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NON-POINT SOURCE WATER POLLUTION MANAGEMENT  
IN CANADA AND THE UNITED STATES  
A COMPARATIVE ANALYSIS OF INSTITUTIONAL ARRANGEMENTS  
AND POLICY INSTRUMENTS

By

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## ABSTRACT

Nearly thirty years after the introduction of water pollution management legislation in Canada and the United States, water pollution remains an important public policy problem. Very basically, water pollution problems can be divided into two types: point source and non-point source. Point source categorizes those cases where inputs into natural ecosystems come from easily identifiable sources such as industrial effluent and municipal sewage treatment outfalls. Non-point source water pollution characterizes inputs into natural ecosystems that are dispersed and multi-sourced such as urban and agricultural runoff, overflow sewage inputs and groundwater contamination. Although in many industrialized states non-point sources are recognized as the primary barrier to meeting water quality objectives, jurisdictions internationally have tended to limit the scope and focus of water pollution management efforts to more easily identifiable point-sources.

This dissertation examines intergovernmental institutional arrangements and policy instrument strategies being implemented in Canada and the US to address non-point source water pollution. This research indicates that an important determinant of instrument choice, design and comparative policy effectiveness is institutional capacity. More specifically, jurisdictions that have higher levels of vertical (intergovernmental), horizontal (cross-medium), stakeholder, monitoring and evaluation capacity are more likely to have effective policy instrument strategies. Based on six case studies examining three different policy instrument strategies, the dissertation provides evidence that jurisdictions in the US have higher levels of institutional capacity to manage these complex water pollution problems than jurisdictions in Canada.

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## LIST OF ABBREVIATIONS

(in alphabetical order)

ANSI	Areas of Natural and Scientific Interest (Ontario)
AOC	Area of Concern (Great Lakes)
BMP	best management practice
CCME	Canadian Council of Ministers of the Environment
CCREM	Canadian Council of Resource and Environment Ministers
CCRM	Canadian Council of Resource Ministers
CE	conservation easement
CEPA	Canadian Environmental Protection Act
CLTIP	Conservation Land Tax Incentive Program (Ontario)
CPR	common pool resource
CSA	cost-shared agreements
CSO	combined sewer overflow
CURB	Clean Up Rural Beaches (Ontario)
CVC	Credit Valley Conservation Authority
CWA	Canada Water Act
CWA	Clean Water Act (US)
CWAP	US Clean Water Action Plan
DATCP	Department of Agriculture, Trade, Consumer Protection (Wisconsin)
DEC	Department of Environmental Conservation (New York)
DEQ	Department of Environmental Quality (Michigan)
DNR	Department of Natural Resources (Wisconsin)
DOE	Department of the Environment (Canada)
EEAC	Ecological and Environmental Advisory Committee (Ontario)
EFP	Environmental Farm Plan (Ontario)
EIA	environmental impact assessment
EIS	environmental impact statement
ENGO	environmental non-governmental organization
EPA	US Environmental Protection Agency
ESA	Environmentally Sensitive Area (Ontario)
FON	Federation of Ontario Naturalists
FWP	Federal Water Policy (Canada)
GAAMP	Generally Acceptable Agricultural Management Practices
GAO	US General Accounting Office
GRCA	Grand River Conservation Authority
GVSU-WRI	Grand Valley State University Water Resources Institute (Michigan)
HEW	US Department of Health, Education and Welfare
HRCA	Halton Region Conservation Authority
IJC	International Joint Commission (US-Canada)
LCD	Land Conservation District (US)
LGRLT	Lower Grand River Land Trust
LTA	Land Trust Alliance
LWCB	Land and Water Conservation Board (Wisconsin)
MDA	Michigan Department of Agriculture
MISA	Municipal-Industrial Strategy for Abatement (Ontario)

MMA	Ministry of Municipal Affairs (Ontario)
MNR	Ministry of Natural Resources (Ontario)
MOE	Ministry of the Environment (Ontario)
MOU	Memorandum of Understanding
NDP	New Democratic Party (Ontario)
NEC	Niagara Escarpment Commission
NEPA	US National Environmental Protection Act
NPDES	US National Pollutant Discharge Elimination System
NPS	non-point source
NRB	Natural Resources Board (Wisconsin)
NRDF	Natural Resources Defence Fund
OECD	Organization for Economic Cooperation and Development
OEPA	Ontario Environmental Protection Act
OFA	Ontario Federation of Agriculture
OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs
ONTA	Ontario Nature Trust Alliance
OP	Official Plan (Ontario)
OSCIA	Ontario Soil and Crop Improvement Association
OWRA	Ontario Water Resources Act
PIS	policy instrument strategy
PS	point source
PWQO	Provincial Water Quality Objectives (Ontario)
RFF	Resources for the Future (US)
ROP	Regional Official Plan (Ontario)
RWQP	Rural Water Quality Program
SCS	Soil Conservation Service (US)
SDWA	Safe Water Drinking Act (US)
STP	sewage treatment plant
SWQD	Surface Water Quality Division, Michigan Department of Environmental Quality
TMDL	Total Maximum Daily Load
TRM	Targeted Runoff Management
US	United States
USDA	US Department of Agriculture
WNYLC	Western New York Land Conservancy
WPCA	Water Pollution Control Act
WQA	Water Quality Act (US)
WWTP	wastewater treatment plant

## SECTION I

**The Policy Problem, The Research Design  
and Macro-Level Institutional Comparisons**

## Chapter One

### Dimensions of the Policy Problem and the State of Comparative Policy Research

*“There is always someone or something downstream”*<sup>1</sup>

#### Introduction

Nearly 30 years after the introduction of environmental legislation in many industrialized nations, water pollution remains an important problem. Although many countries have attempted to restore and prevent further degradation of water resources using a variety of approaches and instruments, water pollution remains a significant environmental problem in many jurisdictions. The obvious outstanding policy question is why in spite of substantial investments and legislative action, have water quality objectives not been met?

Analogous to the distinction between stationary and mobile sources in the context of air pollution, water pollution can be divided into two broad types: *point source* and *non-point source*. Point source (PS) pollution categorizes those cases

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<sup>1</sup> Credit Valley Conservation Authority, *Facing Change: A Business Plan for Watershed Management*, 1999: 5.

where inputs into natural ecosystems come from easily identifiable sources such as industrial waste and municipal sewage treatment outfalls. Non-point source (NPS) pollution categorizes inputs into natural ecosystems that are dispersed and multi-sourced such as urban and agricultural run off, overflow sewage inputs, and groundwater contamination. Although these classifications are not always clear cut, what is very clear from policy analysis of water pollution problems to date is that overwhelmingly policy efforts and policy studies have focused on state institutions and the management of point-source pollution.

Although in many industrialized states, NPS water pollution problems are recognized as increasingly important in meeting water quality objectives, jurisdictions worldwide have tended to limit the scope and focus of pollution management to more easily identifiable point sources.<sup>2</sup> Early policy efforts in managing water pollution focused on managing PS pollution primarily through legislation and regulatory instruments. The visibility of stationary sources and the ability to identify responsible parties made it relatively easy for policy makers and societal interests to come to some consensus about not only the nature of the problem but the solutions.

Although there are well documented success stories of water quality improvements resulting from PS regulation, the limited ability of PS approaches to meet water quality objectives only gives a partial picture. There is no convincing evidence that massive government spending on municipal wastewater treatment facilities and point source industrial pollution control has significantly improved

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<sup>2</sup> Organization for Economic Cooperation and Development. *Environmental Performance Reviews: Progress in the 1990s*, (Paris: OECD, 1996).

water quality.<sup>3</sup> The traditional 'polluter pays' framework and regulatory enforcement have failed to curtail further degradation of water resources. This has forced policy makers to consider alternative approaches and instruments.

Within an era of fiscal restraint, many industrialized countries with membership in the Organizational for Economic Cooperation and Development (OECD) have come to realize that regulatory approaches while in some cases effective, have not always delivered results at least cost.<sup>4</sup> Countries are moving beyond uniform country-wide approaches whether based on air emissions, water effluent standards or best available technology standards because these approaches disregard differing pollution abatement costs among sectors, differing loading levels and differing assimilative capacities of different environments.<sup>5</sup> Refining country wide regulations with rules and objectives for specific ecosystems and exploring alternative instruments and arrangements involving a variety of state and societal actors is a trend evident in all areas of pollution management.

Traditional state structures and policy instruments have not and will not have the capacity to effectively meet water quality objectives in the future. This is not to say that "end-of-the-pipe" regulation and enforcement are not useful components of a comprehensive water quality management approach and cannot be improved. However, "up-stream" water pollution inputs are an increasingly important source that demand different public policy solutions. The challenge is one of matching

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<sup>3</sup> Rosenbaum, Walter. *Environmental Politics and Policy*, 2nd Ed. (Washington: Congressional Quarterly Press, 1991), 200.

<sup>4</sup> Ibid. OECD, 1996.

<sup>5</sup> Ibid. OECD, 1996.

appropriate instruments and implementation institutions with the nature of the problems and moving beyond medium-based approaches.

Water pollution problems, instrument selection and institutional arrangements are intimately linked within the context of state and societal institutions. Policy makers face the difficult challenge of addressing particular environmental problems within existing institutional arrangements or creatively adapting existing institutions and instruments to manage complex pollution problems. Since water does not respect man-made boundaries and political territories, unlike other natural resources which occur in finite spaces, policies at any level of government cannot be fully understood without reference to the workings and interconnections of intergovernmental arrangements. These spatial attributes and complex dimensions make water pollution problems challenging to address.

It is the unique aspects and the multi-dimensional character of NPS water pollution problems which make them an interesting and challenging set of public policies to study. Arguably as the nature of policy definition shifts and broadens from point source pollution to non-point source water pollution, sub-national governance structures (in particular community-based, intergovernmental systems) will become increasingly important and the role of national and intergovernmental institutions at the executive level may indeed decline. The nature of the problem will therefore require innovative, intergovernmental, integrated instruments based on state-society approaches and inter-organizational institutional arrangements to address the complex nature of water pollution.

The objective of this research is to examine the institutional arrangements and policy instruments that exist to address non-point source water pollution problems



in Canada and the United States. The research is exploratory, comparative and evaluative. It is based on the assumption that policy analysis of water pollution policies needs to include more emphasis on the features of policy instruments and the institutional arrangements designed for their implementation in order to evaluate which conditions and factors determine a jurisdiction's capacity to address these complex water pollution problems and achieve desired policy outcomes.

In order to better understand the policy challenges associated with this type of water pollution it is critical to clearly articulate the nature of NPS water pollution problems and the state of policy research in this area before outlining the research agenda. The remainder of Chapter 1 provides a detailed analysis of the character of this set of public policy problems. Three key dimensions of water pollution problems are reviewed in the context of problem definition: the scientific dimension; the source dimension and the property rights dimension. The chapter concludes with a section outlining the current state of policy studies in this area and the need for comparative research. Building on Chapter 1, Chapter 2 outlines the central research questions and the theoretical foundation on which the research design is built.

### **The Nature of Non-Point Source (NPS) Water Pollution Problems**

Problems are the raw material of public policy. In order to understand public policy it is therefore important to understand the nature of the problem, its inherent character and how it is defined and perceived. Environmental policy problems are extremely variable in character and technical features making them an interesting and challenging set of policies to study. To understand the policy challenge, it is critical to understand the nature of the policy problem and how it has been defined. The

policy literature on problem definition offers some insights into the importance of this component of the policy making process.

*Problem definition* can be defined as "the processes by which an issue or problem, having being recognized as such and place on the public policy agenda, is perceived by various interested parties, further explored, articulated and possibly quantified; and in some but not all cases, given an authoritative or at least provisionally acceptable definition in terms of its likely causes and consequences".<sup>6</sup> Problem definition is also influenced by "causal stories" and the solutions that are associated with a given definition.<sup>7</sup>

Rochefort and Cobb argue that not enough attention has been paid to the varied dimensions and attributes of problem definition in policy studies. An intimate understanding of the multiple dimensions of public policy problems including causation, the nature of the problem, the characteristics of the problem population, proximity, severity and the nature of solutions have important implications for policy research.<sup>8</sup> Of central importance is the relationship of problem definition to policy solutions and outcomes which have in many policy areas not been adequately studied.<sup>9</sup> Depending on the policy area, some of these dimensions may be more

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<sup>6</sup> Hogwood, B.W. and L.A. Gunn *Policy Analysis for the Real World* (London: Oxford University Press, 1984), 109.

<sup>7</sup> Stone, D.A. "Causal Stories and the Formation of Policy Agendas", *Political Science Quarterly*, Vol.104, 1989: 281-300.; Wildavsky, A. *Speaking Truth to Power* (Boston: Little Brown, 1974).

<sup>8</sup> Rochefort, David A. and Roger W. Cobb "Problem Definition, Agenda Access and Policy Choice", *Policy Studies Journal*, Vol.1, 1993: 62.

<sup>9</sup> Rochefort, David A. and Roger W. Cobb "Problem Definition, Agenda Access and Policy Choice", *Policy Studies Journal*, Vol.1, 1993: 59

important in problem definition than in others. In the environmental policy area in particular, the technical and complex character of environmental problems have implications for the types of solutions explored and selected by policy makers. Although scientific information is recognized as important in the problem definition stage, there is evidence that it may or may not contribute to the agenda-setting process and result in political action.<sup>10</sup>

Rocheport and Cobb also call for more research on how long-established problem definitions in specific policy areas may undergo transformations as the problem is redefined. This phenomenon is arguably underway in the water pollution policy area. Key elements to the transition are seemingly a changing role for science and technology in problem definition, a recognition that approaches and instruments have not achieved desired ecological improvements and an increasingly decentralized policy making and implementation process involving state and societal actors. These changes in many ways parallel a redefinition of environmental problems generally, and water pollution problems specifically, in many industrialized countries.

To fully explore and analyze water pollution policy it is therefore critical to understand some of the key dimensions of water quality problems. Fundamentally, environmental problems vary on a number of different dimensions: scale, scope and risk (human health and ecosystem health). Three dimensions in particular frame the character of water pollution problems and have had direct implications for the policy solutions and instruments selected to date: the scientific character of water pollution, the complexity of sources and the importance of property rights.

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<sup>10</sup> Harrison, K. and G. Hoberg "Setting the Environmental Agenda in Canada and the US: the Cases of Dioxin and Radon", *Canadian Journal of Political Science*, 24, 1991.

## The Scientific Dimensions of Water Pollution Problems

The first dimension of water pollution problems, scientific character, is common to all pollution problems. Environmental problems can be broadly framed using two scientific principles: the *materials balance principle* and the *ecosystem principle*. The materials balance principle states that the weight of resources processed, manufactured, and consumed in society equals the weight of resources returned to the environment, albeit in a transformed state".<sup>11</sup> This process occurs within and between all organisms and is fundamentally governed by the laws of thermodynamics. These laws are based on the principle that matter and energy cannot be destroyed or created and that economic production and other natural processes merely transforms them from one state to another such as wastes.<sup>12</sup> Thus, waste materials are simply residuals, some of which may have a polluting effect, especially if they are concentrated in areas that cannot easily store or assimilate them.<sup>13</sup>

The second principle, *the ecosystem principle*, states that biological and physical processes are interconnected at different scales. Ecosystems are self-regulating communities of energy and matter that perform essential services and

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<sup>11</sup> Kneese, A. and Blair T. Bower *Managing Water Quality: Economics, Technology and Institutions* (New York: Johns Hopkins Press, 1968).

<sup>12</sup> Baldwin, John H. *Environmental Planning and Management* (London: Westview Press, 1985), 19.

<sup>13</sup> Sproule-Jones, M. *Governments At Work: Canadian Parliamentary Federalism and Its Public Policy Effects* (Toronto: University of Toronto Press, 1993), 210.

functions for economies, humans and other life forms.<sup>14</sup> Ecosystems can therefore be as small as a pond or as large as a fresh water basin such as the Great Lakes. In the context of these two principles, environmental pollution represents a "disturbance" or imbalance of a given ecosystem.<sup>15</sup> This complexity and interdependence of ecosystems compounds environmental problems as ecosystems are characterized by multiple uses.

Regardless of size and scale, all ecosystems have similar basic functions in terms of human use. Ecosystems perform four basic functions:

- 1) the **Regulation Function** is the capacity of a natural resource to regulate and maintain ecological processes and life support systems through a continuous recycling process;
- 2) the **Carrier Function** is the capacity of the natural environment to provide space and suitable substrate for human activities, such as the capacity of a watershed to be used for human settlements, industry, waste disposal, recreation, habitat and other uses;
- 3) the **Production Function** is the capacity of the natural environment to provide raw materials and energy (fish for consumption, water for industrial processes, reproductive success for example); and
- 4) the **Inspirational Function** is the capacity of the natural environment to provide opportunities for cognitive development, aesthetic and recreational experiences.<sup>16</sup>

These four basic functions are based on an ecosystem perspective of interactions between natural and human systems. These interrelated functions add another layer

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<sup>14</sup> DeGroot, Rudolph *A Functional Ecosystem Evaluation Method As A Tool in Environmental Planning and Management*, (Ottawa: Canadian Environmental Research Council, 1988).

<sup>15</sup> Ibid: 212

<sup>16</sup> Ibid. DeGroot with additions.

of complexity to water pollution problems as most water bodies face multiple uses. Usually, designated use is defined in terms of human use. Depending on the jurisdiction, a given ecosystem may be designated for a number of different uses including recreation (fishing, swimming, boating), transportation (shipping, logging) waste disposal (industrial, municipal), drinking water supply or habitat.

Although there are no set parameters to describe the impacts of human uses on ecosystem functions, there are "indicators" of ecosystem health and water quality that aid in diagnosing water quality problems. Generally five sets of scientific parameters are used to indicate water pollution problems in surface and groundwater and, on occasion, in sediments: dissolved-oxygen levels, suspended solids, pathogens, nutrients, heavy metals and toxic substances. All these sets of parameters can indicate negative impacts on natural ecosystem functions from a variety of human uses. Most jurisdictions use one or more of these parameters to monitor and manage water quality.

A variety of physio-chemical, biological, and socio-economic indicators are needed to comprehensively assess environmental problems and the performance of policy solutions. In addition to the scientific dimensions of water pollution problems which are common to environment problems in general, another important dimension of water pollution problems is the complexity of sources.

### **The Source Dimension of Water Pollution Problems**

Water pollution comes from several primary and secondary sources including: domestic sewage, industrial and agricultural wastes, runoff and natural processes. As outlined earlier, sources of water pollution can be divided into two basic types:

point source and non-point source. Historically, policy makers have viewed point sources as the primary culprits in the pollution of natural water bodies. Two point sources in particular have received the attention of policy makers: waste water treatment systems and industrial effluent.

In terms of point-sources, treatment of domestic sewage has been viewed by policy makers as the most important source of water quality problems. Investment in sewage treatment facilities has been the primary policy tool used to address human health and water quality issues in urbanizing areas. The emphasis has been placed on varying levels of treatment for different human uses of water. In most urban locales at least primary treatment facilities exist which filter out floating solids in the water before discharging the water into waterways. Some jurisdictions have secondary treatment facilities which add a biological process by allowing bacteria to consume some of the wastes in water. Most urban areas in industrialized countries are serviced by primary treatment and a smaller portion is serviced by secondary treatment. For example, currently 32% of the US population is serviced by secondary treatment and 20% of the Canadian population.<sup>17</sup>

In some locales a third level of treatment called “tertiary treatment” entails adding one or more chemical removal processes to the physical and biological processes. Tertiary treatment makes it possible for communities to have “closed systems” whereby water in a community is continually recycled and not released back into natural ecosystems. Many urban centres in industrial nations have developed tertiary levels of service. In the US, 29.8% of the population has this level of service

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<sup>17</sup>OECD, *Environmental Data Compendium*, (Paris: OECD, 1995).

and 28% of the Canadian population.<sup>18</sup> In rural and unserved areas, remaining populations are serviced by wells and septic systems. In many jurisdictions, water and wastewater treatment facilities are only as effective as their capacity. Many water and wastewater facilities are supported by back-up facilities called combined sewer overflows (CSOs). CSOs are container facilities that are located where sanitary and storm sewers interconnect. During rainstorms, CSOs can become overloaded and discharge a multitude of pollutants directly into waterways. Outfalls from these facilities can affect the five sets of parameters outlined above. Thus, loadings to watercourses vary by site, depend on the nature and level of treatment facilities and the character of the receiving body.

Another important point-source that has been targeted by policy makers has been industrial effluent. Many industries use water in their production processes and have used water courses as depositories for production by-products and waste. Although many direct their wastewater to municipal or on-site treatment facilities, many continue to contribute wastes directly to natural water courses.

Policy makers in many jurisdictions have focused on regulation of effluent (wastewater and industrial) through permitting regimes as the primary instrument to address these point sources. However, by the mid 1980s, many countries including the US, reported non-point sources as the largest source of water pollution in surface waters.<sup>19</sup> Combined, a variety of diffuse non-point sources contribute to water pollution and degradation of water quality.

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<sup>18</sup> Ibid.

<sup>19</sup> Data for 370,000 stream miles not meeting designated uses in the US, collected in 1986. *U.S. Environmental Protection Agency, Progress Report 1995:46*. See also US EPA, *Atlas of America's Polluted Waters*, 1998.



In many watersheds, the major NPS pollutant by volume is sediment runoff. Recent data from the US National Water Quality Inventory indicates that siltation and erosion loadings are the leading pollution problem in US rivers and streams.<sup>20</sup> Many of these sources are closely related to land use. Soil erosion from agricultural production and run-off from farm lands is a major NPS of water pollution. These sources are primary sources of contamination that can lead to public health concerns if they enter drinking water supplies.

Finally, natural processes also contribute as sources of water pollution problems. Streams receive water from a variety of natural sources including rain, ground water seepage, springs and glacial melting but also from a variety of sources associated with human use.<sup>21</sup> Nutrients are an essential component of ecological processes and perform an important role in all of the ecosystem functions above. However, these process can be impaired or accelerated by human activities. The natural process of eutrophication (the enrichment of waters with nutrients) for example is impaired by the presence of excess nutrients such as nitrates, ammonia and phosphorous.<sup>22</sup> An ecosystem that is in a eutrophic state exhibits severe water quality problems. In general, the system creates large amounts of algae biomass and the water becomes very turbid, aesthetically unpleasant and ecosystem functions become severely stressed. Ultimately the ecosystem is characterized by low

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<sup>20</sup> U.S. Environmental Protection Agency, *National Water Quality Inventory: 1996 Report to Congress*, (Washington: US EPA Office of Water, April, 1998).

<sup>21</sup> Overcash and Davidson, *Environmental Impact of Non-Point Source Pollution*, (Ann Arbour: Science Publishers, 1980), 171.

<sup>22</sup> Goudie, A. *The Nature of the Environment* (Oxford: Basil Blackwell Publishing, 1984), 208.

biodiversity, dominance by several aggressive species and instability for many native species. Nitrate is another naturally occurring compound that enters the water column as nitrogen through a number of sources including agriculture fertilizers, animal waste, industrial outfall, storm water run off, seepage from septic tanks and run off from golf course maintenance.

Although some degree of erosion can be natural, it is often accelerated by land-use practices. Intensively cropped lands and urban construction contribute to man-made soil erosion which is accelerated by reductions in natural vegetation cover, specifically surrounding waterways. A recent study by the Department of Natural Resources in Wisconsin of 277 sites on 102 streams in the state indicates that both urban and rural sources are important. The research found that stream quality starts to suffer when as little as 8 to 12 percent of land in proximity to a watershed is paved or otherwise impervious to water accelerating the runoff.<sup>23</sup> The most common approaches used to manage these sources is through the promotion of proper land and water management practices (proper tilling and shoreline protection), construction of man-made structures (slope modifications, buffers), mitigating construction measures and restricting or encouraging certain types of land use.

US data indicate that the second largest group of NPS sources in rivers, creeks and streams are nutrient loadings (primarily nitrogen, potassium and phosphorous). Run-off from roads and poor farming practices are sources of contaminants which find their way into streams and rivers via different non-point sources such as waste applied to agricultural lands as fertilizer or nutrients applied

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<sup>23</sup> Wisconsin, Department of Natural Resources, "Study Shows Suburban Development Severely Degrades Stream Quality", *Wisconsin Outdoors and Conservation News*, May 1998.

to golf course greens. Generally runoff is accelerated during significant rain events and seasonal melts.

Pathogens, such as coliform bacteria are the third leading source of impairment in US rivers and streams.<sup>24</sup> Potential sources include inadequately treated or sewage overflows of human waste and waste from livestock and wildlife. These sources can be extremely toxic if they find their way to drinking water supplies in urban and rural areas. In addition, other toxic compounds in the form of pesticides, herbicides and heavy metals often find their way into watercourses as non-point sources. Heavy metals are found naturally in the environment as are nutrients but can be extremely toxic to humans, fish and wildlife if present in high levels. Runoff may carry oil, gasoline, agricultural chemicals, heavy metals, and other toxic substances into nearby waterways.

Water pollution is also the result of toxic organic substances that are foreign to natural ecosystems. Persistent organic chemicals have been targeted for “virtual elimination” because of their sub-lethal effects on benthos and their bioaccumulation in fish and other species that biomagnify their impact as they move up the food chain. Evidence exists that many of these chemicals have negative impacts on reproductive processes (including mutagenic biological offspring) and are carcinogenic in a number of species.

Groundwater is another important, but less understood, source of surface water contamination. Groundwater is water that has seeped into the soil and collects in an aquifer or ground water recharge area (usually within a mile of the earth's

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<sup>24</sup> U.S. Environmental Protection Agency, *National Water Quality Inventory: 1996 Report to Congress*, (Washington: EPA Office of Water, April, 1998).

surface). As ground water travels slowly (perhaps only a mile or two per year) it absorbs minerals and eventually finds its outlet in springs, streams, lakes or oceans. Groundwater has increasingly been recognized as important as surface waters for a variety of human uses such as a source of drinking water for urban and rural populations, agricultural irrigation and agricultural and industrial water supply for production purposes. The sources of ground water until recently were poorly understood. The major ground water contaminant sources are septic tanks, underground storage tanks, agricultural activities, landfill sites, road salting, construction activities and abandoned waste sites - many of which are non-point sources. The interconnection with surface water makes management of the two intricately linked.

In addition to the diversity of sources, water pollution problems are influenced by hydrology, topography, seasonality and climatology. For example, lakes differ significantly from rivers and streams on all these features. Together lakes, creeks and streams make up drainage basins of various sizes. Lakes are often the receiving bodies "downstream" in a given watershed or basin. Rivers, creeks and streams are the "upstream" components or collectors that define a given basin. The total land surface from which a system of streams receives its waters is termed the *drainage basin*. Generally, NPS water pollution problems occur in the upstream portions of drainage basins and have significant impacts downstream on the water quality in the receiving body or catchment. Streams and creeks are often the recipients of non-point sources.

A stream can be defined as a mass of water with its load moving in a more

or less definite pattern and following the course of least resistance toward a lower elevation receiving body.<sup>25</sup> Creeks and streams themselves are extremely variable.

Based on continuity of flow, streams may be:

**permanent** - streams which receive waters mostly through seepage and springs from surface waters;

**intermittent** - streams which receive their waters primarily from surface runoff and thus are seasonal; and/or

**interrupted** - streams which flow alternately on and below the surface.<sup>26</sup>

Streams are best viewed as fragile ecosystems that are easily influenced by human land and water use. Virtually any pattern of land use is reflected in the drainage basin. It is for this reason that creek and stream watersheds are important units of analysis in assessing sources of water quality problems and implementing solutions - particularly non-point sources. It has frequently been observed that "creeks and streams are the collectors, concentrators and integrators of all the impacts of man on watersheds and they truly reflect whether we know how to manage our environmental affairs".<sup>27</sup>

In many jurisdictions management regimes have been developed and designed based on the source dimension of water pollution problems. The most common are regulatory regimes based on water quality standards. Two types of standards are

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<sup>25</sup> Reid, George K. *Ecology of Inland Waters* (New York: Reinhold Publishing, 1961), 45.

<sup>26</sup> Reid, George K. *Ecology of Inland Waters* (New York: Reinhold Publishing, 1961), 49.

<sup>27</sup> Larkin, Peter. *Freshwater Pollution Canadian Style* (Kingston: McGill-Queen's University Press, 1974), 14.

commonly established: *stream standards* and *effluent standards*. Stream standards refer to water quality standards that are established for receiving waters, whereas effluent standards refer to the quality of the effluents that are discharged to receiving waters.<sup>28</sup> Stream standards take into account the dilution capacities of streams as well as recognizing the uses of streams are variable. These standards, sometimes generally referred to as "ambient standards" or "water-quality based limits", are developed by estimating the amount of pollutants that a stream can "safely" absorb.<sup>29</sup> These types of standards are usually measured in levels of concentration such as parts per million (ppm). Effluent standards, on the other hand, are usually based on restricting the type or amount of pollutants that can be discharged and sometimes called 'loading limits', and may also establish degrees of treatment required before discharge. Effluent standards have been the preferred standards used in association with the regulation of point-sources.

In the majority of instances of water pollution, it is impossible to make a simple statement, guideline or regulation that a certain substance is harmful without specifying the nature and the volume of receiving waters as well as the ecosystem function being impaired. Under these conditions it becomes difficult to frame adequate policies based on standards and the role of science becomes critical in this policy area. Because of the variance in ecosystems outlined above, standards also

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<sup>28</sup> Waite, Thomas D. *Principles of Water Quality* (New York: Academic Press, 1984), 236.

<sup>29</sup> US Environmental Protection Agency, *EPA Progress Report*, 1995.

vary by type, season, geographic area and population density. Due to the variable nature of standards, it is not surprising that standards vary across jurisdictions. It becomes even more difficult to govern ecosystems using standards and effluent controls when the sources of pollution are not easily identifiable or observable. Monitoring NPS pollutants is in some cases technically infeasible and in many cases prohibitively expensive.<sup>30</sup> These site-specific dimensions of NPS water pollution problems have been one of the main arguments in favour of a degree of decentralization in addressing these problems.<sup>31</sup>

The source dimension is therefore of central importance as NPS water pollution problems present a unique set of challenges for policymakers. To date, the key operational rule for water quality management has been point-source effluent regulation. In most jurisdictions this involves regulation of identifiable industrial and municipal outfalls based on effluent or loading standards by state actors. However, the scientific and source dimensions of water pollution problems limits the applicability of regulatory rules. These dimensions of problem definition also limit the effectiveness of regulatory approaches since a large portion of pollutants flow into ecosystems from non-point sources or already exist in waters or sediments in situ

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<sup>30</sup> Ribaldo, M.O. et.al. *Economics of Water Quality Protection from Non-point Sources: Theory and Practice*, U.S. Department of Agriculture, December 1999: 26.

<sup>31</sup> Shortle, J.S. "Environmental Federalism and the Control of Water Pollution: Is the Current Allocation of Responsibilities Between National and Local Authorities About Right?" in J.B. Braden, H. Folmer and T.S. Ulen eds. *Environmental Policy with Political and Economic Integration* (Cheltenham: Edward Elgar Publishing, 1996). See also Greenfield, R. "Controlling Non-point Sources of Pollution: The Federal Legal Framework and the Alternative of Non-federal Action" in *Perspectives of Non-point Source Pollution*, US EPA, 1985.

and are compounded by human activities.

Further complicating the establishment of rules and standards for non-point sources in river, creek and stream ecosystems is the challenge of determining which discharger is responsible - the assigning responsibility dimension inherent in non-point pollution problems.<sup>32</sup> Here the source dimension interacts with the property rights dimension since water quality is intimately related to land use. In this context, creeks and streams, like other water resources, have certain common property resource properties and thus pose collective action dilemmas.

### **The Property Rights Dimension of Water Pollution Problems**

Property rights are the third important dimension of water pollution problems - particularly NPS water pollution problems. Property rights within a given ecosystem impact in many ways on the type of institutional arrangements needed and available to manage water pollution problems. In these cases, natural resource problems from local to international levels all pose the same structural dilemma of being beyond the ability of individual persons, communities or nation-states to solve alone and therefore require collective decisions and cooperative action.<sup>33</sup>

Creeks and streams are variable in terms of property rights. In any given

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<sup>32</sup> Shortle, James S. and David G. Abler "Non-point Pollution" in *The International Yearbook of Environmental and Resource Economics 1997-98*, (Lyme, US: Edward Elgar Publishing, 1997), 114.

<sup>33</sup> McKean, Margaret. "Success in the Commons", *Journal of Theoretical Politics* 4, 1992: 247.



ecosystem there may be a number of individuals who own and use land (property) in close proximity to water resources. Some streams run through private property only, others through a mix of private and publicly owned property. Given these characteristics, creek and stream ecosystems can be classified as common pool resources (CPR). In CPR cases, the resource is available for everyone's use, the resource is characterized by non-exclusion and one person's use may directly reduce the use or value of the common pool to others.<sup>34</sup> Property rights range from open-access conditions at one extreme to individual private property rights at the other extreme. These rights may be held by individuals (private property rights), groups (collective property rights) or by the state (an extended form of collective rights).<sup>35</sup> One type of ownership does not however guarantee the efficient management of a resource.<sup>36</sup> Different bundles of property rights affect the incentives individuals face, the types of actions individuals take and the outcomes they achieve.<sup>37</sup>

In the case of a creek ecosystem for example, if a farmer were using a creek that ran through his property as a water supply for his cattle and as a disposal site for his agricultural wastes, his use directly reduces the quality of water for those owners

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<sup>34</sup> Bish, Robert L. *Basic Principles of Political Decentralization to Local Authorities*, Bureau for Economic Policy and Analysis, University Series No.5, University of Pretoria, 1983: 32.

<sup>35</sup> Libecap, G. "Property Rights in Economic History", *Explanations in Economics*, Vol.23, 1986: 235

<sup>36</sup> Schlager, Edella and Elinor Ostrom "Property Rights Regimes and Natural Resources", *Land Economics* 68, 1992:256.

<sup>37</sup> Ibid. , 256.

or users downstream. If all the users of the creek decide to use the resource in the same way, the creek would become polluted and collective action would be required to restore it or prevent a "tragedy of the commons" from occurring.<sup>38</sup> This example illustrates a problem that arises when individuals must cooperate to achieve a goal that is in both their collective and individual interest to pursue - water quality. The challenge in terms of policy development is to alter the incentive structures or rules to better manage the creek ecosystem collectively. This is particularly challenging in ecosystems with large sets of users with different bundles of property rights. Nonetheless, a variety of instruments and institutional arrangements can be used to address these three dimensions of NPS water pollution problems.

In most modern industrial states, policy makers have focused on point sources of water pollution and their regulation. The limitations of this narrow problem definition and emphasis on regulatory instruments has overlooked many of the important dimensions of water pollution problems. The scientific, source and property rights dimensions of water pollution problems in particular pose some interesting challenges for policy makers. In addition, current regulations are only one of a number of possible ways to address these types of collective action problems.

In summary, these dimensions of NPS water pollution problems pose particular challenges for designing and implementing effective policies. Policy makers in many jurisdictions are realizing the complex dimensions of water pollution

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<sup>38</sup> Hardin, G. "The Tragedy of the Commons", *Science*, 162:1, 1968: 243-248.

problems and the limitations of past approaches. Policy makers are beginning to acknowledge the need to move policy efforts beyond the implementation of traditional regulatory frameworks and medium-based approaches. Unfortunately policy research has not followed suit.

### **Comparative Policy Studies to Date**

As is evident in many disciplines, scholars have dedicated an increased research effort in recent decades to understanding environmental policy. Following the introduction of environmental legislation in many industrialized democracies in the 1970s, many policy studies focused on the analysis of traditional institutions, the development of regulatory bureaucracies and other well studied influences on policy. Studies were primarily at the national level, based on one country, descriptive in nature and focused on the traditional institutional development of a new policy area.<sup>39</sup> Initial studies were directed at the analysis of critical articles of new legislation that emerged in the early 1970s and then progressed to analyze the institutions that evolved to implement and enforce the content of the legislation.

Early policy studies focused on one medium or pollution problem (water, air, waste or land). Although the complexity and interrelatedness of environmental problems began to be recognized in the environmental literature in the 1960s and 70s, it was not until the late 1980s and early 1990s that policy makers attempted to

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<sup>39</sup> Ringquist, Evan J. *Environmental Protection at the State Level: Politics and Progress in Controlling Pollution* (New York: M.E. Sharpe, 1993), 5.

address problems in a more comprehensive way through legislation and new approaches. With a second wave of legislation and legislative amendments during this period, territorial and comparative policy studies - especially in the American political science literature<sup>40</sup>, began to more comprehensively assess the role of sub-national governments in this policy area. The focus began to shift towards the analysis of how sub-national governments addressed pollution problems and the increasing importance of non-state actors in policy formulation and implementation.

During this same period, public choice theorists contributed significantly to this body of work by analyzing the importance of the nature of the good in this policy sector and how different jurisdictions have attempted to solve 'tragedy of the commons' dilemmas and common property resource problems using alternative institutional arrangements. Several theorists had for some time been analysing natural resource management and "common property" problems and began to use this alternative approach to analyze environmental problems on an intergovernmental and micro-level scale.<sup>41</sup>

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Welbourn, David M. "Conjoint Federalism and Environmental Regulation in the US", *Publius*, Vol 18, 1988: 27-43.; Lester, James P. ed. *Environmental Politics and Policy: Theories and Evidence* (Durham, NC: Duke University Press, 1989); Lowry, William R. *The Dimensions of Federalism: State Governments and Pollution Control Policies* (Durham, NC: Duke University Press, 1992); Ringquist, Evan J. *Environmental Protection at the State Level: Politics and Progress in Controlling Pollution* (New York: M.E. Sharpe, 1993).

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Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action* (New York: Cambridge University Press, 1990); Sproule-Jones, M. *Governments at Work: Canadian Parliamentary Federalism and Its Public Policy Effects* (Toronto: University of Toronto Press, 1993).

With a renewed interest in environmental politics and policy in the early 1990's, all aspects and elements of the policy making process received increased analysis by policy scholars. Studies focused on the importance of government technocratic elites, political ideas and concepts such as "sustainable development" and, increasingly, on the role of organized interest associations and societal players in the policy making process. Comparative studies outlined the impact institutions have had on the evolution of policy implementation, policy styles of different states and the administrative capacity of different states to address pollution problems and represent diffuse interests.<sup>42</sup> The impact of federalism on policy outcomes in particular has been the topic of much scholarly debate in Canada and the US.<sup>43</sup> Interestingly, cross-national comparative studies have revealed that many

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<sup>42</sup> Vogel, David "Representing Diffuse Interests in Environmental Policy Making" in Weaver, K. and B. Rockman ed. *Do Institutions Matter? Government Capabilities in the US and Abroad* (Washington: The Brookings Institute, 1993).

<sup>43</sup> Welbourn, David M. "Conjoint Federalism and Environmental Regulation in the US", *Publius*, Vol 18, 1988: 27-43.; Lester, James P. ed. *Environmental Politics and Policy: Theories and Evidence* (Durham, NC: Duke University Press, 1989); Lowry, William R. *The Dimensions of Federalism: State Governments and Pollution Control Policies* (Durham, NC: Duke University Press, 1992); Ringquist, Evan J. *Environmental Protection at the State Level: Politics and Progress in Controlling Pollution* (New York: M.E. Sharpe, 1993).  
 Sproule-Jones, M. *Governments at Work: Canadian Parliamentary Federalism and Its Public Policy Effects* (Toronto: University of Toronto Press, 1993): 209-248;  
 Skogsdad, Grace and Paul Kopas "Environmental Policy in a Federal System: Ottawa and the Provinces" in Boardman, Robert ed. *Canadian Environmental Policy: Ecosystems, Politics and Processes* (Toronto: Oxford University Press, 1992);  
 Doern, G. Bruce and Thomas Conway *The Greening of Canada: Federal Institutions and Decisions* (Toronto: University of Toronto Press, 1994); Harrison, Kathryn *Passing the Buck: Federalism and Canadian Environmental Policy* (Vancouver: University of British Columbia Press, 1996). Farfard, P. and K. Harrison, *Managing the Environmental Union: Intergovernmental Relations and Environmental Policy in Canada* (Kingston: Queen's University Press, 1999).

industrialized countries have defined their environmental problems similarly and have used similar legislation and policy instruments to tackle environmental issues.<sup>44</sup>

In many policy contexts, policy studies reflect a shift in many industrial democracies to the use of market-based, voluntary instruments and implementation arrangements.<sup>45</sup>

Although voluntary agreements between governments and industry have been in place for decades, these arrangements are increasingly being explored in all areas of pollution management. The cost of regulation is becoming far more influential in shaping how policy makers evaluate existing policies and define alternatives for reform. "Regulatory costs have risen, in good part, because ecological damage has proven to be far more extensive and its causes more complex, than was imagined when programs were initially designed".<sup>46</sup> Policy in many jurisdictions has shifted from a system of grants to loans and many jurisdictions have been forced to look at alternatives.

Market-based instruments have been proposed as alternatives to command and control instruments. These have included pollution fees applied to emissions and outputs, tax incentive schemes to encourage polluters to invest in new, cleaner treatment and emission technologies, and tradeable emission permits. Many of these

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<sup>44</sup> OECD, *Environmental Performance Review* (Paris: OECD), 1996.

<sup>45</sup> Lotspeich, R. "Comparative Environmental Policy: Market-types Instruments in Industrialized Countries", *Policy Studies Journal*, 26:1, 1998: 85-104.

<sup>46</sup> OECD, *Environmental Performance Review* (Paris: OECD, 1996).

alternative policy instruments have been proposed in combination with each other and in conjunction with existing regulatory instruments. All, however, have been designed with large, stationary, point-source pollution in mind and property rights as a defining feature.

### **Why a Canada - US Comparison?**

With the above policy trends evident in many industrial democracies, comparative approaches to the analysis of environmental policy are increasingly important. The ability to analyze and understand water pollution management policies in one country is considerably enhanced in a comparative context. With the objective of examining water pollution management policy in Canada, a comparative analysis with the United States (US) is instructive for a number of reasons. Most importantly is the potential for policy learning based on the political, economic, socio-cultural and geographic similarities and differences between these two countries.

In terms of similarities, the nature and dimensions of water pollution problems are invariable across governance systems. Ecosystems have similar biological, physical and human-use functions at a number of different scales irrespective of whether they are in Canada or the US. Water pollution problems in both Canada and the US are the result of *point* and *non-point* sources and both states have not met water quality objectives in many ecosystems. This is particularly evident in the Great Lakes basin where environmental problems have been defined

similarly in both states and similar policy instruments and institutional arrangements used to address point-source problems have resulted in similar outcomes.

Policy solutions have evolved with both similarities and differences in Canada and the US. In some instances the solutions are posed in collective international agreements to address trans-boundary pollution issues such as Great Lakes water quality and acid rain. To date, both states have selected policy instruments that emphasize "command and control" approaches although they have been characterized as using different implementation styles.<sup>47</sup>

In both nation states, initial legislation and policy efforts primarily focused on PS pollution control and remediation. Both countries' federal arrangements involve shared responsibility for environmental policy between national and sub-national governments and both have used traditional bureaucratic arrangements to implement environmental policy.<sup>48</sup> Both have developed environmental management regimes in a context of some constitutional ambiguity, overlap and interdependence.

"Despite the overall similarity in approach, however, there are important differences between the two jurisdictions. The two nations are broadly believed to

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<sup>47</sup> Howlett, M. *Beyond Legalism? Policy Instruments, Implementation Styles and Convergence in Canadian and US Environmental Policy*, paper presented at the Annual Meeting of the Western Economics Association, San Diego, July 7, 1999.

<sup>48</sup> Phaelke, Robert and Douglas Torgerson ed. *Managing Leviathan, Environmental Politics and the Administrative State* (Toronto: Broadview Press, 1990); Doern, G. Bruce and T. Conway *The Greening of Canada: Federal Institutions and Decisions*, (Toronto: University of Toronto Press, 1994); Rosenbaum, Walter A. "The Bureaucracy and Environmental Policy" in Lester, James P. ed. *Environmental Politics and Policy: Theories and Evidence*, (London: Duke University Press, 1989).



possess rather distinct political cultures and government structures.<sup>49</sup> In particular, Canada and the US are characterized as having distinct regulatory frameworks, reflecting each nation's institutional make-up and regulatory style".<sup>50</sup> Comparative policy studies to date outline the impact institutions have had on the evolution of policy implementation, policy styles and the performance of Canada and the US in meeting water quality objectives.

The Canadian *policy making style* is characterized as more closed, informal and cooperative whereas the US policy style is characterized as open, formal, legalistic and adversarial.<sup>51</sup> In particular, the two countries have been characterized as having two distinct regulatory styles. Canadian policy makers are more likely to pursue collaborative efforts. US policy stakeholders, due to cultural and institutional factors, are less oriented to consensus building and more likely to resort to the judiciary on environmental issues.<sup>52</sup> Research however, suggests that this depends on the specific environmental policy area and that both countries' styles include

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<sup>49</sup> Gibbins, Roger and Neil Nevitte, "Canadian Political Ideology: A Comparative Analysis, *Canadian Journal of Political Science*, Vol.18, 1985: 577-598. Lipset, Seymour Martin. *Continental Divide: The Values and Institutions of the United States and Canada* (New York: Routledge, 1990).

<sup>50</sup> Hoberg, G. "Comparing Canadian Performance in Environmental Policy", in Boardman, R. ed. *Canadian Environmental Policy: Ecosystems, Politics and Process* (Toronto: Oxford University Press, 1992), 254.

<sup>51</sup> Harrison, K. *Passing the Buck: Federalism and Canadian Environmental Policy* (Vancouver: University of British Columbia Press, 1996); Hoberg, G. "Environmental Policy: Alternative Styles" in M. Atkinson ed. *Governing Canada: Institutions and Public Policy* (Toronto: Harcourt Brace, 1993).

<sup>52</sup> Vogel, D. *National Styles of Regulation* (Ithica, NY: Cornell University Press, 1986: 267), Rabe, B.G. *Beyond NIMBY*, (Washington, DC: Brookings Institution, 1994).

elements of bargaining, legalism and cooperative approaches.<sup>53</sup> Although there are some similarities in approach and instrument choice, comparative policy studies also reveal little evidence of policy convergence. There is evidence that both countries have transnational policy communities and cross-national agreements in several areas such as the Great Lakes but domestic policy approaches are characterized as distinct. The US is characterized by its adversarial legal approach and Canada by its multi-stakeholder, negotiation approach.<sup>54</sup>

There is also some interesting comparative research on the participation, role and impact of societal interests in the policy making process. Some comparative analysts have argued that “the content and intensity of public opinion have been more important than the structure of political institutions in determining cross-national and temporal differences in environmental policy”<sup>55</sup> but there is increasing evidence that institutional arrangements are a very powerful set of explanatory variables when comparing environmental policy in Canada and the US. Although there are some similarities in the types of participatory processes and influence of public opinion in Canada and the US, different institutional arrangements have facilitated different

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<sup>53</sup> Ibid. Hoberg.

<sup>54</sup> Hoberg, G. "Sleeping with the Elephant: The American Influence on Canadian Environmental Regulation", *Journal of Public Policy*, Vol II:1, 107-132. and Howlett, M. "The Judicialization of Canadian Environmental Policy, 1980-1990: A Test of the Canada-United States Convergence Thesis", *Canadian Journal of Political Science*, 27:1, 1994: 99-127.

<sup>55</sup> Vogel, D. "Representing Diffuse Interests in Environmental Policy Making", in Weaver, R.K. and B.A. Rockman, eds., *Do Institutions Matter? Government Capabilities in the United States and Abroad*, (Washington, DC: The Brookings Institution, 1993), 265.

forms and impacts of participation.<sup>56</sup>

The *impact of federalism* in particular on environmental policy outcomes is the topic of much comparative scholarly debate. In Canada, intergovernmental relations are characterized as both cooperative and conflictual depending on the particular environmental policy area being examined.<sup>57</sup> In the US, intergovernmental arrangements are said to exhibit varying degrees of "conjointness" between the federal and state governments.<sup>58</sup> Canadian rules-in-use for water quality management are asymmetrical in favour of provincial governments and these asymmetries result in different instruments and approaches among different provinces.<sup>59</sup> The policy making process and implementation arrangements are dominated by state-centred approaches and the discretionary exercise of this dominance through delegated authority.<sup>60</sup>

There is evidence however, that both countries are attempting to improve

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<sup>56</sup> VanNijnatten, Debora L. "Participation and Environmental Policy in Canada and the US: Trends Over Time", *Policy Studies Journal*, Vol.27, No.2, 1999: 267-287.  
Harrison, K. "The Origins of National Standards: Comparing Federal Government Involvement in Environmental Policy Making in Canada and the United States", in Fafard, P. and K. Harrison, *Managing the Environmental Union: Intergovernmental Relations and Environmental Policy Making in Canada*, (Kingston: Queen's University Press, 2000), 49-80.

<sup>57</sup> Doern, G.Bruce and T. Conway *The Greening of Canada: Federal Institutions and Decisions*, (Toronto: University of Toronto Press, 1994): Ibid. Harrison 1996 & 2000.

<sup>58</sup> Welbourn, David M. "Conjoint Federalism and Environmental Regulation in the United States", *Publius*, Vol.18, Winter 1988: 27-43; Fiorino, Daniel J. *Making Environmental Policy* (Berkeley: University of California Press, 1995), 85.

<sup>59</sup> Sproule-Jones, M. *Governments at Work: Canadian Parliamentary Federalism and Its Public Policy Effects* (Toronto: University of Toronto Press, 1993), 212-213.

<sup>60</sup> Ibid. Sproule-Jones

intergovernmental cooperation by selecting and designing more cooperative policy instruments involving state and societal actors in policy implementation.<sup>61</sup> Comparative implementation studies indicate that US policy designers have attempted to alter their institutional arrangements to improve intergovernmental cooperation and implementation. "The aim is to allow regional and local governments to set rules that are appropriate to local circumstances and subject to consistency with national goals".<sup>62</sup> Peter May calls this a trend towards "cooperative intergovernmental policy".<sup>63</sup>

However, May argues that despite the shift of more responsibility for environmental management to the states in the US federal system, the dominant intergovernmental framework is still largely one of regulatory prescription and coercion and successful implementation depends on levels of agency commitment and capacity.<sup>64</sup> Some analysts argue that the states have grown into their roles as implementation agents and that their capacity and relationships with the federal level

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<sup>61</sup> Harrison, Kathryn. *Talking With the Donkey: Cooperative Approaches to Environmental Protection* paper presented at the Canadian Political Science Association Annual Meeting, June 1998, Ottawa, Ontario; Clinton, B. and A. Gore *Reinventing Environmental Regulation*, Council on Environmental Quality, Washington, D.C., 1995; Furlong, Scott "Reinventing Regulatory Development at the Environmental Protection Agency", *Policy Studies Journal*, Vol 23:3, 466-481.

<sup>62</sup> May, Peter J. "Can Cooperation Be Mandated? Implementing Intergovernmental Environmental Management in New South Wales and New Zealand", *Publius*, 25:1, 1995: 93

<sup>63</sup> May, Peter et.al. *Environmental Management and Governance: Intergovernmental Approaches to Hazards and Sustainability* (New York: Routledge, 1996).

<sup>64</sup> Ibid May 1995: 92

are important factors in explaining progress in the implementation of environmental policies in the US.<sup>65</sup>

In both Canada and the US, there is general agreement that federalism results in variation across provinces and states. The debate however continues on the implications of federalism in terms of policy implementation and outcomes. The implications of federal institutional arrangements form the core of an ongoing debate. State, local and regional authorities are increasingly depicted as more capable and innovative than centralized federal arrangements in solving environmental problems in Canada and the US. However, additional empirical research needs to probe this proposition. There is a growing body of scholarship on common property resource management that provides some convincing evidence that decentralized, self-managed systems rather than state-centred arrangements provide the most promise in solving common pool resource problems.<sup>66</sup> This evidence is however not unchallenged.

Although Canada's institutional arrangements in the environmental policy area are characterized as decentralized compared to the US, recent comparative

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<sup>65</sup> Lester, James P. "A New Federalism? Environmental Policy in the States" in *Environmental Policy in the 1990s* ed. Norman J. Vig and Michael E. Kraft (Washington DC: Congressional Quarterly Press, 1990), 59-80. Scheberle, Denise. *Federalism and Environmental Policy: Trust and the Politics of Implementation* (Washington DC: Georgetown University Press, 1997).

<sup>66</sup> Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action* (New York: Cambridge University Press, 1990). Ostrom et.al. *Rules, Games and Common Pool Resources*, (University of Michigan Press, 1994). Sproule-Jones, M. *Governments at Work: Canadian Parliamentary Federalism and Its Public Policy Effects*, (Toronto: University of Toronto Press, 1993).

analysis of sub-national governments in Canada and the US suggests that US states are far ahead of their provincial counterparts in moving towards pollution prevention, cross-media policy integration and to more comprehensively measuring environmental outcomes.<sup>67</sup> The explanation for these differences suggests that some degree of centralized federal policy involvement leads to state policy entrepreneurship, innovation and learning through networking.<sup>68</sup> The impacts of centralized and decentralized institutional arrangements is an ongoing area of research that requires further exploration.

There are also some interesting comparative findings related to environmental *policy instruments* in these two countries. There are two streams of analysis: research related to instrument choice and research related to instrument performance. In general, similarities in choice are attributable to similarities in ends, goals and problem definitions.<sup>69</sup> There is also some evidence that policymakers in Canada and the US have shifted their focus from a relatively limited number of traditional, command and control, state-managed, “substantive” policy instruments to more voluntary, market-based, “procedural” instruments based on state-society partnerships in the context of broader administrative reform and institutional change

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<sup>67</sup> Rabe, Barry G. “Federalism and Entrepreneurship: Explaining American and Canadian Innovation in Pollution Prevention and Regulatory Integration”, *Policy Studies Journal*, Vol.27, No.2, 1999: 288-306

<sup>68</sup> Ibid.

