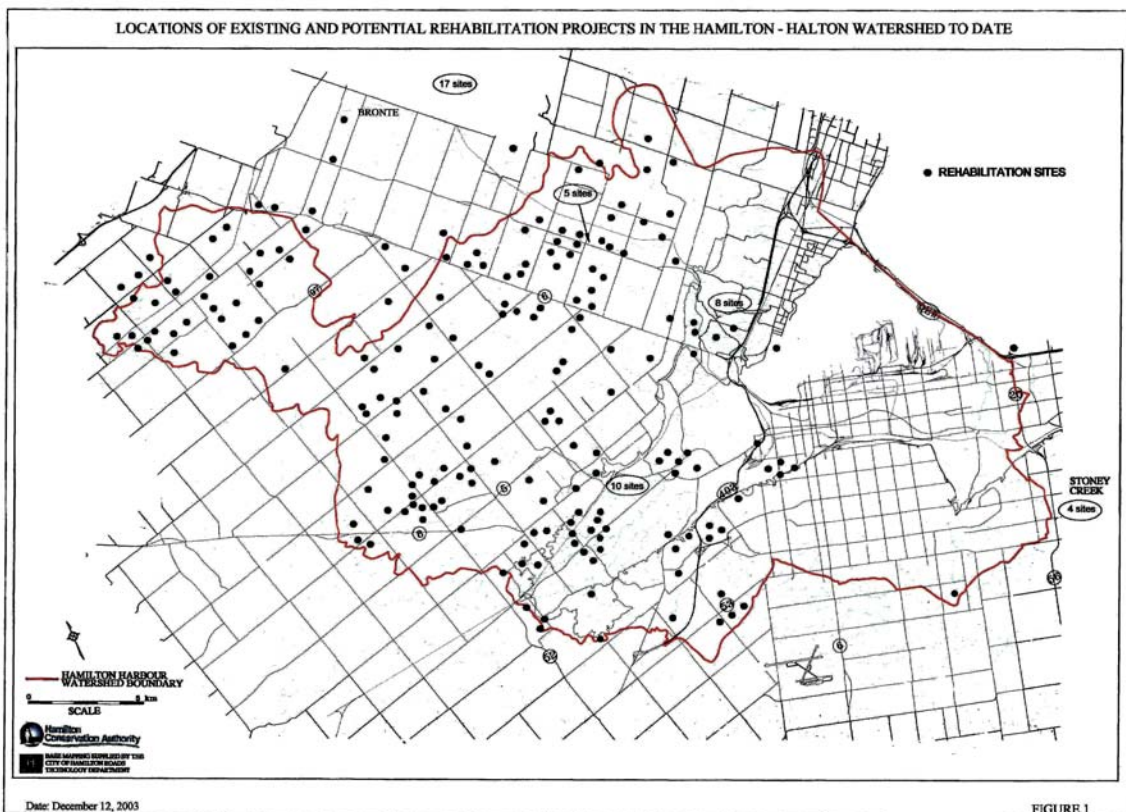
A comprehensive review was conducted with a focus on environmental damage assessment and cost savings of the projects. The benefit-to-cost ratio of the HHWSP projects is based on two approaches:

- 1) damage cost assessments that are viewed as cost savings if avoided by preventative actions, for example, the prevention of manure contaminating streams saves the cost of wastewater treatment;
- 2) the transfer of benefits estimated from existing, published studies on similar contexts but in different locations, for example, the estimated value of wetlands and forests based on literature estimates of the cost of replacing the ecosystem services they provide, using the least cost alternatives.

The evaluation of many rehabilitation and pollution prevention projects was subject to a wide range of variability and uncertainty, often involving several factors, and this is reflected in the reported range of benefits achieved. Essentially, all of the uncertainty encountered in the study is accounted for in the reported range, thus maximizing the confidence that the estimates are consistent with the published literature on which they are based.

Table 1. Estimated avoided costs and benefits generated by the HHWSP projects compared to actual HHWSP costs (1994-2002).

Rehabilitation and Pollution Prevention Projects	Actual HHWSP Costs (1994-2002)	Average Estimated Benefits of HHWSP Projects (Range in brackets)
Estimates of avoided costs		
1) Riparian buffer strips	\$17,553	
avoided costs of wastewater treatment		\$755,371 (\$19,888 - \$1,490,854)
avoided costs of streambank maintenance		\$1,856 (\$659-\$3,053)
avoided costs of flooding		\$504 (\$228-\$781)
2) Cattle fencing	\$74,745	
avoided costs of wastewater treatment		\$394,502 (\$5,760 - \$783,244)
3) Manure storage tanks	\$84,689	
avoided costs of wastewater treatment		\$528,275 (\$41,469 - \$1,015,081)
4) Eavestroughs	\$11,804	N/a
Estimates based on benefits transfer		
1) Forests	\$20,813	\$69,693
2) Wetlands	\$4,757	\$603,229
Carbon stored		\$14,976 (\$14,186 - \$31, 531)
Fish and Wildlife Projects	\$27,947	N/a
Total	\$242,308	\$2,368,405 (\$755,110 - \$3,997,466)
Benefit-to-Cost Ratio		9.8 (3.1 - 16.7)



Map of the HHWSP area and project sites. Map provided by HHWSP

Comparing the benefits of the HHWSP to the costs, the benefits outweigh the costs by 10 to 1, on average, ranging from 3 to 16 times, as shown in Table 1. These monetary values cover only a part of the gains and benefits produced by the program and do not include all benefits (outlined at right). Through the findings of this study it shows that it is more effective to prevent pollution and degradation, than it is to clean up after the fact. Therefore these projects are cost-effective and economically feasible.

The costs to clean up environmental degradation have been studied and analyzed. In this case benefits have also been studied and analyzed. The bottom line is, pollution prevention is **THE KEY** to reducing environmental damages and associated costs.

For further information on this study, please contact the Great Lakes Sustainability Fund by email at glsf@ec.gc.ca

Have you ever wondered what it would cost to replace the natural areas protected by private landowners?

There are a number of other benefits which have not been calculated in this analysis:

- ✿ increased herd health and streambank stability due to livestock restriction from streams
- ✿ increased property values
- ✿ recreational values (e.g. fishing and swimming)
- ✿ return on environmental education
- ✿ soil conservation benefits
- ✿ avoided costs of dredging
- ✿ return on no-till practices
- ✿ money going into local economy through projects
- ✿ improvement of habitat for wildlife



Before - March 2002



During - July 2002



After - September 2003

Riparian buffer restoration resulting from a HHWSP Fencing Project