<sup>69</sup> Harrison, Kathryn. *Talking With the Donkey: Cooperative Approaches to Environmental Protection* paper presented at the Canadian Political Science Association Annual Meeting, Ottawa, Ontario, June 1998.

under the ideas and principles of New Public Management.<sup>70</sup>

The research on performance of different types of environmental policy instruments has been an area of recent research attention as policy makers search for more effective and more efficient policy solutions. Generally, studies of performance all face the problems of data availability, determining criteria for evaluating performance and measuring environmental policy outcomes. In a study of instruments in the Great Lakes Basin, Rabe and Zimmerman concluded that governments that adopt “integrated regulations” perform better than those which rely on “fragmented regulations”.<sup>71</sup> Their basis of comparative performance is based on the assumption that regulatory instruments which comprehensively cover air, water and soil are more likely to result in environmental improvements than regulations that only address one of these media.

In terms of *policy implementation*, comparative policy studies indicate that although Canadian jurisdictions select traditional policy instruments, the implementation framework in Canada is more decentralized and discretionary.<sup>72</sup> Although there are some similarities in policy goals and contents, there is evidence

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<sup>70</sup> Howlett, M. *Beyond Legalism? Policy Instruments, Implementation Styles and Convergence in Canadian and US Environmental Policy*, paper presented at the Annual Meeting of the Western Economics Association, July 7, 1999.

<sup>71</sup> Rabe, Barry G. and Zimmerman, Janet B. "Beyond Environmental Regulatory Fragmentation: Signs of Integration in the Case of the Great Lakes Basin", *Governance*, 8:1, 1995:58-77.

<sup>72</sup> Ibid. Hoberg 1993: 257

that the two countries have different implementation styles - especially over time.<sup>73</sup>

There is also recent evidence that suggests both countries are moving towards negotiation rather than litigation approaches and that a new implementation style is emerging as Canada and the US move towards more voluntary approaches and instruments.<sup>74</sup>

Until recently, comparative research on *policy outcomes* has been less developed. Although the means are similar, outcomes can differ dramatically. Much of the comparative public policy literature points to significant institutional differences that shape policy behaviour and subsequent outcomes.<sup>75</sup> Comparative analysis of policy performance and outcomes is largely done at the national level using aggregate measures of performance. There is also an ongoing debate about what indicators of performance are useful.

Some research focuses on performance as the degree to which solutions and outcomes have a comprehensive, integrated and cross-medium impact. Due to data limitations, comparative analyses become difficult. Although performance in this body of research is embedded in the analysis of regulatory instruments, the indicators of performance are based on the assumption that comprehensive, integrated, cross-

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<sup>73</sup> Howlett, M. *Beyond Legalism? Policy Instruments, Implementation Styles and Convergence in Canadian and US Environmental Policy*, paper presented at the Annual Meeting of the Western Economics Association, July 7, 1999.

<sup>74</sup> Ibid Howlett, 1999.

<sup>75</sup> Rabe, Barry G. and William R. Lowry "Comparative Analysis of Canadian and American Environmental Policy", *Policy Studies Journal*, Vol.27, No.2, 1999: 263.



medium solutions are more likely to result in environmental improvements.<sup>76</sup> Impacts on ecosystems and environmental quality are very rarely used as the basis of analyzing policy performance. Although there is criticism that both countries have weak systems of monitoring, evaluation and reporting on the impacts of environmental policies, there is some evidence that Canadian policy makers continue to focus on output measures as US policy makers are attempting to move towards more comprehensive outcome measures.<sup>77</sup> Output measures in this research are narrowly defined as outputs of program implementation such as participation rates and outcomes measures include data on actual impacts in terms of water quality.

Assessing the ability and progress of these two countries in meeting environmental objectives is a challenging area that requires additional research. Comparative analysis indicates that performance varies based on a number of different dimensions including population density and pollution severity. In the area of water pollution management, there are few studies which look at performance of policy approaches in these two countries. However, there is some evidence that in terms of performance defined as policy effort, the US effort exceeds Canada's.<sup>78</sup> There are also several studies that have focused on the cooperative international

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<sup>76</sup> Rabe, B, and J. Zimmerman "Beyond Environmental Regulatory Fragmentation: Signs of Integration in the Great Lakes Basin", *Governance*, 81:1, 1995: 58-77.

<sup>77</sup> Rabe, Barry G. "Federalism and Entrepreneurship: Explaining American and Canadian Innovation in Pollution Prevention and Regulatory Integration", *Policy Studies Journal*, Vol.27, No.2, 1999: 302-303.

<sup>78</sup> Ibid. Hoberg, 1993: 257

efforts on the Great Lakes through the International Joint Commission and the Remedial Action Plan process.<sup>79</sup> However, most comparative findings on the character and performance of water pollution policies in both countries focus on PS water pollution. As a result, important dimensions of problem definition related to water quality and outcomes have been neglected in the comparative policy literature.

In summary, comparative policy studies to date indicate that some interesting findings can be derived from comparisons of environmental policy in Canada and the US. As outlined above, much of the research effort focuses on explaining differences in policy styles, implementation and outcomes due to institutional arrangements. There is some evidence that both countries share regulatory strategies, environmental technologies and policy goals related to water quality but there is limited comparative analysis of policy implementation, instruments and outcomes in specific policy areas.<sup>80</sup> This is particularly evident in the case of comparative policy research on NPS water pollution management.

As illustrated by the comparative policy studies on water pollution management, there is still a tendency to focus on point-source, medium specific studies at the national levels in Canada and the US. Overwhelmingly, policy studies have focused on the analysis of traditional institutions and regulatory instruments and

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<sup>79</sup> Hartig, John H. and M. Zarrell, *Under RAPs* (Ann Arbor: University of Michigan Press, 1992). Sproule-Jones, M. *Governments at Work: Canadian Parliamentary Federalism and Its Public Policy Effects*, (Toronto: University of Toronto Press, 1993).

<sup>80</sup> Rabe, Barry G. and William R. Lowry "Comparative Analyses of Canadian and American Environmental Policy", *Policy Studies Journal*, Vol.27, No.2, 1999: 263.

the capacity of state agencies to meet water quality objectives. In particular, policy studies to date have focused on the ability of state institutions to tackle point-source pollution. A comparative analysis of NPS water pollution management provides the opportunity to assess some of the findings and theories developed to date using an inherently complex, cross-medium case. This is particularly important as future progress in water quality management in Canada and the US is arguably a function of how jurisdictional authority will be allocated and harmonized in light of the complexity of water quality problems and solutions.

The character of environmental policy making has not fundamentally changed in that it still involves elements of adversarial bargaining and cooperative approaches reflecting the mix of institutional arrangements in this policy area. The process of elite interaction, conflict, bargaining and centralized negotiation at the federal and judicial level is seemingly giving way to a less technocratic, elitist and more consensual and decentralized policy making process. Centralized regulatory instruments and institutions in many cases have not and will no longer "fit" the nature of the good as problem definition shifts. This is likely partially explained by the increased capacity of societal forces but it is also argued here that it is because of the changing definition of environmental problems and an important and long overdue shift in focus to prevention, non-point source, cross-medium pollution problems and the institutional arrangements needed to address these complex policy problems.

### **The Need for Comparative Policy Research**

Based on the three dimensions of water pollution problems outlined above, a fundamental assumption can be made that traditional state institutions and policy instruments *have not* and *will not* have the capacity to effectively make or implement policy in this area. The predominant definition of water pollution problems as medium-based, point source problems has not resulted in effective policy solutions or has only addressed some pollution problems in some ecosystems. Arguably, as the nature of policy definition shifts and broadens from PS pollution to NPS water pollution, sub-national governance structures (in particular community-based, intergovernmental systems) will become increasingly important and the role of national and intergovernmental institutions at the executive level may indeed decline. Paralleling shifts in other environmental policy areas, water pollution management is increasingly complex, preventative and cross-medium or “horizontal” in character. The nature of the problem will therefore require innovative, intergovernmental, integrated instruments based on state-society approaches and inter-organizational institutional arrangements to address the complex nature of water pollution.

Institutional arrangements in both Canada and the US have primarily developed to address point-source water pollution. Policy studies reflect the emphasis policy makers have placed on regulatory regimes designed to implement PS approaches. Although there is recognition that problem definition has shifted, there has not been an adequate policy response nor a theoretical or research agenda to understand the present shift.

Policy analysis needs to incorporate a better understanding of these emerging approaches and instruments. In addition to gaining a better understanding of these new policy approaches, policy analysis needs to include more emphasis on implementation and evaluation of which instruments and institutional arrangements best address water pollution problems under which conditions. Importantly, policy studies must also be cognisant of the important dimensions of water pollution problems. Several exploratory questions need to be addressed in comparative context:

How are jurisdictions in Canada and the US addressing non-point source water pollution problems?

What are the basic policy instruments being used in Canada and the US to address non-point source water pollution?

What factors contribute to the selection of certain policy instruments in Canada and the US?

What institutional arrangements exist to support the effective implementation of existing policies?

What are the design principles or institutional conditions that contribute to improved effectiveness of policy instruments?

Essentially, the policy challenge lies ahead in the flexibility and adaptability of existing institutional structures to deal with increasingly complex policy problems such as NPS pollution. In order to assess how different jurisdictions are addressing these types of water pollution problems, it is important to understand what types of policy instruments are being used, why they have been selected and how they are being implemented. In the context of a Canadian and American comparison, analysis

of NPS, intergovernmental governance arrangements at the watershed level is needed. Too few comparative policy studies focus on this level of analysis.

Chapter 2 outlines the theoretical foundations of the research framework. In addition to the general research questions listed above, the chapter will argue that institutional arrangements are significant determinants of instrument choice, design and effectiveness in the context of the analytical framework, the research design and methodology.

## **Chapter Two**

### **Theory, Concepts, the Analytical Framework & the Research Design**

#### **Introduction**

The importance of researching NPS water pollution management in Canada and the US rests on the dimensions and severity of water pollution problems outlined in Chapter 1. As indicated in Chapter 1, the general argument that certain institutional conditions influence the choice, design and likely performance of certain policy instruments will be more fully articulated in this chapter. It is important that this be done in the context of the theory and concepts that form the foundation of the research agenda.

Several assumptions and concepts articulated in the theoretical literature to date form the foundation of the research agenda. The research agenda combines the approach used by many scholars associated with the “neo-institutional” approach and those scholars that have contributed to the body of knowledge on common property

management and self-governing forms of collective action. The approach also draws on important theoretical concepts from the problem definition, policy instrument and implementation literature in policy studies.

The first section of this chapter outlines the fundamental theoretical assumptions on which the research agenda is built. The next section outlines the central research questions and concepts that will form the basis of the comparative research framework. The final section of the chapter outlines the factors and variables that will be examined through comparative case analysis and the research methodology.

### **Theoretical Foundations and Assumptions**

This study is based on a number of theoretical assumptions which are derived broadly from neo-institutional theory in the policy literature and more specifically from common property resource management theory. As articulated by Guy Peters, neo-institutional theory in political science comes in a number of varieties.<sup>1</sup> The approach to this research is grounded in more than one of these varieties. The hybrid that forms the basis of the theoretical framework will become clearer by articulating the theoretical assumptions that underlie the research approach and methodology.

Several basic assumptions are derived from a neo-institutional perspective and the numerous variants under this body of theory. The *first assumption* is that

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<sup>1</sup> Peters, B. Guy, *Institutional Theory in Political Science: The New Institutionalism* (London: Pinter Publishers, 1998).



institutional arrangements matter. They are the variables that are the most important determinants in the policy process and they are also the factors that require explanation.<sup>2</sup> Beyond emphasizing institutions as the major factor in explanation of policy variance, neo-institutional theory attempts to move beyond traditional institutional description and incorporate a level of analysis that connects individual choice with collective and organizational level factors. Institutions for the purposes of the research are conceptualized very broadly as rules and incentives, formal and informal, that shape and constrain the behaviours of individuals and organizations involved in solving collective action problems. Institutions are defined to include state structures and community structures that make a difference in the way policy problem solvers process and make choices. Individual preferences are shaped to a large extent by their involvement in institutional contexts. These institutional contexts include formal and informal cultural factors, 'logics of appropriateness' which define what the institution and its members should and should not do<sup>3</sup>, and rules and incentives<sup>4</sup> that have an effect on policy choices. Beyond this assumption and more importantly, institutions matter in different contexts, in different ways and with different impacts on policy choice and outcomes.

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<sup>2</sup> Ibid, p.150

<sup>3</sup> See March, J.G and J.P.Olsen *Rediscovering Institutions: Organizational Factors in Political Life*, (New York: Free Press, 1989). March, J.G and J.P.Olsen "The New Institutionalism", *American Political Science Review*, 78, 1990.

<sup>4</sup> Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action* (New York: Cambridge University Press, 1990).

Institutions thus constrain choices of different policy stakeholders in different ways.

Some institutional theorists focus on macro-level political units of analysis as a basis of comparison<sup>5</sup> and others on meso or micro levels of analysis. One common thread for neo-institutional theorists is the tendency to emphasize state-centred theoretical frameworks while acknowledging the importance of societal stakeholders in the policy process.<sup>6</sup>

Building on this first assumption, water pollution management is therefore shaped not only by interests and ideas but also by an inheritance of laws, government institutions and court decisions over many years, particularly the last thirty. Statute law has evolved from common law predicated on property rights and thus property rights form the basis of how problems have been defined, instruments selected and institutions designed for implementation. The approach is thus explicitly a historical-institutional approach.<sup>7</sup> Policy decisions and rules are to some degree institutionalized and subsequent policy choices are in part determined by past policy decisions. However, the 'path dependent' nature of the policies is not rigid and can be altered to improve policy outcomes. This approach to studying water pollution management is therefore a powerful grounding to examine the interconnectedness of

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<sup>5</sup> Weaver, R.K. and B.A. Rockman *Do Institutions Matter? Government Capabilities in the US and Abroad*, (Washington, DC: Brookings Institution, 1993).

<sup>6</sup> Peters, B. Guy *Comparative Politics: Theory and Methods*, (New York: New York University Press, 1998).

<sup>7</sup> According to Peters, the historical institutional approach can be integrated with most, if not all, the other versions of new institutionalism. See Peters, B. Guy. *Institutional Theory in Political Science: The New Institutionalism* (London: Pinter Publishers, 1998) 76.

the nature of the problem, the evolution of intergovernmental institutions, instrument choice, implementation and outcomes.

Neo-institutional theory has also contributed to instrument choice theory. According to this theory, choice and design of effective policy instruments can be explained partly by historical process and to a degree is determined by the actors involved.<sup>8</sup> From a neo-institutional perspective, instrument choice and the selection among alternative instruments is not primarily guided by effectiveness but by the “logic of appropriateness” according to conventions, rules and norms.<sup>9</sup> Choice of preferred policy instruments is shaped by the nature of the problem at hand, the characteristics of the instrument, resource intensiveness, past experiences of governments in dealing with the problem or using the instrument, the preferences of decision makers and implementers and the likely reaction to the choice by policy stakeholders.<sup>10</sup> The choice of instruments is also restricted because actors do not know of alternative instruments or the costs of changing the instrument are too high. Thus, the choice and character of the policy instrument is determined by the

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<sup>8</sup> Brunsson, N. and J.P. Olsen "Organizational Forms: Can We Choose Them?" in N. Brunsson and J.P. Olsen ed. *Reforming Organization* (Chatham NJ: Chatham Publishers, 1993),1-5.

<sup>9</sup> See March, J.G and J.P.Olsen "The New Institutionalism: Organizational Factors in Political Life", *American Political Science Review*, Vol.78, 1984: 734-9.

<sup>10</sup> Linder, S.H. and B.Guy Peters "Instruments of Government: Perceptions and Contexts", *Journal of Public Policy*, Vol.9, 1989: 35-58.

institutional context in which it is designed, evolves and is implemented.<sup>11</sup>

Problems are defined and instruments are selected within the context of broader institutional arrangements such as those outlined in constitutional law and federalist structures. As outlined in Chapter 1, water pollution problems vary on a number of different dimensions. Policy makers face the difficult challenge of matching particular environmental problems with existing levels of jurisdiction. Since water does not respect man made boundaries and political territories, unlike most other natural resources which occur in finite spaces, water policies at any level of government cannot be fully understood without reference to the workings and interconnections of the rest of the political system (similar to understanding ecosystems).

In terms of policy analysis, one of the critical analytical choices relates to the scope and scale of the problem definition and the scope and the level of the response to the problem.<sup>12</sup> In the case of non-point source water pollution, it is argued here that these two choices should be defined and examined closely. Increasingly these solutions are administrative and involve both state and societal actors with different and competing interests. As outlined in Chapter 1, the policy problem of non-point source pollution is inherently complex, variable, local and intertwined with property

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<sup>11</sup> Bagchus, R. "The Trade Off Between Appropriateness and Fit of Policy Instruments", in Peters, B. Guy and F.K.M. Van Nispen *Public Policy Instruments: Evaluating the Tools of Public Administration*, (Northampton: Edward Elgar, 1998), 57-60.

<sup>12</sup> Fiorinio, Daniel J. *Making Environmental Policy* (Berkeley: University of California Press, 1995), 191.

rights.

The types of policy solutions needed to address non-point source pollution fall predominantly at state/provincial and local levels because the nature of the good requires rules that are specific to the environmental problems of a given ecosystem - which tend to be sub-national in scale. The issue is one of matching appropriate instruments and institutional arrangements with problems. Choices are not made in a vacuum, they are affected by how a problem is defined, what resources are available for dealing with the problem and the political, social and economic constraints surrounding instrument choice. These dimensions of water pollution problems make solutions inherently intergovernmental in a federal system. However, these same dimensions and spatial attributes are not necessarily incompatible with federalism as an institutional form and may indeed be complementary.

In addition to understanding how problem definition and institutions frame the choice of instruments, policy research needs to further explore the conditions in which certain instruments are more effective than others. Admittedly, this is a complex policy research challenge.

*A second assumption* is that societal actors and cooperative approaches based on state-society partnerships are increasingly important in policy making and policy implementation. In most ecosystems, multiple stakeholders interact as owners, managers and users of the water resource. State actors are only one subset of these stakeholders. Non-state policy actors are thus increasingly important in understanding and evaluating water pollution governance and management regimes.

Paralleling shifting definitions of water pollution problems have been shifts in the importance of democratic participation of the public in policy making in this area. These shifts are evident in the emergence of many articles of legislation that explicitly require different forms of public involvement in formulation, implementation and enforcement.<sup>13</sup> This participation has manifested itself in legal challenges and private litigation, new modes of policy making and new actors in the implementation of water pollution management programs. This opening of the policy process has been paralleled by a simultaneous shift from centralized technocratic decision making to more decentralized participatory policy making. Stakeholder involvement stems from multiple uses of a given water resource and increased stakeholder involvement has been seen by decision makers as a way of implementing policies in a more efficient way.

The capacity and organizational strength of environmental non-governmental organizations (ENGOS) has increased markedly in the past twenty years especially at the sub-national and local level.<sup>14</sup> In both the US and Canada, the capacity and influence of organized environmental groups depends on their structure, resources and strategies.<sup>15</sup> There is increasing evidence that traditional policy communities in

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<sup>13</sup> Rosenbaum, Walter A. "The Bureaucracy and Environmental Policy" in Lester P. James ed. *Environmental Politics and Policy: Theory and Evidence* (London: Duke University Press), 1989: 215

<sup>14</sup> Ingram, Helen and Dean E. Mann, "Interest Groups and Environmental Policy" in Lester, J.P. *Environmental Politics and Policy: Theory and Evidence* (London: Duke University Press, 1989).

<sup>15</sup> John C. Pierce et.al. *Citizens, Political Communication and Interest Groups: Environmental Organizations in Canada and the US*, (NY: Praeger Publishers, 1992).

this area are changing and that the role of scientific policy players has become increasingly politicized.<sup>16</sup> Arguably, as policy emphasis shifts to pollution prevention and non-point source pollution management, these groups could play a larger role in the policy making and implementation process especially at the sub-national levels. The proliferation of advisory committees, stakeholders groups, task forces and round tables at all levels of government indicate the demand for a more responsive, democratic policy making process. These societal players will undoubtedly have an affect on the policy making structures that evolve to deal with environmental problems in the future.

The next set of assumptions are drawn from theoretical foundations of common property resource management theory which is more broadly embedded in public choice theory or what has been labelled a 'public choice institutional' perspective.<sup>17</sup> This body of literature is concerned with how institutions can be designed to improve the collective choices of individuals to overcome classic collective action problems. Other dimensions of central concern in this body of literature are the issues around multi-stakeholder coordination and the role of the

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<sup>16</sup> Wilson, Jeremy. "Wilderness Politics in BC" in Coleman, W. and G. Skogstad ed. *Policy Communities and Public Policy* (Toronto: Copp Clark Pitman, 1990), 140-168. Skogstad, G. and P. Kopas "Environmental Policy in a Federal System: Ottawa and the Provinces" in Boardman ed. *Canadian Environmental Policy: Ecosystems, Politics & Process* (Toronto: Oxford University Press, 1992).

<sup>17</sup> See Dunleavy, P. *Democracy, Bureaucracy, and Public Choice* (Englewood Cliffs, NJ: Prentice Hall, 1991). Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action* (New York: Cambridge University Press, 1990). Sproule-Jones, M. *Governments at Work: Canadian Parliamentary Federalism and Its Public Policy Effects*, (Toronto: University of Toronto Press, 1993).

property rights in collective action problem solving.

Based on the theoretical scholarship of those who have studied common property resource management, a *third assumption* is that the property rights and the specific nature of the problem are important in defining the nature of water pollution problems and the nature and scale of appropriate solutions. As discussed in Chapter 1, property rights are an important defining feature of the nature of water pollution problems. Policy theory and research on the nature of water pollution problems, as common property resource problems stems most notably from Garrett Hardin's "tragedy of the commons". The common property resource theory which has evolved from the tradition of analyzing these types of collective action dilemmas, reveals some interesting conditions under which water resources can be managed collectively.

Resource ownership and property rights, within a given ecosystem, impact in many ways on the type of institutional arrangements needed and instruments available to manage water quality. For example, in any given creek ecosystem or drainage basin there may be a number of individuals who own property in close proximity to the ecosystem. Pollution problems, whether point source or non-point source, are in the language of economics - negative externalities.

An externality exists when the decisions of one individual or firm affects the utility, costs or benefits of another individual.<sup>18</sup> Pollution in this scenario is an

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<sup>18</sup> Johnson, David B. *Public Choice* (New York: Bristolcone, 1991), 67



externality that does not lend itself to easy solutions because in each case there are at minimum two opposing parties involved: the party that generates the externality and the party that receives the externality (whether human or non-human, private or public). Importantly, rules and policy solutions are based on the assumption that the parties are identifiable. NPS water pollution challenges this framework. The development of water pollution management regimes are based on property rights which stem from the historical interpretation of common law. Non-point source pollution challenges this framework because there is no clear-cut relation between clearly identifiable polluters and pollutees and no unambiguous causal link.<sup>19</sup> Rather, in most cases, there are a multitude of disperse polluters emitting different pollutants which interact in time and space to cause a variety of environmental problems.

Elinor Ostrom and other common pool resource (CPR) theorists, argue that in complex situations users of CPRs will cooperate if they have opportunities and incentives.<sup>20</sup> The number of individuals or size of the community involved in the collective action problem has for some time been recognized as an important variable in making effective collective choices to solve collective action problems.<sup>21</sup> Small-scale or local commons regimes are "more likely to have the formal conditions

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<sup>19</sup> Sollner, Fritz "The Role of Common Law in Environmental Policy", *Journal of Contemporary Law*, 1992:75.

<sup>20</sup> Ostrom, E. et.al. *Rules, Games and Common Pool Resources*, (University of Michigan Press, 1994).

<sup>21</sup> Olson, Mancur *The Logic of Collective Action: Public Goods and the Theory of Groups* (Cambridge, Mass: Harvard University Press, 1965); Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action* (New York: Cambridge University Press, 1990).

required for successful and enduring collective management”<sup>22</sup> Among these conditions are the visibility of the common resources and behaviours towards them; feedback on the effects of regulations; widespread understanding and acceptance of the rules, and the backing of rules by social compliance.<sup>23</sup> The willingness of resource users and managers to use moderate sanctions can also increase cooperation.<sup>24</sup>

The number of individuals or groups involved in managing a given ecosystem may nonetheless require some incentives to mobilize collective problem solving and management. Large groups with difficult to determine property rights will tend to face "free-rider" problems. In the case of the users or owners of a creek ecosystem for example, if there are many users and owners, some can receive the benefits of proper management (water quality) without compliance to the rules. For instance, the farmer could choose not to alter his farming practices and still receive the benefits of any improvements. His continual non-compliance however will ultimately degrade the creek - especially if others in close proximity to the creek make similar choices. This outcome is more likely to happen if the rules are perceived as being unfair, too costly to abide by, and the benefits of compliance are unclear or

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<sup>22</sup> Ibid Ostrom, E. 1990.

<sup>23</sup> Ostrom, E. et.al. *Rules, Games and Common Pool Resources* (University of Michigan Press, 1994).

<sup>24</sup> Ostrom, E. "A Behavioural Approach to the Rational Choice Theory of Collective Action" in Ostrom et.al. *Rules, Games and Common Pool Resources* , (University of Michigan Press, 1994), 327-328.

undervalued.

Research has shown that in terms of property rights, the commons is far from being a "free-for-all" and the use of the commons is closely regulated through communal rules, norms and practices.<sup>25</sup> Interestingly, some collective actions involving natural resource management result in tragedies of the commons and others do not. One type of ownership does not however guarantee the efficient management of a resource.<sup>26</sup> Different bundles of property rights affect the incentives individuals face, the types of actions individuals take and the outcomes they achieve.<sup>27</sup>

Clearly, regulatory rules and private litigation are not the only policy alternatives when it comes to managing these problems. One of the most common misunderstandings is that common property problems lend themselves to solutions of either enhancing private property rights (privatization) or developing a more active role for state institutions to enforce compliance.<sup>28</sup> In reality, many studies have demonstrated that there are a wide range of governance alternatives and self-governing institutional arrangements that can overcome these problems. A number of comparative policy studies have revealed that these problems can be overcome

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<sup>25</sup> Benson, B. "Customary law as Social Contract", *Constitutional Political Economy*, Vol 3, 1992: 1-27.; Matthews, David Ralph, *Controlling Common Property: Regulating Canada's East Coast Fishery*, (Toronto: University of Toronto Press, 1993).

<sup>26</sup> Schlager, Edella and Elinor Ostrom "Property Rights Regimes and Natural Resources", *Land Economics*, Vol 68, 1992: 256

<sup>27</sup> Ibid. 256

<sup>28</sup> McCay, Bonnie J. and James M. Acheson "Human Ecology of the Commons" in McCay and Acheson ed. *The Question of the Commons*, (Tucson: University of Arizona Press, 1987), 9.

under different kinds of institutional arrangements.<sup>29</sup>

A second critical variable in terms of successful common property resource governance is some measure of a strong, developed community.<sup>30</sup> Importantly however, community alone is not sufficient for solving CPR problems.<sup>31</sup> Other variables such as the scope of problem, the number of actors involved in decision making and the heterogeneity of actors resources and preferences also make a difference.<sup>32</sup>

In terms of ecosystem management, another reason community is an important variable is that in communities where people rely on their natural resources for their livelihood they develop an intimate knowledge of the ecosystem and its functions and this knowledge informs their policies and actions. Information is an important variable - not only the availability of information but the symmetry of information held by decision makers and when the information is obtained or used in the decision making process.<sup>33</sup> Provision of information can arguably improve

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<sup>29</sup> McKean, Margaret "Success in the Commons", *Journal of Theoretical Politics*, Vol 4, 1992: 247-82. Ostrom, E. et.al. *Rules, Games and Common Pool Resources*, (University of Michigan Press, 1994).

<sup>30</sup> Singleton, S. and Michael Taylor "Common Property, Collective Action and Community", *Journal of Theoretical Politics*, Vol.4, 1992: 309-324.

<sup>31</sup> Ostrom, E. "Community and the Endogenous Solution of Commons Problems", *Journal of Theoretical Politics*, Vol.4, 1992: 343-352.

<sup>32</sup> Keohane, Robert and Elinor Ostrom "Introduction", *Journal of Theoretical Politics*, Vol.6, 1994: 403-428.

<sup>33</sup> Libecap, Gary "The Conditions for Successful Collective Action", *Journal of Theoretical Politics*, Vol. 6, 1994: 563-592.

cooperative approaches.

Essentially the common property resource literature rests on a bottom-up approach to analyzing the implementation of policy solutions. Policy success is strongly linked with implementation that allows individuals to cooperate to solve problems. The research under this approach attempts to analyze the conditions under which cooperation occurs, the incentives in place to foster problem solving and the degree to which capacity exists and can be fostered to overcome the collective action problem. An important contribution of this approach is the assumption that no one best instrument or solution exists. Rather, certain institutional conditions will increase the likely performance of certain instruments and approaches. A well performing institution is one that is designed to overcome identifiable shortcomings in the market or political system to achieve collectively desirable outcomes.<sup>34</sup> One of the key questions for this variant of institutional theory is what impact do various institutional arrangements have on the performance of policy. This approach attempts to identify what works, what does not work and why.<sup>35</sup>

*A fourth assumption* underlying the research is that point source regulatory approaches and instruments have not effectively addressed water pollution problems and are not transferable to non-point source problems. As highlighted in Chapter 1, the limited success of effluent regulation of point-source pollution only gives a

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<sup>34</sup> Peters, B. Guy *Institutional Theory in Political Science: The New Institutionalism* (London: Pinter Publishers, 1998), 59.

<sup>35</sup> Ibid, p.94

partial picture. Many policy studies focus on evaluating the performance of these regulatory regimes in terms of the relationship between pollution control expenditures and reduced inputs, improvements in water quality, and valuations of improved uses. Studies in some cases reveal significant reductions in loadings due to these regulations. However, non-point source pollution clearly does not fit within the context of these findings. The assumption or claim that similar regulatory approaches can be used from site to site and problem to problem and yield similar outcomes is misleading at best. Regulations based on standards and incomplete scientific information cannot be applied from one site to the next without careful consideration of the nature of the good or the environmental problem in question. This is not to say that some policy instruments cannot be applied in different instances and across jurisdictions but that variance in outcomes can to some degree be explained by the nature of the problem as an important contextual variable. NPS water pollution problems need to be addressed in different ways using different instruments.

*A final assumption* is that policy makers in Canada and the US have similar instrument options at their disposal to address NPS water pollution but that instrument choice and institutional arrangements designed for implementation will vary depending on a number of factors and the broader institutional context. It is not assumed that there is one best instrument for all non-point source water pollution problems. Rather, it is hypothesized that effectiveness of an instrument for a given ecosystem will vary based on a number of factors. Based on the theoretical

assumptions outlined above, it is hypothesized that those instruments and implementation arrangements that take the local nature of the water pollution problem into consideration, create incentives for stakeholder involvement, involve cooperative partnerships between levels of government, take cross-medium (land and water use) approaches and incorporate monitoring and evaluation mechanisms will be the most successful at addressing these complex water pollution problems. In order to better assess the contextual factors of instrument choice and implementation it is necessary to identify the key concepts and clarify how they are defined and operationalized in the research.

### **Central Concepts & Research Questions**

Very basically, a *policy instrument* is an authoritative means of accomplishing a certain end.<sup>36</sup> Instruments can be classified using a variety of typologies. The most basic uses the "carrots", "sticks" and "sermons" typology to distinguish between economic, regulatory and information or exhortation instruments.<sup>37</sup> Most classifications and categorizations have developed based on

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<sup>36</sup> Elmore, R.F. "Instruments and Strategy in Public Policy", *Policy Studies*, Vol.7, 1987: 175.

<sup>37</sup> Vedung, E. "Policy Instruments: Typologies and Theories" in Bemelmans-Videc, M.L., R. Rist and E. Vedung., *Carrots, Sticks and Sermons: Policy Instruments and Their Evaluation*, (London: Transaction Publishers, 1998). Harrison, Kathryn. "Talking with Donkey: Cooperative Approaches to Environmental Protection" paper presented at the Canadian Political Science Association Annual Meeting, Ottawa, June 1998.

dimensions such as degree of coerciveness, state versus societal provision and continuums of "hard" to "soft".<sup>38</sup> Recognizing there are limitations to the different typologies and families of policy instruments, the framework is nonetheless helpful in distinguishing between different state approaches to problem solving. Hard instruments or "sticks" are those which are compulsory, exact and rigid, while soft instruments imply a higher degree of voluntary compliance, adaption and flexibility.<sup>39</sup>

The degree of hardness in reality depends on how rigidly rules are monitored and how unconditionally compliance is enforced. In other words, many regulatory instruments may be used softly and are often used in combination with other instruments. Similarly, "carrots" cover a broad range of instruments. Negative economic instruments such as taxes can be hard while economic incentives such as subsidies, tax credits and incentive schemes can be soft since they are based on voluntary compliance. These types of instruments distribute the costs of pollution control differently between polluters and the rest of society. For example, subsidies place the burden of pollution on taxpayers, while taxation instruments place the

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<sup>38</sup> Doern, G.B. and R.W. Phidd *Canadian Public Policy: Ideas, Structure, Process, Second Edition*, Scarborough: Nelson Canada, 1992); Howlett, M and M. Ramesh *Studying Public Policy: Policy Cycles and Policy Subsystems* (Toronto: Oxford University Press, 1995).

<sup>39</sup> Eckerberg, K. "Comparing the Local Use of Environmental Policy Instruments in Nordic and Baltic Countries: The Issue of Diffuse Water Pollution" in *Environmental Politics*, Vol.6, No.2, Summer 1997:24-47.



burden on polluters.<sup>40</sup> In addition to subsidies and taxes, contracts and redefinitions of property rights would also fall under the broad category of "carrots". Generally "sermons" are soft and are used in their own right or to disseminate information on the meaning, availability and nature of other policy instruments.<sup>41</sup>

State authorities in many industrial democracies have used similar policy instruments to address water pollution problems. "Sticks" based on "command and control" effluent standards are the most common instruments designed with large, stationary, point-source pollution in mind and property rights as the defining feature. The policy instruments used in Canada and the US to address point sources are very similar. Broadly speaking, the two countries tend to use similar types of policy instruments, eschewing purely market-based or state-based solutions in favour of a mix and both seem to be moving towards the use of more cooperative instruments.<sup>42</sup> Nonetheless, regulation and public spending on wastewater treatment facilities have been the preferred instruments to manage effluent from easily identifiable sources. However, as outlined in Chapter 1, point source water pollution instruments have

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<sup>40</sup> Ribaudó, M.O. *Economics of Water Quality Protection from Non-point Sources: Theory and Practice*, U.S. Department of Agriculture, December 1999: 27.

<sup>41</sup> Vedung, E. "Policy Instruments: Typologies and Theories" in Bemelmans-Videc, M.L., R. Rist and E. Vedung., *Carrots, Sticks and Sermons: Policy Instruments and Their Evaluation*, (London: Transaction Publishers, 1998).

<sup>42</sup> Rosenbaum, W. "The Bureaucracy and Environmental Policy" in J.P. Lester, ed. *Environmental Politics and Policy: Theories and Evidence* (Durham NC: Duke University Press, 1989) and Harrison, Kathryn "Talking with the Donkey: Cooperative Approaches to Environmental Protection" paper presented at the Canadian Political Science Association Annual Meeting, June 1998, Ottawa, Ontario.

either failed to achieve desired policy outcomes or only addressed a portion of water quality problems in some ecosystems. In most jurisdictions a mix of instruments are used to address water pollution problems.

A policy instrument may be chosen for a wide variety of reasons. An instrumentalist approach assumes that instruments are selected according to policy goals and implemented by actors without preferences. However, policy instrument choice may be influenced by a number of institutional factors. Consistent with the neo-institutional orientation outlined above, choice of policy instruments is influenced by institutional context and the number of alternative policy instruments is restricted as a result of historic exclusion and sunk costs.<sup>43</sup> Certain conditions under this approach are central to explaining instrument selection: the character of the problem, the institutional context, the instrument design features, and the target group. A good instrument choice could therefore be based not only on effectiveness (in meeting goals) but also on appropriateness. The choice of instrument is restricted, either because actors do not know of alternative instrument choices or the costs of changing the instrument are perceived as being too high.<sup>44</sup> Instrument choice is thus also influenced by the provision of information.

It is often very difficult to single out the effects of a specific instrument,

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<sup>43</sup> Bagchus, Rene. "The Trade-off Between Appropriateness and Fit of Policy Instruments" in Bemelmans-Videc, M.L., R. Rist and E. Vedung., *Carrots, Sticks and Sermons: Policy Instruments and Their Evaluation*, (London: Transaction Publishers, 1998), 53.

<sup>44</sup> Ibid.

because instruments are often part of a mix and are often tightly coupled with implementation agents and arrangements. In order to fully analyze instrument choice, design, implementation and effectiveness it is important to analyze the institutional arrangements inherited or specifically designed to implement the selected instrument. Instruments are assumed here to be the linkages between problem definition and implementation stages of the policy process. The concept of a *policy instrument strategy* is a helpful construct for analyzing instruments and implementation arrangements at the operational level. A policy instrument strategy is defined as a particular mix of policy instruments and the organization of their implementation.<sup>45</sup> This concept articulates that typically instruments and organizational strategies are interconnected.<sup>46</sup> Policy instruments are therefore tightly connected to different types of implementation arrangements. The selection and use of certain policy instruments depends on the institutional arrangements available to implement the selected instruments and the contextual appropriateness of an instrument. Instruments must therefore be analyzed in the context of problem definition and the implementation arrangements in which they are embedded at the operational level.

In order to characterize NPS water pollution management strategies in

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<sup>45</sup> Vedung, E. "Policy Instruments: Typologies and Theories" in Bemelmans-Videc, M.L. R. Rist and E. Vedung., *Carrots, Sticks and Sermons: Policy Instruments and Their Evaluation*, (London: Transaction Publishers, 1998).

<sup>46</sup> Ibid.

Canada and the US, it is therefore important to analyze the evolution of problem definition, instrument choice, design features and implementation arrangements. This involves a “top down” process of analyzing the evolution of intergovernmental institutional arrangements at the federal and sub-national levels and a “bottom up” analysis of the instruments, their design features and implementation arrangements at the operational or program level. This approach incorporates sensitivities to scale and allows for linkages to be made between micro levels of analysis and more macro level, intergovernmental components of the policy implementation process. The concept of a policy instrument strategy allows for the comparative analysis of instrument choice, design and implementation arrangements using both this top-down and bottom-up approach. The focus on policy instrument strategies as units of analysis therefore explicitly examines the policy instrument in practice in the implementation stage of the policy process.

In comparative public policy, the theoretical focus on different political institutions in many ways depends on the particular component of the policy process under study. For example, studies that focus on the policy formulation process may focus on different political institutions than studies which focus on the implementation component of the policy process. The focus of the comparative analytical framework outlined below is explicitly on the bureaucratic institutions involved in implementing policy instrument strategies in the broader institutional context. The next section outlines the central research questions and the analytical framework that form the foundation of the research design.

## The Analytical Framework & Research Questions

Based on these theoretical assumptions and the central comparative concept of a policy instrument strategy, the exploratory research questions outlined in Chapter 1 can be reformulated in comparative context using the central comparative concept. These general questions frame the research and analytical framework:

What policy instrument strategies have been developed and used in Canada and the US to address non-point source water pollution problems?

Which institutional factors contribute to the selection of certain policy instruments in Canada and the US?

What are the design principles or institutional conditions that may contribute to more effective policy instrument strategies?

From these very broad research questions several more specific research questions can be developed in the context of existing theory on environmental policy in Canada and the US and more specifically on the capacity of jurisdictions to solve NPS water pollution problems. The comparative analytical framework is based on the theoretical assumptions outlined above, the general research questions which are both *exploratory* and *evaluative* and the following research questions incorporating the comparative concepts that will be used in the research design:

Does variation in institutional capacity in Canada and the US account for differences in policy instrument choice and design?

Does variation in institutional capacity in Canada and the US account for differences in effectiveness of different policy instrument strategies?

The research will demonstrate that variation in institutional capacity in Canada and the US can account for differences in NPS policy instrument strategy selection,

design and effectiveness. Therefore, it is important to note that the comparative analytical framework will be used to not only analyze the choice and design of different policy instrument strategies but also comparatively evaluate their effectiveness.

The analytical framework depicted in Table 2-1 is used to guide data collection related to the core research questions. Each set of variables is tied together in the policy process. The emphasis of the framework however is on policy instrument strategies (the intersect between instrument selection, design and implementation arrangements at the program level). The framework allows for a comparative description, analysis and evaluation of policy instrument strategies using three broad sets of variables: situational variables, institutional variables and outcome variables.

**Table 2-1 The Analytical Framework**

<b>Situational Variables</b>	<b>Institutional Variables</b>	<b>Outcome Variables</b>
<b>Community Characteristics</b> <ul style="list-style-type: none"> <li>● socio-economic</li> <li>● population</li> <li>● land use</li> <li>● resource base</li> </ul>	<b>Stakeholders/Agents</b> <ul style="list-style-type: none"> <li>● state and/or societal rules and incentives for participation</li> <li>● number and type</li> <li>● role in design and implementation of policy instrument strategy</li> </ul>	<b>Effectiveness</b> <ul style="list-style-type: none"> <li>● agency activity</li> <li>● participation rates</li> <li>● problem solving capacity</li> <li>● perceptions of officials</li> </ul>
<b>Ecosystem Conditions</b> <ul style="list-style-type: none"> <li>● physical character of the ecosystem</li> <li>● identification of primary and secondary pollution sources</li> <li>● scientific/technical features of the pollution problem</li> </ul>	<b>Policy Instrument</b> <ul style="list-style-type: none"> <li>● legal authority</li> <li>● policy goals and objectives</li> <li>● design features based on watershed approach</li> <li>● funding (sources, levels)</li> <li>● implementation arrangements</li> <li>● monitoring and compliance</li> </ul>	<b>Ecological</b> <ul style="list-style-type: none"> <li>● use improvements</li> <li>● aesthetic improvements</li> <li>● water quality improvements (parameters)</li> </ul>

The objective of the research is to analyze how these three sets of variables interact in a given case to describe and evaluate different policy instrument strategies and the hypothesized importance of institutional capacity in Canada and the US.

## SITUATIONAL VARIABLES

To fully assess the context in which each of the cases is embedded, it is important to explore and characterize a number of situational or contextual variables. As indicated in Table 2-1, *situational variables* (community characteristics and ecosystem conditions) are preconditions - conditions that existed prior to the development of management rules, selection and design of policy instrument strategies. Data collection and analysis of this set of variables allow for the identification of similarities and differences in problem definition across jurisdictions. Situational variables are those variables that define the character of the given ecosystem. It is assumed that these characteristics have an effect on how the policy problem has been defined as well as instrument selection, design and institutional arrangements for implementation (policy instrument strategies). The situational variables for each case fall into two broad categories: community characteristics and ecosystem characteristics.

**Community Characteristics** - socio-economic character of the ecosystem, population, land use, character of property rights and major uses of the ecosystem as a resource.

**Ecosystem Characteristics** - physical character, primary and secondary sources of pollution, scientific and technical features of the pollution problem(s), severity of the pollution problem.

Stemming from the core research questions and the analytical framework, several additional research questions can be developed specifically related to these contextual factors:

Do certain community or ecosystem factors contribute to the selection, design and preference for certain policy instrument strategies?

Do higher proportions of private property in a given ecosystem contribute to the selection and design of more voluntary policy instrument strategies?

Are policy instrument strategies that take situational variables into consideration in design and implementation more effective?

## **INSTITUTIONAL VARIABLES**

Institutional variables are those variables that are hypothesized to play an important role in allocating management authority in a given ecosystem (both formal and informal, state and societal) to achieve policy objectives. *Institutional variables* are conceptualized and analyzed at two levels. The first level includes institutional rules derived from the constitutional, statutory and policy context in each country. The character of institutional arrangements in both countries is inherently intergovernmental including the rules and incentives for participation of state and societal actors. The second level includes rules and incentives embedded in the design features of the policy instrument and implementation arrangements - policy instrument strategies. It is hypothesized that the first level has significant implications for the choice, design, institutional character and effectiveness of policy instrument strategies at the second level.

The character of the policy instrument strategy is mainly operationalized in terms of design principles (legal authority, goals and objectives, rules related to



stakeholder and agent participation, and mechanisms of implementation, monitoring and compliance). Collectively, institutional arrangements are conceptualized as a hierarchy of intergovernmental rules and incentives (constitutional, legal and administrative) for state and societal participation in instrument design and implementation. Policy instrument strategies will be examined and compared in the broader intergovernmental context of institutional arrangements used to govern and manage water quality. Three different policy instrument strategies will be examined and compared in terms of *institutional capacity*. As defined below, this concept is broader than the concept of policy capacity. Policy capacity is generally defined as a loose concept which covers the ability and resources of government agencies and personnel to review, formulate and implement public policies.<sup>47</sup> The concept of institutional capacity includes the resources, personnel and expertise of governments and societal stakeholders to design and implement public policies.

**Institutional capacity** is a multi-dimensional concept. In addition to a general characterization of intergovernmental and state-societal involvement in instrument selection, design and implementation, this concept can be analyzed along four dimensions:

- i) **vertical institutional capacity** - vertical integration and cooperation of different levels of government in designing and implementing the policy instrument strategy, includes incentives for instrument choice and the degree of centralization and decentralization evident in the policy instrument strategy;
- ii) **horizontal institutional capacity** - degree to which the given policy instrument strategy addresses the cross-medium character of non-point source water pollution problems and the degree to which land use and water quality policies are integrated;

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<sup>47</sup> Canada. Federal Deputy Minister Task Force on Strengthening Policy Capacity. See also Anderson, George "The New Focus on the Policy Capacity of the Federal Government", *Canadian Public Administration*, 39:4, 1996: 469-488.

iii) **stakeholder capacity** - the character of state-society partnerships and the level of involvement of stakeholders in the given policy instrument strategy;

iv) **monitoring and evaluation capacity** - the presence of resources and mechanisms to monitor and evaluate the policy instrument strategy, indicators of how the policy instrument strategy is validated.

Using these dimensions of institutional capacity, a basic evaluation framework of low, medium and high can be used to compare policy instrument strategies (operationalized in Table 2-2). Institutional capacity is not an absolute measure but rather a comparative, relative measure using ordinal rather than interval scales. Low capacity along any of these dimensions indicates no or very little capacity, medium indicates some or indirect capacity and high indicates institutional arrangements that support a well designed and cohesive policy instrument strategy. The operationalization of different capacity levels is outlined in Table 2-2.

**Table 2-2 Operationalization of Institutional Capacity**

<b>INSTITUTIONAL CAPACITY</b>	<b>LOW</b>	<b>MEDIUM</b>	<b>HIGH</b>
Vertical Capacity	- each level of government acts independently in designing and implementing policy instrument strategy - no incentives for cooperation	- some degree of cooperation in design and implementation	- all three levels of government encouraging or participating in design and implementation
Horizontal Capacity	- PIS does not address cross-medium character of NPS water pollution or integrate medium-based institutions	- PIS to some degree attempts to integrate medium-based institutions	- PIS fully integrates land use and water quality institutions
Stakeholder Capacity	- little or no involvement of stakeholders in PIS	- some level of stakeholder involvement in PIS	- high level of stakeholder involvement in PIS
Monitoring and Evaluation Capacity	- no monitoring or evaluation strategy and resources	- some level of monitoring and evaluation goals and resources and basic data collection and reporting on policy outputs	- clearly defined monitoring and evaluation strategy, resources and comprehensive data collection and reporting on outcomes

This set of variables are collectively hypothesized to have an effect on outcomes associated with different policy instrument strategies. These variables are hypothesized to effect instrument selection, design of implementation arrangements, establishment of incentives for participation and effectiveness. The research design is constructed around the hypotheses that high levels of institutional capacity contribute to the selection and design of certain policy instrument strategies and high

levels of institutional capacity will contribute to comparatively higher levels of effectiveness for different policy instrument strategies. Fundamentally, the research will demonstrate that variation in institutional capacity in Canada and the US account for differences in NPS policy instrument selection, design and effectiveness.

In summary, the analysis attempts to assess the degree to which policy instrument strategies that: take the local nature of the pollution problem into consideration (situational variables); create incentives for stakeholder involvement (stakeholder capacity); involve all levels of government (vertical institutional capacity); integrate land use and water quality management approaches (horizontal capacity); and have high levels of monitoring and enforcement capacity will be more effective in addressing NPS water quality problems. In order to explore and evaluate these research questions it is important to outline how effectiveness will be defined and operationalized.

## **OUTCOME VARIABLES**

Finally, *outcome variables* (effectiveness measures) allow for the *comparative analysis* of performance of different policy instrument strategies in different institutional and ecosystem contexts. Generally, effectiveness is exhibited in those policy instrument strategies that allow stakeholders to cooperate to solve NPS water pollution problems. Outcome variables encompass various indicators of performance in managing non-point source water pollution problems. These indicators must be analyzed in the context of the complexity of problems in this area as described in Chapter 1.

It should be highlighted that there are significant limitations on using ecological outcome measures. Environmental policy in most Western democracies, including Canada and the US, has been criticized for its emphasis on “output” measures that document and examine the volume of work completed by an agency.<sup>48</sup> Critics contend that “outcome” measures need to be developed and assessed in order to analyze policy performance.<sup>49</sup> The limitations of developing and evaluating outcomes measures in the environmental policy area is however intimately tied to the scientific dimensions of environmental problems and data collection methods outlined in Chapter 1.

Availability and comparability of ecological data is a significant limiting factor as agencies may collect data on different ecological indicators and water quality parameters or use different data collection methods. Within each jurisdiction and watershed, there are numerous factors and differences in data collection methods and parameters that may have an effect on water quality outcomes. In addition, in any given watershed it is extremely difficult to attribute improvements or degradation to a given policy instrument. Given these very limiting factors in quantifying ecological performance related to any given policy instrument strategy, outcomes and effectiveness are characterized and analyzed using a comparative framework.

This set of variables includes measures of implementation impacts. Although

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<sup>48</sup> Rabe, Barry G. "Federalism and Entrepreneurship: Explaining American and Canadian Innovation in Pollution Prevention and Regulatory Integration", *Policy Studies Journal*, Vol.27, No.2, 1999: 302.

<sup>49</sup> Ibid, Rabe. See also Davies, J.C. and Mazurek J., *Regulating Pollution: Does the US System Work?*, (Washington, DC: Resources for the Future. 1997).

there are numerous indicators of policy and environmental performance, the analysis focuses on comparative effectiveness of policy instrument strategies in terms of policy outputs and where possible ecological improvements in terms of use improvements and supported or perceived aesthetic improvements. Policy instrument strategy outcomes in terms of pre and post instrument water quality improvements will not be included due to the data limitations outlined above. Basic comparable output data is more readily available (resources allocated, participation rates etc.) and will form the foundation of operationalizing effectiveness of different policy instrument strategies. Effectiveness thus has two components: instrument outputs and ecological improvements.

**Instrument Outputs** - measures of program activity including number of participants, compliance levels, documented and perceived effectiveness of the given instrument by policy makers, implementers and stakeholders. Indicators include primarily agency outputs at the watershed level (sub-national and local levels).

**Ecological Improvements** - reported use improvements (improvements in designated human and ecological uses), perceived improvements in aesthetics, use and water quality by stakeholders.

Ecological improvements include reported improvements in designated human uses as well as improvements in uses of the water resource for fish and wildlife. The data collected are primarily qualitative in nature and are primarily reported as perceived improvements in water quality by stakeholders rather than quantitative improvements in water quality parameters.

Both of these dimensions of effectiveness are operationalized comparatively. In other words, effectiveness is not an absolute measure but rather a comparative, relative measure. Although there are limitations in operationalizing effectiveness in

this way, the use of low, medium and high does allow for the comparative assessment of outcomes related to policy instrument strategies in a given case.

**Table 2-3 Operationalization of Policy Instrument Strategy Effectiveness**

	<b>LOW</b>	<b>MEDIUM</b>	<b>HIGH</b>
<b>Policy Outputs</b>	- no or very little documented or perceived positive outputs by policy implementers & stakeholders	- some documented and perceived outputs attributable to the policy instrument strategy	- well documented indicators of outputs attributable to the PIS (participation rates, agency outputs etc.)
<b>Ecological Indicators</b>	- no indicators of improvements in water quality as a result of the policy instrument strategy	- some indirect indicators and evidence that the policy instrument strategy has had positive impacts on water quality	- well documented, qualitative and quantitative evidence of improvements in water quality as a result of the policy instrument strategy

A highly effective policy instrument strategy is one that exhibits improvements in collective action to address NPS water pollution problems. In terms of outcomes, it is expected that policy instrument strategies that take the local, cross-medium nature of the NPS pollution problems into consideration, create incentives for stakeholder involvement, involve institutional integration vertically and horizontally and have a high level of monitoring capacity will be more effective.

Admittedly, it is difficult to attribute outcomes to one given policy instrument strategy since in most watersheds a number of different policy instrument strategies are being implemented simultaneously. This is a significant research challenge. Nonetheless, qualitative information has been collected to determine comparably

how policy makers and implementers perceive different policy instrument strategies and their contribution to ecological improvements. In addition, collection of this information also contributes to an assessment and characterization of institutional monitoring and evaluation capacity.

The concepts and analytical framework outlined above form the foundation on which the research design and methodologies have been built. The concepts and framework clearly articulate the explicit focus on the implementation stage of the policy making process and the hypothesized importance of examining institutional arrangements as determining factors in instrument choice and performance of different policy instrument strategies. The next and final section of this chapter outlines the methods that have been used to collect data on the concepts and different components of the analytical framework.

#### **The Research Method:**

The main objective of the research is to use the analytical framework to describe, examine and comparatively evaluate different policy instrument strategies being used in Canada and the US to address non-point source water pollution problems. The comparative case study approach has been adopted as the preferred research method.

The case study approach allows for an in-depth top-down and bottom-up approach to observing, documenting and analyzing different policy instrument



strategies in action in different jurisdictional contexts.<sup>50</sup> The comparative approach enables the discovery and analysis of patterns across cases and facilitates systematic evaluation of relationships and theories.<sup>51</sup> Although primarily a qualitative research approach, these approaches combined allow for the exploration and description of complex intergovernmental relationships, complex design features of policy instrument strategies and an examination of policy outcomes which together are used to explore theoretical explanations of differences in this policy area in Canada and the US.

In total, six cases have been selected to compare different policy instrument strategies. The six case studies are used to examine what happens in practice when policy instrument strategies are implemented. This involves an exploration of the choice of instrument (ranging from regulatory instruments to voluntary community-based instruments), the character and design features of different policy instrument strategies and the performance of a given policy instrument strategy in a given jurisdiction. The geographical unit of analysis suited to characterize and compare policy instrument strategies (problem definition, instrument choice, implementation and intergovernmental institutional arrangements) is the watershed.

As defined in Chapter 1, a watershed is the total geographic area from which a system of streams and creeks receive waters which empty into a receiving body. Creeks and streams are often the recipients of non-point source water pollution in

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<sup>50</sup> For more on the value of this approach see Mazmanian, Daniel A. and Paul A. Sabatier *Effective Policy Implementation* (Lexington, KY: Lexington Books, 1981) and Sabatier, Paul A. "Top-Down and Bottom-Up Approaches to Implementation Research: A Critical Analysis and Suggested Synthesis", *Journal of Public Policy*, 6:1, 1986: 21-48.

<sup>51</sup> Collier, D. "The Comparative Method" in A. Finifter ed. *Political Science: The State of the Discipline II* (Washington: American Political Science Association, 1993), 105-119.

upstream portions of larger watersheds and thus provide a suitable and manageable scale of analysis. The scope of the research focuses on river, creek and stream ecosystems in the broader Great Lakes basin where different policy instrument strategies have been implemented to address non-point source water pollution.

The Great Lakes Basin was selected as the geographic focus of the research. Three cases are in Ontario and one case has been selected from New York, Michigan and Wisconsin.<sup>52</sup> All cases focus on a watershed scale of analysis allowing for an intergovernmental examination of a given policy instrument strategy in action.

Cases selected include watersheds with rural and urban features and with both public and privately owned lands in proximity to water basins. One case was selected in each country to compare a similar type of policy instrument strategy. Each case was selected based on similarity of pollution problems and water pollution sources and similarity of instrument selected to address non-point source pollution (directly or indirectly). The selection of cases is therefore not random. As Ostrom has outlined:

“Biologists face the problem of studying complex processes that are poorly understood. Their scientific strategy involves identifying for empirical observation the simplest possible organism in which a process occurs. The organism is not chosen because it is representative of all organisms. Rather, the organism is chosen because particular processes can be studied more effectively using this organism rather than another”.<sup>53</sup>

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<sup>52</sup> Preliminary research indicated that these states had experience with the different policy instruments used to address NPS water pollution and that these states were generally viewed as “pace-setters” in environmental policy. See Lowry, William R. *The Dimensions of Federalism: State Governments and Pollution Control Policies*, (Durham NC: Duke University Press, 1992) and Rabe, B.G. “Federalism and Entrepreneurship: Explaining American and Canadian Innovation in Pollution Prevention and Regulatory Integration”, *Policy Studies Review*, Vol.27, No.2, 1999:291.

<sup>53</sup> Ostrom, E. *Governing the Commons: The Evolution of Institutions for Collective Action*, (New York: Cambridge University Press, 1990), 26.

Recognizing the limitations of a case study and watershed approach in terms of generalizations, this bottom up analysis of policy instrument strategies will be complemented by a more traditional historical institutional top-down approach to analyze the intergovernmental character of policy and institutional arrangements in this policy area. Although the case approach in a limited number of watersheds limits the ability to generalize from one watershed to the next, the approach does allow for in-depth analysis of different policy instrument strategies in different institutional contexts. This allows for both exploratory, descriptive analysis of policy instrument strategies and an examination of detailed institutional similarities and differences in comparative context.

The cases have been selected to study the institutional arrangements and instruments involved in addressing NPS water pollution problems. Each case is a watershed facing NPS pollution problems and the challenge of overcoming barriers to collective action. From an examination of these cases the study attempts to identify the underlying design principles and conditions of successful NPS water pollution management and compare similarities and difference in policy instrument strategies across countries with similar macro-level institutional federal arrangements but different intergovernmental implementation arrangements.

This approach allows for an examination of the basic hypothesis that effective policy instrument strategies are those that allow individuals in a given watershed to cooperate to solve NPS pollution problems. The institutional context in general, and institutional capacity in particular, can be examined using this approach to assess the

conditions under which participation and cooperation occurs to solve collective action problems. In other words, which policy instrument strategies are supported by institutional capacity which provides incentives and opportunities to solve NPS water pollution problems?

The cases in Table 2-4 have been selected to compare and contrast institutional arrangements, policy approaches and instruments used in Canada and the US at the sub-national level to address non-point source water pollution. The six cases allow for a comparison of policy instrument strategies, why the instruments were selected and how the instruments have been designed, developed and implemented in Canada and the US at the operational level. Comparing policy instrument strategies in both countries allows for the examination of variance in problem definition, institutional arrangements, policy instrument strategies and outcomes. The selected instruments range from traditional regulatory instruments to voluntary community-based stewardship programs.

**Table 2-4 Selected Cases**

<b>Policy Instrument Strategy</b>	<b>CANADA</b>	<b>US</b>
Land-Use Regulation (Sticks)	Halton Region, Ontario & the Sixteen Mile Creek Watershed	Kent County, Michigan and the Bear Creek Watershed
Subsidy-based, Best Management Practices (Carrots)	Peel Region, Ontario & the Caledon Creek Watershed	Jackson and Ozaukee Counties, Wisconsin & the Cedar Creek Watershed
Tax Incentives (Carrots/Sermons)	Waterloo Region, Ontario & the Grand River Watershed	Erie County, New York & the Eighteen Mile Creek Watershed

Many countries have used similar instruments to address NPS pollution problems.<sup>54</sup> The most common instruments used to address NPS water pollution problems are "carrots" in the form of subsidies. These instruments are designed to subsidize the implementation of "best management practices" (BMPs). Best-management practices attempt to reduce the likelihood of pollutants entering surface or groundwater by managing adjacent lands with ecologically sensitive practices such as protection of streambanks, proper manure and chemical storage and encouraging alternative agricultural production methods. Public funding of BMP cost-sharing programs generally covers management improvements of waterway buffers, nutrient and pesticide management, streambank and grade stabilization to prevent erosion, well upgrades, manure storage facility relocations, livestock fencing, urban stormwater runoff upgrades, filtration units, detention and retention basins, and other water protection engineering measures of a temporary and permanent nature. The prohibitive costs of these measures to landowners have led to state action in the form of incentives.

Other instruments used to management NPS water pollution are less direct and attempt to achieve water quality objectives through land use management rules and voluntary incentives that encourage private protection, stewardship and management of land and water resources. These types of instruments typically attempt to internalize environmental externalities by utilizing the existing legal system or by better defining and enforcing property rights.

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<sup>54</sup> Eckerberg, K. "Comparing the Local Use of Environmental Policy Instruments in Nordic and Baltic Countries: The Issue of Diffuse Water Pollution" in *Environmental Politics*, Vol.6, No.2, Summer 1997:24-47. See also OECD, *Water Management: Performance and Challenges in OECD Countries*, 1998.

Many instruments and combinations of instruments have been used to address NPS water pollution in different jurisdictions. Using the basic instruments framework, the most common instruments in this policy area are subsidy-based, cost-shared programs based on Best Management Practices (carrots), land use regulation (sticks) and voluntary private stewardship backed by tax incentives (carrots/sermons). Each of these policy instrument strategies is analyzed in comparative context.

The unit of analysis in each case is a policy instrument strategy being implemented in a watershed. The watersheds selected allow for the analysis of one policy instrument strategy while recognizing and highlighting that other policies and programs are being implemented in the same watershed to address water pollution problems.

### **The Major Research Stages**

The research is divided into two main stages. The first stage of the research involves a historical, institutional analysis of non-point source water pollution management in Canada and the US in the broader context of macro-level institutional arrangements and policy instruments used to address water pollution management problems generally. This analysis is the basis of Chapter 3 and revisited in Chapter 10.

In many respects, Chapter 3 is a top-down, traditional historical-institutional analysis of rules in use to manage NPS water pollution in Canada and the US. Chapter 3 outlines how different levels of rules have evolved in these two different countries at the constitutional, national, intergovernmental and sub-national levels.

This institutional comparison is critical to outline prior to an analysis and evaluation of different policy instrument strategies being used in each country at the operational level to address NPS water pollution problems. Chapter 3 concludes with an analysis and summary of institutional variance in this policy area by country. The more macro-level institutional analysis presented in Chapter 3 also assists in assessing institutional capacity as an important variable in determining policy instrument strategy choice, design and ultimately effectiveness in this policy area in Canada and the US. This chapter also forms an important foundation for examining and comparing in more detail the three policy instrument strategies in stage two.

Stage two involves an exploration and description of the policy problem and the policy instrument strategy at the watershed level. This stage of data collection involved the collection of site specific data on the features and functions of the given ecosystem and includes a review of pertinent legislation, existing institutions and implementation rules pertaining to the watershed under study. Elite interviews with policy implementers and stakeholders (see Appendix 2-1 for a list of interviewees) were used to collect information based on the analytical framework. The following information was collected for each case from secondary sources, government documents and interviews with key policy informants (see Appendix 2-2 for sample interview questions):

- i) data on primary pollution problems, sources, land use and policy objectives to determine how the policy problem has been defined and by whom;
- ii) information on origins, evolution and parameters of instrument choice; design features of the policy instrument strategy;

- iii) data from secondary and interview sources that identifies policy stakeholders, implementers and the character of their relationships; perceptions of policy implementation; and perceived levels of cooperation;
- iv) data from documented sources and key policy informants on outcomes related to the policy instrument strategy; including indicators and perceptions of effectiveness, successes and failures.

In each case, the given policy instrument strategy is examined in the context of higher level rules to best characterize the design features of the instrument in the intergovernmental context. For example, the local and operational rules are examined as embedded in the broader context of institutional rules at the provincial, state, national and constitutional levels. The intergovernmental character of the instrument design principles and instrument implementation strategy are examined in each case using a bottom up and top down approach. In each of the cases, the situational variables are described and the design features of the policy instrument strategy are outlined in an intergovernmental context in order to characterize the dimensions of institutional capacity and reported outcomes that form the basis of the comparative analysis of each policy instrument strategy in Chapter 10.

Chapters 4 through 9 are divided into three sections. Each section includes the analysis of one policy instrument strategy in a watershed in each country. This approach allows for a more bottom-up analysis of instrument design features and instrument strategies being used at the operational level. Using the analytical framework above, similar variables are examined in each case. These empirical chapters will demonstrate the significance of the situational and institutional variables in policy instrument strategy choice, design and effectiveness. The in-depth, detailed case analysis in the empirical chapters is also necessary to assess and



compare the four dimensions of institutional capacity and comparative effectiveness. The findings from these three major sections are then analyzed comparatively in Chapter 10.

Chapter 10 compares the policy instrument strategies examined in all six cases. This chapter evaluates the case findings in the context of the analytical framework and research questions. Chapter 11 re-aggregates the analysis of policy instrument strategies and compares empirical findings on a more macro level. The chapter also analyzes the findings in the broader context of comparative public policy findings and the general theoretical assumptions that form the foundation of the research. The concluding chapter also analyzes why the policy instrument strategies are similar or different in these two countries and assesses the degree to which institutional capacity is a determinant of choice and performance of different policy instrument strategies in Canada and the US.

## Appendix 2-1

### LIST OF ORGANIZATIONS CONTACTED & INTERVIEWEES

#### United States

Non-Point Source Regional Coordinator, Region 5, US Environmental Protection Agency

NPS Regional Manager and Water Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality

Cannon Township Clerk/Watershed Administrator, Cannon Township Michigan.

Bear Creek Project Manager, Grand Valley State University, Water Resources Institute

Director, Runoff Management Section, Watershed Bureau, Wisconsin Department of Natural Resources

Senior Water Resources Specialist, Runoff Management Section, Watershed Bureau, Wisconsin Department of Natural Resources

Non-Point Source Implementation Coordinator, Runoff Management Section, Watershed Bureau, Wisconsin Department of Natural Resources

Non-Point Source Education Coordinator, Bureau of Watershed Management, Wisconsin Department of Natural Resources

Director, Land Conservation Department, Ozaukee County, Wisconsin

Soil Conservationist, Land Conservation Department, Ozaukee County, Wisconsin

Director, Bureau of Watershed Management, New York Department of Environmental Conservation

Non-point Source Program Coordinator, Bureau of Watershed Management, New York Department of Environmental Conservation

Director, New York Land Trust Alliance

Watershed Project Coordinator, Western New York Land Trust

## **Canada**

Water Policy Analyst, National Water Issues Branch, Environment Canada

Assistant Director, Urban and Rural Programs Section, Water Policy Branch, Ontario Ministry of Environment

Non-Point Source Pollution Specialist, Water Quality Section, Water Management Branch, British Columbia Ministry of Environment, Lands and Parks

Environmental Inspector, Regional Municipality of Halton

Water Quality Specialist, Halton Region Conservation Authority

Staff Liaison, Ecological and Environmental Advisory Committee, Planning Department, Regional Municipality of Halton

Program Advisor & EFP Program Manager, Ontario Soil and Crop Improvement Association

Manager, Resources Management Branch, Ontario Ministry of Agriculture and Rural Affairs

Chairman, Environment Committee, Ontario Federation of Agriculture

Farm Policy Researcher, Ontario Federation of Agriculture

Environmental Farm Plan Representative/Coordinator, Peel Region, Ontario

Water Quality Specialist, Credit Valley Conservation Authority

Conservation Lawyer & Vice Chair of the Ontario Nature Trust Alliance

Program Implementor, Conservation Strategies Division, Environmental Conservation Branch, Ontario Region, Environment Canada

Biologist and Program Advisor, Lands and Natural Heritage Branch, Ontario Ministry of Natural Resources

Senior Policy Analyst, Land Use Policy Branch, Ontario Ministry of Environment

Manager of Property & Business Development and Project Coordinator, Rural Water Quality Program, Grand River Conservation Authority

Director, Lower Grand River Land Trust

Appendix 2-2  
Sample Research Interview Questions

**BACKGROUND** - Introductions & General Overview of the Research Project

1. Background and Organizational Questions:

- a) What is your full title?
- a) What are your primary roles and responsibilities in the organization?
- b) Do you have an organization chart indicating the structure of the organization?
- c) How long have you been with the organization?
- d) What resources are allocated to your unit (staffing, budget, etc.)?

**POLICY CONTEXT/LEGISLATIVE HISTORY**

2. Can you provide me with some historical context on the mandate and role of your organization in the management of non-point source water pollution?
3. Can you characterize the historical and current approach to NPS water pollution management in your province/state?
4. In terms of your province/state's environmental priorities (related to other environmental problems/priorities) how important is NPS pollution management?
5. What are the key pieces of legislation or policies that have facilitated or inhibited your ability to address non-point source water pollution problems?
6. Where do the resources to implement policies and programs related to NPS water pollution come from (federal, provincial/state, local, other)?

**POLICY APPROACH/INSTRUMENT CHOICE & DESIGN**

7. How would you characterize the current problem solving approach to NPS water pollution management in your state/province/county/region/municipality?
8. What are the key policy approaches or instruments being used to address NPS water pollution problems in your jurisdiction? Describe their characteristics and features.
9. In developing management strategies to address NPS water pollution problems, are there other jurisdictions you have looked to for approaches, models, programs?
10. How important are property right issues in the management of NPS water pollution problems in your jurisdiction? Is a watershed approach used?

## **POLICY ACTORS**

11. Who defines NPS water pollution problems and determines priorities in your state/province/county/region/municipality?
12. Who, in your opinion, are the *key policy developers* involved in the development of NPS water pollution policies and programs?
13. Who are the *key policy implementers* of NPS water pollution policies and programs in your province/state?

## **INTERGOVERNMENTAL/STAKEHOLDER RELATIONS**

14. Are there other government organizations (legislative, bureaucratic) that are involved in NPS water pollution policy & management? If so, how are they involved?
15. Which agencies/organizations (federal, state, local and non-governmental) do you *regularly* interact with?
16. Are there organizations or other units in your organization you feel you should be working with to address NPS water pollution problems?
17. Who are the other stakeholders in NPS water pollution management?
18. How important are partnerships with other governments and non-governmental organizations in this policy area? Has there been an increase or decrease in the reliance on partnerships in this policy area? Why?
19. In general, would you characterize policy development / implementation as centralized or decentralized?

## **POLICY PROGRESS & OUTCOMES**

20. Would you argue that there has been progress or lack of progress in addressing NPS water pollution problems in your jurisdiction? Why?
21. How is your agency measuring progress?
22. Does your agency currently monitoring water quality in river and creek ecosystems? *If so*, which parameters are measured? Who does the monitoring? How often? Are any reports available? *If not*, why not?
23. Is there any data available on an aggregate level or watershed-level regarding progress (participation levels, agency outputs, use/aesthetic improvements, water quality data)?
24. Are there others in your organization, or partner organizations, I should contact for further information in NPS water pollution management efforts in your jurisdiction?
25. Are there any reports or publications I should collect or consult for further information on NPS water pollution management?

## **Chapter Three**

### **Institutional Arrangements & Policy Instrument Strategies Designed to Address Non-Point Source Water Pollution in Canada and the US**

#### **Introduction**

Policy instruments, implementation strategies and outcomes cannot be fully understood or evaluated without a contextual understanding of the institutional arrangements in which they are nested. In this chapter, the legislative context and institutional arrangements used to address water quality management generally, and non-point source water pollution in particular, at the national and sub-national levels in Canada and the US is reviewed. The chapter highlights key articles of legislation, policy, and program initiatives in the area of non-point source water pollution management. The chapter outlines the significance of institutional arrangements for policy instrument strategy choice and design in each country. It will also form the foundation of the institutional analysis at the operational level in Chapters 4 through

9 and contribute to the comparative analysis of institutional capacity in Chapter 10.

Since rules for water quality management are organized intergovernmentally and have evolved over time, a traditional historical-institutional approach will be used to highlight the key institutional arrangements that frame water pollution management policy at the national and sub-national levels in Canada and the US. In both countries, institutional arrangements consist of formal and informal rules-in-use to manage water resources. The focus of this chapter will be on the formal rules and institutions that stem from common law traditions and property rights in both countries. Although constitutional decisions and statutes override common law, in many cases the roots of institutional arrangements and indeed instrument choice can be traced back to common law traditions in both states. For this reason, the analysis begins with the fundamental common law traditions related to water and property rights.

### **Institutional Arrangements for Water Pollution Management in the US**

Two basic common law institutions have evolved in the US regarding water as a property right. Seventeen western states, on one hand, establish water property rights by an appropriative system of "beneficial use". Because water is relatively scarce, priority on water rights is ranked by time of first usage. Eastern states in the US utilize a riparian "on the banks of" system whereby rights to water are established by contiguity to bodies of water. For example, those property owners who own land touching water resources are granted certain legal rights under common law. In other

words, rights to water use and quality were granted to property owners who owned land touching and adjoining watercourses. The landowner had the legal right to determine water uses subject to reasonable use limitations which were determined and defined by the court system and private litigation. These rules are operational unless trumped by constitutional and statute law. It is in this legal context that authority and institutional arrangements have evolved in the US to manage water resources and water quality.

Not unlike other federal systems of government, institutional arrangements in the US share similar asymmetries that have evolved over time under constitutional and statute law. To fully understand the rules governing water quality in the US, it is therefore important to analyze policy in its complex intergovernmental setting.

### **The Federal Role in Non-point Source Water Pollution Management**

The US federal government derives its constitutional authority to make environmental policy from three primary sources. Article IV, Section 3 of the US Constitution (1788) empowers Congress to make “all needful rules and regulations respecting the Territory or other Property belonging to the United States”. The federal government thereby exercises plenary over the resources of public lands. Secondly, the US Supreme Court has interpreted Congress’ power to “regulate commerce among the states” very broadly. Nearly all of the long series of federal environmental enactments that have appeared since the 1960s, including the Clean



Water Act, have been exercised by Congress under its commerce power.<sup>1</sup> The third constitutional power Congress has relied on is its constitutional power to raise taxes, borrow money and spend (Article I, Section 8) to recruit the states into voluntarily administering federal environmental programs and following federal guidelines.<sup>2</sup>

Drawing on these constitutional basis of authority, the earliest piece of federal legislation related to water quality was the Refuse Act in 1899 prohibiting the dumping of debris in navigable waters. In particular, this statute prohibited industrial discharge into waters without a permit from the U.S. Army Corps of Engineers.<sup>3</sup> This piece of legislation succeeded the common law of navigable servitude and was designed to prevent impediments to navigation, not to control pollution.

Until 1948, legal authority to control water pollution belonged almost exclusively to the states and localities. In 1948 the first major piece of federal water pollution control legislation was passed - the Water Pollution Control Act (WPCA). This piece of legislation was primarily enacted to provide states and localities with funds for sewage treatment plant construction. As a result, by 1948 all states had an administrative agency responsible for water pollution control, although the powers of these agencies varied widely.<sup>4</sup>

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<sup>1</sup> Holland, K.M. et.al. *Federalism and the Environment: Environmental Policy Making in Australia, Canada and the US*, (Westport, CN: Greenwood Press, 1996), 3.

<sup>2</sup> Ibid.

<sup>3</sup> Lowry, William R. *The Dimensions of Federalism: State Governments and Pollution Control Policies*, (Duke University Press, 1992), 57.

<sup>4</sup> Davies, J. Clarence *The Politics of Pollution*, (New York: Pegasus, 1970).

It was not until 1956 that the WPCA was amended to include federal enforcement authority to interstate waters, which were defined as waters which flowed across or form part of the boundaries between two or more states . This legislative amendment made provisions for grants for sewage treatment plant construction for states and localities. In 1961, another amendment extended federal pollution control authority to navigable waters and increased the funding available for sewage treatment plant (STP) construction. State and local officials, enticed by federal dollars, gradually became more receptive to a federal presence in water pollution policy. Jurisdiction gradually passed from the locale to the state level as it became apparent that localities were unable to manage pollution problems and as environmental problems were redefined from public health problems to broader socio-ecological problems. The shift in authority was also a function of the fact that in many instances the resources required to address water pollution problems were beyond the capacity of local governments.

The funds for water pollution control for construction of sewage facilities from the 1950s through the 1970s increased the federal presence in local water resource management and pollution control. This paralleled a variety of forces that prompted increased reliance on states and local governments as regulatory agents in carrying out federal programs.<sup>5</sup> Up until this point, the federal agency responsible for administering the WPCA was the Public Health Service. In 1965 the Water

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<sup>5</sup> Advisory Commission on Intergovernmental Relations, *Protecting the Environment, Politics, Pollution and Federal Policy*, (Washington, DC: ACIR, 1981).

Quality Act initiated the federal government's role in standard setting and established a new Federal Water Pollution Control Agency under the auspices of the Department of Health, Education and Welfare (HEW). State authorities guarded their prerogative of controlling water resources and wanted to continue their pivotal role in determining what their standards would be and how they would be enforced. The Water Quality Act however did give the federal government participation in the development and enforcement of stream standards.<sup>6</sup>

Since the National Environmental Protection Act (NEPA) was legislated in 1970 the federal government has also been involved in environmental assessment. This piece of legislation had a broad impact on administrative processes across the federal government since all agencies were required under the legislation to identify and assess any programs or projects that may significantly impact on the environment. This provision also had the impact of making environmental research and technical support a significant function of the emerging environmental bureaucracy.<sup>7</sup>

Interstate or Regional Basin Commissions have also been used in the US to manage river and stream basins that flow through more than one state. These commissions generally have comprehensive powers for the development of measures

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<sup>6</sup> Nemerow, Nelson L. *Stream, Lake, Estuary and Ocean Pollution*, 2nd Edition, (New York: Van Nostrand Reinhold, 1991), 317.

<sup>7</sup> Rosenbaum, Walter A. "The Bureaucracy and Environmental Policy" in James Lester ed. *Environmental Politics and Policy: Theories and Evidence*, (Durham, NC: Duke University Press, 1989), 213.

affecting the quality and quantity of surface and ground water. Although these commissions have had some success in generating interstate and municipal abatement, there is some criticism that these commissions are too large to solve smaller, more complicated local water quality problems that plague rivers and streams.<sup>8</sup>

In 1971, the Federal Water Pollution Control Agency of HEW was replaced with a new federal department - the Environmental Protection Agency (EPA). Through five regional offices, the EPA attempted to maintain strong regional support at the federal level and work with the states through cooperative enforcement programs. The establishment of the EPA further strengthened the research and technical policy function of the federal government in the environmental policy area. Legislative reform in the early 1970s further defined the federal government's role in water quality management.

The Senate Bill known as the Muskie Bill in 1972 amended the WPCA and greatly diminished state control over water pollution management. It relied almost entirely upon effluent standards established by the EPA rather than by state agencies. States were to implement, but not modify, federally set standards and limits using "best practicable technology" by 1977 and "best available technology" by 1983.<sup>9</sup> The legislation was based on defining water quality in context of what use a

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<sup>8</sup> Nemerow, Nelson L. *Stream, Lake, Estuary and Ocean Pollution*, 2nd Edition, (New York: Van Nostrand Reinhold, 1991), 318.

<sup>9</sup> Lowry, William R. *The Dimensions of Federalism: State Governments and Pollution Control Policies* (Durham, NC: Duke University Press, 1992), 58.

particular body of water is intended to serve - designated uses.

The backbone of the 1972 Clean Water Act (CWA) was the National Pollutant Discharge Elimination System (NPDES) program, a permitting program that targeted point source polluters. Under this program, state and federal regulators provide permits to all industrial and municipal facilities that discharged into public waterways. Setting and enforcing NPDES permits became the cornerstone of the national water quality effort. Implementation of the NPDES system in most states was designed to be administered by a designated lead agency. Thirty- nine states administer their own NPDES programs while EPA has the lead implementation responsibility in the remainder.<sup>10</sup>

In addition to the permitting framework established to target point sources of water pollution, there was a section of the federal legislation that did contain provisions to develop NPS controls related to wastewater management plans. Although Section 208 of the 1972 legislation did contain provisions to address NPS pollution through the development of wastewater management plans called "208 Plans", few program initiatives incorporated measures to address non-point source pollution.<sup>11</sup>

In 1977, the Rural Clean Water Program under the Clean Water Act could have had a significant impact on federal involvement in non-point source pollution

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<sup>10</sup> US. Environmental Protection Agency, *EPA Progress Report*, 1995.

<sup>11</sup> Baldwin, John H. *Environmental Planning and Management* (London: Westview Press, 1985),171.

management. This program was based on 3 to 10 year volunteer contracts with farmers whereby the government would provide technical assistance and cost sharing to install "best management practices". Some 21 projects were selected but low amounts of funding are said to have significantly weakened the policy effort.<sup>12</sup>

In 1980, the Comprehensive Environmental Response, Compensation and Liability Act earmarked a "superfund" of \$1.6 billion to help finance site remediation efforts and encourage the cleanup of priority US watersheds. Again, the emphasis was on grants to remediate site specific pollution problems primarily caused by point sources.

Over time, several amendments to the WPCA gradually increased the federal government's "high vertical involvement" in water pollution management.<sup>13</sup> Federal government funding for environmental problem solving has been a key strategy to its involvement in this policy area. However, in contrast to point-source water quality management, federal involvement in non-point source pollution control during this period has been characterized as "so low that states acted rather autonomously".<sup>14</sup> Although the policy objective of improving municipal sewage treatment facilities very much remained a priority of federal policy, in the mid 1980s there was increasing evidence that point source pollution management was only part

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<sup>12</sup> Lowry, William R. *The Dimensions of Federalism: State Governments and Pollution Control Policies*, (Durham, NC: Duke University Press, 1992), 100.

<sup>13</sup> Ibid. Lowry, 1992: 58.

<sup>14</sup> Ibid. p. 89

of the policy problem.

With the election of Ronald Reagan in 1984 there was an attempt to retreat from federal involvement in water pollution control. However, the EPA began to be confronted with NPS water pollution problems and the reality that these diffuse sources of water pollution required different approaches. By the mid-1980s, non-point source pollution accounted for nearly two-thirds of the pollutants reaching American waterways<sup>15</sup> and it was clear that point source permitting regimes were not meeting water quality objectives.<sup>16</sup>

Although between 1979 and 1988 federal grants to the states for water pollution management fell by 68%<sup>17</sup>, there was momentum in Congress to strengthen the federal government's leadership role. In 1987 Congress amended the Clean Water Act nearly unanimously over the veto of President Reagan. This legislative amendment reinforced the federal presence in water quality management and reconfirmed the role of state and local agencies as implementation agents. The amendments continued the shift of responsibility for the construction, operation and maintenance of water treatment facilities and NPDES permitting to states and municipalities. One of the major changes under this legislation was the transition

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<sup>15</sup> U.S. Environmental Protection Agency, *Progress Report*, 1995. Based on 370,000 stream miles not meeting designated uses in the US, collected in 1986 for Biennial Report to Congress.

<sup>16</sup> Rosenbaum, Walter A. *Environmental Politics and Policy*, 2nd Ed. (Washington: Congressional Quarterly Press, 1991).

<sup>17</sup> Ringquist, Evan J. *Environmental Protection at the State Level: Politics & Progress in Controlling Pollution* (New York: M.E. Sharpe, 1993), 62.

from a grants program to a state revolving loan fund program. Each state uses the fund primarily to make loans for wastewater treatment facilities and upgrades. Some of the authority to determine and administer water quality regulations was returned to the states but the EPA still played an active role in determining water quality standards. One important addition to the CWA was the requirement that state agencies monitor and report water quality progress through biennial reporting.

Section 305 of the CWA/WQA requires each state to report every two years on the status of water quality within their boundaries. The reporting forms the basis of the biennial National Water Quality Inventory report to Congress. States are required to collect data and report water quality conditions based on supporting uses. In each state, water quality for rivers and streams is rated for individual uses such as swimming and fishing and on overall uses for a given watershed. States are also required to identify causes and sources of non-attainment if uses are identified as being impaired.<sup>18</sup> Unfortunately, 305(b) data are not gathered in a consistent manner from one state to the next and only 19 percent of rivers and streams are actually monitored in a given year for water quality.<sup>19</sup> These variations limit the utility of data for identifying trends or making state comparisons.

One of the most important additions as part of the 1987 CWA amendments was Section 319. This section for the first time directly addressed non-point source

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<sup>18</sup> U.S. EPA. <http://www.epa.gov/OWOW/monitoring>

<sup>19</sup> Ribaldo, M.O. *Economics of Water Quality Protection from Non-point Sources: Theory and Practice*, U.S. Department of Agriculture, December 1999:5



water pollution by requiring the states to assess non-point sources in their jurisdiction and develop implementation plans with the assistance of the EPA.<sup>20</sup> The legal definition of a NPS is anything that does not fit the legal definition of a point source which is defined in Sec.502(4) of the CWA as:

“Any discernable, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, container, concentrated animal feeding operation, vessel or other floating craft, from which pollutants are or may be discharged”.

In practice, NPS consist generally of polluted run off that is not regulated under the federal CWA National Pollutant Discharge Elimination System (NPDES) permitting program. Sec. 319 thus had potentially broad applications in water pollution management. This section of the CWA required (1) all states to assess their waters for non-point sources and submit NPS pollution control management plans for approval by EPA and (2) create watershed-based state programs to repair damages and prevent further degradation to water quality.<sup>21</sup>

In addition to legislative reform, Congress recognized the need to establish the federal Non-Point Source Management Program to provide federal leadership and resources to help implement Sec.319 and focus state and local NPS efforts. Under Sec.319(h), states, territories and Indian tribes were eligible to receive grant monies to support a variety of activities including technical assistance, technology transfer,

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<sup>20</sup> Ringquist, Evan J. *Environmental Protection at the State Level: Politics and Progress in Controlling Pollution* (New York: M.E. Sharpe Inc., 1993), 57.

<sup>21</sup> Adler, Robert W. *The Clean Water Act: 20 Years Later*, (Washington: Natural Resources Defence Fund, 1993), 241.

demonstration projects and monitoring initiatives. Federal grants of up to 60% of the costs of state management plans were to be available on the approval of state plans.<sup>22</sup>

Although only \$400 million of the \$18 billion allocated for water pollution programs over four years was designated to the NPS Management Program in 1987 (\$100 million per year), Section 319 under the CWA redefined water pollution problems in the US and prompted states to strategically redefine their policy focus.<sup>23</sup> It was under this legislation that states and local governments were encouraged not only to better define their NPS water pollution problems but to develop institutional arrangements for action. The legislation also resulted in more federal participation in the development and enforcement of stream standards.<sup>24</sup> Although financial assistance and reporting requirements are the most common mechanisms by which the federal government is involved in NPS water pollution management, involvement of the EPA now also comes in many forms: developing national NPS water quality guidelines and best management practices (BMP) criteria, administering grant and cost-sharing arrangements and providing technical assistance to implement state management plans.

In 1990, the Pollution Prevention Act further refined EPA's mandate and role adopting a pollution prevention strategy and approach. Although pollution

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<sup>22</sup> U.S. Environmental Protection Agency. *Non-Point Sources Management Program* (<http://www.epa.gov/OWOW/NPS/index.html>)

<sup>23</sup> Lowry 1992: 101.

<sup>24</sup> Nemerow, Nelson L. *Stream, Lake, Estuary and Ocean Pollution*, 2nd Ed. (New York: Van Nostrand Reinhold, 1991), 317.

prevention was adopted as the preferred approach to environmental protection and gave some impetus to the NPS Program, the momentum of the program was slow in the first few years. By this time, the momentum to shift responsibility to the states was resulting in a state backlash around the issue of “unfunded mandates”. State and local governments were reacting to declining federal contributions to a growing environmental mandate.<sup>25</sup> A report in 1990 by the Federal General Accounting Office (GAO) reviewed the progress of implementing the Sec.319 NPS Program and reported that a lack of resources was a key barrier to effectively managing NPS water pollution and that greater leadership was need from the EPA.<sup>26</sup>

In 1991, the EPA released its pesticides and ground water strategy. This strategy allowed the EPA to redefine its role in water quality management based on the importance of ground water-surface water interactions but the emphasis of the NPS program remained focused on surface waters. Many states had not completed NPS Management Plans and EPA began to take steps to improve the NPS Program. By 1992 (five years after Section 319 was added to the CWA), the setting and enforcement of the NPDES remained the cornerstone of the national water quality effort.

In 1993, the EPA’s Office of Policy, Planning and Evaluation evaluated a

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<sup>25</sup> Harrison, Kathryn. “The Origins of National Standards: Comparing Federal Government Involvement in Environmental Policy in Canada and the US”, Kathryn Harrison and Patrick Fafard ed., *Managing the Environmental Union* (Kingston: Queens Institute for Intergovernmental Relations, 2000).

<sup>26</sup> US, General Accounting Office . *Water Pollution: Greater EPA Leadership Need to Reduce Nonpoint Source Pollution* , 1990: 14-22.

sample of ten state NPS programs and recommended the EPA's Office of Water should more clearly emphasize a watershed approach and clarify the federal role in the NPS program.<sup>27</sup> That same year, the Natural Resources Defence Fund (NRDF) published "The Clean Water Act: 20 Years Later" criticizing NPS efforts as "virtually non-existent poison runoff controls".<sup>28</sup>

Although evaluations of the program after five years of implementation were negative, by 1993, all states had completed their NPS Management Plans and had them approved by EPA for funding. The initial acknowledgment of NPS water pollution as a problem in the 1972 CWA was formally institutionalized through Sec. 319 and the 1987 CWA amendments.

These legislative and institutional reforms reinforced the importance of upstream approaches and the EPA began to formally report that NPS pollution in many locations is the chief remaining water pollution problem, and the biggest obstacle to achieving water quality standards in many of the nation's lakes, streams, and aquifers.<sup>29</sup> In 1996, the EPA more explicitly adopted a watershed approach to focus water pollution management efforts and in 1997 established a federal inter-agency NPS Task Force to improve efforts nationwide.<sup>30</sup> The result was the

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<sup>27</sup> US EPA *State Implementation of Nonpoint Source Program*, Office of Policy, Planning and Evaluation, June 1992.

<sup>28</sup> Adler, Robert W. et.al. *The Clean Water Act: 20 Years Later*, (Washington: Natural Resources Defence Council, 1993).

<sup>29</sup> US. Environmental Protection Agency, *EPA Progress Report*, 1995.

<sup>30</sup> U.S. EPA (<http://www.epa.gov/OWOW/NPS/nsfsnsm/index.html>)

formation of a National Working Group and a revised funding guidance for fiscal year 1997 and future years.

The new funding guidance replaced the existing competitive approach to awarding state grants with an allocation formula to determine the amount awarded to each state with the objective of streamlining the funding process.<sup>31</sup> In addition, states were required to review and, as appropriate, revise their NPS management programs to reflect nine new key elements:

- 1) the state program contains explicit short and long term goals, objectives and strategies to protect surface and ground waters;
- 2) the state strengthens its working partnerships and linkages to appropriate state, interstate, tribal, regional and local entities (including conservation districts), private sector groups, citizen groups and other federal agencies;
- 3) the state uses a balanced approach that emphasizes both state-wide NPS programs and on-the-ground management of individual watersheds;
- 4) the state program (a) abates known water quality impairments from non-point sources and (b) prevents significant threats to water quality from present and future NPS activities;
- 5) the state program identifies watersheds impaired by NPS pollution and establishes a process to progressively address impaired waters by conducting more detailed watershed assessments, developing watershed implementation plans and then implementing the plans;
- 6) the state establishes flexible, targeted and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as possible and the state programs include a mix of regulatory, non-regulatory, financial, and technical assistance as needed to achieve and maintain beneficial uses as expeditiously as practicable;
- 7) the State identifies federal lands and activities which are not managed consistently with State NPS Program objectives and, where appropriate, seeks EPA assistance to help resolve the issues;
- 8) the state manages and implements its NPS program efficiently and effectively, including necessary financial management;

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<sup>31</sup> U.S. EPA, Office of Water. *Non-Point Source Program and Grants Guidance for Fiscal Years 1997 and Future Years*, (<http://www.epa.gov/OWOW/NPS/npsguid1.html>) April, 1998.

- 9) the state periodically reviews and evaluates its NPS management programs using environmental and functional measures of success and revises its assessment and management program at least every five years.<sup>32</sup>

These nine key elements became the criteria by which updated NPS Management Plans would be assessed by EPA.

“A state which incorporates all nine key elements and has a proven track record of implementation of its non-point source programs will be formally recognized as a Non-point Source Enhanced Benefits State and will be afforded substantially reduced oversight and maximum flexibility to implement their State programs to achieve water quality objectives.”<sup>33</sup>

With these efforts to streamline the NPS Program, EPA's role in the NPS Program “will shift away from grants oversight and administration towards technical cooperation and assistance to help states implement well-designed NPS programs”.<sup>34</sup>

The regional structure of the EPA has not changed (see Appendix 3-1a) and each of the 10 regions continues to have a NPS Coordinator. However, the Office of Wetlands, Oceans and Watersheds (see Appendix 3-1b) and the NPS Control Branch in particular, has decentralized many implementation and management functions to state agencies.<sup>35</sup>

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<sup>32</sup> U.S. EPA, Office of Water. *Non-Point Source Program and Grants Guidance for Fiscal Years 1997 and Future Years*, (<http://www.epa.gov/OWOW/NPS/npsguid1.html>), April 1998

<sup>33</sup> Ibid.

<sup>34</sup> Ibid.

<sup>35</sup> Telephone with EPA, NPS Regional Coordinator, Region 5, October 8, 1999. The NPS Control Branch is part of the Assessment and Watershed Protection Division in the EPA's Office of Wetlands, Oceans and Watersheds (<http://www.epa.gov/owow/org.html>), November 1999.

Although there were pressures to improve the efficiency of the program and streamline administration with the state implementation agents, the EPA's staffing levels have been increasing. EPA employed 17,200 employees in 1996 and 18,300 by 1998. In 1997, the agency's total annual budget was \$6.8 billion of which \$2.2 billion was allocated to point source water resource management and \$100 million (or less than 5%) for NPS water quality management.<sup>36</sup>

In addition to the new NPS funding guidance, there were indications as early as 1992 with Al Gore's endorsement of the NRDF book "The Clean Water Act: 20 Years Later" that the Clinton Administration would address water pollution issues as part of its agenda. In February 1998, the Clinton government announced the Clean Water Action Plan (CWAP). The plan states that:

After 25 years of progress, the nation's clean water program is at a crossroads. To fulfil the original goal of the Clean Water Act - fishable and swimmable waters for every American - the nation must chart a new course to address the pollution problems of the next generation".<sup>37</sup>

The CWAP doubled the annual federal funding support for the federal NPS Program from \$100 million to \$200 million annually.<sup>38</sup> The Clean Water Action Plan also allocated \$100. million to assist farm implementation programs related to water

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<sup>36</sup> Davies, Clarence and Jan Mazurek *Pollution Control in the United States: Evaluating the System* (Washington: Resources For the Future, 1998).

<sup>37</sup> US, Environmental Protection Agency and Department of Agriculture, *Clean Water Action Plan: Restoring and Protecting Americas Waters* , February 1998.

<sup>38</sup> U.S. Environmental Protection Agency, *Clean Water Action Plan*, June 1998 (<http://www.epa.gov/OWOW/NPS/fy19992.html>)(<http://www.epa.gov/cleanwater/programs/budget.htm>)

pollution prevention.<sup>39</sup> By the late 1990s, investment and current expenditure of public sector resources on water pollution abatement and control reached 3.9% of Gross Domestic Product (GDP) in the US.<sup>40</sup> Federal policy makers clearly continue to see a role for the federal government in providing resources and technical assistance to state and locally-based watershed implementation approaches.

The eligibility for new federal NPS Program funds was tied into the implementation of the new funding guidance. In order to be eligible for new funds, all states are required to submit updated NPS Management Plans addressing nine new funding criteria outlined by an EPA National Working Group. By December 1999, all but nine states had submitted updated NPS management plans to the EPA for approval, 16 had been fully approved and the remainder were in the process of having their plans reviewed.<sup>41</sup>

Fiscal year 2000 marks the tenth year of the state implementation of the Federal NPS Management Program. With the funding allocation in 2000, the program will pass the \$1 billion mark.<sup>42</sup> In addition to reforming the NPS Management Program, the EPA has been moving towards integrating the point

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<sup>39</sup> U.S. EPA, Office of the Chief Financial Officer (<http://www.epa.gov/ocfo/2000bib.pdf>)

<sup>40</sup> OECD, *Water Management: Performance and Challenges in OECD Countries* (Paris: Organization for Economic Cooperation and Development, 1998), 11.

<sup>41</sup> U.S. EPA, Office of Water, *Status of Updated NPS Management Plans Map* ([http://www.epa.gov.on/OWOW/NPS/npsus.html](http://www.epa.gov/on/OWOW/NPS/npsus.html)), December 1999.

<sup>42</sup> US, EPA, Office of Water, *Supplemental Guidance for the Awarding of Section 319 Non-point Source Grants in FY 2000*. (<http://epa.gov/OWOW/NPS/Section319/fy2000.html>), December 21, 1999.



source and non-point source efforts under Sec 303(d) of the CWA which attempts to address water pollution through a Total Maximum Daily Load (TMDL) Framework. This framework attempts to link Sec. 319 efforts to the NPDES point-source permit system requirements.

A TMDL is the sum of individual wasteload allocations for point sources, load allocations for non-point sources and natural backgrounds and a margin of safety.<sup>43</sup> A TMDL approach forces the accounting of all sources of pollution in a given watershed and assists in the determination of how additional basin reductions, if needed, may be obtained.

TMDL rules represent a dramatic shift in water quality regulation. Today fewer than 10 percent of the nation's most polluted rivers are affected by industrial point sources. The new rules are far more expansive. EPA will require states to identify all waterbodies that are in violation of water quality standards, comprehensively identify all sources and develop concrete plans and timetables for bringing the waterbody into compliance. The approach will target many polluters who were not previously regulated. To implement the TMDL framework, states must begin to collect far more and better data than they do presently about water quality and sources of pollution.<sup>44</sup>

Over 500 TMDL plans have been initiated by state agencies since 1993 and 225 have been and approved by EPA.<sup>45</sup> Again, emphasis is placed on integrating federal funding and regulatory instruments with state and local water quality improvement

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<sup>43</sup> U.S. Environmental Protection Agency, *Guide to Federal Water Quality Programs and Information*, Office of Policy, Planning and Evaluation, 1993.

<sup>44</sup> *New EPA Water Quality Regulations Will Pose Serious Implementation Challenges for States*, Washington: Resources for the Future, News Release, March 2, 2000.

<sup>45</sup> U.S. Environmental Protection Agency, *Total Maximum Daily Loads Plans* (<http://www.epa.gov./OWOW/TMDL/docs.html>)

and watershed restoration efforts. Approvals and reporting requirements still reside with delegated state agencies and EPA regional offices. There are approximately 40,000 TMDL watershed reports to be completed nationally by 2005. Although this program and reporting process is separately administered by EPA, it will have significant impacts on the future directions of point and non-point source water pollution management programs in the US.<sup>46</sup>

During this same time period, other federal departments and agencies have also contributed to NPS water pollution efforts. Since agricultural runoff is a primary source of NPS water pollution in many ecosystems, the U.S. Department of Agriculture (USDA) also administers and funds several programs related to NPS water pollution management such as the Agricultural Conservation Program, the Forestry Incentives Program, the Water Bank Program and in partnership with farm organizations in some jurisdictions the Farm\*A\*Syst program. Similar to the EPA's NPS Management Program, the USDA's programs are based on two principles: voluntarism and localism.<sup>47</sup> The USDA has also recently taken the lead on an interagency Stream Corridor Restoration initiative.<sup>48</sup>

In summary, federal involvement in water pollution management of non-point sources comes in many forms: grants for program administration, program

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<sup>46</sup> Telephone interview with EPA, NPS Regional Coordinator, Region 5, October 8, 1999.

<sup>47</sup> Lowry, 1992: 100

<sup>48</sup> U.S. Department of Agriculture, *Stream Corridor Restoration* ([http://www.usda.gov/stream\\_restoration](http://www.usda.gov/stream_restoration)), 1999.

enforcement, pollution control facilities, technical assistance and research cost sharing. The EPA now has a variety of responsibilities related to non-point source water pollution management including: developing non-point source water quality guidelines and criteria that enable states to set water quality standards; administering grant programs to encourage best land use and management practices; and supporting cost-sharing arrangements to implement state non-point source management plans. Financial aid and reporting requirements are the most common mechanisms by which the federal government is involved in non-point source water pollution management. From the outset, Sec.319 also explicitly emphasized a partnership approach to the Non-Point Source Pollution Program. Intergovernmental cooperation with sub-national agencies has been central to water quality management in the US federal system. An examination of NPS institutional arrangements at the state level is essential to understand how federal and state policies have been implemented.

### **Sub-National Water Quality Management in the US**

The intergovernmental nature of environmental policy making in the US has been characterized as "conjoint federalism" - whereby state and federal authority blend and apply concurrently to the objects of regulation.<sup>49</sup> National goals drive regulatory programs and federal and state agencies exercise concurrent enforcement authority. This evolution reflects the fact that of the 25 federal environmental laws

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<sup>49</sup> See Welbourn, David M. "Conjoint Federalism and Environmental Regulation in the United States", *Publius*, Vol.18, Winter 1988: 27-43. and Fiorino, Daniel J. *Making Environmental Policy*, (Berkeley CA: University of California Press, 1995), 85.

passed between 1960 and 1980 eighteen asserted federal authority on matters which states previously held exclusive jurisdiction.<sup>50</sup> Recent studies have shown that "conjointness" varies depending on the state in question and the type of environmental policy in question - water vs. air, point vs. non-point source pollution. There is also evidence that not only does federal involvement in pollution control vary by medium (more federal involvement in water pollution than in air pollution), not surprisingly there is a significant difference between federal government involvement in point vs. non-point source pollution and there is considerable variance by state.<sup>51</sup>

Prior to the federal legislation in the 1970s most water-use, land-use and related policies were the domain of state and local governments and governed by common doctrine of reasonable use. Initially, NPS pollution management was largely left up to individual states with little federal involvement. Common law, local governments and in some cases state governments determined the usage and rules surrounding water resource management. Water resource uses and water quality standards varied significantly across jurisdictions. Many jurisdictions primarily focused on the installation, maintenance and operation of primary and secondary sewage treatment facilities and the implementation of the federal NPDES.

As early as 1972, Section 208 of the WPCA mandated state plans for

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<sup>50</sup> Welbourn, David M. "Conjoint Federalism and Environmental Regulation in the United States", *Publius*, Vol.18, Winter 1988: 27-43.

<sup>51</sup> Lowry, William R. *The Dimensions of Federalism: State Governments and Pollution Control Policies*, (Durham NC: Duke University Press, 1992), 100.

wastewater treatment and integrated non-point source pollution control plans. Although the EPA was given the authority to review NPDES control plans and NPS efforts, the agency granted the states extremely wide discretion and limited its involvement to the encouragement of voluntary applications of "best management practices" at the state and local levels. The basic BMP approach initially involved general systematic steps to analyze pollution sources and then states selected the most suitable, cost effective solutions and implemented them locally. However, by 1986, 33 of the 52 states ranked non-point source pollution as their major water pollution problem.<sup>52</sup>

As outlined above, Section 319 of the 1987 CWA established two new requirements related to non-point source pollution management for all US states:

- i) reporting on waters impairs due to non-point sources; and
- ii) development and implementation of state programs for controlling non-point source pollution including methods and a time frame for remedying problems.

In addition to these requirements, Sec. 319 clearly articulates the preference of BMP subsidy-based instruments and implementation arrangements based on partnerships. These policy directives are clearly articulated in the funding guidance.<sup>53</sup> The funding allocations under Sec.319 are directly channelled to state governments who in turn fund local non-point source pollution management initiatives. Although some states

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<sup>52</sup> U.S. Environmental Protection Agency, *EPA Progress Report 1995*: 72.

<sup>53</sup> U.S. Environmental Protection Agency, *Non-Point Source Management Program Funding Guidance*, 1989.

did have legislation and institutional arrangements in place to address NPS water pollution prior to the federal legislation, for many states the federal amendments under Sec.319 were the stimulus for action.

In order to meet the federal legislative requirements outlined in Sec.319 of the CWA and to be eligible to receive federal funding, many states began to undertake a NPS assessment process with several partner agencies in the state. The process was led by a designated lead agency in partnership with EPA officials, USDA officials and local stakeholders. This process involved states taking an inventory and assessing all existing state programs related to NPS water pollution management, identification of all waters not meeting water quality objectives and prioritizing watersheds to address non-point source problems.

On approval of assessment reports, each state was eligible to apply for Sec.319 grants. The approval process was designed to satisfy the requirements stated in an EPA funding guidance as conditions of approval and funding:

- 1) identification of the Best Management Practices (BMPs) required to address each non-point source identified in the assessment;
- 2) identification and description of specific programs needed to implement BMPs;
- 3) identification of the lead agencies involved in implementation;
- 4) a schedule of implementation milestones;
- 5) certification of adequate state authority to implement the programs described;
- 6) description of how funding from federal, state and local sources will be integrated to achieve nonpoint source pollution abatement objectives;
- 7) identification of programs to be reviewed for consistency with Sec. 319;
- 8) demonstrated adequacy of public notice and input.<sup>54</sup>

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<sup>54</sup> Wisconsin, Department of Natural Resources, *Non-point Source Management Report*, 1988: 1.

On approval by the EPA, the state was eligible to receive Sec.319 grants which primarily funded state agency staff to implement the Non-point Source Management Plan. Any local unit of government is eligible to receive funding on application to the state lead agency. Typically, funds for implementation projects are awarded to counties, municipalities, watershed councils, soil conservation districts, resource conservation councils and departments based on watershed and project proposals.

By 1993, all states had complied with Sec. 319 requirements and were implementing NPS cost-shared management programs. Some states continue to rely almost exclusively on federal funding for NPS programs and others have state and local funding sources.<sup>55</sup> As will be outlined in the US cases, in most states subsidy-based instruments based on the implementation of Best Management Practices (BMPs) form the foundation of the federal cost-shared program. However, although grant-based subsidy programs form the foundation of NPS water pollution efforts, the states and local units of government also have other instruments at their disposal and often employ a mix of instruments to address NPS water pollution problems.

In terms of “sticks” used to manage NPS water pollution problems in US states, a recent study examining the laws and enforceable mechanisms for the control of NPS water pollution in all 52 states found that many states do have enforceable

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<sup>55</sup> Telephone interview with EPA, NPS Coordinator, EPA Region 5, October 8, 1999.

mechanisms in their state legislation but that there is great variability across states.<sup>56</sup> A state by state analysis of legislation revealed that enforceable standards were found to be based on a mixture of agriculture laws, forestry laws, nuisance prohibitions, general water pollution discharge prohibitions, fish and game laws, and criminal laws.<sup>57</sup> Many of the enforceable standards in state legislation were found to be based on requirements of proof of a detrimental effect directly traceable to the source in question before enforcement action can be taken. As outlined in Chapter 1, this requirement often makes “sticks” associated with NPS water pollution unenforceable.

The study also found that many of the state efforts are watershed-based or targeted on critical areas or particular impaired waters and that the array of mechanisms varies not only by state but by watershed to watershed and activity by activity.<sup>58</sup> In addition, the study found that state laws often delegate standard setting, implementation and enforcement duties to units of local government of conservation districts.<sup>59</sup> Instruments such as land use regulations in the form of local ordinances are predominantly the responsibility of local units of government.

The use of land use ordinances as “sticks” typically include rules designed to

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<sup>56</sup> U.S. Environmental Law Institute *Enforceable State Mechanisms for the Control of Non-Point Source Water Pollution*, October, 1997

<sup>57</sup> U.S. Environmental Law Institute *Almanac of Enforceable State Laws to Control Non-point Source Water Pollution*, 1998.

<sup>58</sup> U.S. Environmental Law Institute *Enforceable State Mechanisms for the Control of Non-Point Source Water Pollution*, October, 1997.

<sup>59</sup> Ibid.



prevent soil erosion along creek banks, prevent sedimentation, preserve the vegetation along the creeks and ensure adequate setbacks for buildings, structures and septic systems. Ordinances are developed at the town and county levels and are administered by local zoning administrators and planning commissions.

Another important policy instrument that has recently been used to indirectly address non-point source water pollution in the US is that of tax incentives and conservation easements. Conservation easements which legally place restrictions on different types of land use are becoming increasingly popular in protecting water resources. At the local level, a variety of non-profit land trusts or conservancies are increasingly important as implementation agents in the management of conservation easements for the purposes of protecting land and water quality. Although both conservation easements and land trust organizations vary significantly in structure and function, these voluntary tools are considered to be very flexible in achieving environmental objectives.

Finally, in most instances governments at all levels combine rules with information instruments based on land and water stewardship principles. This group of instruments include public education initiatives targeted at landowners in close proximity to watersheds. These instruments are often used in combination with other policy instrument strategies.

## **Institutional Arrangements to Manage NPS Water Pollution Management in Canada**

Environmental problems related to water quality in Canada, as in the US, have primarily been defined in the context of property rights and constitutional rules. Common law or "riparian rights" form the basis of water quality rights. Prior to the 1960's, common law in the Eastern Canadian provinces provided that riparians, those holding land adjacent to or under a stream, lake or harbour have legally enforceable rights to the quality of water they use. The basic principle is that every riparian proprietor is entitled to the water of his stream in its natural flow without sensible alteration to its character or quality.<sup>60</sup> This legal right means that if an individual or owner upstream changes the quality or level of water flowing past his or her land to the detriment of those downstream, he or she may be liable to a suit in civil court.<sup>61</sup>

Since the 1960s, statutory law has evolved from common law predicated on property rights. Thus, property rights frame how water pollution rights and problems have been defined in Canada. Common law has increasingly been supplemented and further defined by statute law under the authority of the Canadian constitution. Water pollution management must therefore be understood in this evolutionary legal context.

Since pollution was not a prominent public policy issue in 1867, it is not

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<sup>60</sup> Canada. Environment Canada. *The Legal Framework for Public Participation in Canadian Water Management*, 1975.

<sup>61</sup> Estrin, David and John Swaigen, *Environment on Trial: A Guide to Ontario Environmental Law and Policy, 3rd Edition* (Toronto: Edmond Montgomery Publications, 1993), 114.

surprising that responsibility for environmental protection was not explicitly allocated to either the federal or provincial legislatures under the British North America (BNA) Act (cited hereafter as the Constitution Act.<sup>62</sup> Section 91 of the Constitution Act gives the federal government legislative authority in a number of areas relevant to water resource management. "Navigation and shipping" powers [Sec.91 {10}] grant parliament broad powers over works and operations that affect navigable waters. "Sea Coast and Inland Fisheries" [Sec.91 {12}] allows the federal government to pass regulations pertaining to fisheries and restrict the pollution of fishing waters. These constitutional powers have subsequently resulted in federal reliance of the federal Fisheries Act (and its amendments) as an important statute and rationale for involvement in water quality management.

Another critical legislative strength of the federal government lies in its criminal law powers and its jurisdiction over works and undertakings connecting a province with one or more provinces or extending beyond the limits of a province [S.91 {29} and S.92 {10c}]. Finally, the residual or general power to pass laws for the "peace, order and good government of Canada" gives the federal government some legislative leeway on issues of national and international concern.

Under Section 92 of the Constitution Act the provinces in effect own all lands, mines and minerals within their geographic boundaries (that have not been sold or are not subject to aboriginal rights). Section 92 also grants provinces the

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<sup>62</sup> Section 1 of the 1982 Constitution Act replaced the reference to the Canadian constitution as the British North America Act, 1867.

authority to manage and dispose of these lands. However, no reference was made in the constitution to the ownership of important natural resources such as water. The property and civil rights clause [S.92{13}] gives the provinces legislative jurisdiction over the property they own and has been used along with provincial control over natural resources [S.92{5}] as a basis of water resource legislation. "Local works and undertakings" [S. 92{10}] and "generally all matters of a merely local or private nature in the province" [S. 92{16}] have also been used to authorize legislation in this policy area. With the patriation of the constitution in 1982, these fundamental divisions of power and bases of legal authority did not change.<sup>63</sup>

Since the 1960s, intergovernmental relations has been an important institutional feature of environmental policy making. "While the federal government is able to deal with some problems that have a national scope, the most-effective problem solving is often accomplished intergovernmental agreement rather than legislative dictates".<sup>64</sup> Over time, a unique set of formal intergovernmental institutions have evolved to manage the intergovernmental character of environmental policy making and implementation in Canada. The Canadian Council of Resource Ministers (CCRM) established in 1964 evolved into the Canadian

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<sup>63</sup> Note that the Constitution Act of 1982 did amend Section 92 and added Sec.92(A) making the provinces jurisdiction over natural resource management more explicit.

<sup>64</sup> Howlett, M, and M Hessing *Canadian Natural Resource and Environmental Policy: Political Economy and Public Policy*, (Vancouver: University of British Columbia Press, 1997); see also David Vanderzwaag and Linda Duncan "Canada and Environmental Protection: Confident Political Faces, Uncertain Legal Hands" in R. Boardman ed. *Canadian Environmental Policy: Ecosystems, Politics & Process* (Toronto: Oxford University Press, 1992), 3-23.

Council of Resource and Environment Ministers (CCREM) in 1971 and in 1988 became the Canadian Council of Ministers of the Environment (CCME). This organization brings Ministers of the Environment from the federal and provincial levels together annually to discuss environmental policy issues. This organization has brought an element of "executive federalism" to this policy area and undoubtedly influenced the impact of federalism on policy directions.

Beyond the formal mechanisms of executive federalism in the environmental policy area, extensive bureaucratic relationships exist at the nonpolitical level over shared jurisdictional issues.<sup>65</sup> CCME is also mirrored by a committee of Deputy Ministers and supported by its own administrative secretariat which has had an impact on defining the implementation arrangements of federal-provincial policy. The organization is led by a steering committee called the Environmental Planning and Protection Committee. The committee consists of federal and provincial public service professionals with expertise in intergovernmental environmental issues. Executive federalism in this area involves extensive bureaucratic relations through the formal activities and initiatives of CCME and also through more informal mechanisms of intergovernmental relations. Intergovernmental agreements between the federal government and one or more provincial governments have been the predominant tool for implementing agreed upon policy goals related to water quality management.

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<sup>65</sup> Sproule-Jones, M. *The Real World of Pollution Control* (Vancouver: Westwater Research Centre, 1981).

### **Institutional Arrangements at the Federal Level**

The 1970 Canada Water Act (CWA) was the first piece of legislation at the federal level to explicitly address water quality. This article of legislation was "enabling" rather than "regulatory" as it articulated the federal government's authority in this policy area, enabled the establishment of institutional arrangements and enabled the federal government to reach agreements with the provinces and industry to address water pollution problems.<sup>66</sup> The CWA explicitly articulated that the approach to water quality management would be based on consultation (Part I - Sec.4) and negotiated agreements with the provinces (Part I, Sec.5-8).

Implicitly, the federal legislation and approach viewed water pollution problems as point source problems. From the outset, the federal government attempted to assert a role in management of point sources by financially supporting the construction and upgrading of sewage treatment plants in municipalities across Canada<sup>67</sup> and by regulating toxic substance releases under Part III of the CWA and the Environmental Contaminants Act. The federal government's role however remained passive in terms of an implementation role, relying on bilateral monitoring and implementation agreements with the provinces. The federal government during

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<sup>66</sup> Doern and Conway 1994: 22.

<sup>67</sup> Canada. Environment Canada. From 1960 to 1980 the federal government provided loans and grants for the construction of main trunk sewers and sewage treatment plants. The program was terminated in 1980 however municipal water and sewer infrastructure can be considered for funding under other federal programs in the areas of economic development and job training. ([http://www.ec.gc.ca/water/en/info/pubs/fedpol/e\\_fedpol](http://www.ec.gc.ca/water/en/info/pubs/fedpol/e_fedpol)), Federal Water Policy, Specific Policy Statement on Provision of Municipal Water and Sewer Infrastructure, 1987

this time exhibited ambivalence “and rejected the notion of national standards altogether” in large part based on opposition to federal unilateralism from four of the most populous provinces on constitutional grounds.<sup>68</sup> This ambivalence and the federal government’s weak implementation capacity was also related to the federal government’s institutional capacity in the area of water quality management under the federal Department of the Environment.

The Government Organization Act and the Department of the Environment Act in 1970-71 set out the authority and responsibility of the DOE and department officials. The department brought together several units of other departments into seven service based divisions including the Water Management Service. The department underwent several “mandate debates” and reorganizations in its formative years.<sup>69</sup> Scientific, technical and operational capacities of DOE were predominantly located in the Inland Waters Directorate. In addition to the separate fisheries management responsibilities granted to the Department of Fisheries and Ocean in 1979, DOE remains the other key federal institution with legislative authority over water resource and water quality management. However, ongoing internal struggles over water resources management plagued the DOE during this time. The DOE lacked a unifying role and mandate which could integrate the Lands Directorate and

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<sup>68</sup> Harrison, Kathryn “The Origins of National Standards: Comparing Federal Government Involvement in Environmental Policy in Canada and the United States” Kathryn Harrison and Patrick Fafard ed. *Managing the Environmental Union* (Kingston: Queen’s Institute for Intergovernmental Relations, 2000).

<sup>69</sup> Doern and Conway 1994: 17

the Wildlife Service.<sup>70</sup> Although in many ways the DOE remained a "house divided", weak statutory capacity has contributed to its weak role in water pollution management.<sup>71</sup> Initially the authority focused on implementation of the Canada Water Act and later the 1987 Federal Water Policy (FWP).

The FWP reconfirmed the federal government's commitment to water quality research and a point source wastewater infrastructure support role. As articulated in the five broad strategies and specific policy statements, the approach to water quality management continued to reflect the recognition of the provinces proprietary rights over land and water resources.<sup>72</sup> In addition to the FWP, the federal government, in collaboration with the provinces through CCME, established Canadian Water Quality Guidelines in 1987. These water quality guidelines are however left up to the provinces to interpret and implement through their own provincial water quality standards.

Until 1988 the CWA, the Fisheries Act and the FWP formed the foundation of the federal government's policy authority in the area of water quality management. The Canadian Environmental Protection Act (CEPA) was passed in 1988 emphasizing pollution prevention, an ecosystem approach and toxic substances management. The CEPA superseded the Clean Air Act, the Environmental

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<sup>70</sup> Ibid. 1994: 32

<sup>71</sup> Ibid. 1994: 36-37.

<sup>72</sup> Canada. Environment Canada. *Federal Water Policy*, 1987 (<http://www.ec.gc.ca/water/en/info/pubs/fedpol>)



Contaminants Act, the Ocean Dumping Control Act and Part III of the Clean Water Act. This legislation reinforced the federal government's focus on toxic substance regulation as central to its water quality mandate. Although important Supreme Court decisions have reinforced the federal government's constitutional authority in the areas of environmental assessment and regulatory enforcement<sup>73</sup>, the constitutional and legislative basis of authority in water quality management remains embedded in the institutional context outlined above.

The emphasis on point source problems and solutions remained unchanged. The federal policy role has primarily been channelled through other ecosystem-based efforts such as remediation of water pollution problems in the 43 Areas of Concern (AOC) on the Great Lakes under the Canada-US Great Lakes Water Quality Agreement (1987). Although many AOCs identified NPS problems in the Stage I documents<sup>74</sup>, NPS implementation efforts under Remedial Action Plans have been very limited as governments on both side of the border have focused on the remediation of in many cases historical, high cost, point source problems.

The \$3 billion federal Green Plan which was implemented from 1990-95 did not result in any significant changes in terms of problem definition or implementation. The plan contained very little in the way of federal incentives to

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<sup>73</sup> See *Crown vs. Zellerbach* 1988, *Crown vs. Hydro Quebec* 1998.

<sup>74</sup> The Remedial Action Plan process requires Areas of Concern to submit a Stage I report outlining the character of the ecosystem problems and the degree of impairment of 14 beneficial uses, a Stage II report outlining the plans for remedial action and a Stage III report documenting the restoration of beneficial uses before the AOC is de-listed.

develop national water quality standards and avoided confrontation with the provinces by focusing on research partnerships.<sup>75</sup> Although some funding was earmarked through Agriculture Canada and the Canada-Ontario Environmental Sustainability Agreement to address farming practices that impacted the environment, no explicit goals were articulated and funded to address non-point sources of water pollution.

Clearly, federal policy has evolved in an institutional context based on how water pollution problems have been defined at the federal level and how institutional arrangements have evolved. Point-source water pollution implicitly remains the focus of federal water quality management efforts under traditional control-based approaches and regulatory frameworks. The policy effort has specifically been designed to manage and implement traditional controls at source and particular emphasis has been placed on regulation of toxic substances. Federal policy to date reflects (1) the federal government's role in research, developing policy, regulations and standards and (2) its low level of involvement in implementation through fiscal federalism and bilateral agreements with the provinces. Although Part II of the CWA contains provisions for the establishment of joint federal-provincial water quality management programs and agencies, this provision has never been used. Bilateral agreements and CCME have filled this institutional role. Environment Canada is currently developing federal freshwater policy but NPS water pollution is not being

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<sup>75</sup> Hoberg G. and K. Harrison "Its Not Easy Being Green: The Politics of Canada's Green Plan ", *Canadian Public Policy*, Vol.20, 1994: 119-137.

discussed as a separate item.<sup>76</sup>

The recent Harmonization Accord developed by CCME and signed by all provinces (except Quebec) in January 1998 represents a new intergovernmental approach to environmental policy making and implementation. Multilateral sub-agreements on specific environmental problems is seemingly supplementing the traditional bi-lateral approach. Its success will therefore largely depend on the willingness of signators to follow through on its implementation.<sup>77</sup> To date, sub-agreements on water quality management have not been negotiated or formalized.<sup>78</sup>

The federal government has not been actively involved in NPS problem definition and implementation beyond Environment Canada's role in some basic research on selected watercourses.<sup>79</sup> The primary federal focus on water and ecosystem research is also reflected in the organizational structure of Environment Canada (see Appendix 3-2). This research support role and lack of provincial reporting requirements make any national data on the level of water quality impairment associated with non-point sources non-existent. The federal role in the area of water pollution management remains weak and in the case on NPS water

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<sup>76</sup> Email correspondence with Water Policy Analyst, Water Policy and Transboundary Issues Section, National Water Issues Branch, Environment Canada, Ottawa, Ontario. April 29, 1999.

<sup>77</sup> Ontario Legislative Library, *Canada-Wide Accord on Environmental Harmonization*, report from the Legislative Research Service, July 1998.

<sup>78</sup> Canadian Council of Environment Ministers (<http://www.mbnet.mb.ca/ccme/harmonization>), October, 1999.

<sup>79</sup> Canada. National Waters Research Institute, Aquatic Ecosystems Protection Branch, Non-Point Source Pollution Project.

pollution is virtually non-existent. There is no indication that this policy position is changing.<sup>80</sup>

The capacity of Environment Canada to play a role in water quality management has also been influenced by the federal government's Program Review exercise beginning in 1994 and recent budget cuts. Program Review resulted in a staff reduction of 1,400 approximately 25 percent of total DOE staff.<sup>81</sup> A press release also indicated that in addition to the elimination of positions, \$234 million would be cut from the department's budget.<sup>82</sup> Since that time, the total budget for Environment Canada has consistently fallen from \$621.3 million in 1996/97 to \$551 million in 1998/99 (\$358 million is allocated to environmental protection if weather reporting is excluded).<sup>83</sup> The lack of federal policy in the area of non-point source water pollution can therefore in part be explained by the limited policy capacity of the DOE and even more so by provincial constitutional authority and implementation dominance in water pollution management - especially related to explicit provincial authority over water resources and lands.

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<sup>80</sup> Environment Canada. *Plans and Priorities 1999/2000*  
(<http://www.ec.gc.ca/rpp/index.htm>)

<sup>81</sup> Savoie, D. *Towards a Different Shade of Green: Program Review and Environment Canada* paper prepared for the Canadian Centre of Management Development, 1997:24.

<sup>82</sup> Canada. Environment Canada. *Program Review Results*, 27 February 1995.

<sup>83</sup> Environment Canada. *1998/99 Estimates, Part III, Report on Plans and Priorities*, 1999.

### **Sub-National Non-Point Source Water Quality Management in Canada**

The evolution of federal policy and institutions related to water quality management and recent policy studies reveal that the basic logic of rules-in-use for water quality management in Canada give pre-eminence to the institutional and operational rules of the provinces. The rules in Canada for water quality management are dominated by provincial regulations within the federal context.<sup>84</sup> Ontario will be used as a case to illustrate the evolution of institutional arrangements at the provincial level to address water quality issues.

Between 1884 and 1956 the primary legislative instrument in Ontario used to address water quality issues was the Public Health Act (primarily focusing on bacterial pollution). In 1956 the Ontario Water Resources Commission was established under the Ontario Water Resources Act (OWRA) to manage water use and water quality in the province. Although the OWRA granted the Minister a broad mandate over surface waters and groundwaters in Ontario, the Commission's most significant activities were in the area of financing municipal sewage system development and upgrading. In 1972 the Ontario Environmental Protection Act (EPA) created the Ministry of the Environment and supplemented the OWRA as the basis of water pollution management efforts. The EPA legislation prohibited the discharge of contaminants to the natural environment, including water except where

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<sup>84</sup> Sproule-Jones, Mark H. *Governments at Work: Canadian Parliamentary Federalism and Its Public Policy Effects* (Toronto: University of Toronto Press, 1993).

specifically permitted by a Certificate of Approval.<sup>85</sup> Implementation remained focused on construction of sewage treatment facilities in partnership with municipalities, point source effluent regulation, prosecution of pollution offences and the establishment of permitting and monitoring regimes. In addition to legislation governing water use and quality, many provinces have water quality objectives and regulatory regimes. In Ontario, since 1986, the Municipal-Industrial Strategy for Abatement (MISA) program is one initiative under the Environmental Protection Act that establishes regulatory effluent standards based on total loadings that must be approved by the Ministry of the Environment for works that discharge directly into watercourses. The principle goal of MISA is to build on provincial water-quality objectives in an attempt to control point source water pollution by establishing total discharge limits (effluent standards) and emphasizing control technologies. The goal is the virtual elimination of persistent toxic substances from effluent which are discharged into Ontario's lakes, rivers and streams.<sup>86</sup> The program places discharge limits on companies in nine industrial sectors (covering 300 industries) in the province rather than on a case by case basis.<sup>87</sup> The regulations were promulgated between 1993 and 1995, effluent limits were in force from 1996-1998 and have been

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<sup>85</sup> Ontario, Ministry of Environment's Legislative Authority (<http://www.ene.gov.on.ca/envision/gp/3303e.pdf>)

<sup>86</sup> Email correspondence from Y. Macabuag, and M. Dales, Ontario Clean Water Agency, February 3, 2000.

<sup>87</sup> Ontario, Ministry of Environment, *Municipal-Industrial Strategy for Abatement*, 1986. The nine sectors include: petroleum; pulp and paper; metal mining; metal casting; industrial minerals; organic chemicals; inorganic chemicals; iron and steel; and electric power generating.

enforceable across the nine sectors since 1998.<sup>88</sup> This program also does not cover the other major contributor of point-source water pollution, water and wastewater treatment facilities in the province.

Water and wastewater treatment facilities operate under permits and Certificates of Approval from the MOE. Some 450 municipal wastewater/sewage treatment plants (WWTP/STPs) are regulated under this permitting regime rather than MISA.<sup>89</sup> This is particularly important since almost one-third of wastewater received by WWTPs is discharged by industry, many pollutants pass through sewage treatment facilities.<sup>90</sup>

The current water management and policies administered by the Ministry of the Environment are based on the Provincial Water Quality Objectives (PWQO). The Canadian Water Quality Guidelines developed by the Council of Ministers of the Environment provide the basic scientific information about different water quality parameters and the provinces use these as a reference point in developing their own water quality management guidelines. The provincial objectives are the basis for establishing acceptable limits for water quality and quantity consistent with the protection of the aquatic ecosystem. The PWQO are numerical and narrative ambient surface water quality criteria which serve as physical and chemical indicators of

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<sup>88</sup> Telephone interview with Senior Industrial Specialist, MISA Program, Water Policy Branch, Ministry of Environment, May 24, 2000.

<sup>89</sup> Ontario. Ministry of Environment, *Municipal-Industrial Strategy for Abatement*, 1986.

<sup>90</sup> Ibid.

minimal acceptable levels for aquatic life and other uses of surface waters.<sup>91</sup> “They are applicable to all waters in the province except in those areas specifically designated, such as areas influenced by MOE approved point source discharges”.<sup>92</sup> These objectives are updated routinely through Ontario’s Water Quality Objective Development Process. The Ministry is also responsible for implementing Ontario Drinking Water Objectives which are based on treated drinking water objectives (the former are ambient surface water quality objectives).

By the late 1980s the Ministry of Environment did recognize that rural sources of water pollution were an important contributor to water pollution in the province. In 1991, the then newly elected New Democratic Party government approved a 10 year \$60 million program called Clean Up Rural Beaches (CURB). The program was designed to subsidize farmers to change farming practices to address the problem of beach closures due to bacterial contamination. Although the program did begin to build organizational capacity to address agro-environmental pollution problems in the government’s main environmental agency in partnership with Conservation Authorities, the program was cancelled with the election of the

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<sup>91</sup> Ontario. Ministry of Environment, *Water Management: Policies: Guidelines and Provincial Water Quality Objectives*, 1994 (revised February 1999) (<http://www.ene.gov.on.ca/envision/gp/3303e.pdf>)

<sup>92</sup> Ibid. In specific instances where groundwater is discharged into surface waters, PWQOs may also be applied to groundwater. Groundwater is assessed using Ontario Drinking Water Objectives.



Conservative Government in 1995.<sup>93</sup>

There is also evidence that during this same time period, MOE officials focused primarily on the technical challenges and implementation of MISA at the expense of other policy approaches and reinforcing a point-source orientation.<sup>94</sup>

Subsequent progress in the area of non-point source water pollution management was also impacted by the funding and staff cuts the Ministry of the Environment has endured in the past five years.<sup>95</sup> The Ministry's operating budget declined from a high in 1989/90 of \$454 million to \$164.8 million in 1999/00. The most significant cuts have been since 1994 bringing the operating budget of the ministry in real 1998 dollars to 1973/74 levels.<sup>96</sup> Staffing levels at MOE have dropped from a high of 2450 in 1990 to 1460 in 1999.<sup>97</sup> Some 350 staff were laid off in May 1996 and an additional 303 in January 1997.<sup>98</sup>

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<sup>93</sup> Montpetit, E. and W. Coleman "Policy Communities and Policy Divergence in Canada: Agro-Environmental Policy Development in Quebec and Ontario", *Canadian Journal of Political Science*, Vol 32:4, 1999: 708.

<sup>94</sup> Rabe, Barry G. "Federalism and Entrepreneurship: Explaining American and Canadian Innovation in Pollution Prevention and Regulatory Integration", *Policy Studies Journal*, Vol 27., No.2, 1999: 295.

<sup>95</sup> Personal interview with Assistant Director, Urban and Rural Programs Section, Water Policy Branch, Ontario Ministry of Environment, August 25, 1999.

<sup>96</sup> Krajnc, Anita "Wither Ontario's Environment? Neo-Conservatism and the Decline of the Environment Ministry", *Canadian Public Policy* March 2000: 111-127. See also Ministry of Environment Business Plan (<http://www.gov.on.ca/MBS/english/press/plans99/env.html#allocations>).

<sup>97</sup> Ibid.

<sup>98</sup> Ibid. Krajnc. See also Ontario Public Sector Employees Union, 1997 *Nothing Left to Cut: A Field Report on the Activities of the Ministry of Environment*, (Toronto: Ontario Public Sector Employees Union 1998).

Within the Ministry of Environment, the current branch responsible for water quality management is the Water Policy Branch. This branch is responsible for developing policy and programs related to water quality and quantity issues in the province. Although the primary role of the unit is to manage point sources of water pollution, the Urban and Rural Programs Section does attempt to address cross-jurisdictional issues in conjunction with other agencies. A five ministry Ontario Water Directors Committee consisting of directors from the Ministries of Environmental, Natural Resources, Agriculture, Food and Rural Affairs, Municipal Affairs and Economic Development and Trade has recently been working on the development of a five year plan to move towards more integrated approaches to water quality and quantity management in the province. This committee reports to an Assistant Deputy Minister Committee which in turn reports to a Deputy Ministerial committee of Resource Management. Although efforts are being made under the new organizational structure to integrate water quality and land use policies (see Appendix 3-1), policy implementation remains medium-based within the Ministry.<sup>99</sup> A recent water pollution tragedy in Walkerton, Ontario illustrates the point-source orientation of the MOE and the capacity issues outlined above.<sup>100</sup>

Another key area that involves the provincial governments in water pollution

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<sup>99</sup> Personal interview with Assistant Director, Urban and Rural Programs Section, Water Policy Branch, Ontario Ministry of Environment, August 25, 1999.

<sup>100</sup> On May 29, 2000 an E-Coli contamination in the water supply of Walkerton, Ontario killed six citizens. At time of writing, Premier Mike Harris had responded to the tragedy by establishing a public inquiry to determine the source of the contamination and examine water pollution management in the province.

management has been indirectly through the environmental assessment process. The Ontario Environmental Assessment Act of 1976 originally only applied to undertakings of the Ontario government and its agencies. In 1977 this application was broadened to specifically include undertakings of Conservation Authorities and again in 1980 to municipalities. In 1987 the application of the Act was extended to include private or public waste management facilities including land filling, incineration, processing, transfer of waste where the facility exceeds a certain size. The Act requires these undertakings to undergo an environmental assessment process in addition to municipal assessment requirements.

Municipalities also play a role in implementing water quality management goals through point source monitoring and through water protection efforts. Municipalities have used a variety of instruments to control the use of land in their boundaries including official plans, zoning by-laws, subdivision control, demolition control and expropriation powers. Provincial governments have a supervisory and appeal function related to these activities. In Ontario this is done through the Planning Act administered by the Ministry of Municipal Affairs and the Ontario Municipal Board. Other ministries are also involved in this process and recent policy directives indicate that increasingly the planning process is being decentralized to municipal governments and Conservation Authorities with less provincial involvement.<sup>101</sup>

In addition to the MOE and municipal governments in Ontario, the Ontario

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<sup>101</sup> Ontario. Planning Act, Draft Revisions to Environmental Assessment Guidelines, 1996.

Ministry of Agriculture, Food and Rural Affairs (OMAFRA) is another policy agent in water pollution management since many non-point sources of water pollution are related to agricultural practices and land use. In Ontario, the environmental effects of farming practices have been defined as part of agricultural policy rather than environmental policy.<sup>102</sup> Agricultural waste and the negative ecological implications of farming practices are thus not covered directly in Ontario's Environmental Protection Act but rather left to the discretion of OMAFRA under the Farm Practices Protection Act.<sup>103</sup>

The Ministry of Natural Resources (MNR) also plays an important policy role in protecting wetlands, forests, fish habitat streams and other elements of the environment deemed important. Similar to the Ministry of Environment, the MNR has also faced significant budget reductions. The operating budget of the MNR was reduced from \$519 million in 1995 to \$364 million in 1999/00.<sup>104</sup> Budget reductions were reflected in a staff layoff announcement in 1996 that 2,170 MNR employees would be eliminated over a two year period.<sup>105</sup> These reductions in resources have narrowed the focus of the ministry and affected its capacity to contribute to non-point source water pollution management efforts in the province. Increasingly, the

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<sup>102</sup> Montpetit, E. and W. Coleman "Policy Communities and Policy Divergence in Canada: Agro-Environmental Policy Development in Quebec and Ontario", *Canadian Journal of Political Science*, 32:4, 1999: 701.

<sup>103</sup> Ibid.

<sup>104</sup> Krajnc, Anita "Wither Ontario's Environment? Neo-Conservatism and the Decline of the Environment Ministry", *Canadian Public Policy* March 2000: 114-5.

<sup>105</sup> Ibid.p.114

Ministry has had to devolve responsibilities to statutory agencies in the province called Conservation Authorities.

The Conservation Authorities Act established statutory corporations across Ontario to manage watersheds (see Appendix 3-2). Each Authority consists of representatives of the provincial government and of each municipality within a watershed. The power and function of Conservation Authorities also varies across the province. Conservation Authorities have a broad range of powers including the ability to purchase, lease or expropriate land. They may also make regulations restricting and regulating the use of water in or from surface water bodies within their jurisdiction particularly related to flood plain management. More recently Conservation Authorities have been involved in watershed planning, environmental assessment and community stewardship of environmental resources. Several provincial governments have also established special regional planning authorities to address the cross-jurisdictional character of certain ecosystems (Niagara Escarpment Commission in Ontario, the Fraser River Estuary Program in BC). In some cases, the policies of these authorities take precedence over regional and local planning decisions.

Only British Columbia has developed an action plan to tackle non-point source water pollution. In March 1999, British Columbia adopted a five-year Action Plan to address non-point sources from land development, agriculture, stormwater run-off, forestry, atmospheric deposition and marine activities under existing articles

of provincial legislation.<sup>106</sup>

In terms of NPS water quality management, the crux of effective policy is at the land-use water-use interface. Provincial policies and municipal policies have been used in tandem to indirectly address non-point source pollution. In the context of intergovernmental relations, cooperative efforts at the provincial and municipal levels are slowly evolving to address NPS water pollution. Arguably, as environmental problem definition shifts and NPS pollution management becomes increasingly important, institutions at the provincial and municipal levels in partnership with community stakeholders will become increasingly important.

Stemming from the constitutional rules concerning land use management in Canada, federal involvement in land use management and regulation is virtually non-existent (except for the tax incentives which will be discussed in Chapter 9). Planning and land use management are considered to be the exclusive jurisdiction of the provinces. Pursuant to provincial enabling legislation, Canadian municipalities manage land use on behalf of the provinces through approved "official plans".

In some provinces, "upper tier municipalities" or regional governments play an important role in the planning process to ensure regional consideration of planning features and significant areas that need to be protected. In Ontario, "lower tier municipalities" are also actively involved in land use regulation through local by-laws and regulation of land use designations in the context of Regional Official

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<sup>106</sup> British Columbia, Ministry of Environment, Lands and Parks, *Tackling Non-Point Source Water Pollution: An Action Plan*, March 1999.

Plans (ROPs). Land use policy instrument strategies although designed in the context of provincial legislation and policy statements are implemented at the local level.

The federal government in Canada has been slow to use tax instruments to address environmental policy and water resource pollution problems. As an effective land conservation and water quality management tool existing federal income tax and provincial property tax legislation has largely failed to encourage the use of these tools in Canada.<sup>107</sup> In 1995, the Minister of Finance announced the federal government's commitment to exploring the use of tax-based instruments to address environmental problems. The proposed revisions to tax legislation was a response to the federal government's interest in exploring alternative environmental policy instruments based on several influential reports including the 1994 Final Report of the National Task Force on Economic Instruments and Disincentives to Environmental Practices.<sup>108</sup>

Conservation easements held by public agencies or private conservation organizations such as conservancies and land trusts are a rare but emerging instrument in Ontario and Canada. These instruments remain predominantly focused on land use preservation and management. Only very recently have these tools been

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<sup>107</sup> Attridge, Ian C. *Conservation Easement Valuation and Taxation in Canada*, Report No. 97-01 prepared for the North American Wetlands Conservation Council and the Habitat Conservation Division, Canadian Wildlife Service, Environment Canada, 1997: xv.

<sup>108</sup> See also Denhez, M. *You Can't Give it Away: Tax Aspects of Ecologically Sensitive Lands*, North American Wetlands Conservation Council, Ottawa, Canada, 1992; Silver, T.M. et.al. *Canadian Legislation for Conservation Covenants, Easements and Servitudes: The Current Situation*, (Ottawa: North American Wetlands Conservation Council, 1995).

discussed as a potential part of the water quality management regime.

With this historical review of institutional arrangements in both countries it is now possible to make some general summative comparisons of each country's approach to addressing non-point sources of water pollution. Table 3-1 provides a summary of the major institutional arrangements in Canada and the US used to address NPS water pollution problems.



**Table 3-1  
Comparison of Major Institutional Arrangements in Canada and the US  
to Address Non-Point Source Water Pollution**

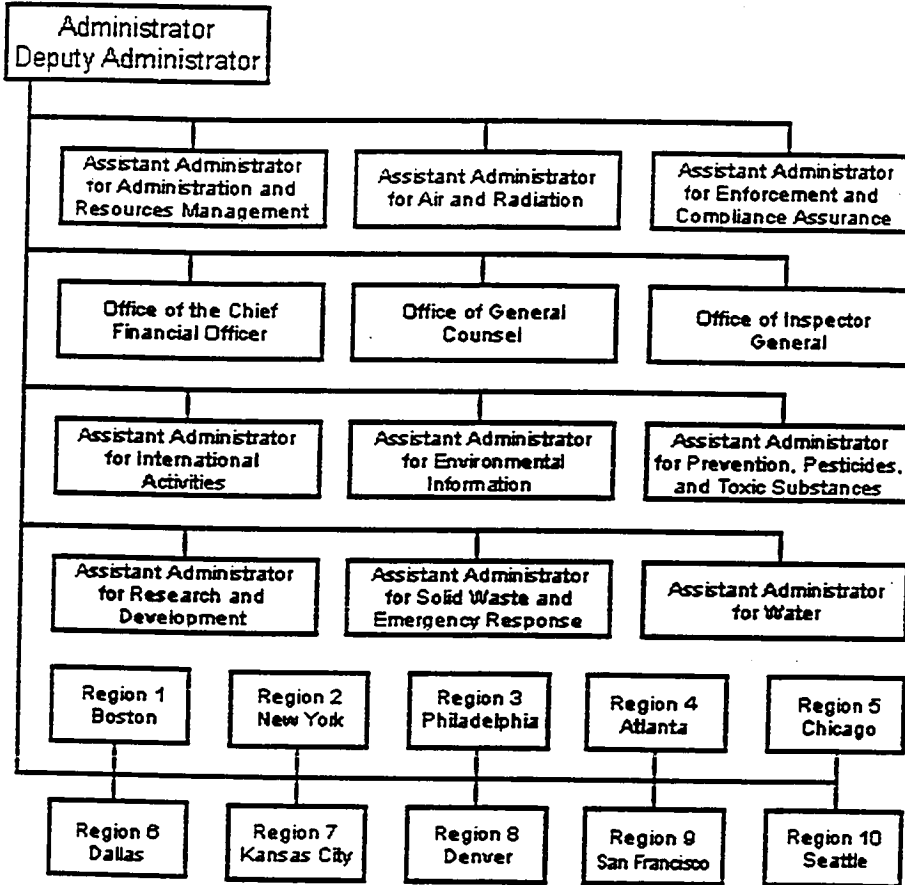
	US	CANADA
General Water Quality Management Approach	<ul style="list-style-type: none"> <li>- source oriented</li> <li>- ecosystem, watershed based</li> <li>- predominantly focused on point source regulation</li> <li>- predominantly medium based</li> <li>- predominantly watershed based</li> </ul>	<ul style="list-style-type: none"> <li>- ecosystem oriented in some areas (IJC, Great Lakes RAPs)</li> <li>- point source financial support role for sewage treatment facilities</li> <li>- regulation and permitting of point sources at provincial level</li> <li>- medium based</li> </ul>
Federal	<ul style="list-style-type: none"> <li>- specific legislation related to NPS water pollution under CWA (1987)</li> <li>- Federal NPS Management Program</li> </ul>	<ul style="list-style-type: none"> <li>- CWA (1970) enabling legislation focused on federal support for provincial point source management systems</li> <li>- 1987 Federal Water Policy reconfirmed this wastewater infrastructure role</li> <li>- Fisheries Act</li> <li>- Canadian Environmental Protection Act regulation of toxic substances</li> </ul>
State/Provincial	<ul style="list-style-type: none"> <li>- diversity of state statutes relating directly and indirectly to NPS water pollution management</li> </ul>	<ul style="list-style-type: none"> <li>- constitutional jurisdiction grants preeminence to provinces</li> <li>- no provinces with direct NPS legislation</li> <li>- BC has NPS program</li> <li>- Conservation Authorities in Ontario primary watershed/local management agencies</li> <li>- indirect role in NPS water pollution management</li> </ul>
Local	<ul style="list-style-type: none"> <li>- implementation agents at a watershed level</li> </ul>	<ul style="list-style-type: none"> <li>- land use management rules</li> </ul>
Intergovernmental Arrangements	<ul style="list-style-type: none"> <li>- mandatory state-federal reporting relationship through legislation</li> <li>- relationship through federal NPS program implemented by state and local agencies</li> </ul>	<ul style="list-style-type: none"> <li>- relationship at the executive levels through CCME and intergovernmental bi-lateral agreements and water quality guidelines</li> <li>- no intergovernmental agreements related to NPS water pollution management</li> </ul>

It is in this context that jurisdictions in Canada and the US have selected and designed policy instrument strategies. Although different watersheds face different water pollution problems, policy instrument strategies must be addressed, analyzed and evaluated in the context of these institutional arrangements.

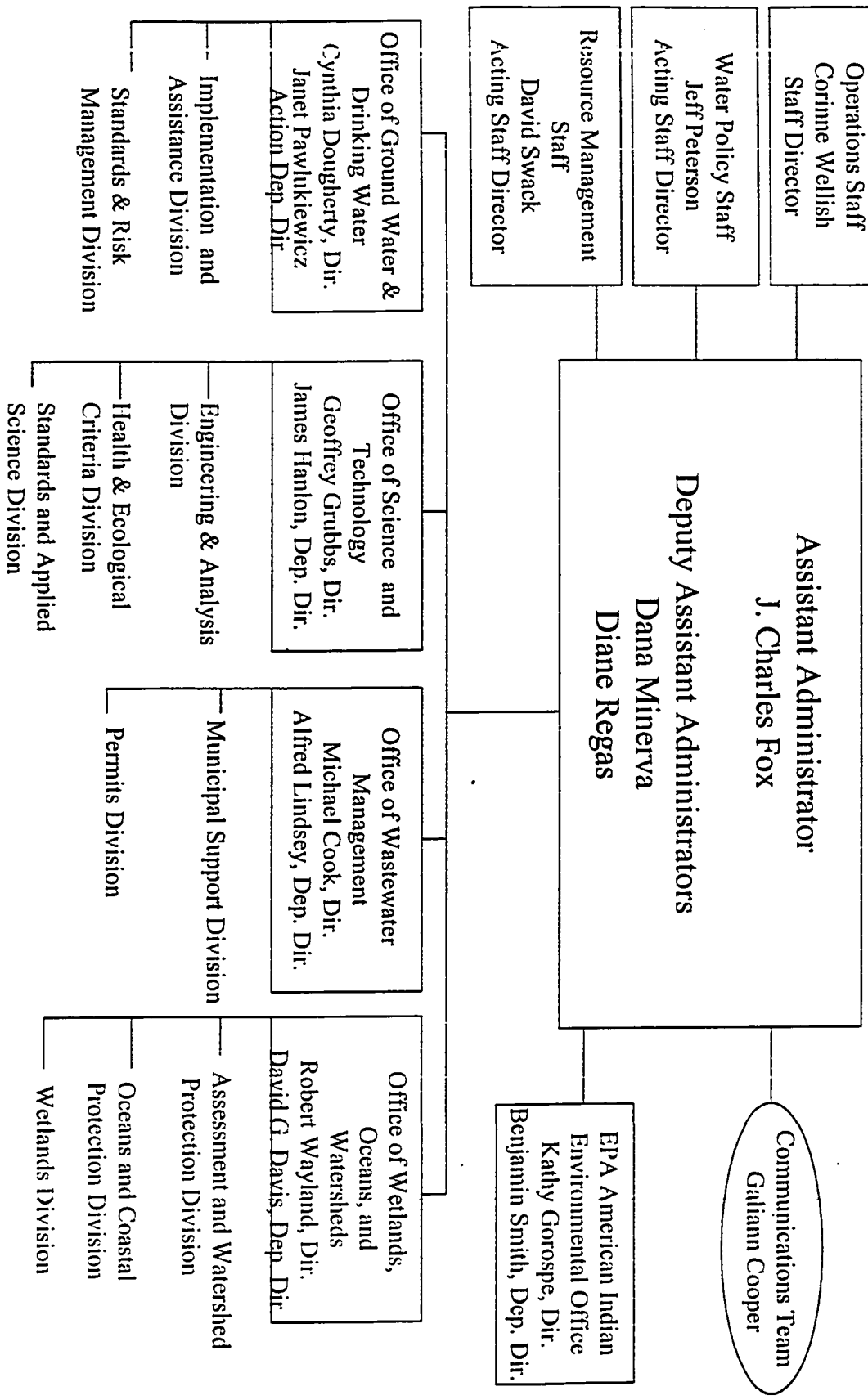
The next three sections present an in-depth case analysis of the context, design and implementation of three different policy instrument strategies - land use regulation, subsidy-based instruments and tax incentive-based instruments. Each section covers one policy instrument strategy and contains two chapters - one case study of a watershed in the US and one case study of a watershed in Canada. Each chapter follows the analytical framework outlined in Chapter 2. The next two chapters examine the use of land use regulation as a policy instrument strategy to address non-point source water pollution in the US and Canada.



### EPA Organizational Structure



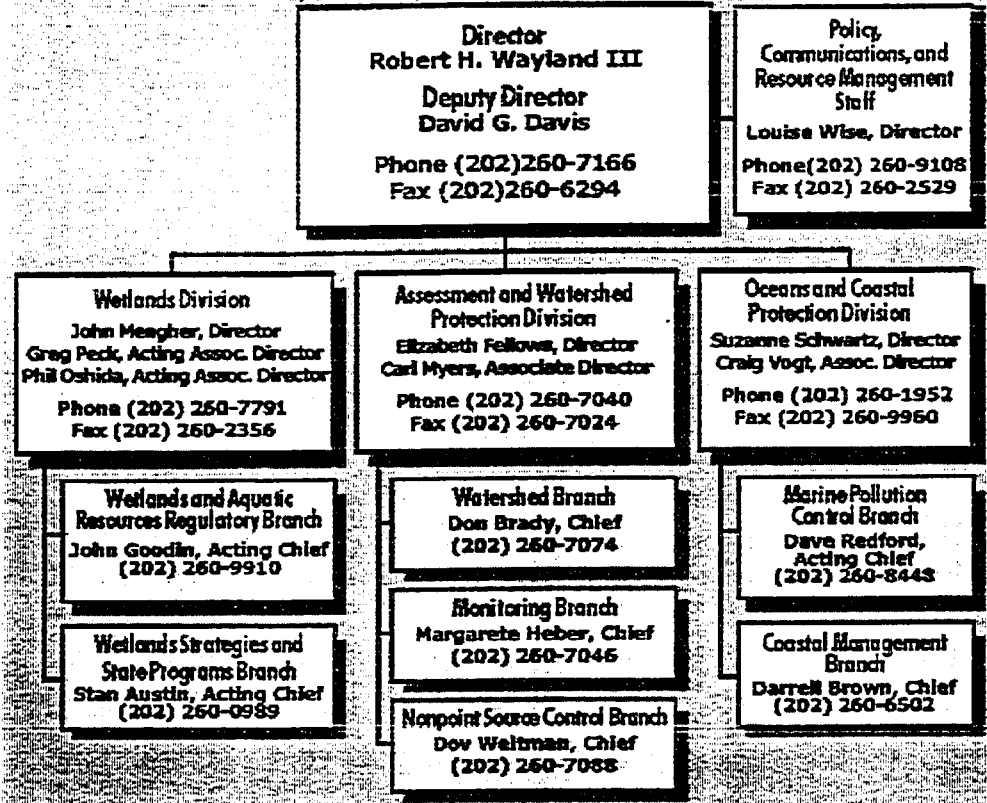
# Office of Water



Source: <http://www.epa.gov/OW/chartt12.html>

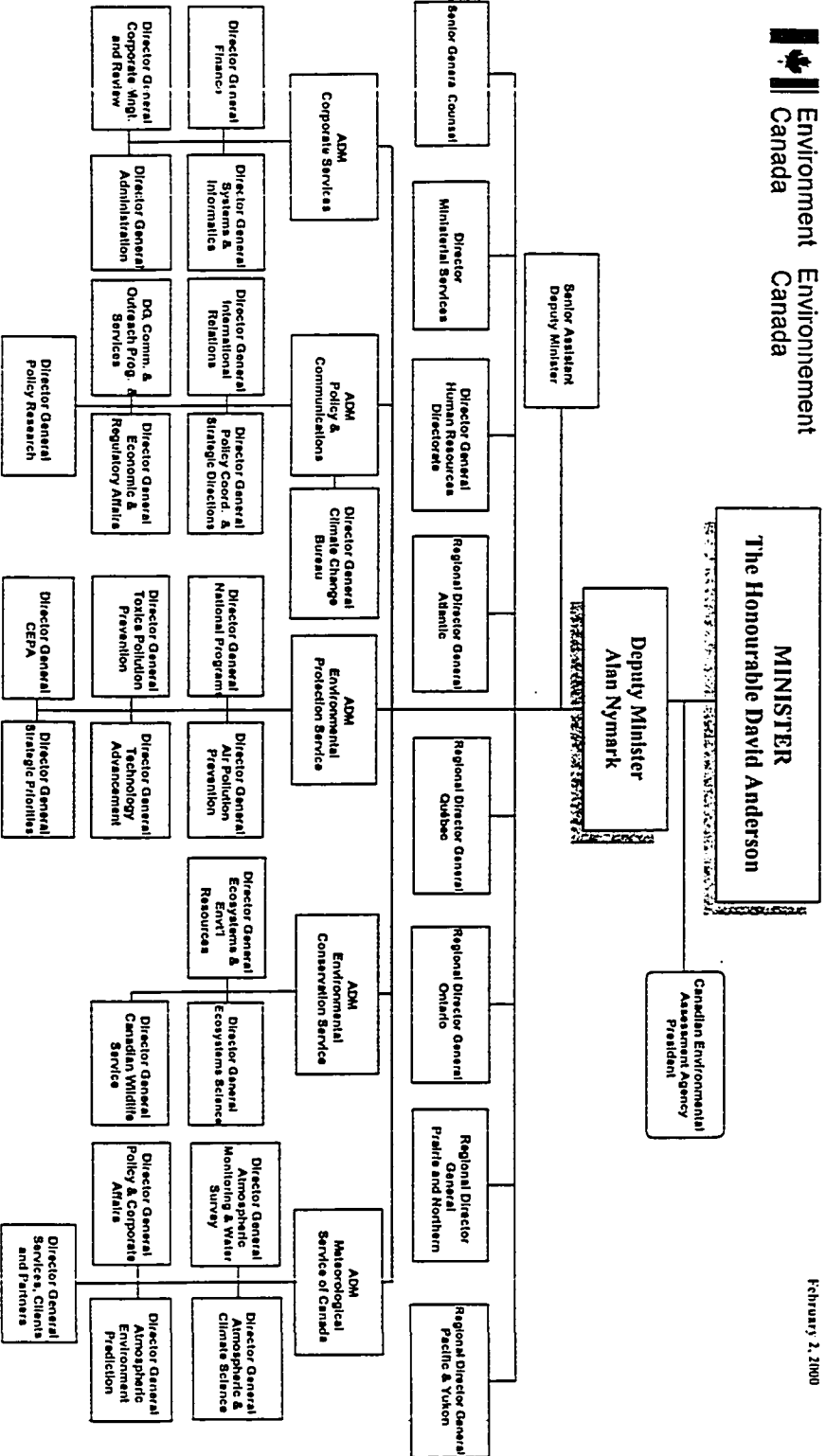
**OFFICE OF WETLANDS, OCEANS, & WATERSHEDS**

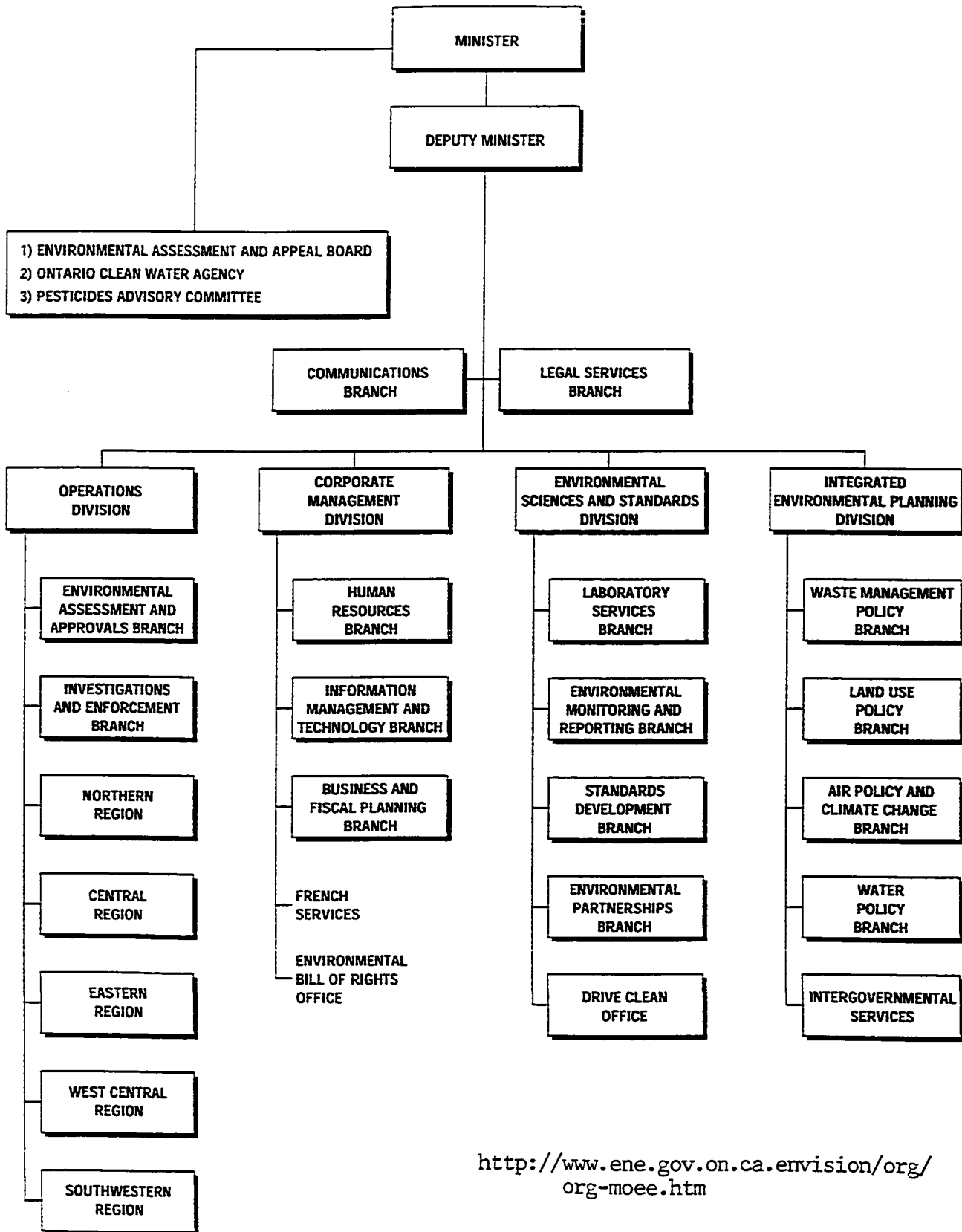
**Office of Wetlands, Oceans, and Watersheds Organizational Chart**

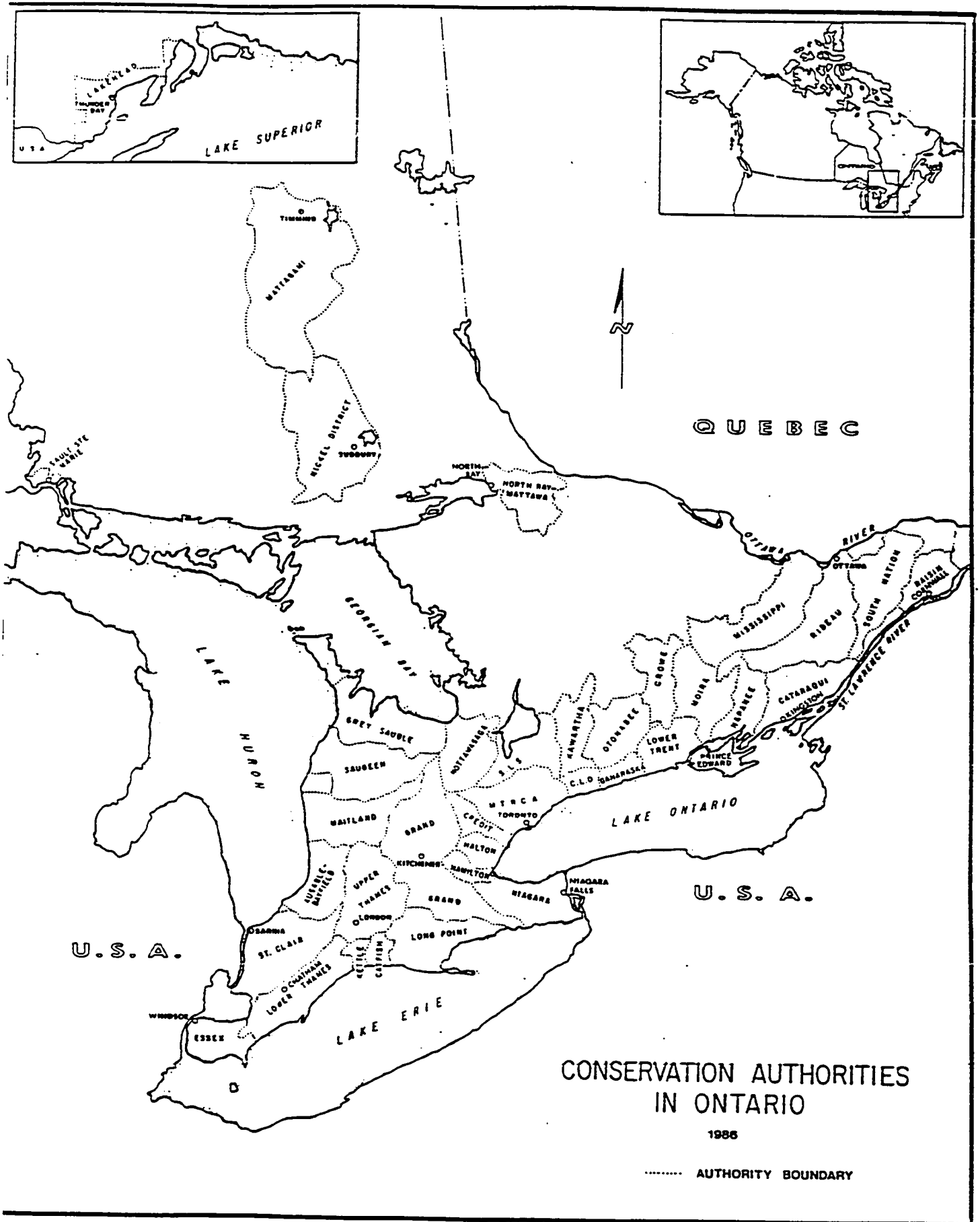


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## SECTION II

### Land Use Regulation Policy Instrument Strategies

## Chapter Four

### Land Use Regulation as a Policy Instrument Strategy: Michigan & The Bear Creek Watershed Case

#### Introduction

“There shall be no man or woman dare to wash any unclean linen, wash clothes, nor rinse or make clean any kettle, pot or pan or any such like vessel within twenty feet of the old well or new pump. Nor shall anyone aforesaid, within less than a quarter mile of the fort, dare to do the necessities of nature, since by these unmanly, slothful and loathsome immodesties, the whole fort may be choked and poisoned”.<sup>1</sup>

Common law and government regulations related to clean water and safe drinking water have existed in America since colonial times. In the US, these types of rules have been aggregated and transformed into more significant regulations under the Clean Water Act, the Safe Drinking Water Act, various statutes at the state level and ordinances at the local level. The relationship between land use and water quality has been known for sometime and water use and land use have long been regulated to

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<sup>1</sup> Governor Gage of Virginia, *Proclamation of Jamestown*, Virginia, 1610.

preserve the water quality of fresh water basins. Rules related to the interface between land use and water quality are therefore not new. Indeed this quote indicates the non-point source water pollution from daily uses of different water resources is a historic problem of human settlements. Overtime, these rules have evolved paralleling more sophisticated scientific understandings of water pollution problems. Increasing human use of water resources have resulted in increasingly complex and diffuse sources making the policy solutions equally complex and challenging.

This chapter and Chapter 5 outline the most traditional policy instrument strategies used to manage non-point source water pollution in Canada and the US - land use regulation. A case study from the US and Canada respectively will be used to demonstrate the significance of institutional capacity as a determinant of instrument choice and design in Canada and the US and to compare the effectiveness of this policy instrument strategy in addressing NPS water pollution problems.

The approach in each case is inherently intergovernmental and thus each case will outline the features of land use rules from both a top-down and a bottom-up perspective. Each case will be used to highlight the situational context of the pollution problems, the character and design features of the policy instrument strategy; the character of intergovernmental institutional arrangements and the indicators of impacts the instrument has had on addressing non-point source pollution problems in a given watershed. The cases selected face similar NPS water pollution challenges.

As outlined in Chapter 3, amendments to the federal Clean Water Act of 1987

directed all US states to assess the extent of non-point source (NPS) pollution within their borders and prepare a management plan to address this type of pollution. By 1993 all states had complied with the federal requirements. In response to the federal legislation and funding guidance, many states outlined similar policy instrument strategies to address NPS water pollution problems in their watersheds.

The State of Michigan is one of the Great Lake states with a national reputation for the progressive use of land use planning and regulation to address environmental problems.<sup>2</sup> For this reason, Michigan has been selected as a state in which to examine the implementation of land use regulation policy instrument strategies to address non-point source water pollution. One particular watershed has been selected for an in-depth case study analysis. The Bear Creek watershed is one of several watersheds in Michigan that has received Sec. 319 funding. This particular watershed provides the opportunity to examine the land use policy instrument strategy in action as part of the larger policy instrument strategy being employed in the state. In order to fully analyze and evaluate this instrument strategy at the watershed level it is important to first examine the context of NPS water pollution management at the state level in Michigan.

### **Features of the Policy Instrument Strategy at the State Level in Michigan**

Prior to 1988, the State of Michigan did not have a defined state program to

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<sup>2</sup> Personal interview with Environmental Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality, August 6, 1998.

comprehensively address NPS water pollution in the state. The State began its compliance with the federal Sec.319 requirements in 1988 by designating the Surface Water Quality Division (SWQD) of the Michigan Department of Natural Resources as the designated lead agency in the NPS effort. Similar to the process in other states, Michigan began its NPS assessment process by inventorying related water pollution management efforts and characterizing the NPS problem facing different watersheds in the state. To begin this process the SWQD conducted a survey of natural resource, environmental, public health and agricultural agencies in Michigan regarding their perception of the extent of NPS pollution in Michigan.<sup>3</sup> The perception survey was also used to identify 297 watersheds in Michigan with NPS water pollution problems (of which the Bear Creek is one, see Appendix I).<sup>4</sup> Findings from the assessment report were used to develop Michigan's 1988 *Non-Point Source Pollution Abatement Report* which was submitted to EPA.

A management plan called *Michigan's Nonpoint Source Pollution Control Management Plan* was developed as an accompanying document to the NPS Pollution Abatement Report. This 1988 report received contributions from 147 individuals organized into nine Technical Committees, was written by NPS Unit staff at the DNR and was reviewed by 23 members on a NPS Advisory Committee to fulfil

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<sup>3</sup> Over 100 state and local agencies including health departments, drain commissions, conservation districts were sent a survey regarding perceived NPS problems in their local watersheds. Michigan Department of Natural Resources, Surface Water Quality Division. *Michigan's Non-Point Source Pollution Assessment Report*, November 1988: Appendix B.

<sup>4</sup> Michigan Department of Natural Resources, Surface Water Quality Division. *Michigan's Non-Point Source Pollution Assessment Report*, November 1988.

Sec. 319 requirements under the CWA and to qualify the State of Michigan for a portion of funding appropriated by Congress to address NPS pollution problems.<sup>5</sup> The stated purpose of Michigan's 1988 NPS Management Plan was to improve and protect the state's water resources from impacts of non-point sources, and achieve water quality standards and desired water uses.<sup>6</sup>

Many of the priorities contained in the Plan were designated to address multiple sources and types of NPS pollution and included the following general program recommendations:

- maintain, strengthen and modify existing programs, especially those in the agricultural areas to maximize their non-point source control benefits;
- establish and support NPS programs which will effectively integrate and coordinate the efforts of local, state, and federal agencies and organizations;
- utilize demonstration projects as models for future state-wide programs to refine inter-agency relationships and evaluate program effectiveness;
- implement programs wherever possible on a watershed basis;
- direct limited resources to watersheds with a higher priority for protection and improvements;
- establish a coordinated NPS data clearinghouse and information management system;
- expand water quality data base through sampling, monitoring and research;
- evaluate and research NPS water quality standards and establish "advisory levels" for human health effects for which adequate standards are not currently available;
- complement existing programs with an incentive program directed towards watershed where BMPs will have significant benefits for water quality.<sup>7</sup>

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<sup>5</sup> Ibid., ii

<sup>6</sup> Michigan Department of Natural Resources, Surface Water Quality Division, *Michigan's Non-point Source Pollution Control Management Plan*, November 1988. Desired water uses primarily include the human uses which states must report on to EPA every two years.

<sup>7</sup> Michigan Department of Natural Resources, Surface Water Quality Division, *Michigan's Non-point Source Pollution Control Management Plan*, November 1988.

After approval of the state's management plan in 1990, funding from Sec.319 of the Clean Water Act provided financial support to implement many of these recommendations. Due to the diffuse nature of the pollution and the state's inexperience with NPS issues, demonstration grants were emphasized as the principal means to address NPS pollution. The early stages of implementation therefore focussed on developing a technical understanding of the NPS pollution problem. BMP manuals were developed covering various sources of NPS pollution. However, as the program moved from demonstration projects and technical definition stage to the implementation stage "the need to improve mechanisms to deliver the information and educate people on NPS pollution control and watershed management was identified".<sup>8</sup> By 1994 several watershed based plans were being implemented and receiving federal funding.

In 1995, the environmental programs in the Michigan Department of Natural Resources were moved into the newly created Michigan Department of Environmental Quality (MDEQ). The NPS Point Source Unit in the Surface Water Quality Division employed 8 full time equivalents (FTEs) and was receiving and administering \$2.6 million annually in Sec. 319 funds.<sup>9</sup> Since 1988, the NPS Program has grown from a few staff located centrally in Lansing to 8 FTEs in

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<sup>8</sup> Michigan Department of Environmental Quality, Surface Water Quality Branch, *Non-Point Source Progress Report*, 1996.

<sup>9</sup> Personal interview with Water Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality, August 6, 1998.

Lansing plus one FT staff person in each of nine district field offices.<sup>10</sup> Section 319 funds were primarily funding DEQ staff at the main office in Lansing Michigan, district personnel in regional offices and project staff at the local levels. Funding was also being used to cover implementation costs. Under the federal funding guidance, the state was required to contribute 40% of the 60% federal funding levels with staff and in-kind contributions.<sup>11</sup>

In the fiscal year 1997/98, Sec.319 provided Michigan with \$3 million of which \$1.9 million was passed to local units of government to develop and implement non-point source watershed plans. The remaining \$1.1 million supported staffing in the DEQ - unit staff in Lansing, including the NPS Coordinator, who is responsible for statewide activities and components of the program and overseeing local watershed projects.

One of the primary roles of DEQ staff is to function as grant administrators of Sec.319 non-point source funding grants. NPS district staff are grant administrators for local watershed grants while central unit NPS staff oversee grants related to NPS programs and ensure grants meet Sec.319 requirements. DEQ central staff also responsible for reporting regularly to the EPA. The Sec.319 funding of NPS staff also covers monitoring and technical support roles.

Funding under Michigan's NPS program is closely tied to watershed planning.

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<sup>10</sup> Personal interview with Water Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality, August 6, 1998.

<sup>11</sup> US. Environmental Protection Agency, Office of Water, *Non-Point Source Program Funding Guidance*, 1998.



Sec.319 grants are structured in this way in accordance with the EPA's funding guidance. Local watershed plans must be developed to apply for Sec.319 funding. Costs for developing a watershed plan are awarded for up to two years under Sec.319 up to a maximum of \$120,000 to assist in the development of anticipated implementation grant applications.<sup>12</sup> The funds are awarded to the DEQ which then grants the funds to local community implementation projects. Any local unit of government is eligible to receive funding. Watershed grants in Michigan have been awarded to drain commissioners, watershed councils, soil conservation districts and conservation and development councils. The non-point source grantee is usually the lead agency in a watershed project. They are the coordinating agency that pulls together the local stakeholders (agencies and individuals involved in the watershed project). In awarding these grants, DEQ uses a Request for Proposal (RFP) Process based on watershed plans.

The watershed plan identifies the features of the watershed and must follow the following ten steps:

- 1) identify a network of stakeholders in the watershed who are interested in improving the watershed
- 2) preparation of a water quality statement:
  - identification of the water quality impairment or threats in terms of designated uses
  - identify the NPS pollutants impairing or threatening designated uses
  - identification of the NPS sources
  - identification of the causes of the sources
- 3) inventory of local programs

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<sup>12</sup> US. Environmental Protection Agency, Office of Water, *Non-Point Source Program Funding Guidance*, 1998.

- 4) define a critical area
- 5) develop an information and education strategy
- 6) inventory the critical area
- 7) quantify and prioritize non-point sources in the watershed
- 8) identify the systems of best management practices needed in the watershed to reduce non-point source pollution
- 9) determine watershed goals
- 10) write and submit the plan.

Once DEQ approves a watershed plan the plans then move into the implementation phase. Typically during the second year of the two-year Sec.319 planning grant, the grantee should begin implementing the information/education component and move to implementing site plans. Another Request for Proposals goes out to local communities interested in implementing watershed plans. DEQ staff review the proposals, with input from other state agencies and a list of proposals is submitted to the EPA which makes the final selection. Upon approval from EPA, DEQ staff work with successful grantees to develop detailed work plans for implementing watershed plans.<sup>13</sup>

Costs for the implementation of watershed plans varies from several hundred thousand dollars to over a million dollars depending on the size of the watershed and the complexity and severity of the pollution problems. Local communities and agencies are expected to contribute time, money and labour for their local watershed. Sec.319 planning grants require a minimum 10% contribution by the local community in the form of financial resources, steering committee staff time, labour

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<sup>13</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality, Lansing, Michigan, August 6, 1998.

and other in-kind services. Sec.319 requires a 30% match for implementation grants and a 50% match for program priorities funding.<sup>14</sup>

In addition, since Sec.319 funds only provide seed money to local projects, the overall goal of the projects is to give local communities the technical knowledge they need to make the project sustainable. Towards the end of the funding period, DEQ staff work with local communities to ensure they become self-sufficient by institutionalizing long-term funding and long-term planning for water quality improvements using such tools as setting up endowment funds to continue efforts, establishing stormwater utility fees and developing land-use management ordinances.

For each project a grant agreement must be signed. A grant agreement is a contract between the DEQ and the local unit of government. Each grantee must submit quarterly progress reports to the DEQ along with financial statements documenting expenditures. Grantees implementing watershed plans must also submit quarterly estimates of the pollutants reduced. This data is then aggregated by DEQ and reported in turn to EPA. EPA has implemented a Grant Reporting Tracking System which is a national database that is used to track the progress in implementing the work plans for all 319 projects. It also helps EPA track and document success stories.<sup>15</sup> By 1998, over 60 watershed plans in Michigan had received funding under these arrangements.

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<sup>14</sup> US. Environmental Protection Agency, Office of Water, *Non-Point Source Program Funding Guidance*, 1998.

<sup>15</sup> US EPA *Section 319 Success Stories*, Volume I, 1994 and Volume II 1997.

In addition to the primary role of overseeing the implementation of NPS grants, NPS Unit staff are also responsible for developing and disseminating information and educational materials for statewide use, including: best management practice manuals; NPS newsletter; NPS fact-sheets; brochures; training programs and conferences.

NPS Program staff at the state level are also responsible for the coordination of the NPS program in conjunction with other programs related to reducing NPS pollution loadings. The DEQ's Soil Erosion and Sedimentation Control Program is another program that is coordinated with NPS Program. This program is responsible for training and auditing state and local agencies that have been given authority under Michigan's Soil Erosion Control Act.

The NPS program is also coordinated with the DEQ Stormwater Program which issues NPDES permits to control stormwater from construction sites and urban areas. The other important partnerships at the state level are with the US Department of Agriculture (USDA) and the Michigan Department of Agriculture (MDA).

The Right to Farm Program was created by the MDA to protect farmers from nuisance lawsuits. Under this program, farmers in compliance with Generally Acceptable Agricultural Management Practices (GAAMPs) are protected from lawsuits. This program was not set up to protect water quality and does not protect farmers if they violate water quality standards.

In relation to other agricultural non-point sources, DEQ has a memorandum of understanding with MDA. DEQ is only involved in cases where a complaint by a

citizen or agency indicates there are damages to a water resource, such as a manure spill. DEQ staff work with the landowner to identify the problem, correct the situation and seek long-term management changes and the implementation of management practices designed for water quality to prevent future pollution. In addition, there are several program such as Farm\*A\*Syst in Michigan administered by the MDA in partnership with Michigan State University Extension which are not integrated with the goals of the NPS Pollution Management Program. According to one program administrator “these programs may or may not be going on in identified Sec. 319 watersheds...there has not been much coordination of these initiatives. Although there was an inter-agency committee at one time... it is now defunct... collaboration with other agencies mainly occurs at the local... implementation level”.<sup>16</sup> In terms of implementation, the Natural Resources Conservation Service (NRCS) in particular has been a significant partner at the local level.<sup>17</sup>

Although there was some consultation in the early stages of NPS assessment and the development of the initial state management plan, ongoing inter-agency communication and coordination is limited. Sec. 319 does require inter-agency consultation and DEQ staff do send out applications for inter-agency review but many

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<sup>16</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality, August 6, 1998, Lansing, Michigan.

<sup>17</sup> Ibid.

agencies do not have the staffing levels to formalize this process.<sup>18</sup>

By 1998, over \$14 million in Clean Water Act Sec.319 funds had been awarded to local units of government to develop and implement NPS watershed projects in Michigan.<sup>19</sup> After almost eight years of implementation, the Michigan NPS Program reported the following outcomes:

- stabilized 39,929 feet (almost 8 miles) of eroding stream banks;
- stabilized 48 eroding access sites;
- installed 21 miles of restrictive livestock fencing;
- installed 48 miles of windbreaks;
- stabilized 65 eroding road crossing;
- sealed 102 abandoned wells;
- installed 139 erosion control structures;
- installed hundreds of other best management practices on agricultural fields, stream; banks, road and in parking lots.<sup>20</sup>

Reportedly since 1990, the NPS Program has prevented approximately 24,000 tons of sediment, 114,000 pounds of phosphorous and 172,000 pounds of nitrogen from entering Michigan's lakes and streams each year.<sup>21</sup> These reported reductions in loadings are based on formulae associated with installation of various BMPs.<sup>22</sup>

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<sup>18</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality, Lansing, August 6, 1998.

<sup>19</sup> Michigan, Department of Environmental Quality *Non-point Source Program Successes* (<http://www.deq.state.mi.us/swq/nps/nps/home.htm>), 1999.

<sup>20</sup> Ibid.

<sup>21</sup> Ibid.

<sup>22</sup> US, EPA annual reporting requires each state to report progress achieved for each funded project. The reporting requires an accounting on BMPs installed and provides state administrators with a formulae to calculate loading reductions for each type of BMP installed. These figures are not confirmed through monitoring of actual loadings pre/post installation.

In 1998, the DEQ NPS Unit was also identified as the lead agency under Governor John Engler's "Clean Michigan Initiative". This initiative proposed a \$675 million bond of which \$50 million will be targeted for reducing and preventing NPS water pollution in Michigan over a seven year period. This bond fund was passed in November 1998 and replaces a similar environmental ten year bond fund that expired in 1998. Although most of the funding continues several initiatives, the \$5-7 million per year over 7 years for NPS programs is new and will result in new staff funding and watershed implementation funding for DEQ. Specific allocations for NPS programs are not surprising since Governor Engler sits on the National Forum for Non-Point Source Pollution.<sup>23</sup>

In addition, subsidy-based grants under this initiative can be awarded to local units of government and non-profit agencies through DEQ approved watershed plans. The addition of non-profit organizations as eligible grant recipients is also new. Applicants will be required to provide at least 25% of the project's total costs as local match.<sup>24</sup> The preferred approach is still one based on voluntarism and subsidy-based BMPs.

To begin the implementation process of new state programs under the Clean Michigan Initiative a Multi-Agency Administrative Rules Working Group was established in March 1999. Draft rules were published in April and formal public

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<sup>23</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality, August 6, 1998.

<sup>24</sup> Governor John Engler, State of Michigan, *Clean Water Michigan Initiative*, July 1998.

comment periods ended on May 14, 1999. The goal is to have the new program funding rules in place to take effect August 1, 1999.<sup>25</sup> The funding covers implementation of physical improvements under DEQ approved watershed plans. There are currently no minimum and maximum grant limits in the rules. In addition to NPS funding, the Clean Michigan Initiative has designated \$90 for a Clean Water Fund of which \$45 million is designated for a 15 year "Strategic Environmental Monitoring Program for Michigan's Surface Waters".<sup>26</sup> The increased effort under the "Clean Michigan Initiative" is also reportedly changing the ad hoc inter-agency coordination that existed previously.<sup>27</sup> Under the federal Clean Water Action Plan increases in funding Michigan is now receiving \$5.8 million annually to implement Sec. 319 programs.<sup>28</sup>

In summary, the dominant, state-wide policy instrument strategy is based on voluntarism and a subsidy-based BMP framework. Due to the Sec. 319 funding guidance and the fact that Michigan's NPS efforts were institutionalized as a result of federal requirements, the federal rules have played an important role in instrument

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<sup>25</sup> Michigan, Department of Environmental Quality, *What's New With Clean Michigan Initiative, Update*, June 22, 1999.

<sup>26</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Surface Water Quality Division, Michigan Department of Environmental Quality, August 6, 1998.

<sup>27</sup> Ibid.

<sup>28</sup> US, EPA, Office of Water, *Supplemental Guidance for the Award of Section 319 Non-point Source Grants in Fiscal Year 2000, Attachment A* (<http://www.epa.gov/owow/nps/Section319/fy2000.html>)



choice and defining the instrument design features at the state level. The instrument strategy is explicitly intergovernmental, watershed-based, requires inter-agency and local stakeholder involvement. Federal requirements have also facilitated recent state commitments to NPS resource allocations for the 1999-2006 time period. In addition to subsidy-based programs Michigan also has a reputation of experimenting with land use regulation as part of its broader NPS water pollution policy instrument strategy.

The local, watershed approach to policy instrument strategies has allowed flexibility for some local jurisdictions in Michigan to use “sticks” to address non-point source water pollution problems. The most traditional of these tools is land use regulation. A case study at the watershed level in Michigan allows for a bottom-up examination of the full package of rules-in-use to address NPS water pollution. However, before examining a watershed case study it is important to briefly outline the historical context surrounding land use regulation as a policy instrument in the US.

### **Land Use Regulation As a Policy Instrument Strategy**

One of the most traditional, yet indirect approaches to managing NPS pollution in the US is through land use regulation. Provisions related to the regulation of private property are clearly articulated in the Fifth Amendment to the US Constitution (which has similar counterparts in state constitutions), which states, "no person shall be deprived of life, liberty or property without due process of law, nor shall private property be taken for public use without just compensation." Interpretation by the US Supreme Court has extended this to mean that a regulation that restricts the use of

property by the state could constitute a taking for which the property owner must be compensated.<sup>29</sup> Through a series of court decisions, government liability for regulatory takings has become an important policy constraint as governments increasingly proceed with caution due to potential legal and fiscal implications.<sup>30</sup> It is in this context that local policy makers and implementers operate. There are two strongly opposed competing philosophies about land use regulation in the US. On the one hand there is pressure to increase regulations on land use to protect land and water quality, on the other hand there are private land owners who seek to reduce the amount of regulation so that they may pursue the highest possible financial return on the development of their land. Fundamentally, all land is considered fair game for development, the question is for what purpose and to what degree. The prevalent view of land use in the US is that land is a commodity and private property rights are paramount. Land is not generally viewed as an integral part of ecosystems or as a societal asset whose development can affect the entire community and water quality.<sup>31</sup> Therefore as a policy instrument to address water pollution, land use regulation is somewhat weakly integrated into the dominant strategy at the state level.

There is only a minor federal and state presence in what has traditionally been local jurisdiction. The National Environmental Policy Act of 1969 and subsequent

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<sup>29</sup> Watson , Elizabeth A. and Judith LaBelle, "An Introduction to Planning and Land Use Management in the United States", *Environments* Vol.24, No.3, 1997: 66.

<sup>30</sup> O'Leary, R. "The Progressive Ratcheting of Environmental Laws: Impact on Public Management", *Policy Studies Review*, Vol.12, No.3/4, 1993: 118-135.

<sup>31</sup> *Ibid.* p. 70

state statutes called "little NEPAs" created a process by which environmental impacts of developments near classified environmental areas such as wetlands, forests and designated park lands are reviewed prior to development being approved. In some states "environmental impact statement" (EIS) processes have also been adopted for developments that exceed a certain size limit (acreage, number of units etc). Very recently, the EPA has developed "model ordinances" that states may voluntarily adopt or adapt and incorporate into their NPS water pollution management efforts.<sup>32</sup> This indicates the federal recognition of the land use-water quality interface in this policy area but implementation is another story.

Beyond general environmental restrictions related to state parks, reserves and game areas, land use regulations to address water quality problems are virtually non-existent at the state level in Michigan. City, county and district governments are still centrally important in determining if and how land-use regulation instruments are used to achieve water quality objectives. It is at this level that these types of rules are in use in Michigan.

Michigan has attempted to use land use regulation tools to better manage the land use - water quality interface, especially in priority watershed that are facing population increases, urbanization and development pressures. As many watersheds at the local level are participating in Sec. 319 programs, there is an explicit requirement that implementation be undertaken jointly. This level of

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<sup>32</sup> US, Environmental Protection Agency, Office of Water, Model Ordinances, (<http://www.epa.gov/owow/nps/ordinance.html>), January 2000.

intergovernmental cooperation however is not institutionalized when land use regulation is the instrument of choice. A case analysis at the watershed level is necessary to examine land use regulation policy instrument strategy at work.

In addition to the BMP "carrots" that form the core of federal and state level management initiatives , local governments have attempted to protect the watershed through land use regulation "sticks". Of the Sec. 319 watershed projects funded in Michigan, one in particular has used a land use regulation instrument strategy to address non-point source water pollution problems. The Bear Creek Watershed in Cannon Township, Michigan will be used to highlight the features of local land use regulation as a policy instrument strategy in a watershed context.

### **The Policy Instrument Strategy in Action: The Bear Creek Watershed Case**

The Bear Creek Watershed is located in Cannon Township, Kent County, Michigan in the western portion of Michigan's lower peninsula (see Appendix 4-1 & 4-2). Bear Creek is in close proximity to Michigan's second largest city, Grand Rapids. The watershed is a sub-watershed of the larger Grand River Watershed, Michigan's longest watercourse, which empties into lake Michigan 40 miles to the west. Grand Rapids is located in the Bear Creek Watershed area. This proximity has made the Bear Creek Watershed a desirable area for residential and commercial development and has introduced a variety of human uses that impact on water quality.

Bear Creek is a cold-water creek that drains 20,096 acres of rolling hills and steep slopes. More than half (55%) of the watershed is in Cannon Township. The

remaining areas of the watershed lie in the adjacent counties of Grattan, Ada, Vergennes and Plainfield. Bear Creek is the major watercourse in Cannon Township. As it runs east to west for some 17 miles, the creek and its tributaries are surrounded by wooded upland areas which slope abruptly toward the narrow flood plain of the creek's main channel. There are several tributaries and intermittent streams that contribute to the watercourse along its entire length. There are also several lakes that drain into the creek which range in size from 1 acre to 200 acres in size. There are an estimated 2000 acres of wetland in the watershed. The northernmost headwaters of Bear Creek originate in springs near Bostwick Lake, the largest lake in the watershed at 210 acres. Springs are an important contributor to the water flow of Bear Creek.

In 1991 approximately 28% of the watershed was shrub/swamp and recreational land, 28% was agricultural (with two thirds devoted to row crops and a third to livestock farming and one tenth to orchard crops), 26% was forested, 8% was wetlands and 10% was urban.<sup>33</sup> As outlined in Appendix 4-3, the land use in the watershed is primarily agricultural with significant forested and open field coverage. The land use in the watershed has been changing in the last decade. The trend between 1991 and 1998 has been towards the conversion of agricultural lands to residential development.<sup>34</sup>

Recreational land in the watershed includes both private and public land. The

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<sup>33</sup> *The Bear Creek Watershed Plan*, prepared by the Bear Creek Project Steering Committee, 1992.

<sup>34</sup> *Ibid.*

privately owned lands include Cannonsburg and Pando Ski Lodges and several private camping areas. The public recreational space includes municipal parks and state natural resource areas. Access to Bear Creek for recreational uses is primarily through Kent County's Townsend Park. Townsend Park is the only portion of the watershed that is publicly owned - estimated at about 2% of the total.<sup>35</sup>

The Bear Creek Watershed has experienced dramatic population growth in the past two decades. As a suburban development area, the watershed has seen significant residential development. Since 1980, the most significant population increases have been in the Cannon Township area. Between 1980 and 1990 the population of Cannon Township has grown from 5,000 to 8,000, a 59% increase. This compares to Michigan's statewide growth over the same period of .3%.<sup>36</sup> Data from the most recent census indicate that this trend has continued and the current population in the watershed is 9,914.<sup>37</sup>

The increasing levels of growth are not a new problem in the Bear Creek watershed area. A report as early as 1970 anticipated this growth:

"Cannon Township is experiencing a healthy growth rate as development around Grand Rapids moves northward. People are building in the attractive natural topography of the township especially around the lakes. The beautiful rolling topography lends itself to development but the soil conditions preclude

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<sup>35</sup> Personal interview with Cannon Township Clerk/Watershed Administrator, August 5, 1998.

<sup>36</sup> *The Bear Creek Watershed Plan*, prepared by the Bear Creek Project Steering Committee, 1992.

<sup>37</sup> Cannon Township, *Bear Creek Watershed Census*, 1996.

further development without adequate sewage disposal systems".<sup>38</sup>

One of the impacts documented in the Watershed Plan has been the change in average size of land holdings. In 1930 the average parcel size was more than 80 acres, by 1966, most of the large tracts had been divided to sizes smaller than 40 acres and by the early 1990s, large parcels of greater than 40 acres were rare and smaller parcels of 10 acres or less predominate.<sup>39</sup> This trend reflects the development pressures on the watershed and the fact that most residents in the watershed commute to the Grand Rapids metropolitan area.<sup>40</sup>

#### **Character of the NPS Pollution Problem in the Bear Creek Watershed**

At least four general categories of NPS pollution are found in the Bear Creek watershed - agricultural, urban/residential, transportation related and stream bank erosion. Agricultural practices including crop rotation practices, fertilizer use, herbicide and pesticide application methods and practices related to livestock management are important contributors to NPS problems in Bear Creek. Livestock accessibility to surface waters contribute significant levels of untreated manure runoff during rain events and heavy snow melts. Livestock also degrade the streambanks compounding natural erosion processes. Manure applications to crop lands also

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<sup>38</sup> Prien and Newhof Consulting, Cannon Township, Michigan, 1970.

<sup>39</sup> *The Bear Creek Watershed Plan*, prepared by the Bear Creek Project Steering Committee, 1992: 14.

<sup>40</sup> Personal interview with Cannon Township Clerk/Watershed Administrator, August 5, 1998.

contribute to NPS pollution.<sup>41</sup>

Residential development is the other major source of NPS water pollution. Soils in the Bear Creek watershed have been designated as having moderate and severe limitations in terms of high permeability and sensitivity to septic systems. Increased paved areas are also contributing to impervious surfaces that compound the amount and velocity of stormwater runoff. In 1998 approximately 80% of the roads in the watershed were paved.<sup>42</sup> At the present time golf course development has also been identified as a significant contributor to NPS water pollution.<sup>43</sup>

After gathering information on nearly every active parcel in the watershed a scoring system to prioritize BMP implementation projects was established. Based on assistance from DEQ project administrators a watershed project proposal was developed and BMPs were prioritized using four criteria: 1) overall cost; 2) extent of current and potential pollutant contributions; 3) willingness of the property owner to participate; and 4) location of site and ability to demonstrate techniques.<sup>44</sup> The use of a Resource Management Agreement signed by the property owner as well as the grantee representative (Michigan DEQ official) and local project staff ensured that all parties were aware of the conditions in terms of environmental improvements, cost

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<sup>41</sup> *The Bear Creek Watershed Plan*, prepared by the Bear Creek Project Steering Committee, 1992: 14.

<sup>42</sup> Bear Creek Watershed Project: Non-Point Source Pollution (<http://www.wri.gvsu.edu/bearpage/stewplan/nonpoint.htm>)

<sup>43</sup> The Bear Creek Watershed Project: Public Policy Initiatives (<http://www.wri.gvsu.edu/bearpage/stewplan/publicpo/htm>)

<sup>44</sup> *Bear Creek Watershed Project: Lessons Learned Report*, Draft July 19, 1999: 10.



sharing and maintenance responsibility.<sup>45</sup>

### **Features of the Land Use Instrument Strategy in Action at the Watershed Level**

Not unlike other NPS Sec. 319 funded watershed projects in Michigan, the dominant policy instrument strategy in Bear Creek has primarily been based on cost-based subsidies, voluntarism and education initiatives. One unique aspect of the policy instrument strategy has been an attempt to integrate land use regulations into the policy instrument strategy at the watershed level.

The Bear Creek Watershed Project is a cooperative watershed plan being implemented by Cannon Township and Grand Valley State University's Water Resources Institute (WRI) since 1992. Since 1992, Cannon Township has had an elected representative responsible for the financial reporting aspects of the project and an appointed Project Manager to manage the implementation on a day-to-day basis.<sup>46</sup> Since the project was awarded funding, the program has been implemented in partnership with Grand Valley State University's Water Resources Institute. The Institute was responsible on a contractual basis for hiring the Project Manager and collecting information related to the implementation of BMPs. The administration of ordinances and land use rules was the responsibility of the locally elected, seven member, Cannon Township Board.

According to the current Watershed Administrator in the township, the Bear Creek Project was driven by two factors... Sec. 319 funding and a proposed residential

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<sup>45</sup> Ibid: 12

<sup>46</sup> Personal interview with Cannon Township Clerk/Watershed Administrator of the Bear Creek Watershed Plan, August 5, 1998.

development on Bear Creek.<sup>47</sup> “A group of about 20 residents got together in response to a proposed residential development and formed PACE (*Preserving the Atmosphere of Cannon’s Environment*) and then the Planning Commission formed a sub-committee with 6-8 members to initiate a study and application for Sec.319 funding”.<sup>48</sup> The town Planning Commission consists of seven appointed members who review site plans and make recommendations to the elected Cannon Township Board for final approval.

One component of the Sec. 319 implementation project for Bear Creek focused on ordinance development as one tool that has been prioritized in the watershed plan to address non-point sources of water pollution. “The regulations are designed to prevent soil erosion along creek banks, prevent sedimentation, preserve the vegetation along the creeks and ensure adequate setbacks for buildings, structures and septic systems.”<sup>49</sup> Ordinances are developed at the town and county levels and are administered by local zoning administrators and planning commissions.

The Bear Creek Watershed Protection Overlay District (covering the towns in the watershed area) has a series of rules outlined in Kent County Ordinance Section 18.01 which states as its purpose:

“To establish regulations to preserve and enhance the integrity of the Bear Creek Watershed and associated tributaries. The regulations are designed to prevent soil erosion along creek banks, prevent sedimentation, preserve and enhance vegetation buffers along creeks and ensure adequate setbacks for

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<sup>47</sup> Personal interview with Cannon Township Clerk/Watershed Administrator, August 5, 1998.

<sup>48</sup> Ibid.

<sup>49</sup> Cannon Township, Michigan, Ordinance 18, Section 18.01

buildings, structures and septic systems”.<sup>50</sup>

Rules for the overlay district are “intended to supplement the regulations of any underlying zone and supercede all conflicting regulations of the underlying zoning districts to the extent of any such conflict. Boundaries of the Protection Zone include all lands which are within 100 feet beyond the ordinary high water mark on each side of creeks and tributaries as shown on the official Cannon Township zoning map any regulations which are more restrictive than this shall prevail over this chapter”.<sup>51</sup>

The ordinance includes rules regarding natural vegetation strips and minimum setbacks of any structures within 100 ft of the defined watershed boundary. The ordinance was passed by the Cannon Township Board and Planning Commission in 1997 and only applies to new developments. A subcommittee of the elected Board reviews local ordinances to ensure consistency with the district ordinance.<sup>52</sup> Land use management tools continue to be locally developed and administered on a town by town basis. “All of the townships in the watershed need assistance in the development of appropriate ordinances to preserve, protect and address NPS in the watershed”.<sup>53</sup>

Monitoring and compliance is done through the planning approvals process. The Planning Commission is the primary organization involved in monitoring and ensuring compliance throughout the development process. Although the township has a Master Plan in addition to the ordinance, there are no designated “no development” or ecologically protected areas.

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<sup>50</sup> Cannon Township Chapter 18 Bear Creek Watershed Protection Overlay District Section 18.01

<sup>51</sup> Ibid Section 18.02

<sup>52</sup> *The Bear Creek Indicator*, a publication of the Bear Creek Watershed Project, Cannon Township, Michigan, Vol.5 No.4, April 1997

<sup>53</sup> Ibid.

“Each development is handled as an individual case...in our state, rights of property owners are paramount... because we are afraid of being taken to court over takings issues. Some developers are asked to undertake environmental assessments by the Planning Commission which are then reviewed by the town planner and town engineer but there are no formal environmental review requirements”. Some states like Oregon have statewide rules but in Michigan each township has there own zoning and ordinance rules... this sometimes creates problems... in Courtland Township for example they had only 1 acre minimum lot rules on agricultural lands where Cannon had 2 acre minimum rules ... they therefore attracted a lot more development because they could get more houses on a piece of property”.<sup>54</sup>

In the context of Michigan's overall Non-point Source Abatement Program, land use rules are a weakly integrated set of regulatory tools.<sup>55</sup> Although used in some areas of the state under extreme development pressures such as the Grand Traverse Bay area, only recently have these types of rules been developed in other jurisdictions such as counties around Grand Rapids. Bear Creek's rules have only recently been put into place. There is significant variation by local jurisdiction since cities and townships have the authority to make local land use rules.

### **Resource Allocations**

The Bear Creek Management Plan was to be implemented over a three year period. The total estimated budget was \$2.3 million of which \$1.2 was allocated to BMP implementation (\$300,000 of which came from the federal Sec.319 NPS Program), \$663,000 to public programming and \$340,000 to staffing costs.<sup>56</sup> The

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<sup>54</sup> Personal interview with Cannon Township Clerk/Watershed Administrator, Aug.5, 1998.

<sup>55</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Michigan Department of Environmental Quality, Surface Water Quality Division, August 6, 1998

<sup>56</sup> *Bear Creek Watershed Project: Lessons Learned Report*, Draft July 19, 1999.

public programming allocation was primarily allocated to educational and community-based partnership programs, approximately \$20,000 was earmarked for ordinance development and approximately \$215,000 for monitoring and evaluation. Federal funding for the project under Sec. 319 ended in September 1998.<sup>57</sup>

Since 1998 the township has funded a part-time Watershed Administrators position which is currently combined with the Township Clerk position. The individual holding this combined full-time position is an elected local official and member of the Township Board. In addition, the township has allocated approximately \$20,000 in 1998/99 to sustain the initiatives that were developed under the Bear Creek Implementation Project.<sup>58</sup> The relationship with Grand Valley State University Water Resources Institute is evolving into a consulting relationship and there is movement away from focussing on BMPs to more emphasis on education and outreach initiatives.<sup>59</sup> “Without Sec. 319 funding it will be up to the township to continue primarily through education initiatives ... ordinances such as those limiting use of certain types of fertilizers may be seen in the future but we have a real hesitancy with the present Board to put these kinds of rules in place... the current philosophy is based on the assumption that education...is important and that fundamentally most residents want to do what is right to protect Bear Creek”.<sup>60</sup> While land use

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<sup>57</sup> *The Bear Creek Indicator*, a publication of the Bear Creek Watershed Project, Cannon Township, Michigan, Vol.5 No.4, April 1997

<sup>58</sup> Personal interview with Cannon Township Clerk/Watershed Administrator of the Bear Creek Watershed Plan, August 5, 1998.

<sup>59</sup> Ibid.

<sup>60</sup> Ibid.

regulations have been used to address NPS pollution and improve water quality, there is no indication that there will be a shift in emphasis from voluntary-based, locally implemented solutions. "I think of BMPs as remedial measures and land use regulations as preventative, although there has been some shift in emphasis to preventative measures, I think the approach to NPS pollution management will remain voluntary".<sup>61</sup>

### **Indicators of Impacts**

At the state level there are reported indicators that the BMP effort funded through Sec.319 program has been a success. "The program has funded 70 projects in Michigan of which Bear Creek is one... we report annually on all the projects to EPA and we also contribute to the biennial National Water Quality Inventory that is submitted by EPA to Congress".<sup>62</sup> New federal funds under the federal Clean Water Action Plan and the State's Clean Michigan Initiative will be used to fund monitoring initiatives either by state agencies or contracted out to organizations such as Grand Valley State University's Water Resources Institute (WRI).<sup>63</sup> "Overall the program is generally seen as a success...there is still the element of landowners not wanting the State telling them what to do... this is one of the reasons local units of government are

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<sup>61</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Michigan Department of Environmental Quality, Surface Water Quality Division, Lansing, August 6, 1998.

<sup>62</sup> Ibid.

<sup>63</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Michigan Department of Environmental Quality, Surface Water Quality Division, August 6, 1998.

implementing the program... but in some cases even if landowners are offered 100% cost share they will not participate”.<sup>64</sup>

Progress reporting was a required component of the Bear Creek funding under Sec 319. Quarterly progress reporting included a narrative report, financial report, report on BMPs implemented and pollutants reduced as a result. The NRCS assisted Project Managers in estimating the pollutant reductions using a calculation for typical BMPs implemented under certain conditions.<sup>65</sup> “My sense of success is based on the reports that grantees submit and the BMPs that have been completed ... the form that requires reporting reductions in pollutants is also an indicator ... this is mainly a report of key pollutants such as sediments, phosphorous and nitrogen... and estimating reductions based on an equation. Grantees were not required to do pre and post project water quality assessments basically they were required to estimate based on the type of BMP installed and the site conditions”.<sup>66</sup> The monitoring requirements and capabilities vary by project.

The impacts of the Bear Creek Watershed Project have primarily been reported as “lessons learned”. The final report of the project focussed on positive outcomes. One of the positive outcomes was reportedly the information resources collected as a result of the project’s partnership with Grand Valley State University’s WRI. “Data

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<sup>64</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Michigan Department of Environmental Quality, Surface Water Quality Division, August 6, 1998

<sup>65</sup> Ibid.

<sup>66</sup> Personal interview with NPS Regional Program Manager & Water Quality Analyst, Michigan Department of Environmental Quality, Surface Water Quality Division, August 6, 1998.

a geographic information system”.<sup>67</sup> The second major positive outcome reported was the Cannon Township Board’s eventual ownership of the project and sustainable commitment to water resource protection with the creation of the “Watershed Administrator” position. The co-author’s of the report including the District DEQ official stated that “we know of no other township that has taken this critical step”.<sup>68</sup>

The need for long term funding for the project was recognized early on and initial steps were taken to create a non-profit organization but were not pursued. “While we never took the final steps in forming a nonprofit group specific to Bear Creek, we were successful in establishing a mindset that long term funding is critical to long term success. Fortunately, Cannon Township has, at least for the time being, accepted full financial responsibility for watershed management activities”.<sup>69</sup>

The establishment and education of partners was also a reported positive outcome.

“We had to work closely with the Township Board, the Kent County Road Commission, Drain Commissioner and state DEQ... we feel that the processes required to implement BMPs, as well as other projects, successfully became integrated into agency programs. While the impacts may be directly causal, we feel that they are at least in part due to the process of regular communication between agencies and project staff to solve real world problems”.<sup>70</sup>

The report also states that “in addition, and perhaps most importantly, Cannon Township made great strides in long term stream protection by creating a Bear Creek

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<sup>67</sup> *Bear Creek Watershed Project: Lessons Learned Report*, draft, July 19, 1999:1.

<sup>68</sup> Ibid: 3

<sup>69</sup> Ibid: 18.

<sup>70</sup> Michigan. Bear Creek Watershed Project, *Lessons Learned Report*, Draft, July 19, 1999:5



Overlay Zone and Open Space Planned Unit Development Ordinance... and an Open Space Preservation Committee that recently presented a proposed comprehensive strategy for land development and preservation in the township. "Cannon Township has made numerous planning and zoning changes. It is at this level that the project is perhaps the most successful, as this is where long term changes in attitudes, understanding and behaviour develop".<sup>71</sup>

Although this report did not quantify impact of the project on the creek, the report indicates that "a number of physical changes to the watershed were also brought about using techniques that improved or protected the quality of Bear Creek ...cattle exclusion fencing, sediment collection, fish passage, and streambank stabilization demonstration projects were implemented".<sup>72</sup>

The original emphasis on BMPs in Bear Creek shifted over the duration of the project. "It soon become clear that the most genuine threats to the long term quality of Bear Creek were not those that could be repaired with structural BMPs. In fact, the entire project became an example used by Michigan's DEQ as one in which information exchange and educational efforts came to dominate... it has been characterized as prevention oriented as opposed to restoration oriented".<sup>73</sup>

In terms of water quality outcomes related specifically to Bear Creek, neither the local government or the state have collected pre and post program data. Fecal coliform testing has been ongoing twice per year in collaboration with the local Health

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<sup>71</sup> Ibid: 5.

<sup>72</sup> Ibid: 3

<sup>73</sup> Michigan. *Bear Creek Watershed Project: Lessons Learned Report*, draft July 19, 1999:5.

Department and the results are published in the local newspaper.

“The results have not been positive... the creek is still not suitable for swimming... sources are still not known. There has been some testing of sediment runoff during storm events and the state is doing testing now for the federal TMDL initiative... water quality monitoring was not an integral part of the Bear Creek Project... there were no water quality monitoring requirements as part of our project... but because of the grant the community and organizations such as the Boy Scouts have become involved in these things. At the beginning some data was required to get funding but not through the implementation stages”.<sup>74</sup>

The state also generates some estimates of reduced pollution loading as the result of installing BMPs. Unfortunately, the data are only estimates based on a generic formula that calculates estimated runoff prevented given the installation of certain BMPs under generic conditions.

Beyond these limited monitoring efforts at the local level, there is no ongoing monitoring or impact assessment at the local or state level. Neither the local government in Cannon Township nor the state have ongoing monitoring and assessment programs. The impact of NPS water pollution management efforts in the past 8 years in terms of water quality are thus difficult to assess. Although the process of implementation was clearly established and reinforced by federal incentives, state diagnostics and local implementation, the agencies have limited capacity to determine the impacts of efforts. Although institutional capacity exists to initiate and implement non-point source management programs and local land use rules, there is very limited capacity to manage and implement these rules on an ongoing basis.

Evaluation of the impact of recently established land use regulations is even

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<sup>74</sup> Personal interview with Cannon Township Clerk/Watershed Administrator, August 5, 1998.

more challenging and difficult to assess given the fact that ordinance rules are combined with the broader BMP instruments in the Bear Creek case. Even if longitudinal water quality data were readily available, it would be difficult to determine if improvements or deterioration over time was attributable to the implementation of BMPs in the watershed, land use regulations or other voluntary initiatives in response to education and public awareness programs.

An evaluation report recently published on the Bear Creek, highlights that the most valuable contribution of the project have been in building community knowledge and institutional assets that will sustain the initiative into the future. According to the report, “the evolution of the Bear Creek Watershed Project has taken a number of turns in the past six years, but the net result is a better informed, prepared and motivated base of local officials and residents in the Bear Creek area and elsewhere”.<sup>75</sup> Institutional partnerships and networks have been established integrating the efforts of all three levels of government, the local government in Cannon Township for the first time has allocated resources to ensure voluntary and educational components of the program continue under a funded staff position and, the township has amended ordinances to reflect problem recognition and work towards preventing further degradation of the creek. However, it remains to be seen if those rules will be adequately implemented and whether monitoring and enforcement regimes will emerge. To date, land use regulations are only initiated for new development proposals through the approvals process. No mechanisms are in place to monitor conditions in the construction or post-development stages once a development permit

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<sup>75</sup>

*Bear Creek Watershed Project: Lessons Learned Report*, Draft July 19, 1999:3.

has been approved.

### **Summary of Land Use Regulation Policy Instrument Strategy**

By using a top-down and bottom up approach to examine the land use policy instrument strategy in Michigan it becomes very clear that land use regulation instrument strategies are not the preferred strategies at the federal and state level in Michigan. This in large part stems from the constitutional and jurisdictional allocation of authority for use of this instrument strategy to local units of government.

The Bear Creek case clearly illustrates how land use regulation instrument strategies are embedded in the overall intergovernmental strategy to address non-point source water pollution in different ecosystems in the State of Michigan: Table 4-1 summarizes the character of the policy instrument strategy in this case.

**Table 4-1**  
**Summary of Land Use Regulation Policy Instrument Strategy in**  
**Michigan & The Bear Creek Watershed Case 1993-1999**

Evaluative Dimensions	Summary
Instrument Design/Approach	<ul style="list-style-type: none"> <li>• explicit watershed approach</li> <li>• design influenced by federal and state rules (Sec.319 funding guidance)</li> <li>• secondary strategy to cost-based BMPs</li> <li>• weakly integrated with primary strategy</li> </ul>
Implementation Agents	<ul style="list-style-type: none"> <li>• local units of government</li> <li>• low federal and state involvement</li> <li>• limited integration beyond BMP component and funding guidelines</li> </ul>
Stakeholder Involvement	<ul style="list-style-type: none"> <li>• involvement in problem definition (GVSU-WRI, other local agencies)</li> <li>• local implementation with state oversight</li> </ul>
Resource Allocations	<ul style="list-style-type: none"> <li>• low state contribution to ordinance development</li> <li>• personnel commitment at local level</li> <li>• low funding at local level</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• focused on state requirements (BMPs)</li> <li>• specific resource allocation but not for land use regulation monitoring &amp; enforcement</li> <li>• only initiated for new development proposals through existing approval process</li> <li>• no pre and post water quality monitoring</li> <li>• no ongoing WQ monitoring programs</li> </ul>
Reported Effectiveness Outcomes	<ul style="list-style-type: none"> <li>• information collected on the watershed</li> <li>• creation of local staff position</li> <li>• establishment of local educational and inter-agency partners</li> <li>• public awareness</li> <li>• development of new county ordinance</li> </ul>
Reported Ecological Outcomes	<ul style="list-style-type: none"> <li>• some estimated loading reductions due to BMPs not land use regulation</li> <li>• fecal coliform testing by local Health Dept. with negative results</li> <li>• sources reportedly still unknown</li> </ul>
Sustainability Potential of PIS	<ul style="list-style-type: none"> <li>• focus on voluntary "sermons" approach</li> <li>• part-time personnel at local level</li> </ul>

Clearly the NPS efforts in the Bear Creek watershed were stimulated by the federal NPS Management Program. The design aspects of the policy instrument strategy at the watershed level were defined in the context of the funding guidance and administrative rules at the federal and state levels. What is clear however from this case is that local units of government have some autonomy in determining how the mix of instruments will be packaged to address the specific NPS problems in the watershed. As development pressures are one of the primary sources of polluted runoff and erosion, it is not surprising that land use regulation “sticks” were adopted as a component of the policy instrument strategy in the Bear Creek watershed.

Based on this case, it is clear that policy instrument strategy choice and design were significantly impacted by institutional arrangements at the state and federal levels. The land use regulation policy instrument strategy reflects the dimensions of this institutional capacity. As outlined in Table 4-2, although there is a medium degree of horizontal capacity reflected in the integration of land use and water quality institutions and a medium level of stakeholder involvement at the local and state levels, the effectiveness of the land use policy instrument strategy is low.

**Table 4-2**  
**Analysis and Evaluation of the Land Use Regulation Policy Instrument Strategy**

<b>Institutional Capacity</b>	<b>Rating</b>
Vertical	Low
Horizontal	Medium
Stakeholder	Medium
Monitoring & Evaluation	Low
<b>Outcomes</b>	
Effectiveness	Low

A low effectiveness rating is attributable to the findings that the land use regulation policy instrument strategy had very little measurable impact in terms of ordinance implementation or in terms of water quality improvements. This is to some degree explained by the secondary character of the instrument strategy in the watershed but it is also explained by the institutional arrangements at the state and federal levels. There are no state or federal requirements or incentives to focus on water quality outcomes using these instruments.

This is especially evident as the use of land use regulation in the Bear Creek case is the exception rather than the rule in the context of the dominant BMP subsidy-based strategy in Michigan. The use of land use regulation is not vertically integrated into the primary institutional arrangements used in Michigan to address NPS water pollution. In large part this is explained by the incentive structures that are institutionalized in the federal Sec. 319 funding guidance.

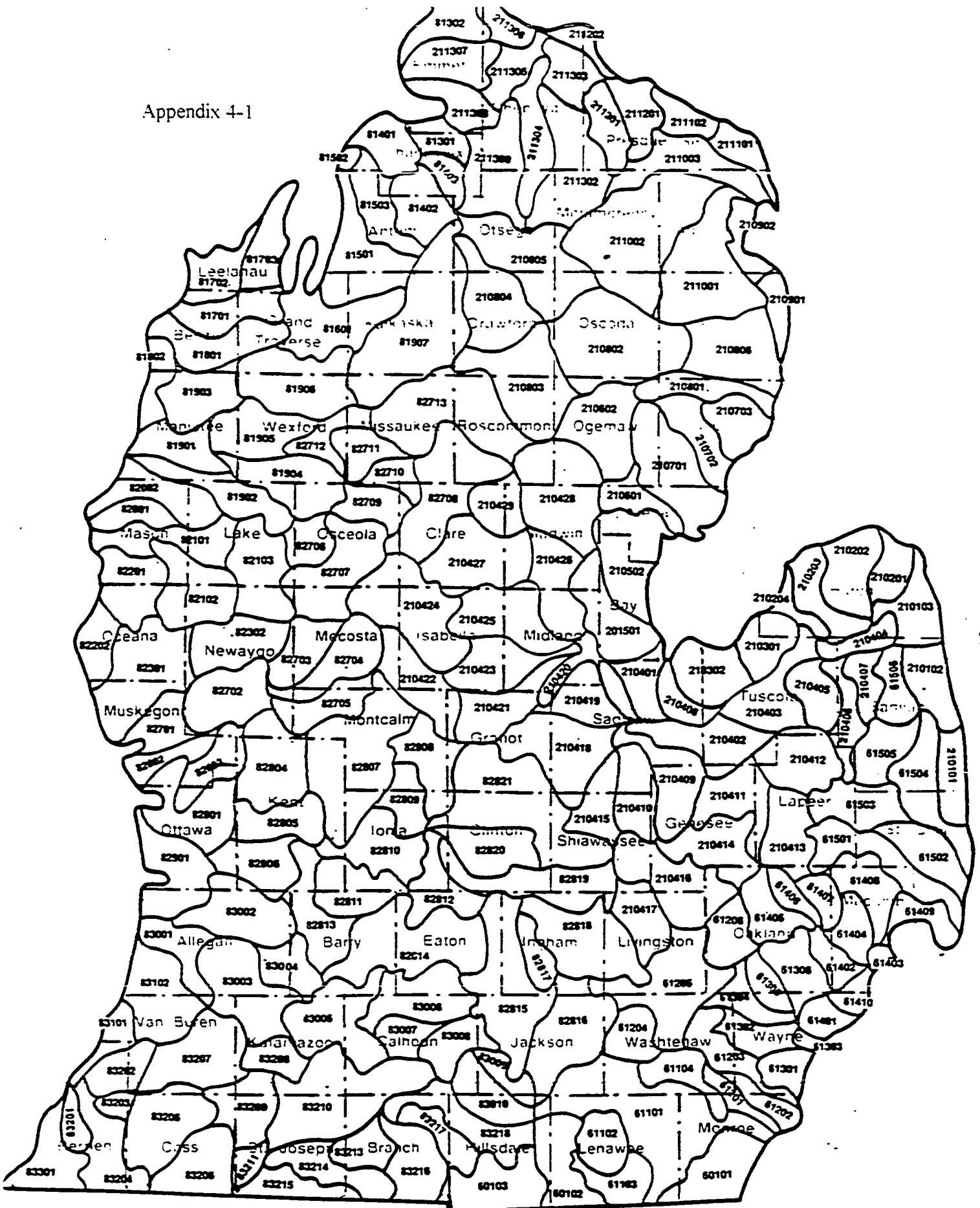
## **Conclusions**

Overall, the choice and design of the land use regulation policy instrument strategy in the Bear Creek watershed is significantly determined by institutional arrangements at the state and federal levels. As highlighted in Chapter 3, institutional constraints in the US constitution have an impact on institutional capacity of the policy instrument strategy at the local, watershed level in Michigan. The institutional capacity of the instrument strategy itself is embedded in this intergovernmental context. These low levels of institutional capacity evident in the policy instrument strategy set the stage for low levels of policy instrument strategy effectiveness.

The findings presented in this chapter however can be more fully analyzed and evaluated in comparative context. The next chapter focuses on the use of land use regulation to address NPS water pollution problems in Canada. Interestingly, the next chapter demonstrates that at the operational level in Canada, similar levels of institutional capacity are evident in the use of land use regulation as a policy instrument strategy to address NPS water pollution yet there is comparatively more potential to use this policy instrument strategy. In addition, the sources of policy ineffectiveness stem from different weaknesses in institutional capacity.



Appendix 4-1

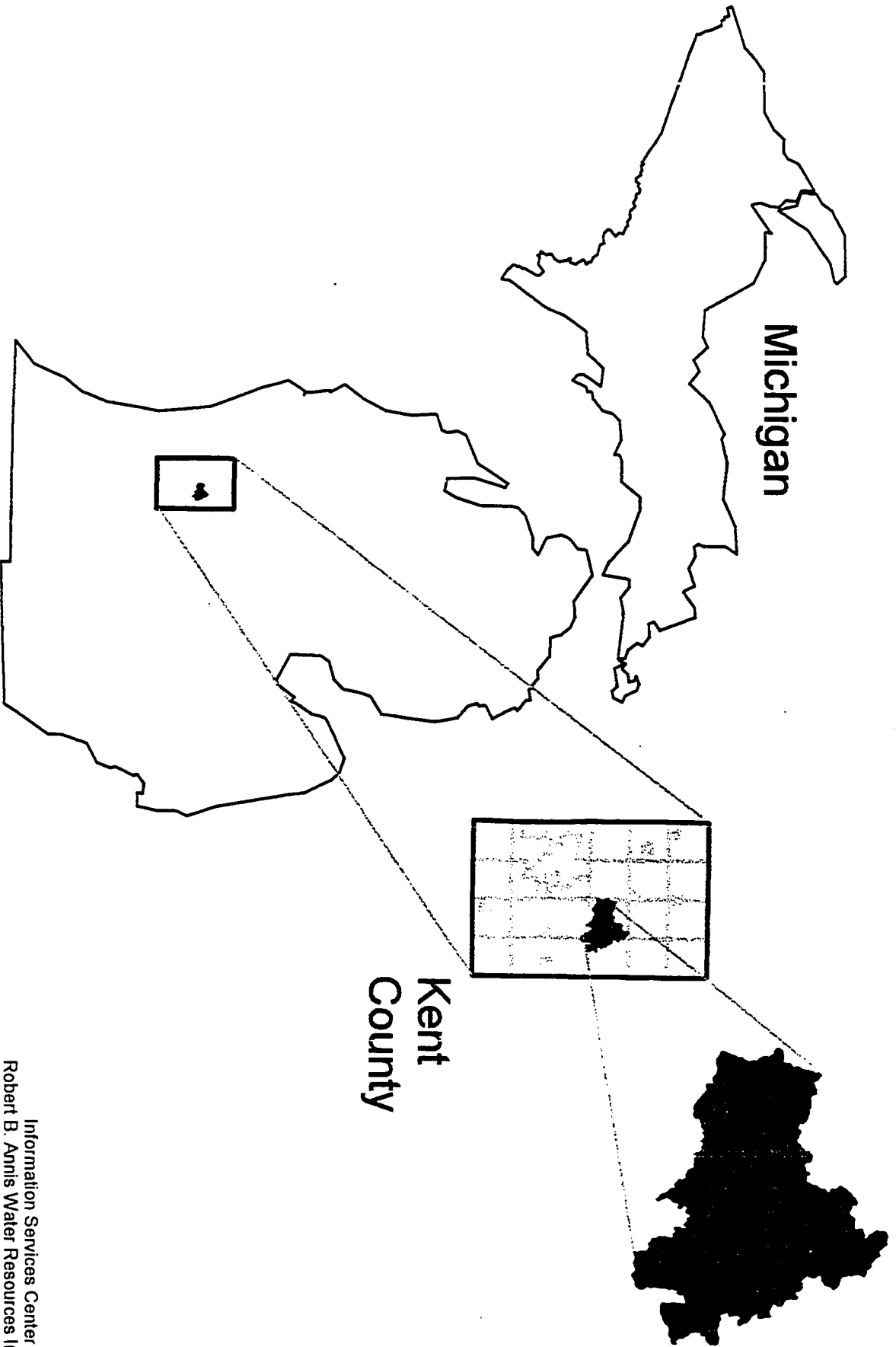


Source: Michigan Nonpoint Source Pollution Assessment Report, 1988.



Appendix 4-2

# Bear Creek Watershed



Information Services Center  
Robert B. Annis Water Resources Institute  
Grand Valley State University

CANNON TWP.





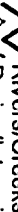

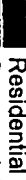
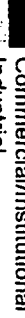




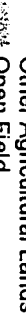

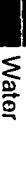



GRATTAN TWP.

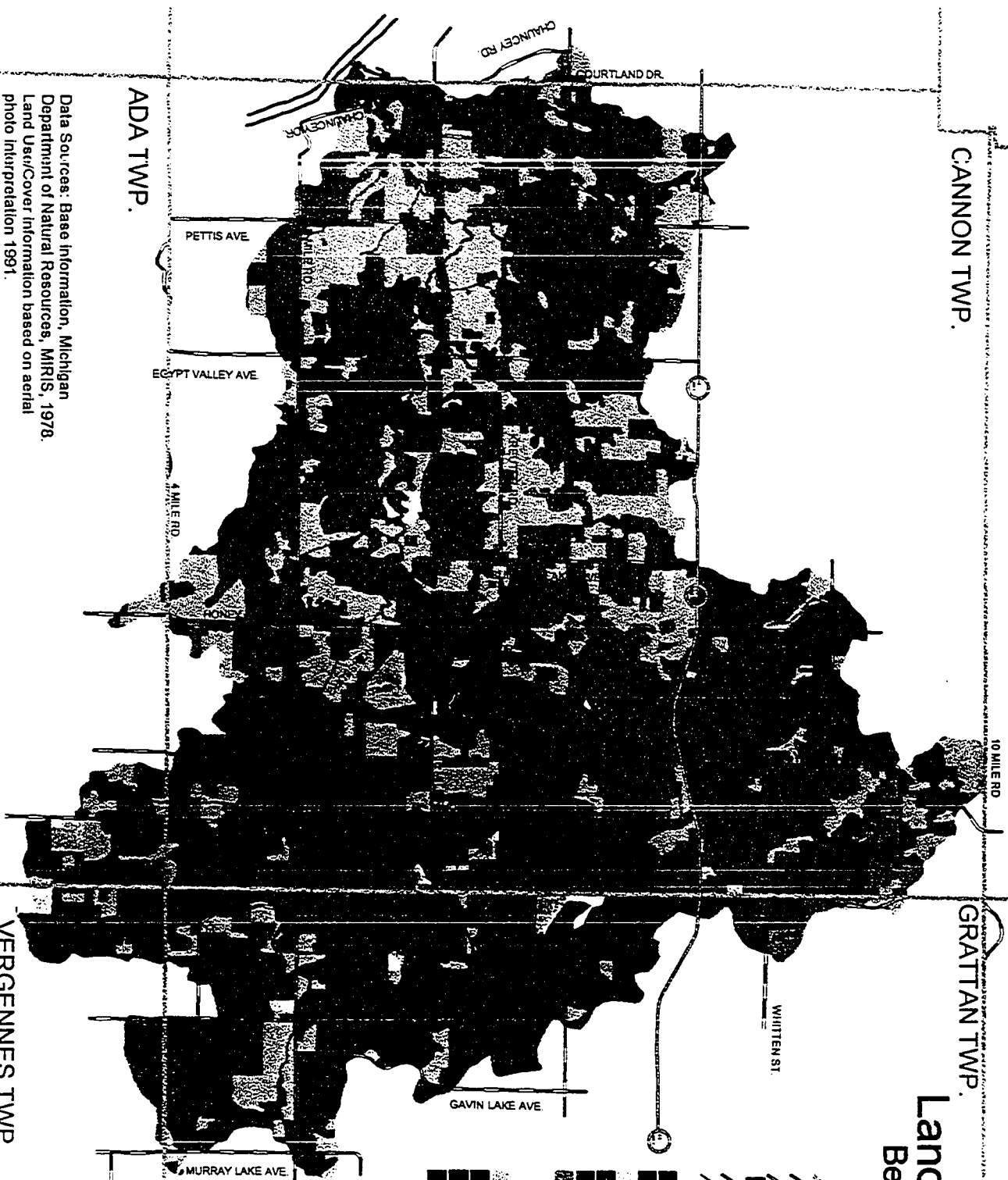
Appendix 4-3

# Land Use/Cover - 1991

## Bear Creek Watershed

Kent County, Michigan

-  Township Lines
-  County Roads (Watershed)
-  Highway
-  Lakes/Ponds
-  Rivers/Creeks
-  Drains/Intermittent Streams
-  Residential
-  Commercial/Institutional
-  Industrial
-  Other Developed Areas
-  Cropland
-  Orchards or Other Specialty Crop
-  Confined Feeding/Permanent Pasture
-  Other Agricultural Lands
-  Open Field
-  Forest
-  Water
-  Wetland



Data Sources: Base Information, Michigan Department of Natural Resources, MIRIS, 1978. Land Use/Cover Information based on aerial photo interpretation 1991.

VERGENNES TWP.

Information Services Center  
 Robert B. Annis Water Resources Institute  
 Grand Valley State University  
 Map Prepared: January 2000

## **Chapter Five**

### **Land Use Regulation as a Policy Instrument Strategy Halton Region, Ontario & The Sixteen Mile Creek Watershed Case**

#### **Introduction**

Stemming from the constitutional rules concerning land use management in Canada, federal involvement in land use management and regulation is virtually non-existent (except for publicly owned federal lands and involvement through income tax incentives discussed in Chapter 9). Planning and land use management are considered to be the exclusive jurisdiction of the provinces. As outlined in Chapter 3 and pursuant to provincial enabling legislation, Canadian municipalities manage land use on behalf of the provinces through provincially approved “Official Plans”.

In some provinces, including Ontario, “upper tier municipalities” or regional governments play an important role in the land use planning process to ensure

regional consideration of planning features and significant areas that need to be protected. Several provincial governments have also established special planning authorities or programs to address the cross-jurisdictional nature of certain ecosystems (e.g. the Niagara Escarpment Commission in Ontario and the Fraser River Estuary Program in British Columbia). In Ontario, Conservation Authorities also have statutory authority for watershed and flood plain management in 38 regions across the province. In some cases, the policies of these authorities take precedence over regional and local planning decisions. Protection of ecologically sensitive areas and watersheds in many provinces are regulated through land use planning and approval systems by local units of government.<sup>1</sup> It is in this institutional context that the use of land use regulation instruments must be examined and analyzed.

This chapter will review land use regulation as a policy instrument strategy in the province of Ontario. An in-depth case analysis of Sixteen Mile Creek watershed in Halton Region will be used to analyze the policy instrument strategy in action.

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<sup>1</sup> Depending on the jurisdiction, land use regulations may be the responsibility of lower tier municipalities, upper tier municipalities (regional government units) or both if the jurisdiction has both local official plans and regional official plans. Where regional responsibilities exist, local plans must be approved by the elected regional council to ensure conformity with the regional official plan.

## **Features of the Land Use Policy Instrument Strategy at the Provincial Level in Ontario**

Land use planning and regulation has been an important function of local governments in Ontario since before Confederation. The current Planning Act (1996 and amendments) outlines the rules and responsibilities of municipalities with regards to planning and development of lands in Ontario. Supplemented by the Implementation Guidelines for the Comprehensive Set of Policy Statements, municipalities are in large part responsible for implementing land use regulations through the Official Plan (OP) process and zoning by-laws. The Ontario Planning Act requires all municipal jurisdictions (both regional and local where regional units of government exist) to complete an OP every five years and submit it to the provincial Ministry of Municipal Affairs for review and approval. The OP sets out the municipality's general planning goals and policies that will guide future land use. Zoning by-laws are the rules and regulations that control development as it occurs.<sup>2</sup> If property owners want to use their land in a way that conflicts with the official plan, they must pursue an amendment to the plan through a formal application process.<sup>3</sup>

In terms of protection and management of ecologically sensitive areas and watersheds, many official plans have designated lands for specific levels of protection from changes in land use and development. The Greenlands system

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<sup>2</sup> Ontario. Ministry of Municipal Affairs, *Citizen's Guide to the Planning Act*, 1997.

<sup>3</sup> Ontario. Ministry of Municipal Affairs, *Citizen's Guide to Official Plans*, 1997.

consists of the designations related to the protection of natural areas. Typically this includes the designations of Escarpment Natural Area, Greenlands A, Greenlands B and Regional Waterfront Parks. Greenlands A designations include areas in the regulatory flood plain managed by Conservation Authorities and Provincially Significant Wetlands. All of the areas included in this designation have provincial legislation supporting their protection.

Greenlands B designation includes a number of designations such as Provincially and Regional Areas of Natural and Scientific Interest (ANSIs), Environmentally Sensitive Areas (ESAs), Natural Heritage Areas and Public Open Space. These designated lands do not have provincial legislation supporting their protection but are protected through provincial policy statements and local rules typically documented in Regional Official Plans (ROPs). In jurisdictions where regional units of government exist, local official plans must conform to the regional official plans. All local official plans must be approved by the elected Regional Council to ensure conformity to the Regional Official Plan. Section 27 of the Provincial Planning Act requires that every local official plan and by-law must conform with the Regional Official Plan within one year after the ROP is approved by the Minister of Municipal Affairs.<sup>4</sup>

Mechanisms of protection from adverse land use are typically implemented through a formal review or environmental impact assessment process at the local

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<sup>4</sup> Regional Municipality of Halton, *Natural Heritage Policy Paper*, Revised Draft, April 1998: 19.

and/or regional level. A hierarchy of protection rules, review processes and implementation arrangements thus exists in local land use regulation in Ontario. Conflicts under the Planning Act and official plan process are heard by the Ontario Municipal Board, an independent administrative tribunal responsible for hearing appeals of local planning decisions.

In Ontario, “lower tier municipalities” are also actively involved in land use regulation through local by-laws and the regulation of land use designations in the context of Regional Official Plans (ROPs). If proposed land use changes have implications for policies outlined in the ROP, lower level municipalities must notify the regional Planning Department and proper approvals must be in place in order for development or changes in land use to occur. ROPs also include policies for the preparation of watershed and sub-watershed studies and plans. These provisions allow regional governments to undertake watershed planning and implementation initiatives, often in partnership with local Conservation Authorities.

Land use designations are an important operational feature of land use management regimes in Ontario. In addition to the Greenland designations through provincial statute and policy statements, the Provincial Planning Act (1996) includes provisions for designation of Environmentally Sensitive Areas (ESAs) in ROPs. ESAs are often designated areas in close proximity to watersheds that regulate development in or in close proximity to the designated area. ESAs are ecological designated areas that receive protection and management based on certain ecological criteria - many of which relate to water quality. Operational rules require that



developments or certain land uses “in” or “in close proximity to” ESAs undergo environmental assessment or review prior to development approval. In addition, provincial legislation encourages the establishment of Regional Environmental Advisory Committees (councils of volunteer citizens) to fill a review function and report to Regional Planning Staff and Councillors.

Similar to the previous chapter outlining land use regulation instrument strategies in Michigan to manage NPS water pollution, a watershed case will be used to illustrate the features of land use regulation instrument strategies in Ontario.

#### **The Land Use Policy Instrument Strategy in Action: Sixteen Mile Creek Watershed, Halton Region, Ontario**

Sixteen Mile Creek watershed is located in the Regional Municipality of Halton and runs primarily through the local municipalities of Milton and Oakville (see Appendix 5-1). The watershed is approximately 1068 hectares or 2639 acres in size and runs from the Niagara Escarpment draining all lands in the basin and ultimately emptying into Lake Ontario. The watershed is approximately 20 km wide at its widest point and 35 km in length and is drained by 17 watercourses (2,000 kilometers of creeks and streams).<sup>5</sup>

Sixteen Mile Creek watershed is located in Halton Region, a regional municipality in Ontario just west of Peel Region and the Greater Toronto Region on

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<sup>5</sup> Regional Municipality of Halton, *Sixteen Mile Creek Watershed Plan*, February 1996: 1-3. Conservation Halton, *Inspired by Nature*, January 2000.

Lake Ontario. Most recent data approximate the population in the region at 339,875 people with an increase in population projected to reach 538,000 by the year 2016.<sup>6</sup> Population projections reflect the bedroom-community profile of the region which borders on the Greater Toronto Area.

The two largest municipalities in the region are the City of Burlington (population 180,000) and the Town of Oakville (population 90,000). Oakville in particular has seen dramatic increases in the last ten years increasing by an average of 5,000 per year from 1980 to 1995.<sup>7</sup> In addition to residential land use, land use in the region is a mix of agricultural and open space in the north and residential, commercial and industrial in the south (see Appendix 5-1). The southern portions of the watershed, in closer proximity to Lake Ontario are more urbanized although the upstream portions of the watershed have more recently been facing development pressures. There are plans for urban expansion, mainly in the mid-sections of the watershed (see highlighted areas of Appendix 5-2).

### **Character of the NPS Pollution Problem in Sixteen Mile Creek Watershed**

The residents of Halton region rely on surface waters and water from Lake Ontario for a number of different uses including drinking water, waste disposal, irrigation and recreation. The main sources of NPS water pollution in Sixteen Mile

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<sup>6</sup> Regional Municipality of Halton  
(<http://www.region.halton.on.ca/ppw/planinfo/census96/pop.htm>)

<sup>7</sup> Regional Municipality of Halton *State of the Environment Report*, May 1997: 23

Creek are from adjacent land uses including, farming operations (hay, corn, soybeans and livestock) in the northern sections of the watershed, golf courses, aggregate extraction, transportation and significant urbanization and residential development pressures. In addition, the watershed is home to several waste management sites include Halton's largest landfill.

The southern section is threatened by adjacent urban development as Sixteen Mile Creek is facing pressures for residential development as part of the Greater Toronto Area. As outlined above, the population in the region in 1996 was 339, 875 with a projection of 422,000 by the year 2005 and 538,000 by 2016.<sup>8</sup> Most of this population growth is expected in close proximity to the 16 Mile Creek watershed in the local municipalities of Milton and Oakville.

There is also non-point source run off and accelerated erosion and siltation from agricultural land use, golf courses and major urban road crossings such as highway 403 and a forthcoming six-lane highway crossing (HWY 407). The creek also receives effluent from the existing Milton wastewater treatment plant. Cold water fish habitat still exists in the upper reaches of Sixteen Mile Creek. However, concrete channelization, elevated water temperatures and reduced water quality have restricted habitat quality severely.<sup>9</sup>

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<sup>8</sup> Regional Municipality of Halton, Planning Services Section, *Population Statistics* (<http://www.region.halton.on.ca/ppw/planinfo/BPEnew/Halton.htm>)

<sup>9</sup> *Sixteen Mile Creek Watershed Plan* prepared for the Regional Municipality of Halton by Gore & Storrie Ltd and Ecoplans Ltd., February 1996.

## **The Land Use Regulation Policy Instrument Strategy in Action at the Watershed Level**

Like all regional municipalities in Ontario, Halton Region is required by provincial statute to have an approved Regional Official Plan (ROP) governing land use within its defined borders. As defined in the Region of Halton's Official Plan, Environmentally Sensitive Areas (ESAs) are "land and water areas containing natural features or ecological functions of such significance as to warrant their protection in the best long term interests of the people and environment of Halton".<sup>10</sup> In 1976, the Ecological and Environmental Advisory Committee (EEAC) was established as a volunteer technical advisory committee to regional government and the Planning Department to oversee a study which determined criteria and inventoried potentially sensitive lands. The final study in 1978 proposed the designation of 38 ESAs which was subsequently endorsed by Regional Council and later documented in the ROP. Approximately 11,000 hectares or 10% of Halton's land base was proposed for environmental protection at that time.<sup>11</sup>

In January of 1990, Council approved the Terms of Reference to update the original study. A consulting firm was hired to update the original study and review the designation criteria. Of the 11 designation criteria, four criteria were specifically related to the significance of ground and surface water protection. The revised

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<sup>10</sup> Regional Municipality of Halton, *Official Plan*, 1994.

<sup>11</sup> Regional Municipality of Halton. *Ecological and Environmental Advisory Committee Members' Handbook*, 1995-99.

criteria increased the number of designated ESAs in the region from 38 to 45.<sup>12</sup> Another feature of the report was to better define ESA boundaries. This update to the original study increased the number of lands designated to approximately 12% of Halton's land base.<sup>13</sup> As indicated by the map in Appendix 5-3, virtually all of Halton's watersheds are designated ESAs - including the Sixteen Mile Creek watershed. Any proposed development in, adjacent to or in close proximity to an ESA must go before EEAC for review in the context of the Regional Official Plan. As a member of this committee, some of the data collected on this policy instrument strategy is based on my own observations as a participant observer.

The committee meets formally once per month and is composed of 18-23 volunteer community members with an interest in environmental protection and who are selected based on technical/academic qualifications and municipal representation of the six local municipalities that make up the region. Under the Terms of Reference the goal of the committee is to "advise and assist the Regional Municipality of Halton in the management and conservation of the natural environment in Halton".<sup>14</sup> The committee is "a technical advisory committee

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<sup>12</sup> Regional Municipality of Halton, Ecological and Environmental Advisory Committee, *Environmentally Sensitive Areas Study*, prepared by Geomatics International, 1993.

<sup>13</sup> Regional Municipality of Halton, Ecological and Environmental Advisory Committee, *Environmentally Sensitive Areas Study*, prepared by Geomatics International, 1993.

<sup>14</sup> Regional Municipality of Halton, *Ecological and Environmental Advisory Committee, Terms of Reference*, 1987.

established by Regional Council".<sup>15</sup>

The mandate of EEAC includes:

- reviewing development applications in or adjacent to ESAs;
- recommending and reviewing Environmental Impact Statements;
- monitoring conditions in ESAs;
- examining policy issues affecting the natural environment in the Region;
- increasing public awareness of Halton's natural environment.<sup>16</sup>

EEAC reports to Regional Planning staff, the Planning Commissioner (staff position), the Planning and Public Works Committee of Regional Council (composed of 8 elected regional councillors) and ultimately Regional Council (regionally elected Chair, 20 Councillors and 4 Mayors from municipalities in the Region - Milton, Halton Hills, Burlington and Oakville). On receiving a development proposal in or adjacent to an ESA, regional planning staff forward the proposal to EEAC for review.

EEAC's primary function is review of development proposals in, adjacent or in close proximity to designated ESAs. Development proponents proposing development within ESA boundaries are required to prepared an independent environmental impact assessment (EIA).<sup>17</sup> An environmental assessment may also be required for those development proposals in proximity to ESAs. EIA guidelines in the form of a Terms of Reference have been established by the Region which the

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<sup>15</sup> Ibid.

<sup>16</sup> Regional Municipality of Halton, *Ecological and Environmental Advisory Group Member's Handbook*, I-6.

<sup>17</sup> Regional Municipality of Halton, *Ecological and Environmental Advisory Committee, Environmentally Sensitive Areas Study*, 1978.

proponent of the development must address. Proponents typically hire environmental consultants to prepare the required documentation.

Typically an EEAC subcommittee is established to review the application and any relevant environmental information collected through the EIA. Members of the subcommittee also conduct a site visit to review the proposal, assess the potential impacts of the proposed development on the ESA and indicate more precisely the boundary of the ESA. After reviewing the site and all documentation, the subcommittee reports back to the full committee for endorsement of the written report and recommendations.

EEAC's written comments and recommendations are then forwarded to planning staff and Regional Council. In a typical year, EEAC reviews 15-25 development proposals varying in size and scope. The integration of land and water quality protection under these land use regulations is best illustrated by examining implementation of the rules in the context of a watershed.

Sixteen Mile Creek Valley has been designated as an Environmentally Sensitive Area in the ROP since 1978. As one of 45 ESAs in Halton Region, ESA # 16 (Sixteen Mile Creek Valley) is "protected" in the ROP. It is also provincially designated as a Regionally Significant Life Science ANSI. The land in the watershed is almost totally privately owned except for small portions owned by the Halton Region Conservation Authority and the Ontario Ministry of Government

Services.<sup>18</sup>

In terms of non-point source water pollution management and water quality, the jurisdiction for watershed management is shared between the Regional unit of government, local governments and the Halton Region Conservation Authority (HRCA). The Conservation Authority has recently released a five year plan to protect the natural environment and watersheds in Halton Region.<sup>19</sup> The HRCA's five-year plan does not specifically prioritize water quality management issues in Sixteen Mile Creek.

This in many ways reflects the mandate of HRCA and its current emphasis on the 11 conservation areas in the region covering approximately 3,645 hectares which are owned and managed by the Authority.<sup>20</sup> Although some 62% of HRCA's \$9 million budget goes towards the management of publicly accessible conservation areas and one of these conservation areas is in the Sixteen Mile Creek watershed, the HRCA has not prioritized water quality management.<sup>21</sup>

The HRCA runs several programs in the region related to protecting the natural areas in Halton. In terms of sources of revenue for the HRCA, 60.4% comes from user fees, 21.8% from the area municipalities, 3.2% from the provincial

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<sup>18</sup> Halton Region, *Environmentally Sensitive Area Study*, prepared by Geomatics International, 1993.

<sup>19</sup> Halton Region Conservation Authority, *Inspired By Nature*, January 2000.

<sup>20</sup> Ibid.

<sup>21</sup> Halton Region Conservation Authority, *Focus on Conservation Halton*, January 2000.



government 4% from partnership grants and the remaining 10.6% from “reserve funds”. The agency’s role in watershed management activities is reflected by the small portion of its budget (9%) which is allocated to watershed planning and watershed management.<sup>22</sup> As a result, watershed planning and quality management are primarily the responsibilities of the Regional Municipality of Halton and area municipalities.

In response to development pressures, in the region and Sixteen Mile Creek in particular, the Regional Municipality of Halton undertook a watershed study in the mid 1990s to determine the impacts of different future development scenarios in the watershed. Data for several parameters such as stream flow, suspended solids, fecal coliform, stream temperature, biological oxygen demand (BOD), and dissolved oxygen (DO) levels were collected and analyzed in the watershed study to determine impacts of different development scenarios.

In 1992, the Region funded a monitoring program based on “snapshot sampling” of several water quality parameters<sup>23</sup> during different seasons from nine monitoring stations installed throughout the watershed (see map in Appendix 5-4). The main parameter studied was Dissolved Oxygen (DO) levels. The 1992 data south of Milton (Stations 2 & 4) indicated some improvements from data collected

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<sup>22</sup> Halton Region Conservation Authority, *Annual Report*, 1999.

<sup>23</sup> Snapshot sampling included suspended solids (SS), dissolved solids (TDS, biochemical oxygen demands (BOD), phosphorous (total and soluble), nitrogen (TKN), ammonia, nitrite nitrogen, PH, fecal coliform, heavy metals (copper, iron, lead, zinc, mercury), phenocyl acid herbicides, organochlorine pesticides and PCBs.

in 1973 based on upgrades to the Milton Waste Water Treatment Plant in 1980. However, violations of provincial water quality objectives (PWQO) were documented at Stations 2 & 4, especially during the summer months and the report concluded the “the DO deficiencies in these reaches of the creek are likely attributable to agricultural non-point runoff and from the numerous nurseries and golf courses in the area, contributing to high in-stream nutrient levels”.<sup>24</sup> Several other parameters measured also indicated that Stations 2 & 4 were above provincial guidelines under wet and dry conditions. Station 2 was above the PWQO for fecal coliform under dry conditions and Stations 4 & 5 were well above PWQO for fecal coliform under wet conditions. The data collected were primarily used to forecast impacts in modelling for different development scenarios. Many of the parameters including suspended solids, fecal coliform, dissolved oxygen and BOD levels were at levels of concern under medium and high development scenarios.<sup>25</sup>

Ultimately, the study recommended a sub-watershed approach to water resource management in the watershed. The report also recognized the need for coordination of watershed strategies since the Ministry of Natural Resources, Ministry of Environment, Ministry of Agriculture, The Niagara Escarpment Commission, The Halton Region Conservation Authority, the Regional Municipality of Halton, the Towns of Oakville and Milton, developers and landowners all play

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<sup>24</sup> Regional Municipality of Halton. *Sixteen Mile Creek Watershed Plan*, February 1996:3-61.

<sup>25</sup> Regional Municipality of Halton, *Sixteen Mile Creek Watershed Plan*, February 1996: 4-44.

roles in managing land use, the water resource and protecting water quality. Although the watershed plan does articulate the need to establish and implement “at-source controls” and “runoff management”, the specific implementation strategies are left unspecified.

Land use regulation is the primary tool at the local level used to protect water resources and address NPS water pollution. In the Sixteen Mile Creek case, all development proposals in proximity to the watershed must undergo review by the regional municipality’s Environmental and Ecological Advisory Committee (EEAC). In 1997, of the 16 development proposals reviewed by EEAC, two were specific to ESA # 16.<sup>26</sup> The first was a Club Links 45 hole golf course and the second was a large residential development both partially within the ESA boundary and in close proximity to surface waters.

In both instances, the committee made recommendations to regional planning staff, typically in the form of recommended conditions of approval. Conditions range from technical conditions for types of septic and well systems (using best available technology), to buffers adjacent to watercourses, to planting of specific non-invasive native plant species in landscaping. Typically the committee also recommends all landowners receive a “landowners manual” informing the landowner that their property is in or in close proximity to an ESA, why the lands are designated and, encouraging proper stewardship of the land and water resources. The “sticks” are

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<sup>26</sup> Regional Municipality of Halton, Ecological and Environmental Advisory Committee, *Annual Report*, 1998.

thereby combined with “sermons”.

Measuring the impact of land use regulations in terms of water quality outcomes is very difficult as there is no ongoing monitoring in the Sixteen Mile Creek watershed. The volunteer EEAC committee does cursory prior site visits and assessments but does not have an implementation role. The committee is an advisory committee. The committee does monitor the status of applications in terms of general progress reports, but the committee is not responsible for monitoring developments near watersheds during construction or post-construction phases. Although conditions of approval are often passed on in the approval process, the monitoring and enforcement of those conditions are weak.

In terms of monitoring and enforcement of land use rules, most rules are monitored throughout the development application and review process. Many of the conditions of development outline what management practices the developer must employ throughout construction. In some instances, ongoing reporting and post-development environmental reports are required by the Region’s Planning Department. Developers are often required to re-submit documents outline details of design to regional planning staff. Many of these detailed design reports are then reviewed by the EEAC sub-committee involved with that specific application.

The Region also employs a full-time Environmental Officer who monitors ongoing development sites to ensure compliance with conditions of development approval and issues fines if developers and contractors are in non-compliance. This position also involved an educational role, as the Inspector works closely with

developers and construction companies.<sup>27</sup> Besides this individual, there are no other agencies involved in monitoring to ensure compliance with conditions of development that may negatively effect water quality.

Although combined with land use regulation, private stewardship is an important complimentary approach to management of natural resources in Halton, monitoring and ongoing water quality data collection in Sixteen Mile Creek have not been a priority. Although the provincial government through the Department of Natural Resources introduced a Private Land Stewardship Program in 1994 only a few municipalities have received the \$10,000 and funding for personnel to implement the program. Unfortunately Halton Region has not been successful in securing funding for personnel to launch the program but project funding could be pursued through EEAC or the Planning Department.

### **Resource Allocations**

The provincial Ministry of Municipal Affairs and Housing primarily provides a support role to individual municipalities with regard to land use regulation. Municipalities receive their funding for administration of land use rules from general provincial transfers and the municipal property tax base. Beyond the municipal staff responsible for land use planning functions, the resources allocated to land use regulation and watershed protection are often pooled among different agencies and

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<sup>27</sup> Email Correspondence with M. Rae, Environmental Inspector, Halton Region, November, 1999.

volunteer contributors.

In Halton Region there are no specific resource allocations for non-point source water pollution management or for management and monitoring efforts for Sixteen Mile Creek. Allocations for an Environmental Planner and EEAC are budgeted annually under the Planning and Public Works budget to cover general environmental protection and the implementation of land use regulations. The annual budget allocated for EEAC is approximately \$17,000 of which \$6,000 goes to printing educational materials for landowners and developers, travel and workshop fees for EEAC members. The remainder is allocated to administrative charge-backs for staff time in assisting the committee.<sup>28</sup> In 1995, the Planning Department surveyed EEAC members to determine number of volunteer hours contributed and estimated the value of time volunteered and technical advice at \$150,000 annually.<sup>29</sup>

In addition to the review of development applications by the Region and EEAC, many other agencies are involved in reviewing development proposals depending on the location of the proposed development. Other agencies that may be involved include, the Halton Region Conservation Authority, the Niagara Escarpment Commission, the Region's Health Department, the Ministry of Natural Resources, the Ministry of Environment and on occasion the Department of Fisheries and Oceans. The integration of provincial drinking water quality goals is mainly through

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<sup>28</sup> Email correspondence with K. Kielt, Planning Department, Halton Region. Figures based on 1999 Ecological and Environmental Advisory Committee Annual Report.

<sup>29</sup> Halton Region, Planning Department, estimated in-kind contribution of EEAC members based on survey research conducted by L. Simons, Halton Planning Department, 1995.

the local Health Department's approval of new wells and provincial guidelines related to septic systems in developments not on municipal provision systems.

In the last three to five years there has been a notable decline in the involvement of provincial review as the province has delegated additional responsibilities to the municipalities under the Planning Act. Federal review and involvement is limited to those large scale developments that have potential for negatively impacting fisheries and fisheries habitat.

### **Indicators of Impacts**

Overall, the integration of local land use regulations with provincial surface water quality goals and objectives is weak. Although there is a hierarchy of planning rules and processes, there is very little integration of land use regulations with water quality goals in Ontario. Although there is some evidence of integration at the local level, this varies by watershed. In Halton, at the watershed level, the development review process that is performed by EEAC as a technical advisory committee does take a comprehensive land-water management approach.

The Region's Terms of Reference for environmental impact assessment is very detailed and EEAC provides a review mechanism to ensure these reports typically prepared by environmental consultants include "best management practices". The varied technical expertise on the advisory committee ensures that the work of consultants on behalf of development applicants is accurate, detailed plans are feasible and that conditions of development approval are reflected in those

detailed designs. Ongoing review by planning staff and EEAC ensures details down to the species of non-invasive, native plants used in buffers and berms along watercourses are acceptable. However, under the Provincial Planning Act, the establishment of Environmental Advisory Committees is not a requirement in the official plan process. It is up to each individual municipality to institutionalize a volunteer citizen review process or technical advisory committee.

In terms of evaluating the impact of land use regulations and the review process, there are significant shortcomings in terms of measuring water quality improvements. In the Sixteen Mile Creek watershed there is no ongoing longitudinal collection of water quality data. It is difficult to determine if the efforts of EEAC and land use regulations have been effective in address non-point sources of water pollution. As no data is collected on the number or types of BMPs installed through the conditions of development process, basic output data in terms of number of BMPs installed is also not available. The goal of addressing non-point sources of water pollution are not specifically articulated in land use management rules and implementation processes. These ecosystem protection objectives are however indirectly articulated and addressed through land use management rules.

There is evidence that NPS water pollution prevention is part of the land use regulation rules and implementation process even though these goals are not specifically stated. Land use rules are part of the policy instrument mix at the local level contributing to NPS water pollution management efforts in the Sixteen Mile Creek watershed and other watersheds in Halton Region. Other regions in Ontario



have similar land use rules in place to protect environmentally sensitive areas and watersheds through designations under provincially approved official plans but the implementation and monitoring regimes for those designations varies considerably since there are no review processes or institutional requirements under the provincial Planning Act or Water Resources Act.

**Table 5-1**  
**Summary of Land Use Regulation Policy Instrument Strategy in Halton Region**  
**Ontario & The Sixteen Mile Creek Watershed 1990-1999**

Evaluative Dimensions	Summary
Instrument Design/Approach	<ul style="list-style-type: none"> <li>• no implicit watershed approach</li> <li>• locally designed within provincial framework</li> <li>• predominantly land use policy</li> <li>• no explicit NPS problem definition or goals</li> </ul>
Implementation Agents	<ul style="list-style-type: none"> <li>• local units of government (Regional and local)</li> <li>• inter-agency review (Conservation Authorities, NEC etc.)</li> <li>• no federal involvement (except with Fisheries)</li> <li>• provincial OP approval and appeal role (OMB)</li> </ul>
Stakeholder Involvement	<ul style="list-style-type: none"> <li>• involvement in problem definition (HR Conservation Authority)</li> <li>• implementation managed by local public servants</li> <li>• community volunteer involvement in implementation review</li> </ul>
Resource Allocations	<ul style="list-style-type: none"> <li>• significant local funding of land use regulation</li> <li>• review of rules every five years</li> <li>• significant personnel commitment at local level, but not specific to NPS problems</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• minor resource allocation but not for land use regulation monitoring &amp; enforcement (1 enforcement FTE)</li> <li>• minor role of community committee on site visits</li> <li>• no ongoing WQ monitoring programs</li> </ul>
Reported Effectiveness Outcomes	<ul style="list-style-type: none"> <li>• some information collected on the watershed by Conservation Authority</li> <li>• networks of local and inter-agency partners</li> <li>• public awareness</li> <li>• designation of ESA in watershed</li> </ul>
Reported Ecological Outcomes	<ul style="list-style-type: none"> <li>• no reported progress indicators for the watershed</li> <li>• character of NPS sources still unknown</li> </ul>
Sustainability Potential of PIS	<ul style="list-style-type: none"> <li>• rules institutionalized in land use planning regime</li> <li>• cooperation with Conservation Authority</li> <li>• no specific focus on non-point sources in the watershed</li> </ul>

Overall, the institutional capacity evident in the land use regulation policy instrument strategy in this case is low. As outlined in Table 5-2, although the policy instrument strategy does provide evidence of medium levels of vertical integration as land use regulation rules are linked at the provincial and municipal levels through the official plan process, vertical involvement for the purpose of water quality objectives is low. In addition, this policy instrument strategy indicates the absence of federal government involvement except on the rare occasion where fish species are threatened due to water quality impairments under the federal Fisheries Act.

**Table 5-2**  
**Analysis & Evaluation of the Policy Instrument Strategy**

<b>Institutional Capacity</b>	<b>Rating</b>
Vertical	Low
Horizontal	Low
Stakeholder	Medium
Monitoring & Evaluation	Low
<b>Outcomes</b>	
Effectiveness	Low

In terms of stakeholder capacity, the Sixteen Mile Creek watershed case illustrates the importance of community involvement in protecting water quality through land use regulations. The incentives for stakeholder participation in the collective management and protection of water quality was however limited to those on the technical advisory committee and regional planning staff. The policy

instrument strategy did not include institutional implementation linkages with the other major stakeholder in this case, the Halton Conservation Authority.

The effectiveness rating of low for this policy instrument strategy largely stems from the limited impact land use regulation is seemingly having on the Sixteen Mile Creek watershed. Similar to the US case, it is difficult to determine to what degree the implementation of land use regulations are addressing NPS problems in the watershed. It is evident that a partial explanation for the low effectiveness of the policy instrument strategy can be attributed to the low levels of horizontal institutional capacity. The policy instrument strategy is very medium based. This is reinforced by the lack of horizontal institutional capacity at the local and provincial levels.

The effectiveness of the policy instrument strategy is also affected by the low levels of monitoring and evaluation capacity. Besides the limited data collection on the activities of the Ecological and Environmental Advisory Committee and the water quality data in the Sixteen Mile Creek watershed study, there is no longitudinal data on NPS problems or progress in the watershed.

## **Conclusions**

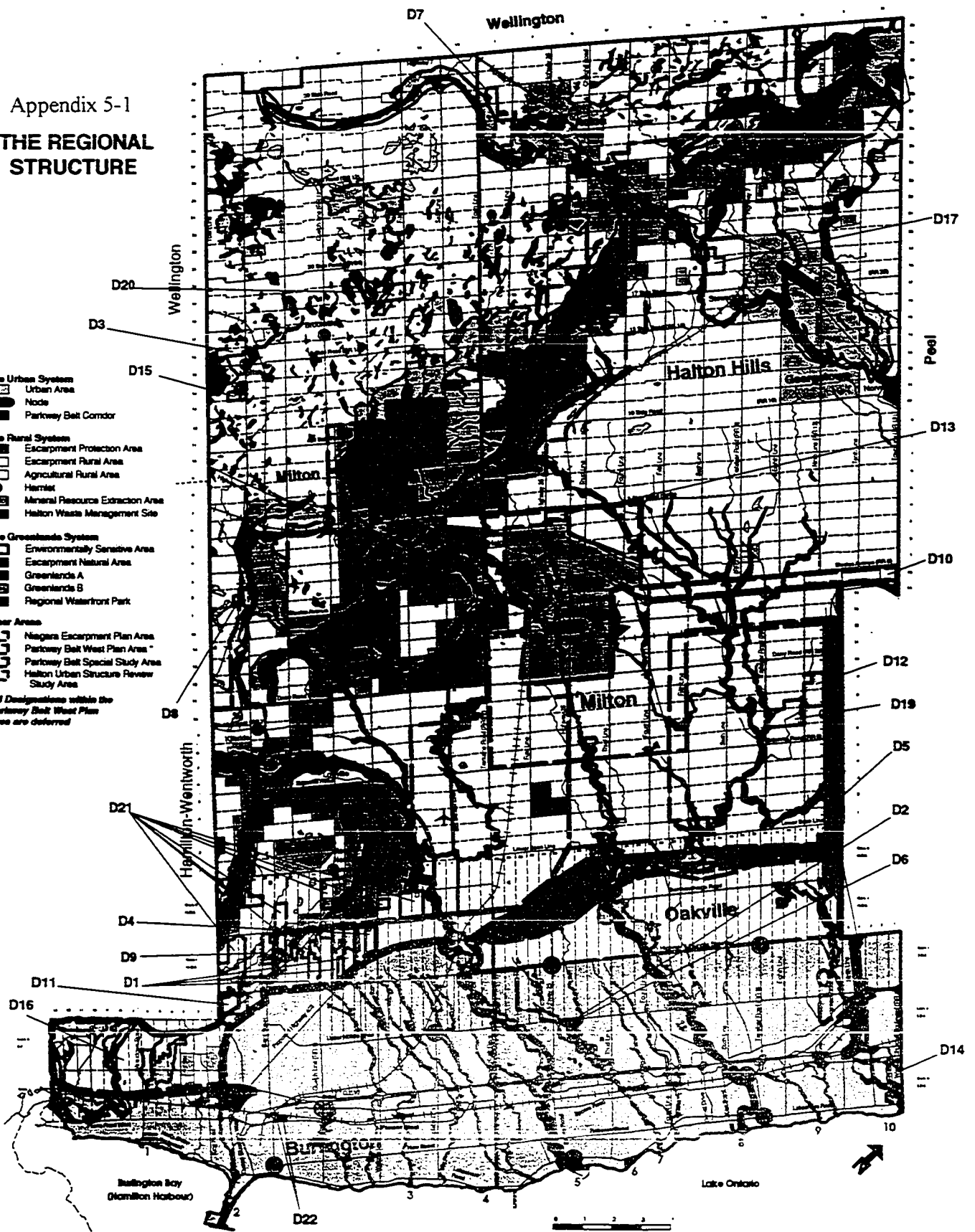
In contrast to the Michigan case, the selection of land use regulation as a policy instrument strategy in Ontario has not been directly related to water quality management goals. The policy instrument strategy has evolved as an indirect tool. Institutional capacity at the federal, provincial and local levels has not facilitated the

choice and development of this policy instrument strategy as an effective NPS management tool. The institutional capacity of the instrument itself is limited by this intergovernmental context. Ultimately this lack of institutional capacity at the macro and operational level does not make this policy instrument strategy the most effective in addressing NPS water pollution problems in the province.

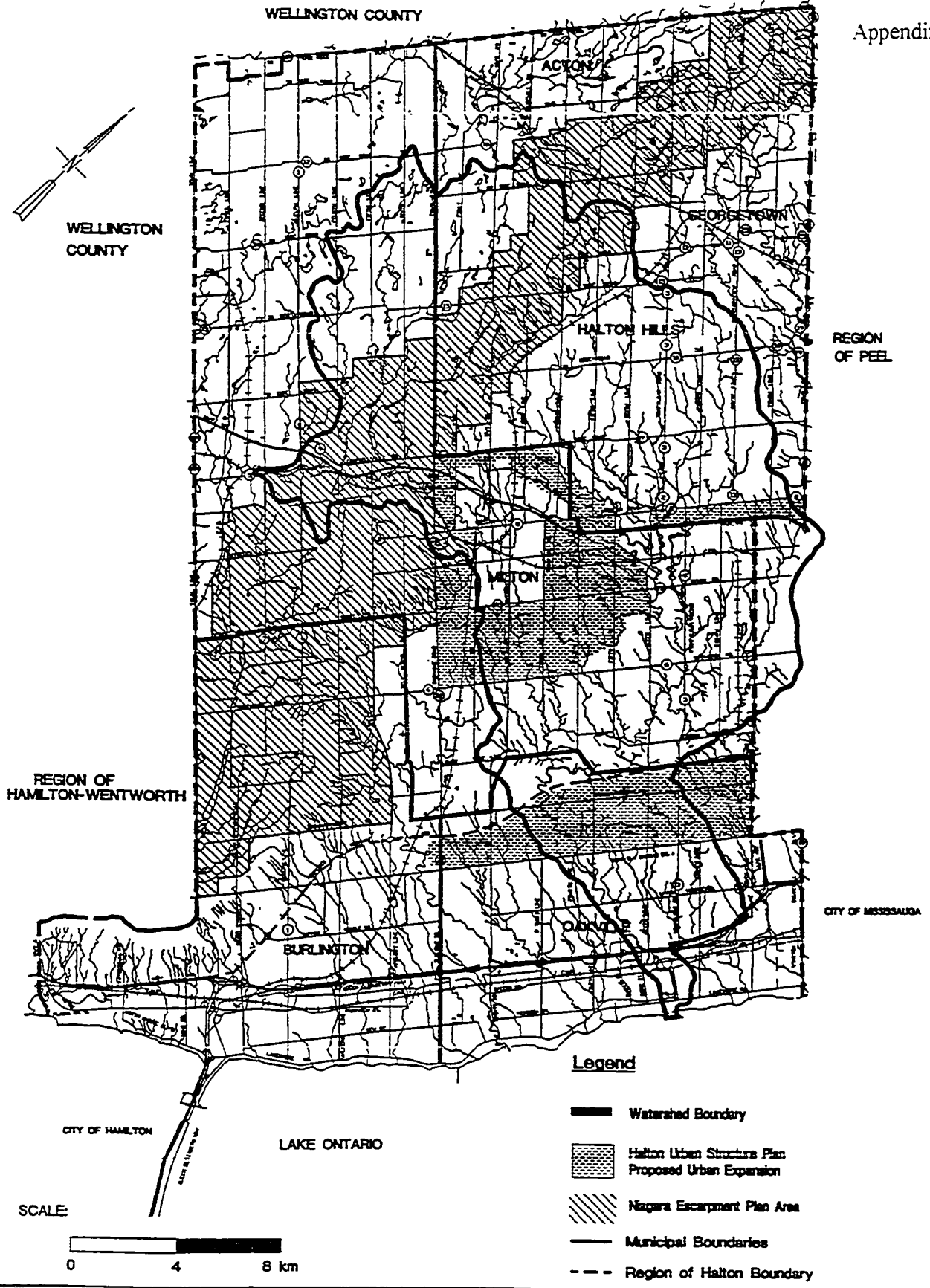
Similar to the Michigan case, the implementation of land use regulation policy instrument strategies to address NPS water pollution in Ontario is not the preferred policy approach. The comparative evaluation of this policy instrument strategy in the context of the analytical framework and core research questions will be further analyzed in Chapter 10. In the next section, two cases are examined to characterize and evaluate the use of subsidy-based policy instrument strategies at the watershed level in the US and Canada.

Appendix 5-1  
**THE REGIONAL  
 STRUCTURE**

- The Urban System**
- Urban Area
  - Node
  - Parkway Belt Corridor
- The Rural System**
- Escarpment Protection Area
  - Escarpment Rural Area
  - Agricultural Rural Area
  - Hamlet
  - Mineral Resource Extraction Area
  - Halton Waste Management Site
- The Greenlands System**
- Environmentally Sensitive Area
  - Escarpment Natural Area
  - Greenlands A
  - Greenlands B
  - Regional Waterfront Park
- Other Areas**
- Niagara Escarpment Plan Area
  - Parkway Belt West Plan Area
  - Parkway Belt Special Study Area
  - Halton Urban Structure Review Study Area
- \* All Designations within the Parkway Belt West Plan Area are deferred*



Source: Regional Municipality of Halton Official Plan, 1995.

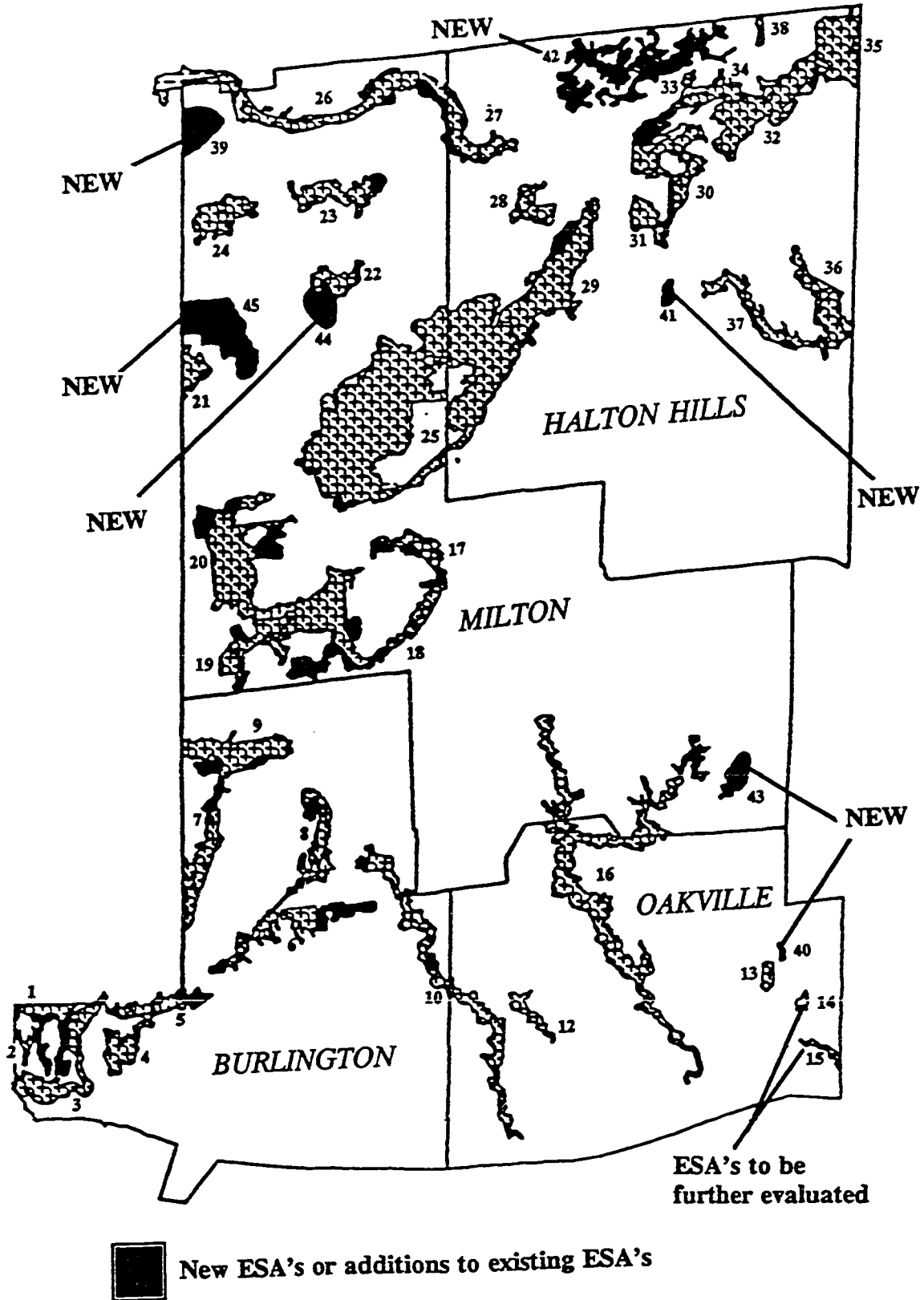


Source:  
**Sixteen Mile Creek  
Watershed Plan**

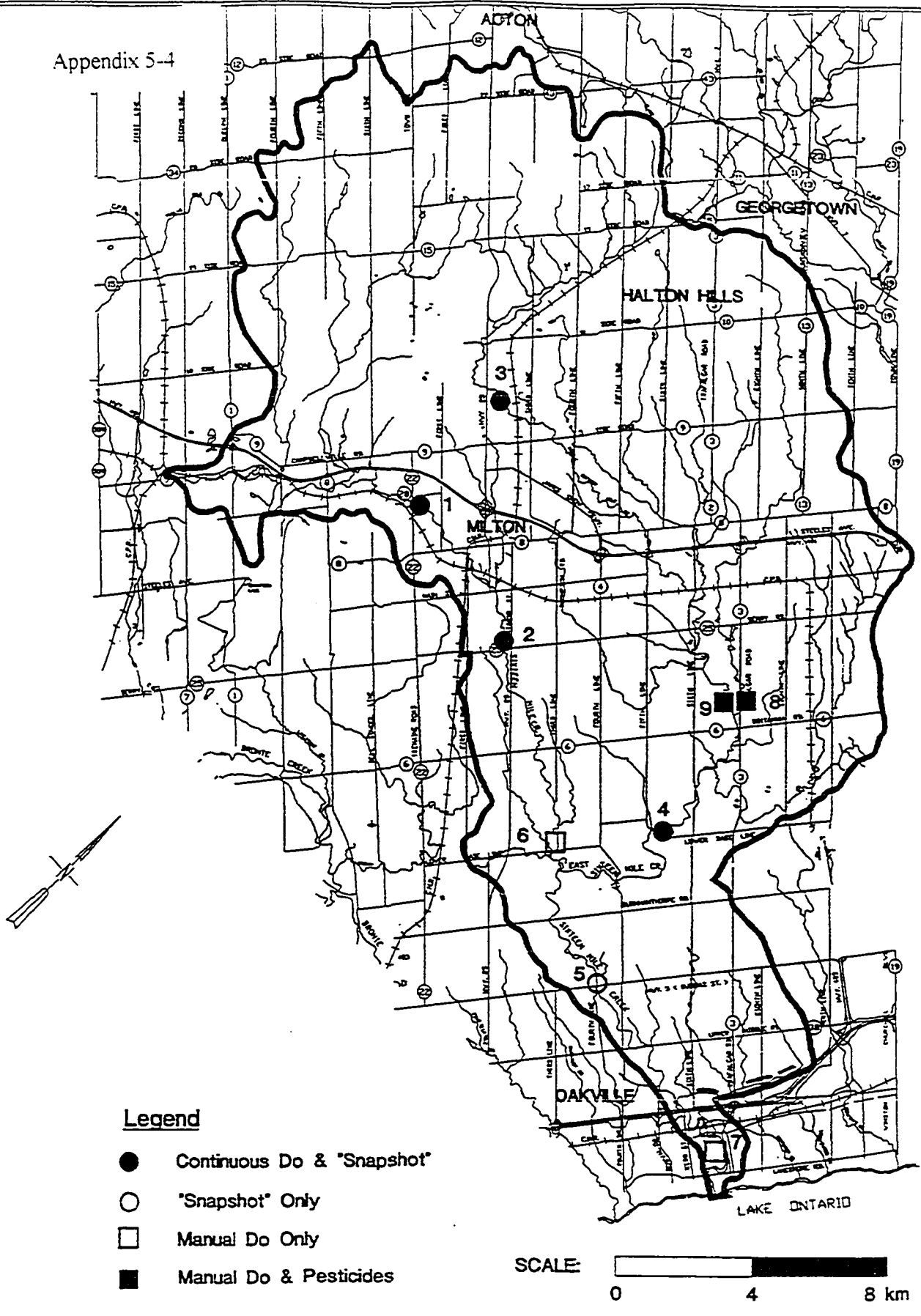
**LOCATION  
PLAN**

FEB 1996

# Environmentally Sensitive Area Study, 1993.







Source:  
**Sixteen Mile Creek  
 Watershed Plan**

**WATER QUALITY  
 MONITORING STATIONS  
 SAMPLED IN 1992**  
 February 1996

Appendix 5-5 Dry Weather Chemical Analysis Results (Means)

Parameter	PWQO or other limit	Station 1	Station 2	Station 3	Station 4	Station 5
SS	-	<3	<3	4	<3	<3
Total NH <sub>3</sub> (unionized)	0.02	0.005	0.01	0.009	0.01	0.006
TKN (as N)	0.5 <sup>1</sup>	0.30	0.41	0.47	0.50	0.43
TP	0.03	0.01	0.03	0.03	0.02	0.01
NO <sub>2</sub> (as N)	0.016 <sup>1</sup>	<0.1	<0.1	<0.1	<0.1	<0.1
NO <sub>3</sub> (as N)	0.5 <sup>1</sup>	0.26	0.33	0.76	0.53	0.60
Cu (µg/l)	5	<0.6	0.7	0.6	0.7	0.9
Pb (µg/l)	25	9	13	11	11	13
Hg (µg/l)	0.2	<0.05	<0.05	<0.05	<0.05	<0.05
Fe	0.3	0.06	0.07	0.27	0.20	0.09
Zn	0.03	0.03	0.03	0.02	0.03	0.03
FC (no/dl) <sup>2</sup>	100	9	24	36	24	14
BOD	6 <sup>3</sup>	<3	<3	<3	<3	<3

Wet Weather Chemical Analysis Results (Means)

Parameter	PWQO or other limit	Station 1	Station 2	Station 3	Station 4	Station 5
SS	-	5	59	91	30	320
Total NH <sub>3</sub> (unionized)	0.02	N/A	N/A	0.007	N/A	N/A
TKN (as N)	0.5 <sup>1</sup>	N/A	N/A	0.48	N/A	N/A
TP	0.03	N/A	N/A	0.05	N/A	N/A
NO <sub>2</sub> (as N)	0.016 <sup>1</sup>	N/A	N/A	<0.1	N/A	N/A
NO <sub>3</sub> (as N)	0.5 <sup>1</sup>	N/A	N/A	0.69	N/A	N/A
Cu (µg/l)	5	N/A	N/A	<0.6	N/A	N/A
Pb (µg/l)	25	N/A	N/A	<0.8	N/A	N/A
Hg (µg/l)	0.2	N/A	N/A	<0.05	N/A	N/A
Fe	0.3	N/A	N/A	0.81	N/A	N/A
Zn	0.03	N/A	N/A	0.06	N/A	N/A
FC (no/dl) <sup>2</sup>	100	<4	76	71	204	108
BOD	6 <sup>3</sup>	<3	3	<3	5	6

Notes: All units in mg/l unless otherwise noted.

Shaded cells indicate measured values at or greater than PWQOs.

<sup>1</sup> Derived from MOE "Water Quality Data for Ontario Lakes and Streams - 1983", March 1989.

<sup>2</sup> Means for fecal coliforms are geometric.

<sup>3</sup> Stream "slightly polluted" at BOD of 6 mg/l or greater (Prati's classification system).

Source: Sixteen Mile Creek Watershed Report, 1996.

## SECTION III

### Subsidy-based Policy Instrument Strategies

## **Chapter Six**

### **Subsidy-based Policy Instrument Strategies Wisconsin & The Cedar Creek Watershed Case**

#### **Introduction**

Although land use regulation is one of the most traditional tools available to address the negative impacts of land use on water quality, it is not necessarily the most popular instrument selected and implemented by policymakers. In this chapter, a case study in the State of Wisconsin will be used to examine the use of subsidy-based policy instrument strategies in the US. Wisconsin has been selected based on its long term experience implementing this type of policy instrument strategy at the watershed level and because of its reputation as a model for this implementation strategy nationally. The watershed level analysis will focus on Cedar Creek Watershed, a watershed in the larger Milwaukee River Basin. Cedar Creek is one of 87 watershed projects that have been implementing subsidy-based policy instrument strategies under the federal Sec. 319 and the state's NPS Water Pollution Program (see watershed 84-8 in Appendix 6-1).

### **Subsidy-based Best Management Practices (BMPs) at the State Level: The Wisconsin Case**

As outlined in Chapter 3, prior to the federal legislation in the 1970s most land-use and water related policies were the domain of state and local governments. Initially, NPS pollution management was largely left to individual states with little federal government involvement. Although in many states, the federal NPS Management Program under Sec.319 of the Clean Water Act established the framework and financial assistance for the implementation of NPS programs, a few states did have legislation and non-point source initiatives underway before federal NPS Management Program was initiated.<sup>1</sup> As early as 1978, policy makers in Wisconsin identified the need to address NPS water pollution problems.

Wisconsin established its own Non-point Source Pollution Abatement Program under Section 144.25 of Wisconsin Statutes in 1978. The stated purposes of the program were to:

- 1) provide the necessary framework and financial assistance for the implementation of measures to meet non-point source pollution abatement needs identified in area-wide water quality management plans;
- 2) provide coordination with all elements of the state's water quality programs;
- 3) provide technical and financial assistance for the application of necessary non-point source pollution abatement measures;

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<sup>1</sup> Wisconsin had established its own Non-point Source Pollution Abatement Program also referred to as the "priority watershed program" based on a watershed pollution abatement approach in 1978.

- 4) focus limited financial and technical resources in critical geographic locations through the selection of priority watershed where non-point source related water quality problems are the most severe and where control is feasible.<sup>2</sup>

Beginning in 1979, the program was implemented by providing grants to individual landowners and communities to subsidize the cost of installing pollution control practices called “best management practices” in watersheds. Best Management Practices (BMPs) are defined in Wisconsin statute as:

“Practices, techniques or measures identified in areawide water quality management plans, which are determined to be the most cost effective means of preventing or reducing pollutants generated from non-point sources to a level compatible with water quality objectives and which do not have an adverse impact on fish and wildlife habitat”.<sup>3</sup>

These measures are typically structural measures such as construction or relocation of manure storage structures, stream bank erosion measures, livestock fencing, alternative crop and tillage methods, water detention basins, fertilizer and pesticide storage structures.

The NPS Pollution Abatement Program implementation is the responsibility of the Department of Natural Resources (DNR). The DNR is accountable to a seven member, Governor-appointed Natural Resources Board. The Board was established in 1966 and has legal authority to set agency policy and recommend regulations for

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<sup>2</sup> Ibid: p.3.

<sup>3</sup> Wisconsin Statute Section 144.25 (2)

legislative approval.<sup>4</sup>

The administration of the NPS Program is more specifically the responsibility of the Land and Water Conservation Board (LWCB). The Land Conservation Board, established by Wisconsin statute in 1977 was initially the board responsible for the Farmland Preservation Program and accountable to the Department of Agriculture, Trade and Consumer Protection (DATCP). In 1981 its responsibilities were expanded to include soil and water management programs, its name changed to the Land and Water Conservation Board, two new governor-appointed members were added and accountability was extended to the DNR. In 1993 through Wisconsin Act 16, the LWCB was given responsibility for the NPS Program.<sup>5</sup>

Identification of priority watersheds has been the major vehicle for implementing the program. The DNR's priority watershed approach fit into the broader mandate of the department to develop and update water quality management plans (called Basin Plans) for 19 large basins in the state every five years.<sup>6</sup> The assessment of non-point sources was added to this mandate and the non-point source needs were then ranked (high, medium and low) within each basin to prioritize

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<sup>4</sup> Wisconsin Department of Natural Resources, Natural Resources Board (<http://www.dnr.state.wi.us/org/nrbaod>)

<sup>5</sup> Email correspondence with Non-point Source Education Coordinator, Bureau of Watershed Management, Wisconsin Department of Natural Resources, October 23, 1999.

<sup>6</sup> Wisconsin, Department of Natural Resources, *Non-Point Source Management Report*, 1988: 11.

implementation in the Non-Point Source Priority Watershed Program.

The program originally started as a rural program and then expanded into an urban program. Urban grant recipients are primarily municipal governments who in turn may work with local groups and developers to implement BMPs. Rural grant recipients are typically Land Conservation Districts (LCDs) who in turn sign cost-share agreements (CSAs) with land owners.

Although DNR and local units of government had the initial responsibility for implementing the program, several complimentary rural initiatives were also being implemented by the DATCP to address soil erosion problems, animal waste management and pesticide use and control in many watersheds. In 1986, the state also signed a Memorandum of Understanding (MOU) with the University of Wisconsin Extension. The MOU defines a cooperative education and research relationship between the University of Wisconsin, DNR and DATCP. These two state departments also had a MOU with the United States Department of Agriculture, Soil Conservation Service (SCS) which clarifies the role of the SCS in assisting County Land Conservation Departments in implementing the projects and outlines the joint SCS and DNR/DATCP activities.

In 1987 the Wisconsin legislature revised state statutes to provide for better coordination between DNR and DATCP programs. Both departments were required to develop a single application package for non-point source projects and work collaboratively on implementation. From the start the relationship between the



departments created challenges for an integrated approach to implementing the NPS program. “Tension existed between the two agencies because they have different missions... relations have improved but there are still issues to be resolved... some competition for power, resources and staff still exists”.<sup>7</sup> Although the two departments have had to work collaboratively in implementing the NPS Program, the DNR has remained the lead agency.

Ten years after the program had been initiated, another amendment, Wisconsin Act 297, created the authority of the DNR to order or cause the abatement of certain non-point sources of water pollution.<sup>8</sup> Until this time, the NPS program was totally voluntary except in cases where there could be a demonstrated nuisance (typically someone downstream could demonstrate loss because of upstream pollution). The burden of proof however was very challenging. This amendment gave the DNR the authority to issue an order in those cases where a responsible party for a non-point source of water pollution could be identified. The notice included the date by which the pollution had to be mitigated. Although this was made an available tool, “the NPS order could be used but was very rarely used”.<sup>9</sup>

In order to meet the new federal assessment and reporting requirements under

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<sup>7</sup> Personal interview with NPS Project Implementation Coordinator, Wisconsin Department of Natural Resources, Madison, Wisconsin, August 24, 1998.

<sup>8</sup> Wisconsin, Department of Natural Resources, *Non-Point Source Management Report*, 1988: 10

<sup>9</sup> Personal interview with NPS Project Implementation Coordinator, Wisconsin Department of Natural Resources, Madison, Wisconsin, August 24, 1998.

Sec. 319, Wisconsin submitted a Non-Point Source Management Report highlighting its current initiatives and outstanding NPS problems. At the time of the report, it was evident that several monitoring and evaluation needs were important to move the program forward. The report identified the need to evaluate the effectiveness of BMP projects and evaluate “the institutional approaches used in the Wisconsin Non-point Source Abatement Program”.<sup>10</sup>

“The Wisconsin Non-Point Source Pollution Abatement Program was established in part to determine if voluntary approaches to non-point source pollution control are effective when cost-sharing and technical assistance funding is not limiting. An evaluation of other approaches is needed... both the viability of cost-sharing as an incentive for BMP installation and the appropriateness of the practices being promoted need to be evaluated. An evaluation needs to be undertaken to determine if the BMPs installed will remain in place or if it is probable that more long term measures such as conservation easements, land purchase and leases may provide longer term water resource improvements and protection, be more cost effective and provide additional environmental benefits”.<sup>11</sup>

The 1988 Management Report highlighted several challenges the program was trying to overcome. In addition to being a ten year progress report, the document also fulfilled the federal assessment and reporting requirements to be eligible for Sec.319 program funding. This was not a difficult requirement to attain as the federal program was said to be modelled after Wisconsin’s program. “In my mind Wisconsin has taken a leadership role in the NPS and groundwater areas... what has

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<sup>10</sup> Wisconsin, Department of Natural Resources, *Non-Point Source Management Report* , 1988: 40-68.

<sup>11</sup> Ibid. p.61

happened at the national level has been modelled after what has been done in Wisconsin".<sup>12</sup> Sec. 319 legislation and funding therefore became supplementary to Wisconsin's own budget allocations. "We have primarily used Sec.319 funds to implement our state program ... we complied with Sec. 319 regulations but we did not restructure our state program".<sup>13</sup> Funding has primarily been used to support state staff and to top up BMP implementation. In 1988, the Wisconsin Department of Natural Resources was designated the lead agency for implementation of the federal Sec.319 Program.

### **Recent Developments: Program Re-Design**

After twenty years of implementation across the state, the program was targeted for a major review. The re-design initiative started in 1996 and gained momentum when Wisconsin Act 27 was passed in October 1997 and added to Chapter 281 of the Wisconsin Statutes. "New legislation was the result of concerns from legislators and those the program impacted that there was a lot of money being allocated with some uncertainty about how the program would continue to grow... there was some political pressure about the distribution of the funding in the state...

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<sup>12</sup> Personal interview with Director, Runoff Management Section, Department of Natural Resources, Madison, Wisconsin, August 25, 1998.

<sup>13</sup> Personal interview with Senior Water Resources Specialist, Runoff Management Section, Department of Natural Resources, Madison Wisconsin, August 25, 1998.

this is one of the most politically scrutinized programs in the state”.<sup>14</sup> “This review has been building for some time”.<sup>15</sup>

“There was also a perception... that different agencies were operating different portions of the program... they had different responsibilities... there was some pressure to ensure more consistency in how they approached programs and regulations ... and there was disagreement between the agencies on how things were to be handled ... so the purpose of the legislation was to direct the agencies work together to determine how the program was going to move forward.

We are in the processes of redefining the program based on a set budget. This was also to address a significant cash flow problem with the program. We have agreements that have been signed with landowners and municipalities that we simply do not have the money to cover. Several agreements are thus on hold. The program became so successful that we have more agreements than we can fund...so now we have to come up with a plan to decide which projects should move forward. In addition, the legislation set up a \$2 million per year fund for new project selection based on different scoring criteria ... more emphasis on remediation and monitoring... more short term projects. Eventually I think the emphasis will shift to these smaller projects.<sup>16</sup>

This new legislation required the DNR and DATCP to develop or modify existing programs and administrative rules related to non-point sources of water pollution and soil and water resource management. The NPS program was to be redesigned based on several guiding principles including: greater emphasis on local government

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<sup>14</sup> Personal interview with Director, Runoff Management Section, Department of Natural Resources, Madison, Wisconsin, August 25, 1998

<sup>15</sup> Personal interview with Senior Water Resources Specialist, Runoff Management Section, Department of Natural Resources, Madison Wisconsin, August 25, 1998.

<sup>16</sup> Personal interview with Acting Section Chief, Runoff Management Section, Department of Natural Resources, Madison, Wisconsin, August 25, 1998.

delivery; management of the program within anticipated budgets using cost-effective measures; shifting fund allocations from watershed projects to a basin-wide approach; and provide landowners outside of watershed projects similar opportunities to participate.<sup>17</sup>

In addition to the legislative requirement for DNR to work on re-designing the NPS Program, the DNR itself was undergoing an internal structural re-organization. The Stormwater Management Program and the Animal Waste Program (both more regulatory in character) were combined with the NPS Program into the new Runoff Management Section which is part of the Watershed Management Bureau in the Water Division of the Department of Natural Resources.<sup>18</sup> “We are going through a structural re-organization but we have also received a clear message from the Wisconsin legislature to look at re-structuring the NPS program specifically. So integration is going on at two levels”.<sup>19</sup>

It was anticipated that this redesign would take approximately 18 months and would be an open consultative review process involving all the program stakeholders.

“Six or seven years ago the members of the Land and Water Conservation Board were given significant authority over policy making related to this program. So what you now have is this appointed board ... most importantly,

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<sup>17</sup> Wisconsin Outreach Advisory Committee, *Non Point Source Program Redesign Initiative: Summary of Work Group Recommendations*, Draft, June 10, 1999.

<sup>18</sup> Wisconsin Department of Natural Resources, Organizational Chart 1999 (<http://www.dnr.state.wi.us/aboutdnr/orgchart.html>)

<sup>19</sup> Personal interview with Director, Runoff Management Section, Department of Natural Resources, Madison, Wisconsin, August 25, 1998.

policy making has to go before this board ...so, consequently it becomes very visible and politicized.<sup>20</sup>

Members of the LWCB are drawn from the DNR and DATCP and 3-4 are appointed by the Governor. The Board meets once per month and functions as a policy setting and funding approval board for the NPS and other land and water resource management programs.<sup>21</sup> “They are primarily an agriculturally oriented board... most of their members come from agricultural backgrounds...there is one urban member but repeated attempts to add more urban representatives have been fought ...by the agricultural interests... in a sense they are probably not the best vehicle for managing this program which is supposed to be both urban and rural”.<sup>22</sup>

The Board approves most major funding initiatives for the NPS program. They do not have law making or administrative rule making authority but have approval authority. The program re-design will also be approved by the Natural Resources Board and the Agriculture Board which are appointed by the governor. These Boards approve all actions taken by their departments.<sup>23</sup> It is anticipated that “under the program re-design the LCWB will have more authority in approving

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<sup>20</sup> Personal interview with Senior Water Resources Specialist, Department of Natural Resources, Madison Wisconsin, August 25, 1998.

<sup>21</sup> Email correspondence with NPS Education Coordinator, Watershed Management Bureau, Department of Natural Resources, October 23, 1999.

<sup>22</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, Madison Wisconsin, August 24, 1998.

<sup>23</sup> Ibid.

projects and funding ...these boards are sometimes hurdles. They ask a lot of questions ... they are definitely not a rubber stamp".<sup>24</sup>

In order to begin the process of program re-design, the secretaries of DNR and DATCP appointed an Outreach Advisory Committee (OAC) to assist the departments with the re-design process. The committee has been meeting every 6 weeks since June 1998. The 22 member committee consists of county representatives, representatives of various state associations such as the Builders Association, the River Alliance, the Land and Water Conservation Association, the Farm Bureau Association, the Manufactures and Commerce Association, the Towns Association, Pork Producers, the Municipal Environmental Group, and representatives from the Departments of Transport and Commerce. The committee is co-chaired by the Directors of Water Resource Management from DNR and DATCP.<sup>25</sup>

Six working groups consisting largely of state agency staff from DNR and DATCP and a representative from University of Wisconsin Extension developed basic recommendations for implementing the state statutes.<sup>26</sup> The draft report was recently forwarded to the Outreach Advisory Committee for review and public

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<sup>24</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, Madison, Wisconsin, August 24, 1998.

<sup>25</sup> Ibid. Non-point Source Program Re-Design, p. 9

<sup>26</sup> Email correspondence with Implementation Coordinator, Runoff Management Section, Wisconsin Department of Natural Resources, July 1999.

hearings. After revisions are made, the OAC will ultimately report to the three state boards: the Agriculture, Trade and Consumer Protection Board, the Natural Resources Board and the Land and Water Conservation Board. It is anticipated that the program re-design will receive final review and approval by the Boards in February 2000.

In terms of the program re-design, the most significant statutory directives under Act 27 were those concerning the establishment of performance standards. The statute requires that performance standards, both agricultural and non-agricultural, be designed to limit non-point source water pollution in such a way that water quality standards are achieved. Although the term water quality standards is not specifically defined in Wisconsin statutes, they are established for surface water by the DNR. "Surface water quality standards describe only the quality of water and are not directly related to a source... water quality standards define goals for specific water bodies and consist of three components: 1) designated uses; 2) criteria; and 3) anti-degradation".<sup>27</sup> Designated uses are present and future uses of a water body, criteria are maximum or minimum conditions necessary to ensure a given designated use and anti-degradation requirements ensures that existing protect the waterbodies which currently meet all designated uses.

These performance standards are regulatory in character and are being

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<sup>27</sup> Wisconsin. Department of Natural Resources, *Non-point Source Program Re-Design Initiative: Summary of Working Group Recommendations*, June 1999.



developed for specific basins, watersheds and even sub-watersheds in Wisconsin.

“The legislation... Act 27 ... also directed DNR and DATCP to work together to develop performance standards ... some movement to simplify measures and allow greater control at the local level... independent of a full blown priority watershed project. The performance standards are enforceable... I don't think that has been worked out as to who is going to do that but when you look at the regulatory climate of the state, to me this is a significant policy shift, rather than leaving everything voluntary. Existing critical site rules are primarily done through state orders ...possibly the local unit of government would play some regulatory or enforcement role. We have recently developed a model stormwater ordinance (to be adopted and or modified by local governments). Because the regulatory authority lies with the local level of government the state just provides a sample.”<sup>28</sup>

“Some of the recommendations in the draft report are quite controversial depending on who you talk to. We are shifting away from a largely voluntary watershed-targeted approach to a two-tiered approach. The first tier will consist of a series of uniform, statewide minimum performance standards for both agricultural and non-agricultural non-point sources. Implementation of these standards is mandatory for all landowners in the state and cost sharing is available. Where implementation of these standards will not result in the attainment of water quality standards for a given watershed, the second tier will come into play. This will involve the establishment of more stringent, targeted performance standards within specific watersheds.”<sup>29</sup>

It is clear that the NPS Program in Wisconsin will take on a more regulatory flavour.

A series of performance standards have been developed and are currently being reviewed. For each practice a standard has been developed, the impact assessed, a rationale provided, a responsible party identified, a way of achieving the standard

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<sup>28</sup> Personal interview with Senior Water Resources Specialist, Runoff Management Section, Department of Natural Resources, Madison Wisconsin, August 25, 1998.

<sup>29</sup> Email correspondence with NPS Implementation Coordinator, Runoff Management Section, Wisconsin Department of Natural Resources, July 1999.

identified, and a way to measure the impact identified. There is also an emphasis that all subsequent implementation projects be based on the most cost effective solutions. "Cost-effectiveness measures" have been defined as those that achieve the necessary level of protection for the least public expenditure and one that is practical to install and manage".<sup>30</sup>

The final program re-design document is scheduled to be finalized and approved in September 1999. The result will be a significant shift in the program and ultimately changes to the operational level rules in the department's NPS regulation - Natural Resources 120 (NR-120). It is anticipated that the state will be providing a base level of funding to counties for implementation of the new standards.<sup>31</sup>

### **Future Directions at the State Level**

The current program re-design in Wisconsin is not being undertaken in isolation. Policy makers have a watchful eye on developments at the federal level.

"Interestingly I see a shift ... some of this is stemming from the federal TMDL requirements under Sec. 303 (d) of the Clean Water Act pressuring the states for action. A TMDL is an accounting of a particular pollutant that a specific stream can handle from all sources (point, non-point, in situ, sediments etc.) that a watercourse can handle and still meet designated uses."<sup>32</sup>

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<sup>30</sup> Wisconsin. Department of Natural Resources, *Non-point Source Program Re-Design Initiative: Summary of Working Group Recommendations*, June 1999:18.

<sup>31</sup> Email correspondence with NPS Implementation Coordinator, Runoff Management Section, Wisconsin Department of Natural Resources, July 1999.

<sup>32</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, August 24, 1998.

“States are required to develop TMDLs for all streams and creeks not meeting designated uses... this is a lot of work...a lot of states... have come to the realization... through law suits primarily... that TMDLs are really the future of water pollution management. This will integrate programs and resources... moves towards large data requirements... a lot of monitoring and allocation of responsibility that raises a whole lot of legal issues. It is not an easy route... but there is discussion that TMDLs will drive future efforts. That will be a shift we will see over the next 5 to 10 years. Wisconsin has been behind the game in terms in TMDLs. Many states such as Oregon and California are ahead of the game and many are using consultants in this area. There is a perception that we are leaders but it is hard for people here to admit we are behind the game in this area... we also haven't had any legal activity related to TMDLs... we don't have that kind of environmental activism here... pushing for implementation of TMDLs.<sup>33</sup>

“There has been some move towards regulatory approaches in some programs...I think this will tie into our program in the future through the TMDL Sec. 303(d). This is all currently being discussed... there are local ordinances that can be put in place...if the state says they are mandatory then some form of funding will have to be allocated ... we might see some movement in that direction... we are in a major transition stage right now”.<sup>34</sup>

Federal funding under the Clean Water Action Plan may have a positive impact. “Federal funding is a small portion of what we do in Wisconsin however it certainly assists us... we have a program integration situation that we are working on, if our federal program funding doubles [under the Clean Water Action Plan] that would certainly help us out”.<sup>35</sup> “We get 2.7 million in fiscal year '98 for 319

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<sup>33</sup> Ibid.

<sup>34</sup> Personal interview with Director, Runoff Management Section, Department of Natural Resources, Madison, Wisconsin, August 25, 1998.

<sup>35</sup> Personal interview with Water Resources Specialist , Runoff Management Section, Wisconsin Department of Natural Resources, August 25, 1998.

...potentially this may double. The current state allocation is approximately \$38 million over two years for the NPS program. About a little under half is spent on staff... including local staff.”<sup>36</sup> In fact, in 1999 and fiscal year 2000, Wisconsin’s federal allocation under Sec. 319 and the Clean Water Action Plan increased to \$5.1 million per year.<sup>37</sup>

The program re-design will result in a different approach to NPS priority watersheds in the future. Larger projects are being replaced by smaller “Targeted Runoff Management (TRM) Projects”. TRM projects are subsidy-based BMP projects that can focus on areas such as watersheds, sub-watersheds or specific sites such as a stream segment. They will be funded for shorter periods (three years rather than eight or more under the present NPS Abatement Program).<sup>38</sup>

### **Policy Instrument Strategy at the Watershed Level: The Cedar Creek Watershed, Wisconsin**

In 1984, the Cedar Creek Watershed was included in a directive of the Wisconsin Legislature which identified five watersheds in the Milwaukee River Basin as priority areas for non-point source pollution control. These five new priority watersheds were added to the list of 17 priority watersheds designated from 1978-

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<sup>36</sup> Ibid.

<sup>37</sup> US, EPA, Office of Water, *Supplemental Guidance for the Award of Section 319 Non point Source Grants, Attachment A* (<http://www.epa.gov/owow/nps/Section319/fy2000.html>)

<sup>38</sup> Wisconsin, Department of Natural Resources, Runoff Management Section, Press Release (<http://www.dnr.state.wi.us/org/water/wm/nps/grants/index.html>)

1983. Although the Cedar Creek watershed was designated as a priority watershed, it wasn't until the early 1990s that the watershed planning process began for this watershed.

Cedar Creek Watershed is a 126 square mile drainage basin located in southeastern Wisconsin. Cedar Creek is part of the larger Milwaukee River basin. The watershed lies in 2 counties, 10 townships, 3 villages and 2 cities. Approximately 72% of the watershed is located in Washington County and 28% lies in Ozaukee County (see Appendix 6-2).<sup>39</sup>

In 1985, close to 87% of the land use in the watershed was rural. Agricultural lands and wetlands are the dominant rural land use making up 64 % and 16% of the watershed land use respectively.<sup>40</sup> Urban land use covered approximately 13% of the watershed (residential land use approximately 9% and transportation 6% and industrial/commercial 1%). Surface water makes up 2.4% of the total land use in the watershed and woodlands approximately 5%.<sup>41</sup>

In 1985 the population relying on the watershed for a variety of uses totalled 27,000. In 1993, it was estimated that the population would increase to 35,000 by the year 2010. The two most populous cities in the watershed are Cedarburg and

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<sup>39</sup> Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993: 2.

<sup>40</sup> Ibid.

<sup>41</sup> Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993: 6.

Jackson. The proximity of the Cedar Creek watershed to metropolitan Milwaukee is a factor in the projection that urban land uses in the watershed will increase by 45% from 1993 to the year 2000.<sup>42</sup>

### **Character of the NPS Water Pollution Problems in Cedar Creek**

In terms of water quality, Cedar Creek and most of its tributaries are only partially meeting their biological use potentials. The most pervasive and serious impacts on the streams comprising the watershed is physical habitat loss due to sediment loadings, degraded streambanks, overgrazing of livestock and development. Most of the surface waters are contaminated with bacteria levels that violate full-body contact recreational use standards. As of 1993, there had been no water quality monitoring conducted on Cedar Creek or its stream tributaries to determine the extent to which urban runoff has affected the quality of sediments, surface waters or biota.<sup>43</sup> However, data collection by the Washington and Ozaukee County Land Conservation Departments indicates the sources of NPS are primarily rural. Eroding agricultural lands is a primary concern. Agricultural lands in the watershed deliver an estimated 11,600 tons of sediment to surface waters each year most coming from croplands.

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<sup>42</sup> Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993: 31

<sup>43</sup> Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993: 4.

This is estimated to be 80% of the total watershed sediment load.<sup>44</sup>

Other major NPS problems in the Cedar Creek watershed include:

#### **RURAL**

- barnyard runoff (of 136 barnyards evaluated, 97 drain to surface waters);
- manure use (estimated 119 livestock operations spread manure in the watershed, over approximately 2500 acres);
- eroding streambanks (numerous sites found to be eroding and subject to unrestricted grazing);
- fertilizer and pesticide use and storage.

#### **URBAN**

- stormwater overflows;
- development (construction erosion);
- surface runoff (accelerated by paved roads, residential fertilizer and pesticide use);

In addition to non-point sources there are 11 point sources that receive discharge permits for Cedar Creek. Two of these are public sewage treatment plants that discharge effluent to the creek. Both are secondary treatment facilities that service 60% of the population in the watershed, the remaining 40% are serviced by private, on-site waste disposal systems and wells.<sup>45</sup>

The Cedar Creek Plan was completed under the Wisconsin NPS Pollution Abatement Program in 1993 with a targeted completion date of 2000. The Plan was developed by the state DNR and DATCP departments, the Washington and Ozaukee

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<sup>44</sup> Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993:5.

<sup>45</sup> Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993: 33

County Land Conservation Departments, the Cedar Creek Advisory Subcommittee and a technical working group.

The Cedar Creek Plan established pollutant reduction goals from the outset.

The *rural* pollutant reduction goals for the watershed were to:

- reduce sediment delivered to the surface waters by 50-75%;
- reduce nutrient loadings to surface waters from animal waste sources and erosion by 60%;
- significantly reduce bacterial contamination of surface waters from animal waste sources;
- significantly improve degraded shorelines by restricting cattle access.

The *urban* pollutant reduction goals were to:

- reduce pollutant loadings (sediment & nutrients) from uncontrolled construction sites in development areas;
- reduce mass loading of urban stormwater pollutants to 50% of 1985 levels;
- reduce stormwater overflow contamination through source area control measures in all urban areas.<sup>46</sup>

The Watershed Plan then detailed recommended management actions at an estimated cost of \$9.1 million of which 37% (\$3.4 million) was tagged for rural NPS implementation and 63% (\$5.7) for urban BMP measures. The State's estimated share was \$5.8 million (including Sec.319 allocations), the local share \$3 million and the landowner share the remainder.<sup>47</sup> The state and local shares would be negotiated

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<sup>46</sup> Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993: 7-8.

<sup>47</sup> Ibid: p.12-13. The State's estimated share for the rural components of the program was projected to be \$2.5 m or 74% and \$3.3 m or 50% of urban NPS for the first four years of the program. Funds for years 4-8 would be in addition to those projected here. The estimates vary depending on the landowner participation rate (p.149-154).



on a project by project basis. These estimates included an estimated 2-3 additional staff positions in Washington County and an estimated 1-2 additional staff positions in Ozaukee County for implementation but do not include allocations for state personnel. State personnel would be covered in DNR's budget.

Implementation is a local responsibility shared by individual land owners and local units of government. There are two types of grants under Wisconsin's NPS program. Local assistant grants fund local staff, vehicles, and other local technical assistance costs and implementation grants provide (in most cases) Local Conservation Districts (LCDs) funds to implement BMPs through Cost Share Agreements (CSAs) signed with landowners. The DNR and DATCP provide administrative, financial and technical support for the projects while the University of Wisconsin Extension and the USDA Soil Conservation Service provide educational and technical assistance. Participation by individual landowners and local units of government is voluntary.

Recipients of subsidies in rural projects are primarily local landowners and recipients in urban projects are both landowners and municipal governments. It was for this reason and others that county Land Conservation Departments (LCDs) and other local units of government were selected as the most appropriate agents to implement the program at the watershed level. "When I first started here I was talking to one of our newspaper people who asked how are you going to deal with negative attitude that people have towards the DNR ... DNR has a bad image because

they are viewed as a big regulatory department... when going out to landowners we framed it as a local program...this has allowed us to built up trust over the years".<sup>48</sup>

The initial stage of each watershed implementation project under the NPS program was the development of a watershed plan. The county LCDs and a local citizen advisory group were very involved in the initial stages.

"Our role was to take an inventory of land use and water use originally... my job was to go out and meet with farmers ask them how many cows they have ...how often are they feeding on the lot ... how often do the farmers scrap their lot ... I would actually sketch their barnyard and cropland, what kind of tillage are they using, soil type... we collected all this data. Farmers were very, very cooperative in our county... people were very open about their problems ... it took my almost two years. Then the DNR took all of our field data any put it into a computer modelling system to analyze runoff. Then we knew roughly what are pollutant loadings were and we set up an advisory group... citizens, farmers, business people... the watershed plan group ... assisted by the DNR".<sup>49</sup>

"Originally, watershed plans were developed and written by DNR staff. More recently these plans have been written locally and DNR provides technical assistance and review."<sup>50</sup> Three management categories were established for each major type of non-point source to assist in prioritizing implementation and determining

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<sup>48</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>49</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>50</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, August 24, 1998.

landowner eligibility for program funding.<sup>51</sup> The categories ranked the most significant contributors to NPS pollution in the watershed with Category 1 being the highest priority. “The goals of the plan determined how many and which people we needed to target... some were Category 1’s which meant they contributed significantly towards degradation ... if they wanted to address other problems on their property ...they had to address the worst problems to get the funding... but it was totally voluntary”.<sup>52</sup> Therefore if a landowner had several sources on his property (manure storage, streambank erosion and cattle access to the creek) then all of the sources needed to be addressed to be eligible for cost-sharing subsidies.

On implementing the program, responsibility was designated to LCDs. Eligible landowners had three years from the start of the project to sign a cost-sharing agreement (CSA). During the first three years of implementation it was the responsibility of County LCD staff to contact landowners in the watershed to encourage the participation in CSAs. LCD staff made personal contacts with eligible landowners. “We explained the opportunity ... in our county it was \$2.1 million roughly...of cost-sharing for landowners to make improvements on their property... and often this brings other benefits to the landowner... we don’t talk so much about

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<sup>51</sup> Wisconsin, *Nonpoint Source Control Plan for the Cedar Creek Priority Watershed*, August, 1993:90.

<sup>52</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

the water quality problems but focus on what is in it for them”.<sup>53</sup> CSAs outline the detailed BMP implementation plans, cost sharing details and the operation and maintenance details over a 10 year period.

In addition, CSAs state that there will not be any additional pollution generated in the future. If the land use changes, the property owner is subsequently responsible for pollution abatement at his or her own cost. “The CSA gets recorded on the landowner’s deed so that if he were to sell his property, the new buyer is aware that he is responsible for fulfilling the obligations”.<sup>54</sup> Landowners have to agree to the implementation of the whole plan... if there is noncompliance we have the authority to ask for repayment but there is often no recourse if the landowner abandons the property or goes out of business.<sup>55</sup>

Once an agreement has been signed, the landowner has up to 5 years to install the BMPs specified on the agreement. Once a CSA is signed with a landowner, they are responsible for getting the work done. Landowners pay their own bills up front and then are reimbursed the appropriate amount by Land Conservation Department staff. All agreed upon practices must be maintained for at least 10 years.<sup>56</sup>

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<sup>53</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>54</sup> Ibid.

<sup>55</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, August 24, 1998.

<sup>56</sup> Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993: 14.

State administrative rules outline the different cost share rates and BMPs eligible for funding and implementation in Wisconsin's Natural Resources 120 (NR 120). In addition to explicitly adopting a priority watershed approach, "the Department of Natural Resources recommends best management practices which are the most cost effective means of preventing or reducing non-point source pollution". There are three major components to the administrative rules in Natural Resources 120 (NR 120): watershed planning rules; BMP installation and cost-sharing rules and thirdly, financial management rules.

The NR 120 explicitly outlines the administrative rules under which the program is implemented and was most recently updated in 1997. Sections 120.01 through 120.30 outline detailed goals, roles, definitions and requirements involved in implementation of the program. These sections include mandatory rules governing each project. For example, 120.04 outlines the role of citizen advisory committees:

"The department (DNR), in cooperation with governmental units, shall appoint a citizen advisory committee for each priority watershed in accordance with Wisconsin Statute 281.65(4). The citizen group shall advise the department (DNR), DATCP and other governmental units on all aspects of the program for their specific priority watershed".<sup>57</sup>

In the Cedar Creek watershed case, the citizen advisory group was not involved in this stage. "The citizen advisory group was very good... but they should have met with us periodically during the implementation process ... that would be my

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Wisconsin Department of Natural Resources Chapter NR 120.04

recommendation”.<sup>58</sup>

The NR 120 also details what are considered acceptable and eligible BMPs, how cost-shared agreements must be drafted and the maximum state cost share rates for the implementation of different BMPs. Most BMPs are eligible for a maximum state cost-share of 50 or 70% and several BMPs have total cost limits. For example, manure storage facilities are eligible for 70% maximum state cost-share up to a maximum of \$35,000 total per facility.<sup>59</sup> “Some are funded at the 50% level because there is an economic benefit to the landowner”.<sup>60</sup> “The rules also require counties to select the least cost measure that will achieve results”.<sup>61</sup>

NR 120 also details what types of BMPs are eligible for funding. Not all sources and BMPs are covered under NR 120. “There are some really bad septic systems... septics are considered a point source so we do not have any jurisdiction they are regulated by a separate department - Department of Commerce (under the NPDES permitting system). Wells are included in the NPS program and a few years ago coverage was extended to cover milk house waste”.<sup>62</sup>

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<sup>58</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>59</sup> Wisconsin, Department of Natural Resources, Regulation Chapter NR 120.18

<sup>60</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, Madison, Wisconsin, August 24, 1998.

<sup>61</sup> Ibid.

<sup>62</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

NR 120.28 outlines the conditions under which the department can resort to enforcement action if the project is not being implemented as per the rules in NR 120.

“The following sanctions may be imposed by the department for non-compliance with Wisconsin Statute 281.65: the grant may be terminated; watershed project costs directly related to noncompliance may be declared ineligible; watershed project work may be suspended; the department may seek recovery of grant payments in whole or in part; other administrative and judicial remedies may be instituted if legally available and appropriate”.

In addition to NR 120 which outlines the administrative rules and guidelines for the NPS Pollution Abatement Program, Wisconsin also has a specific set of regulatory rules that address water pollution caused by animal waste. A separate regulation, NR 243, outlines the conditions under which DNR and DATCP may force landowners and operators to change their actions in regards to animal waste management.

The decisions related to funding watershed projects are centralized with DNR staff at the head office in Madison. The DNR regional staff review the BMP implementation plans and designs to ensure they are the least costly and most effective and in compliance with the NR 120 rules. This is important since we have had some projects that have cost close to \$90,000.”<sup>63</sup>

Once a CSA is signed and approved for funding, LCD staff then assist in the design of BMP implementation plans, monitor the implementation, and inspect the work on completion before the landowners are reimbursed. “We do also integrate

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<sup>63</sup> Personal interview with Soil Conservationist, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

the local land use rules into the design”.<sup>64</sup> “I think these tools are complimentary ... I kind of think of it as the more tools you have in your toolbox the more successful you’ll be... you have ordinances or restrictions, you have the voluntary NPS BMPs with incentives to get people to do things they otherwise wouldn’t do, you have the local towns doing land use plans... its everybody working together”.<sup>65</sup>

By 1993, 86 of the 330 watersheds in the state (making up the 28 larger basins) had initiated similar priority watershed projects.<sup>66</sup> The Cedar Creek watershed was one of these projects and did not reportedly suffer from a shortage of implementation funds.

“Cedar Creek has plenty of money ... one of our other watershed projects is short of implementation money but the state doesn’t allow us to shift monies around ... they don’t allow us to micro-manage... surpluses go back to the state. We can give extra funds to Washington County which is also working on Cedar Creek. I have written and talked to the state about this... they feel like to be fair that if there is extra money everyone in the state should have a crack at it... I can understand some of that. The monies can also only be spent through CSAs... we can’t just spend that money on monitoring. For the time being the state has instructed us not to pursue implementation of new CSAs so the extra money will likely go to Washington County... somebody dropped the ball in the area of financial forecasting... the state lost a lot of credibility with state legislators. They should be taking care of the agreements in existence rather than signing new ones... we lobbied our legislator who sits on the joint finance committee... I feel like we did our

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<sup>64</sup> Personal interview with Soil Conservationist, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>65</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>66</sup> Wisconsin Department of Natural Resources and Wisconsin Department of Agriculture, Trade and Consumer Protection, *Non-Point Source Pollution Abatement Program: 1995 Program Accomplishments*, July 1996.



work at the local level... I met one of our legislators at the Milwaukee Zoo last week and I told him how we need more money... he said the program was already very well funded.. he didn't want to hear it".<sup>67</sup>

Between 1992 and 1996 the character of the policy instrument strategy in the Cedar Creek watershed did not significantly change. "Originally the priority watershed program was all voluntary ... there was not a regulatory stitch anywhere in it... and then we had some regulatory teeth put into the program called the "critical sites" program."<sup>68</sup>

"We had a series of legislative changes in the early 1990s which required the identification of criteria to designate "critical sites" in all new watershed plans. These are sites that pollution needs to be controlled in order for water quality objectives to be met. Once these sites were identified, counties had 90 days to notify landowners of critical sites and then landowners would have three years to sign a cost-share agreement and remedy their problems... if they don't participate after three years then the cost share availability would drop to half and if nothing happens a year after that then enforcement procedures start. This includes action through the Department of Justice and no cost sharing would be available.<sup>69</sup> It is the same mechanism in place for animal waste non-compliance. We have not had to use enforcement since the rules have been in place ...since 1996 ... the early indicators are that the fear is causing landowners to participate and counties to address these sites right up front. So... this has introduced a regulatory component to the program".<sup>70</sup>

"The whole critical sites approach has been an interesting one unfolding in

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<sup>67</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>68</sup> Personal interview with Senior Water Resources Specialist, Runoff Management Section, Wisconsin Department of Natural Resources, August 25, 1998.

<sup>69</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, August 24, 1998.

<sup>70</sup> Ibid.

the past few years... I think it certainly increased participation rates of the worst offenders so to speak ... so ... overall it has been beneficial... we are hearing from counties that critical sites have become the focus of their efforts and thus the program has taken on a more regulatory flavour ... this has had another impact... there are those who want to participate but are not critical sites, Category 1 priorities or are not in one of the priority watersheds”<sup>71</sup>

“In recent years the program and the DNR has come under a lot of criticism... there has been some concern over the funding management of the program ... the program grew at a greater pace than the funding source... we are going to have to address this. Also at the local level, some counties have not managed their projects well... they have signed contracts but not followed through on BMP installation...counties signed contracts to get the credit for pollution reductions... some landowners sign the contracts never intending to install and to get the government off of their property... the contract is not binding...it is one of those things that if they install the BMP they get the government cost-share funds but if they don't install... nothing happens... so this has contributed to problems.”<sup>72</sup>

In addition, there were some political concerns about the cost of the program and the impacts it was having. At the state level currently, there are approximately 14 FTEs at DNR working on the NPS Program and regional staff in five regions... an estimated 30 FTEs in total at the state level.<sup>73</sup> In addition, there are numerous personnel at the municipal level involved in administration and implementation of the program.

DNR also collects data on the nature and time required by county Land

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<sup>71</sup> Ibid.

<sup>72</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, Madison, Wisconsin, August 24, 1998.

<sup>73</sup> Personal interview with Director, Director, Runoff Management Section, Wisconsin Department of Natural Resources, Madison, Wisconsin, August 25, 1998.

Conservation Department staff to administer the program. In 1995, state-wide, LCD staff reported they spent a total of 317,660 hours administering the NPS program through projects at the local level. Of this reported time, 56,382 hours were reportedly spent on technical assistance in the form of designing conservation practices for landowners, 55,484 hours were reportedly spent on project and fiscal management (meetings, coordination, reporting) and 45,931 hours were spent on conservation planning activities (contacting landowners, inventorying data, preparing management plans).<sup>74</sup> Data in Appendix 6-3 indicate that in comparison to the other program responsibilities of LCD staff, the NPS program consumes 41% of their time. Interview discussions with local project staff indicates this is a roughly accurate picture of their activities.<sup>75</sup>

### **Indicators of Impacts**

In terms of participation rates, there has been a general increase in participation to the point that the state does not have adequate funds to implement projects.

“In some counties however it is more difficult. The participation rates are lower for a variety of reasons. For example, in southwestern parts of the state non-participation is cultural. The Amish community of farmers contribute

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<sup>74</sup> Wisconsin, Department of Natural Resources and Department of Agriculture, Trade and Consumer Protection, *Joint Program Evaluation Report of the Non-Point Source Water Pollution Abatement Program*, July 1996: 5.1-5.2

<sup>75</sup> Personal interview with Soil Conservationist, Land Conservation Department and Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

to some severe erosion problems... basically farming practices have not evolved for some 200 years ... there is hesitancy to adopt new technologies. Generally, the western part of the state has been more reluctant to work with government. Agribusiness can be the biggest polluters but they are willing to adopt new technologies. In some cases the financial incentive may not be high enough but overall this has not been the primary reason for not participating. We do also have an economic hardship provision in the NR 120 which allows the percentage of cost share to go up to 85% in some cases. So the reasons vary.”<sup>76</sup>

Participation rates in Cedar Creek were reportedly influenced by the nature of the community and the character of the NPS water pollution problem in the watershed.

“Some were hard sells ... Cedar Creek was a little different ... it is more in a development stage where people were afraid to get involved because they don't think they were going to be farming in another ten years or so...this uncertainty affected the success of the program... I think if you look at the areas away from urbanization pressures the success is much higher... most thought the incentives... up to 70% cost-share... was good”.<sup>77</sup>

There was also some evidence that participation rates were higher because landowners feared regulation.

“We have had people sign up because they fear regulation 10-20 years down the road”.<sup>78</sup> “I think that the fear of regulation has driven the program quite a bit actually ... and peer pressure”.<sup>79</sup>

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<sup>76</sup> Personal interview with NPS Implementation Coordinator, Runoff Management Section, Department of Natural Resources, Madison, Wisconsin, August 24, 1998.

<sup>77</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>78</sup> Personal interview with Soil Conservationist, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>79</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

“I think the voluntary approach is a nice approach but sometimes you may have 2-3 individuals who are the worst contributors that won’t participate... they too need to be responsible.. that is my philosophy. What gives them the right to pollute our streams and creeks... I can appreciate it that some may not have the funds... but even our mandatory critical sites approach provides 70% cost share.

The state officials and local officials seemingly have a different perspective on the program and participation rates at the watershed level.

“One of the problems at the local level.. there has been the idea that the program is flawed because we are providing funding for people who do the wrong things rather than rewarding those who do the rights things. It is a remediation oriented program ... although some plans do have a more preventative approach using easements and buffers etc.”<sup>80</sup>

“There is also variation from county to county in terms of implementation success...the expertise level varies... and I think some of it is this continual tug of war between county control and state control ... similar to what states have with the federal government. So you can look at like a parent - child relationship... you nurture the program until it is up and running and then counties start to rebel and want to do their own thing. This is kind of the relationship that has evolved with some counties. We have a number of counties that have become quite militant...they don’t want DNR involved, they want the funding but they want to manage their own projects and set their own priorities... I can understand this to some degree... our administrative rules (NR 120) ... sometimes lead to frustration at the county level, they want to determine what projects to fund and how to implement them... this becomes difficult when you have numerous watershed projects... 60 odd... being implemented across the state.”<sup>81</sup>

In addition to reporting participation levels and number of CSAs signed, NR 120.30 also requires DNR, jointly with DATCP, to produce a biennial progress report on the

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<sup>80</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, August 24, 1998.

<sup>81</sup> Ibid.

Non-point Source Pollution Abatement Program. This report was to include progress reporting on land management and water quality criteria in the evaluation of program progress. From 1989-1993 reported successes included the installation of 1,385 animal waste BMPs and 82 miles of streambank were protected from erosion. The report highlighted that “the effects of BMP implementation may take at least a decade of monitoring to be noticed but the ultimate goal is to more effectively tie BMPs to water quality improvements.”<sup>82</sup>

In order to address the monitoring concerns expressed in the 1988 Management Report, in 1991 DNR initiated 12 “master monitoring” sites in 9 priority watersheds. These sites were designed as indicators of reduced pollutant loadings as a result of different BMP installations. Approximately \$1.9 million was designated to data collection at these 12 sites.<sup>83</sup> However, because stream master monitoring would not be complete until 2002, the program sought more immediate indices of water quality improvements through the “Signs of Success” (SOS) program in 1992. This evaluative initiative focussed on the measurable improvements of BMP installation “to provide early evidence that better land

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<sup>82</sup> Wisconsin, Department of Natural Resources and Department of Agriculture, Trade and Consumer Protection, *Joint Program Evaluation Report of the Non-Point Source Water Pollution Abatement Program*, July 1996:3.2

<sup>83</sup> Wisconsin, Department of Natural Resources and Department of Agriculture, Trade and Consumer Protection, *Joint Program Evaluation Report of the Non-Point Source Water Pollution Abatement Program*, April 1994: 5.

management does make a difference in priority watersheds”.<sup>84</sup>

Other statewide indicators of progress were also reported. The most recent report published in 1996 reported a total of 86 priority watersheds were involved in implementing the program and state funds spent on the NPS Abatement Program totalled \$23 million annually.<sup>85</sup> At the watershed project level, typically “signs of success” reported in watershed reports included: number and type of BMPs installed, participation rates, landowner contacts and number of cost-share agreements (CSAs) signed. Again, output data is more readily available than outcome data on water quality improvements that are attributable to the program.

Watershed projects were also required to report on the following: administration (financial, number of agreements signed, implementation time-lines etc.) and estimated pollutant reductions (calculating pollutant loading reductions that resulted from BMP installations). Aggregate data indicates that by 1997, 42 CSAs had been signed with landowners in the watershed to implement various BMPs.<sup>86</sup> In the case of Cedar Creek, progress toward achieving pollutant reduction objectives is measured as percentages of pollutant reduction goals specified in watershed plans. Percentages are reported as “actuals to date” and “anticipated” based on future BMP

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<sup>84</sup> Ibid: p.7

<sup>85</sup> Wisconsin, Department of Natural Resources and Department of Agriculture, Trade and Consumer Protection, *Joint Program Evaluation Report of the Non-Point Source Water Pollution Abatement Program*, July 1996: 3.1

<sup>86</sup> Wisconsin, Department of Natural Resources, *Non-Point Source Water Pollution Abatement Program Accomplishment Report*, October 1998.

installations.

**Table 6-1**  
**1995 Loading Improvement Data for Cedar Creek Watershed reported in 1996**  
**Progress Report:**

Phosphorous from Barnyards Goal 579 lbs		Soil or Sediment Load Reductions Goal 7,069 tons/year		Streambank Erosion
48% to date 279 lbs	77% anticipated 444 lbs	12 % to date 827 tons/year	29% anticipated 2,058 tons/year	Not Available

Specific water quality parameters are not being monitored or collected in the Cedar Creek Watershed. "Changes in surface water quality were not to be monitored in the Cedar Creek watershed. Similar sites located elsewhere in the Milwaukee River Basin will be used to determine the impact of BMPs on surface waters. These results will be extrapolated to the Cedar Creek Watershed".<sup>87</sup>

Several evaluation reports have been undertaken on the state program as a whole but very little monitoring and water quality data has been collected for the Cedar Creek project specifically.

"Monitoring is a problem... we don't have a good benchmark... nor do we measure after the BMP implementation to see how successful we have been. The state kind of dropped the ball on some of that ... I think ...in the sense that we have been hounding the state for years to provide money for monitoring... we could do it ... or citizen's groups could do it...there has been some but not a lot. I have heard landowners comment that things have gotten

<sup>87</sup>

Wisconsin Department of Natural Resources, *Non-Point Source Control Plan for the Cedar Creek Priority Watershed Project*, August 1993: 15.



better... I have heard fishermen talking about the fishing getting better... small mouth bass ... that is about the extent of it. I tell our county board members that if you look at the number of projects we have implemented... waste and runoff is no longer going into the creek or river ... so I know we have made improvements".<sup>88</sup>

Others have reported seeing visual and aesthetic improvements on specific properties and in portions of the watershed.<sup>89</sup> However, water quality progress in this project and many others has been a neglected challenge. This challenge was clearly articulated in the 1988 Management Report submitted to EPA and is also recognized by officials at the state level.

"Another thing that I think has been a real failure in the program has been ... that we have not been able to devote the resources required to monitoring... so we can't really show outcomes... the legislature has done an audit of the program on two different occasions and confirmed that monitoring is a problem... they continue to pose the question ... in terms of pollutant reductions what is the program achieving?"<sup>90</sup>

"Most of the indicators we have used have been total reduction indicators, through computer modelling using different water quality parameters. We have not been real successful in this program in tracking water quality changes. I think that is a pretty fair statement... we have not been able to show wholesale changes to state water quality as a result of the program".<sup>91</sup>

The federal reporting requirement do not seem to address this water quality

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<sup>88</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>89</sup> Personal interview with Soil Conservationist, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

<sup>90</sup> Personal interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, Madison, Wisconsin, August 24, 1998.

<sup>91</sup> Personal interview with Water Quality Specialist, Department of Natural Resources, Madison, Wisconsin, August 25, 1998.

monitoring and progress reporting problem. “The EPA national reporting required in Sec. 305(b) is not a good measure because we miss large areas and does not necessarily indicate that the reported results are due to the NPS program. This report is a summary of basin plans which are more detailed but not reported in Sec.305 (b) and Wisconsin handles this report differently.”<sup>92</sup>

Although the monitoring and progress reporting efforts have been a weak component of the program, this does not mean that policy makers have ignored monitoring and reporting all together. Although sophisticated aggregate and watershed project specific monitoring is an identified weakness in the program, the state does collect data related to the success of different BMPs called “single source monitoring”. “All these monitoring components weave together”.<sup>93</sup>

“We have done a lot in terms of NPS management, but to really be able to document it and statistically see a change is very very difficult... I think your talking about years of pre-project and post-project data collection... its hard... all it takes is one bad actor upstream above that site and you cannot see the benefits of actions taken by everyone else... this has been a thorn in our side and we are still trying to figure out how to handle it.”<sup>94</sup>

“I think it is possible but it requires a commitment of time and resources over a very long period of time... and we typically don’t have that type of

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<sup>92</sup> Personal interview with Director, Runoff Management Section, Department of Natural Resources, Madison, Wisconsin, August 25, 1998.

<sup>93</sup> Interview with NPS Implementation Coordinator, Wisconsin Department of Natural Resources, August 24, 1998.

<sup>94</sup> Personal interview with Water Quality Specialist, Department of Natural Resources, Madison Wisconsin, August 25, 1998.

monitoring assistance built into programs”.<sup>95</sup>

### **Future Directions for Cedar Creek**

Due to funding limitations, implementation of the cost-shared agreements with landowners in Cedar Creek have been put on hold. In order to honour the BMP installation agreements, the state has extended the project until 2003. Cedar Creek does not currently have the critical sites component implemented in 1996. The current program redesign may change future implementation directions.

At the project level, staff are not actively involved in the program re-design. However, many anticipate positive changes in the structure of the program and the financial management relationship with the state agencies.

“I think making the program more local would be a good way to go ... we need to have more management flexibility... I do foresee more block type funding in the future but there will always be some conditions... I don't want to be too negative because I think this is a wonderful program, but when you look at the administrative costs... we at the local level know which problems are a priority. This would be good... to let counties decide on what BMPs are most suitable... let us write the plan... let us work with DNR to decide our water quality objectives ...more flexibility... it is not too far off right now. I think the future will have to look at progress in the broader Milwaukee River basin.”<sup>96</sup>

The draft recommendations indicate that the program will be decentralized

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<sup>95</sup> Personal interview with Director, Runoff Management Section, Department of Natural Resources, Madison, Wisconsin, August 25, 1998

<sup>96</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

to some degree, granting more decision making authority to local units of government in terms of implementation but the priority setting and standard setting will remain a state agency function. There is some indication that local units of government should become more active participants in the program. "I think the time has come that we need to pressure for more municipal involvement... although most of the funding comes from property taxes, we now have a municipal sales tax of ½ a percent which was initially to fund a jail... perhaps some sort of targeted tax like this could increase involvement at the local level".<sup>97</sup>

The Cedar Creek watershed case in Wisconsin provides an excellent opportunity to analyze the dominant policy instrument strategy in the state in action. The Cedar Creek case also provides an example of a policy instrument strategy that is being implemented in a mature policy area. The institutional context and the features of the policy instrument strategy in Cedar Creek are summarized in Table 6-2.

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<sup>97</sup> Personal interview with Director, Land Conservation Department, Ozaukee County, Wisconsin, August 24, 1998.

**Table 6-2**  
**Summary of Subsidy-based Policy Instrument Strategy in Wisconsin & The Cedar Creek Watershed 1992-1999**

Evaluative Dimensions	Summary
Instrument Design/Approach	<ul style="list-style-type: none"> <li>• explicit watershed approach</li> <li>• initially voluntary, gradually incorporating regulatory approaches</li> <li>• design impacted by federal funding guidance and state NR 120 regulations</li> <li>• both rural and urban</li> </ul>
Implementation Agents	<ul style="list-style-type: none"> <li>• local units of government (primarily two LCDs)</li> <li>• medium level state involvement</li> </ul>
Stakeholder Involvement	<ul style="list-style-type: none"> <li>• involvement in problem definition (Univ. of Wisconsin, Extension, other local agencies)</li> <li>• primarily state-driven implementation</li> </ul>
Resource Allocations	<ul style="list-style-type: none"> <li>• significant</li> <li>• difficulties in financial management impacting the program</li> <li>• in-kind personnel contribution at the local level</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• focused on state requirements (BMPs)</li> <li>• no specific resource allocation as part of the project</li> <li>• enforcement a state responsibility</li> <li>• no pre and post water quality monitoring</li> <li>• no ongoing WQ monitoring programs</li> </ul>
Reported Effectiveness Outcomes	<ul style="list-style-type: none"> <li>• information collected on the watershed</li> <li>• support of local staff positions</li> <li>• establishment of inter-agency partnerships (local LCDs, state-local)</li> <li>• increases awareness of landowners</li> <li>• aesthetic improvements in the watershed</li> </ul>
Reported Ecological Outcomes	<ul style="list-style-type: none"> <li>• some estimated loading reductions (phosphorous and sediments) based on BMPs installed</li> <li>• identification of "critical sites" to target</li> </ul>
Sustainability Potential of PIS	<ul style="list-style-type: none"> <li>• primarily reliant on state/federal funding</li> <li>• LCDs/personnel at local level</li> </ul>

The Cedar Creek watershed case illustrates that some states in the US had selected subsidy-based policy instrument strategies and institutionalized their implementation prior to the institutional changes at the federal level in Sec. 319 of the CWA. Institutional arrangements at the state and federal levels however have clearly had an impact on choice and design of policy instrument strategies at the local, watershed level.

This case also provides a case where institutional capacity at the state and federal level should hypothetically translate into high levels of institutional capacity at the implementation level. In contrast to the land use regulation policy instrument strategy analyzed in Michigan in the previous section, there is some evidence to support this argument.

As outlined in Table 6-3, institutional capacity ratings for this policy instrument strategy are higher along all dimensions.

**Table 6-3**  
**Analysis & Evaluation of the Policy Instrument Strategy**

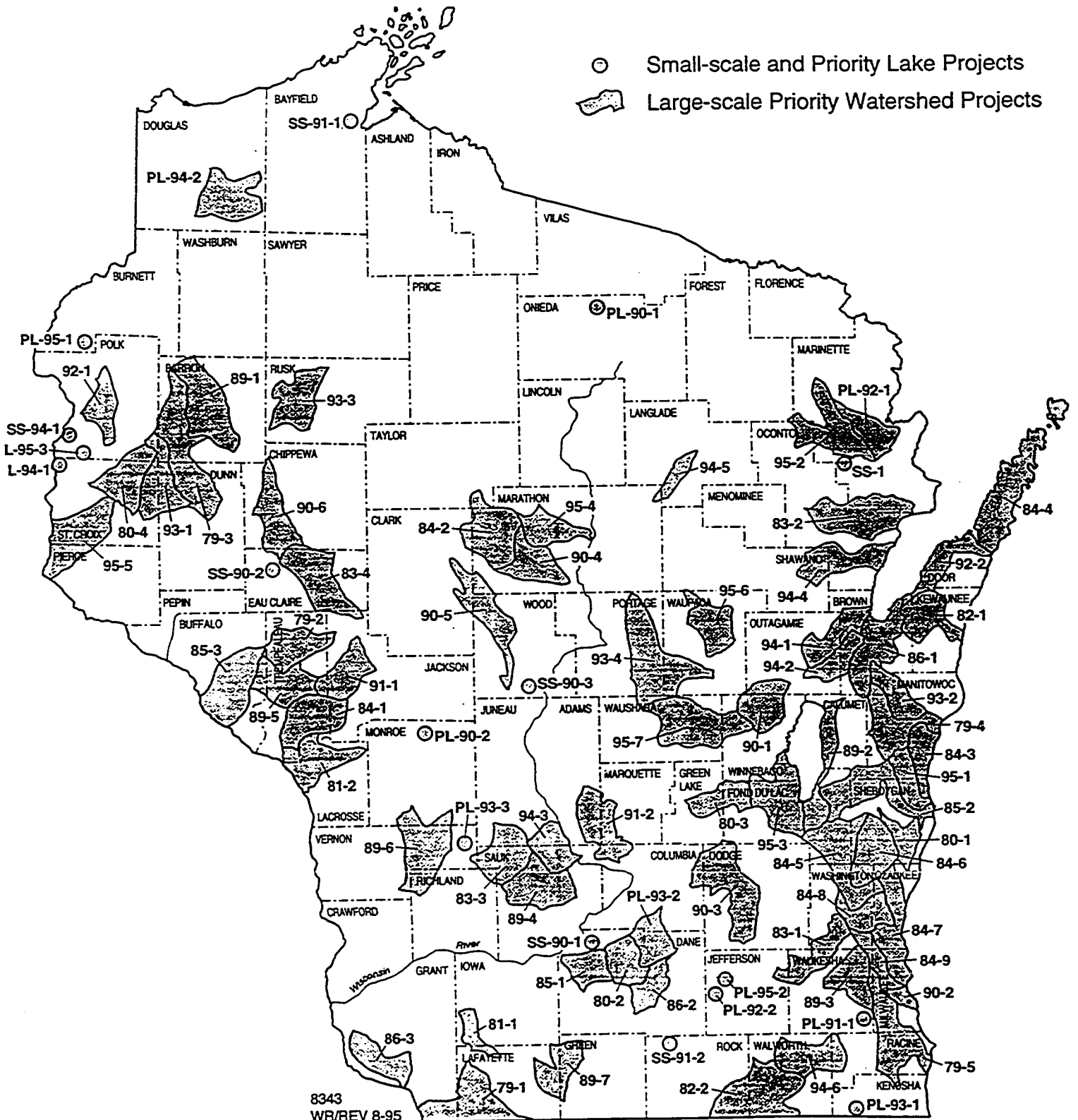
<b>Institutional Capacity</b>	<b>Rating</b>
Vertical	High
Horizontal	Medium
Stakeholder	Medium
Monitoring & Evaluation	Medium
<b>Outcomes</b>	
Effectiveness	Medium

The subsidy-based BMP policy instrument strategy exhibits “high” levels of vertical and stakeholder capacity as institutions and involvement of stakeholders are clearly part of the policy instrument strategy design. Horizontal institutional capacity is also “medium”. Over time, the implementation of this policy instrument strategy at the watershed level has institutionalized a cross-medium, multi-agency approach. These institutional incentives have resulted in some progress in terms of participation rates and some reported progress in addressing water quality problems in Cedar Creek. Combined with the monitoring and evaluation efforts at the state level, the monitoring and evaluation capacity at the watershed level has also improved over time.

### **Conclusions**

In the context of the US federal NPS Management Program, the case in Wisconsin illustrates the implementation of the preferred policy instrument strategy which is being implemented throughout the US. The Cedar Creek watershed case does provide some evidence that policy instrument strategies with high levels of institutional capacity (vertical, horizontal, stakeholder, monitoring and evaluation) exhibit indicators of effectiveness. These findings will be more fully examined in the comparative context of the analytical framework and core research questions in Chapter 10. The next chapter in this section, examines this same policy instrument strategy in action in Ontario.

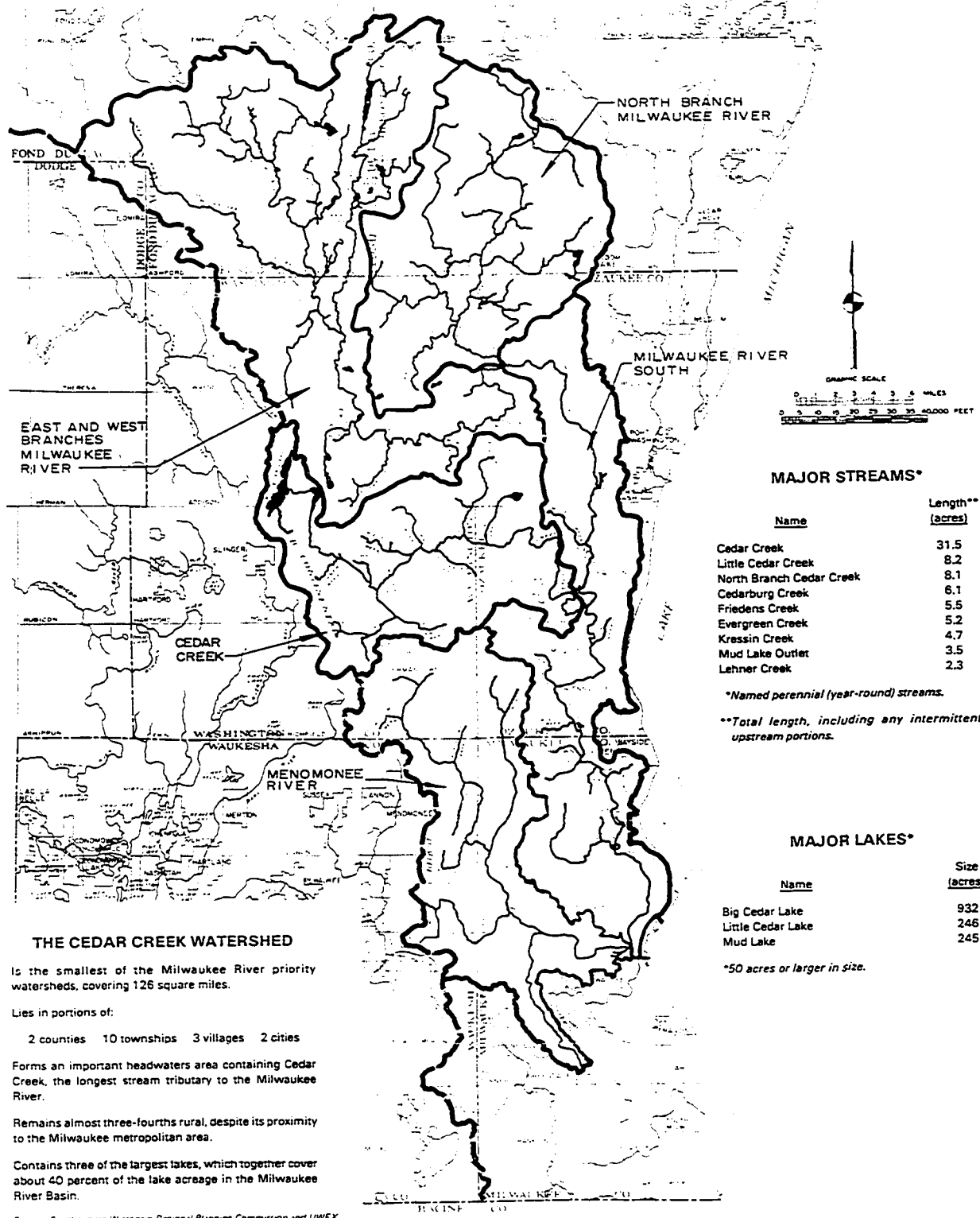
Appendix 6-1 Priority Watershed Projects in Wisconsin, 1995



8343  
WR/REV 8-95

Source: Non-point Source Pollution Abatement Program Accomplishments, 1996.





**MAJOR STREAMS\***

Name	Length** (acres)
Cedar Creek	31.5
Little Cedar Creek	8.2
North Branch Cedar Creek	8.1
Cedarburg Creek	6.1
Friedens Creek	5.5
Evergreen Creek	5.2
Kressin Creek	4.7
Mud Lake Outlet	3.5
Lehner Creek	2.3

\*Named perennial (year-round) streams.

\*\*Total length, including any intermittent upstream portions.

**MAJOR LAKES\***

Name	Size (acres)
Big Cedar Lake	932
Little Cedar Lake	246
Mud Lake	245

\*50 acres or larger in size.

**THE CEDAR CREEK WATERSHED**

Is the smallest of the Milwaukee River priority watersheds, covering 126 square miles.

Lies in portions of:

2 counties 10 townships 3 villages 2 cities

Forms an important headwaters area containing Cedar Creek, the longest stream tributary to the Milwaukee River.

Remains almost three-fourths rural, despite its proximity to the Milwaukee metropolitan area.

Contains three of the largest lakes, which together cover about 40 percent of the lake acreage in the Milwaukee River Basin.

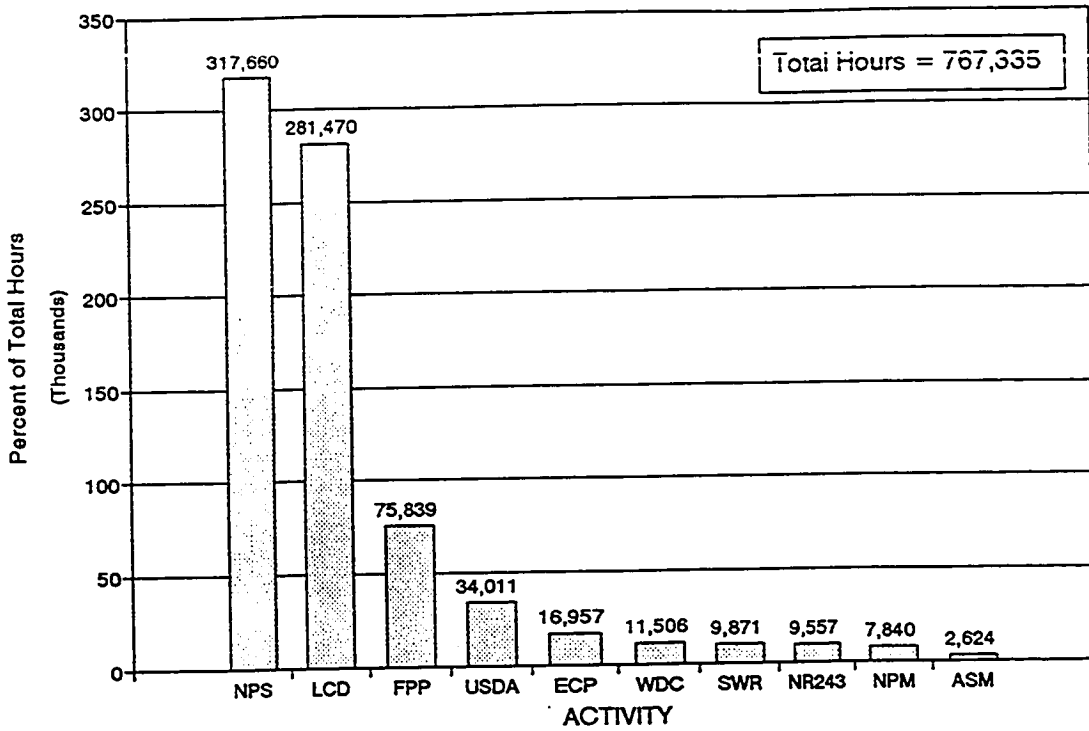
Source: Southeastern Wisconsin Regional Planning Commission and UWEX

Source: Non-point Source Control Plan for Cedar Creek Priority Watershed, 1993.

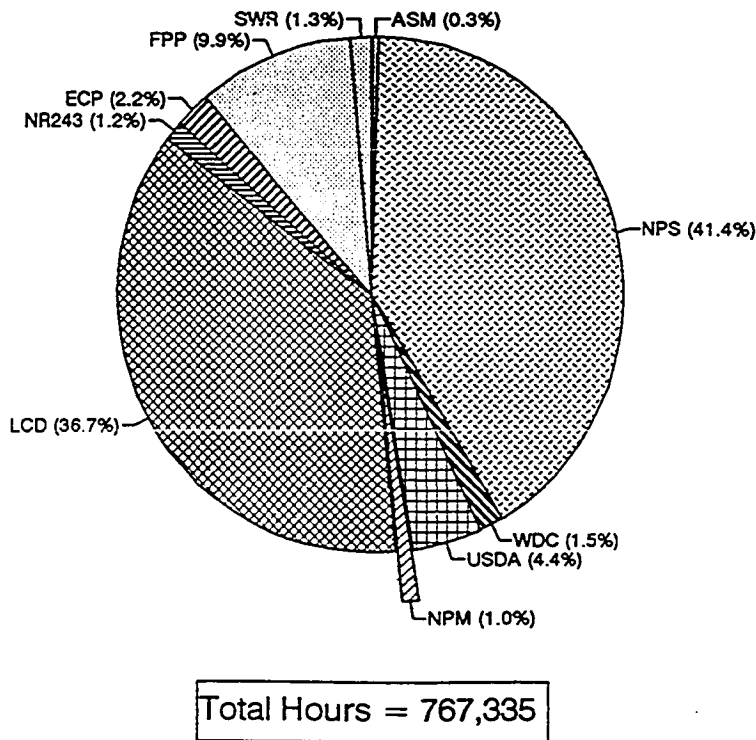
**MILWAUKEE RIVER PRIORITY WATERSHEDS**

Appendix 6-3

LCD STAFF TIME REPORTED IN 1995, BY PROGRAM (Bar)



LCD STAFF TIME REPORTED IN 1995, BY PROGRAM (Pie)



Source: Wisconsin NPS Abatement Program Program Accomplishments, 1996.

## Chapter Seven

### Subsidy-based Policy Instrument Strategies Peel Region, Ontario & The Caledon Creek Watershed Case

#### Introduction

Chapter 3 outlined that the basic logic of rules-in-use for water quality management in Canada give pre-eminence to the institutional and operational rules of the provinces. As outlined in Chapter 3, federal institutional arrangements have not provided leadership or incentives for provinces to develop comprehensive policy instrument strategies to address NPS water pollution. Although all provinces have legislation in place to regulate and control point-sources of water pollution, only British Columbia has a five-year program to deal specifically with NPS water pollution - a program that was only formalized in March 1999.<sup>1</sup> Most other

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<sup>1</sup> British Columbia. Ministry of Environment, Lands and Parks, Water Management Branch, *Non-Point Source Action Plan*, March, 1999 ([http://www.elp.gov.bc.ca:80/wat/wq/bmp\\_c/npsaction.html](http://www.elp.gov.bc.ca:80/wat/wq/bmp_c/npsaction.html))

provinces, including Ontario, have a patchwork of initiatives and instruments that have evolved to deal indirectly with NPS water pollution.

As outlined in Chapter 3, presently in Ontario no comprehensive policy initiative exists to deal with NPS water pollution. No specific programs have been designed or resources allocated to target NPS water pollution. Indirect, subsidy-based policy instrument strategies have however been established to specifically address NPS water pollution management initiatives. In Ontario, these have taken the form of sector specific, agro-environmental policy initiatives.

#### **Sector Specific Subsidy-based BMP Instrument Strategy at the Provincial Level**

Similar to the US, BMPs generally form the foundation of the limited grant incentive programs that have been targeted at the agricultural sector and implemented at the provincial level. As outlined in Chapter 3, the Ontario government has in the past tried to address land use related sources of water pollution through sector specific programs primarily targeted at the agricultural sector. The Land Stewardship Program in the late 1980s encouraged farmers to undertake conservation farm plans by using grant incentives. This voluntary program was designed to address soil erosion and was administered by a farm organization in Ontario - the Ontario Soil and Crop Improvement Association.<sup>2</sup> From 1991 to 1995, the subsidy-based Clean Up Rural Beaches (CURB) program more specifically tried to address agricultural

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<sup>2</sup> Personal interview with Program Advisor, Ontario Soil and Crop Improvement Association, September 18, 1997.

non-point sources of bacterial contamination. The program was designed to provide farmers with up to 50% cost-share subsidies for the installation of BMPs and was administered by the Ministry of the Environment in partnership with Conservation Authorities. Since the program was cancelled in 1995, the Ministry of the Environment has returned to its primary mandate of focussing on point source permitting and management of surface water quality through Provincial Water Quality Objectives. The sector-specific water pollution policies related to agricultural sources have become the jurisdiction of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

OMAFRA has been the primary government agency involved in addressing non-point source water quality problems through agricultural programs. Although previous voluntary programs did attempt to address agricultural sources of non-point source water pollution, the movement to address comprehensively the environmental impacts of farming on land and water quality and the buy in from the farming sector did not receive broad based momentum until the Ontario Environmental Farm Plan (EFP) based on BMPs was initiated in 1992.

The EFP was an initiative by the Ontario Environmental Farm Coalition - a coalition of farmers organizations including - Ontario Federation of Agriculture, Ontario Farm Animal Council and the Ontario Christian Farmers Federation and AGCare (Agricultural Groups Concerned About Resources and the Environment). This coalition was organized in response to the elected NDP government in 1990 and the proposed development of an Environmental Bill of Rights. The elected Minister

of Agriculture, Food and Rural Affairs at the time, Norm Buchanan, created an Agriculture and Environmental Stewardship Advisory Committee made up of representatives from different farm organizations. The Ontario Environmental Farm Coalition self-organized out of this more formalized, state-directed organization to develop agriculture's vision of how to address environmental problems associated with farming. In 1991, the group began to meet regularly to discuss an environmental agenda for farmers in Ontario.

The EFP and the coalition's "Our Environmental Agenda" grew out of these developments. "The coalition decided to launch into their own farm agenda... the Ministry was also working on developing an environmental farm planning process and then we joined forces. The Ministry has since played a supporting role, they helped write the documents and build consensus, Ministry of Natural Resources (MNR) and the Ministry of the Environment (MOE) were also involved... all the time we agreed that the coalition controlled the program".<sup>3</sup>

Funding for the program originally came from Agriculture Canada under the Green Plan and the Canada-Ontario Environmental Sustainability Agreement. From 1992-1997, \$3.9 million of federal Green Plan funds were earmarked to implement Environmental Farm Plans.<sup>4</sup> On termination of the federal Green Plan in 1997, the funding for EFPs in Ontario then came from the federal government's Canada

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<sup>3</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

<sup>4</sup> Agriculture and Agri-Food Canada, Environmental Farm Plan Program ([http://res.agr.ca/lond/gp/efp/efp\\_back.html](http://res.agr.ca/lond/gp/efp/efp_back.html)), November 1996.

Agricultural Adaption Council's CanAdapt Program. A further \$5.6 million of CanAdapt funding will help continue the program beyond the year 2000.<sup>5</sup> Although funding for the program came from federal sources, there was very little federal involvement and funding was initially unconditional in nature. Involvement of federal representatives was primarily membership on the EFP Working Committee which along with several other program committees was responsible for program development and implementation.

A series of committees were designated the responsibility of detailed program design and implementation strategy development. Five committees were established: a Working Committee, Contract Management Committee, Implementation Committee, and Evaluation Committee all reporting to a Steering Committee. Farmers and farm organizations played the leadership role from the outset of program design. This is reflected in the composition of the Steering Committee whose five members included two independent farmers, one representative from the University of Guelph, one representative from the Christian Farmers Federation of Ontario and one representative from the Ontario Federation of Agriculture. In addition, these five also sat on the Working Committee.

The Working Committee was the larger 24 member stakeholders committee which included representatives from each of the Coalition organizations, independent farmers, Agriculture and AgriFood Canada, Environment Canada, OMAFRA, MOE

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<sup>5</sup> Ontario Environmental Farm Coalition, *Ontario's Environmental Farm Plan*, Second Edition, 1996.

and MNR.<sup>6</sup> The function of the committee structure was to make program design and implementation decisions. In addition to the committees, the Coalition worked closely with the three provincial ministries to develop an acceptable policy based on the principles of: voluntarism, localism and “self-initiated environmental assessments”.

In a progress report published by the Ontario Environmental Farm Coalition in April 1995, it was stated that “all parties agree that self-directed initiatives are more likely to work than command and control mechanisms of change”.<sup>7</sup> This agreement on approach stems from the cooperative relationship the Coalition and the Ontario Federation of Agriculture (OFA) have with the Ministry of Agriculture, Food and Rural Affairs and with MNR and MOE.

The Chairman of the Environmental Committee of the Ontario Federation of Agriculture described the relationship with MOE:

“We deal with them often and they have been one of the easiest Ministries to deal with. They fully support our self regulating initiatives and they therefore have not seen a need to impose regulations affecting agriculture. We are also fortunate that the coalition has an agreement with the government to meet with the Deputy Ministers of Agriculture, Environment and Natural Resources two or three times a year... so we have input at the very highest level”.<sup>8</sup>

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<sup>6</sup> Canada-Ontario Environmental Sustainability Agreement, Environmental Farm Plans Committees (<http://res.agr.ca/lond/gp/commcont.html#EFP>)

<sup>7</sup> Ontario Environmental Farm Coalition, *Our Environmental Farm Agenda: What's Been Achieved 1992-1995*, April 1995.

<sup>8</sup> Personal interview conducted by E.Monpetit with Chairman of the Environmental Committee, Ontario Federation of Agriculture, March 13, 1997.



The political climate at the time and the Ontario NDP's explicit environmental agenda, indicated that there would be forthcoming environmental policy action towards the farming community in Ontario. "It [the program] was an attempt by the Coalition to ward off the anxiety that some policy makers would bring in more and more regulation".<sup>9</sup>

Prior to EFP, the Ministries were looking at farm planning separately... this brought MNR, MOE and OMAFRA together. In the past, ministries had funding to develop their own programs 100% ... the MNR still has programs that they run themselves... but there was a preference right from the start... that all future government dealing with grant incentives for environmental action should require an EFP first ...that is a tough sell when a Conservation Authority wants to develop an environmental program in a watershed or the MNR wants to overhaul the wetland program to protect wetlands.<sup>10</sup>

To some degree the design of the program was modelled on a similar voluntary program in Wisconsin. "We did look at the University of Wisconsin Extension... Farmstead Assessment System (Farm\*A\*Syst) program ... the worksheet approach... theirs was specifically designed for assessment of structures on the

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<sup>9</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

<sup>10</sup> Personal interview Program Advisor, Ontario Soil and Crop Improvement Association, September 18, 1997.

farm...and groundwater in particular... we copied that approach but made the program more comprehensive.<sup>11</sup>

One of the concerns from the outset was confidentiality. There was initially a real concern about documentation...that MOE could drive up the driveway and say “can I see your EFP” and then go through and identify non-compliance areas and write you up... then there was the other side ...the concern about how do we really know the farm is changing its poor environmental practices.<sup>12</sup> These concerns framed how the program was to be designed and delivered.

In terms of participation of environmental groups, there was very limited involvement.

“They were involved in the early stages... they reviewed the initial document ... I wouldn't say they had particularly glowing response...by and large they have kind of left agriculture alone for the last little while... we have tried in the review process to have them involved... some groups would push for no pesticide use... we can't go that far... but groups like the World Wildlife Fund promote environmental farm plans in their literature... so we have involved MOE ... Ducks Unlimited... Federation of Ontario Naturalists”.<sup>13</sup>

“We involved [environmental] groups... sometimes they back out...some were involved in assistance and review of the worksheets such as the wetlands worksheet... most have been supportive of the collective approach of the farm

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<sup>11</sup> Personal interview with Farm Policy Researcher, Ontario Federation of Agriculture, Guelph, Ontario, September 18, 1997.

<sup>12</sup> Personal interview with Program Advisor, Ontario Soil and Crop Improvement Association, Guelph, Ontario, September 18, 1997.

<sup>13</sup> Personal interview with Farm Policy Researcher, Ontario Federation of Agriculture, Guelph, Ontario, September 18, 1997.

groups".<sup>14</sup>

Essentially the program design stage was spearheaded by the Coalition and state agencies as partners. The result was a voluntary program that gained the support of provincial bureaucrats and federal funding sources.

The goals of the program were articulated in "Our Environmental Farm Agenda" a document released by the Ontario Environmental Farm Coalition in January of 1992. This document written by farmers representatives recommends that every farm develop an Environmental Farm Plan (EFP) by the year 2000. The central goal of the program was to have every farmer in Ontario develop, implement and maintain an environmental farm plan - the creation of 40,000 individual farms plans - one for every farm business in the province.

In terms of addressing non-point source water pollution, the goals were not specifically linked to water quality objectives. From the outset the program was designed to be a comprehensive approach to environmental management and encouragement of best management practices. In essence, the EFP program was designed to encourage the implementation of BMPs by using moral suasion and economic incentives.<sup>15</sup>

The Ontario Environmental Farm Plan is primarily a subsidy-based incentive

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<sup>14</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

<sup>15</sup> Weersk, A. et.al. "Economic Instruments and Environmental Policy in Agriculture", *Canadian Public Policy*, September 1998, 309-327.

program with the goal of assisting farmers in developing environmental farm plans. “There are really two programs.... the environmental farm plan program and the incentive program... and really the emphasis has always been put on the EFP... the voluntary, education and awareness component of the program ... there are different incentives to participate. The incentive covers just a fraction of what is intended to be done under the EFP. <sup>16</sup> “Every farm business is eligible to receive a maximum of \$1500. per farm towards reasonable costs provided they meet the EFP program’s eligibility criteria. Claims can be made until March 31, 2000 or until program funding runs out”.

Eligibility is determined based on:

- i) completion of a farm plan that has been reviewed and deemed appropriate by the local peer review committee;
- ii) owners are residents of Canada;
- iii) owners are the registered owners of the property in Ontario;
- iv) farm operation produced at least \$7000. in agricultural products in the previous production year.<sup>17</sup>

The farmer is considered to own the property if they lease the land for farming and have a signed lease of at least one year.

In 1993, funding was secured and the coalition implemented a pilot project across the province. Originally the funding starting at \$500. during the pilot and then was increased to \$1500. to try and increase participation.

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<sup>16</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

<sup>17</sup> Ontario Environmental Farm Plan Incentive Program, promotional brochure produced by the Ontario Soil and Crop Improvement Association, May 1997.

The Ontario Soil and Crop Improvement Association (OSCIA) plays the key role in program delivery in partnership with the Ministry of Agriculture and Rural Affairs (OMAFRA) which provides technical support. OSCIA had experience in program delivery for the Ministry of Agriculture, Food and Rural Affairs and was thought to be well suited for delivery of the program.

“Ontario has a very unique structure from a farm organization point of view... for implementation... we sent people down to the US...they don't have these types of organizations... they have a lot of lobby groups but no organizations involved in program delivery...OSCIA was already set up and doing this for us with another program”<sup>18</sup>.

The organization had been contracted to delivery the Land Stewardship program in the mid-1980s. The Land Stewardship Program was a similar BMP initiative targeting large scale producers in Ontario. From OSCIA's involvement in the delivery of the Land Stewardship Program, they were a good candidate to implement the EFP Program, welcomed the new role and they had the local networking to reach the entire Ontario farming community.

“We can deliver to farmers without the same perception... we have no problems of credibility... we have absolutely no links to regulatory action...even though there are some OMAFRA personnel that don't work in the regulatory areas... government is government...that is the perception. We can also deliver the program for far less money than what has traditionally been spent by the government on program delivery. OMAFRA started to download in 1987 ... from that point on we have been delivering for them, the feds and other ministries... so we do have a lot of expertise and a training network out there ... who are knowledgeable, trusted.. and by and large involved in farming in one way or another. There are only about a half-dozen of us in the (central) office but we have close to 175 representatives out in the

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<sup>18</sup>

Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

counties.”<sup>19</sup>

”In fact OSCIA was delivering the Land Stewardship program for our Ministry and then this program came up funded by the feds and then it was just a matter of adding a few hours on for their staff... and they have people in every county”.<sup>20</sup>

The relationship between OMAFRA and OSCIA was well established and cooperative. There was an assumption that OSCIA could more effectively and efficiently implement this program at the local level. In addition, OSCIA’s main office is located in the same building as OMAFRA in Guelph, Ontario.

The pilot project was promoted using a variety of mechanisms in order to encourage participation. “Word of mouth has in large part been the vehicle of communication... at the local level the program can be more targeted ... although initially there was a lot of promotion at meetings, through the media etc.”.<sup>21</sup> OSCIA hired Program Representatives on a regional basis to provide instructional support through EFP workshops. In the early stages, local peer review committees were established to encourage those farmers who were leaders in the community with regard to environmental practices to become involved. The function of local peer review committee is described below.

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<sup>19</sup> Personal interview with Program Advisor, Ontario Soil and Crop Improvement Association, September 18, 1997.

<sup>20</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

<sup>21</sup> Personal interview with Program Advisor, Ontario Soil and Crop Improvement Association, September 18, 1997.

The pilot program was launched as a totally voluntary program not targeted at any specific farmers, Approximately 500 farmers in seven counties took part in the pilot project and the initial delivery process. As outlined in Appendix 7-1, the EFP delivery process was structured around self-assessment and plan development through the use of a workbook. The self-assessment process involved farmers answering 250 questions about their farms related to farming practices, the farmstead and natural areas. Farmers in the pilot project voluntarily attended 2 half-day workshops and spent approximately 8-10 hours of their own time to complete the EFP workbook "risk modules".<sup>22</sup> The workbook includes 23 worksheets divided into three sections: soil and site evaluation; farmstead evaluation; and field evaluation. The workshops and materials are provided to participants free of charge.

Each farmer attends a first half-day workshop to assist with the preparation of their Farm Review. The first step is to develop a sketch of the farmstead including the location of structures, fields and other operations. The map later assists in locating the farm within the county so further data can be extrapolated on soil type, soil compaction and topography to then calculate the potential for surface water contamination, groundwater contamination and erosion. Each of 23 modules asks the farmer to describe and rank the current conditions based on defined criteria for farmstead and field areas. A simple rating system is used: Best 4, Good 3, Fair 2 and Poor 1. The "Best" rating indicates conditions that presently protect or have the

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<sup>22</sup> Ontario Environmental Farm Coalition, *Our Environmental Farm Agenda: What's Been Achieved 1992-1995*, April 1995.

lowest potential for environmental damage. The “Poor” rating indicates conditions that have a high potential to negatively affect the environment. Bold italic type is used in the workbook to indicate conditions that may violate existing legislation. Farmers are then asked to complete the Farm Review process at home. After attending the first workshop as a participant observer, the primary focus of the content and delivery is on education, not on the financial incentive available to install BMPs.<sup>23</sup> The farmers were provided with technical information about the soil types, topography and presence of environmentally sensitive areas in proximity to their farms. Although there was a sense of caution about evaluating and recording information in the workbook, farmers were reassured by the EFP Representative that the information was totally confidential and would only be reviewed by their peers if they decided to apply for the subsidy.<sup>24</sup>

Once the Farm Review is completed farmers can then voluntarily attend a second half-day workshop to learn about and consider different BMPs to address problems identified. This second workshop also assists farmers with the preparation of their Action Plans. A Peer Review Committee, made up of locally appointed farmers, provides a critical review of the action plans and offers advice on possible solutions. Typically ratings that received a 2 or 1 should be considered priorities for action and BMP solutions.

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<sup>23</sup> Attended Ontario Environmental Farm Plan Workshop # 1, Peel Region, Georgetown, Ontario, October 18, 1997.

<sup>24</sup> Ibid.



Only actions that are initiated after a participant has attended an EFP workshop are eligible for funding. After the action plan has been reviewed and approved by the local Peer Review Committee, a claim form is then submitted with receipts by the EFP Program Representative in the county.<sup>25</sup> Participants range from hobby farmers to larger agribusiness operations as there are no restrictions just to participate in the workshops and work on a plan. However, based on the eligibility criteria outlined above, not all farm operators are eligible for the subsidy. In addition to the subsidy incentive, those farmers who develop innovative solutions on implementing their action plans and BMPs are also eligible to enter the EFP Award Contest and possibly win \$1000.

On implementation, there is no technical design assistance, monitoring or follow through.

“For \$1500. we cannot afford to send someone out ... previous programs like Land Stewardship ... when we were talking like \$10,000, \$20,000 and even \$30,000 grants there were on-site inspections... in the mid-80s...the good old days... 8,000 farms over three years were inspected by Ministry staff... now we do perform periodic audits... there were individuals hired from the private sector... farms were randomly selected to audit and ensure the BMP was installed... monitoring costs have gone down considerably... from that audit all were in compliance and only one farmer refused based on his position that this was a voluntary confidential program and did not allow the individual on his farm period. This confirmed that the farm community was not abusing the program”.<sup>26</sup>

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<sup>25</sup> Ontario Environmental Farm Plan Eligibility Criteria  
(<http://res.agr.ca/lond/gp/efp/efp4.html>), November 1996.

<sup>26</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

In 1993, the program was “rolled out” across the province. Some minor modifications were made to the program as a result of the pilot. “We have been encouraging both the farmers and landowners to participate... I have heard some stories ... we have changed the eligibility... it used to be you had to be the registered owner and that has now changed... to include those who lease land to farm... the landowners themselves are encouraged to participate. There is some theory about the disincentives farmers face who lease land but their livelihood and production does depend on the land even if it is leased”.<sup>27</sup>

Complementing this process, an educational process about Best Management Practices (BMPs) was added to the program. A series of eight booklets were produced collaboratively in 1994 to supplement the EFP program and other initiatives. The information project was funded by Agriculture Canada and Managed by the Ontario Federation of Agriculture with the support of OMAFRA. One of the eight high quality booklets comprehensively addresses the technical aspects and BMPs related to water quality. Much of this technical knowledge also formed the foundation of the numerous workbook modules on water wells, disposal of wastes, treatment of household wastewater, livestock yards, milking centre wash-water, manure use and management, stream, ditch and floodplain management.<sup>28</sup> By 1997, 210,000 BMP documents had been distributed and an additional 200,000 were

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<sup>27</sup> Personal interview with Program Advisor, Ontario Soil and Crop Improvement Association, Guelph, Ontario, September 18, 1997.

<sup>28</sup> Ontario Environmental Farm Coalition, *Ontario Environmental Farm Plan Second Edition*, 1996.

planned for distribution to the year 2000.<sup>29</sup> These documents are distributed free at OMAFRA, regional Ontario Federation of Agriculture offices and at EFP workshops.

By 1995, the program boasted that 5,000 farmers in 52 counties across the province had participated in the EFP process.<sup>30</sup> By September 1997 a reported 9,600 participants had participated in the program (96% through workshops and 4% through the independent study option), 175 trained staff were actively involved in delivering the program, 33 OMAFRA staff were providing technical support and 3,000 projects had been completed and funded through the EFP Incentive Program. Green Plan funding from 1992-1997 supported \$3.4 million in grants and 2,867 claims. The farmer contribution has been estimated at over \$10 million.<sup>31</sup>

There have been subsequent modifications to the program. "We have also had to modify the process based on the diversity of farming in the province... some farmers like greenhouse growers initially did not feel the worksheets fit their needs... so we have had to work with them and modify the worksheets to bring new segments of the industry in. Right now we are developing one for bee-keepers ... a separate addendum...the second edition includes many of these changes but the way it is set

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<sup>29</sup> Agriculture Canada. *Best Management Practices* (<http://res.agr.ca/lond/gp/efp/pin/efpfunds.html>), April 1997

<sup>30</sup> Ontario Environmental Farm Coalition, *Our Environmental Farm Agenda: What's Been Achieved 1992-1995*, April 1995.

<sup>31</sup> Ontario Soil and Crop Improvement Association Briefing *EFP Closes in on Milestone*, August 1997.

up is that we can adapt the worksheets".<sup>32</sup>

In 1997, with a change in funding and dollars available for administration, more had to be directed to the incentive program and the delivery portion of the program. "With third party delivery there is the expectation that you deliver the program very inexpensively".<sup>33</sup> "It has forced us to pay OSCIA staff on a performance basis. Some workshops only had two or three people attending and this is inefficient. They are now paid on a per person basis... which changes things significantly in the field. The workshop leader does the recruiting and OFA also has people in the field that are encourage to push the workshops but signing up the workshop participants lies with the workshop leader. It has restructured the workshops".<sup>34</sup>

In general these changes have been undertaken in order to increase participation rates. Since then the participants have ranged ... some are virtually unknowns to Ministry staff and the farm organizations... many who traditionally have not been involved in voluntary farm initiatives.<sup>35</sup>

In 1997, OSCIA also assisted with two surveys to gain a better understanding

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<sup>32</sup> Personal interview with Program Advisor, Ontario Soil and Crop Improvement Association, Guelph, Ontario, September 18, 1997.

<sup>33</sup> Personal interview with Farm Policy Researcher, Ontario Federation of Agriculture, Guelph, Ontario, September 18, 1997.

<sup>34</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

<sup>35</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

of participation rates. To respect confidentiality, everything comes through our office and then out to local representatives... all types and size of farmers have participated and have completed surveys".<sup>36</sup>

A survey of EFP participants in August 1997 indicated that 93% of the 125 respondents started the program by attending Workshop #1 and 85% had their action plan peer reviewed and returned.<sup>37</sup> Some 79% had completed actions in their plans and 29.6% had completed all of the actions in their plans. A reported 62.4% had applied to receive their incentive grant. The average incentive claim was \$1140. (range \$44.-\$1500.) and the average reported cost of actions was \$4470. (range \$150.- \$43,000.). The most common BMP action take was actions related to storage of agricultural wastes (22.4%), soil management (15.1%) and water wells (14.5%). There was some variance in response to this question if the farmers were livestock farmers or cashcrop farmers.<sup>38</sup>

Overall, 24% of the respondents indicated that the EFP had a major effect on their management practices and 63.4% indicated it had "somewhat of an effect". Some 36% reported they took action because of family health and safety concerns, 58.2% because of water quality concerns and 5.6% to meet current legislative requirements. "Projects related to water quality and soil management are the most

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<sup>36</sup> Personal interview with Program Advisor, Ontario Soil and Crop Improvement Association, Guelph, Ontario, September 18, 1997.

<sup>37</sup> Ontario Soil and Crop Improvement Association, *Report on the Statistical Analysis of the Environmental Farm Plan Survey*, August 1997

<sup>38</sup> Ibid.

common”.<sup>39</sup>

The most common reported barrier to action was lack of finances (55%) and no proven solution to the problem (12%). The average reported acreage farmed was 413 acres and 66.9% were farmers 30-50 years of age.

“Depending on the county we are getting different types and sizes of farms. One of the sensitivities we have right now is ... we have farmers with several thousand acres that go through the program and when they see their neighbour with 70 acres eligible for the same incentive... there is some feeling that larger operators should have access to a larger incentive proportionate to their operation... but that is not the way it is set up. I don't think it really affects participation rates.”<sup>40</sup>

These findings confirmed earlier findings in a more extensive study of factors related to the nature of participation undertaken by a Master's student in the Department of Geography at the University of Guelph.<sup>41</sup> Based on a survey of EFP participants distributed by OSCIA to randomly selected counties after eliminating counties that had recently received an EFP survey. Of 400 surveys distributed, 124 were returned - a response rate of 31%. This study focused on factors that were statistically related to participation in the program. Motivations influencing participation in the program were ranked in terms of importance. Some 83% ranked soil and water quality as the

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<sup>39</sup> Personal interview with Farm Policy Researcher, Ontario Federation of Agriculture, Guelph, Ontario, September 18, 1997.

<sup>40</sup> Personal interview with Manager, Resources Management Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, Guelph, Ontario, September 18, 1997.

<sup>41</sup> Furman, Margaret, *Factors Associated with Sustained Farmer Participation: A Report to the Ontario Environmental Farm Plan Program*, summary of Master's Thesis, Department of Geography, University of Guelph, July 1997.

strongest motivating factor, human health reasons ranked next, learning environmental information ranked third, then farmer image, fear of penalty and the economic incentive ranked subsequently.

A variety of variables were tested for their influence on EFP participation. Numerous variables were found to exhibit a statistically significant relationship with participation including: community involvement of the farmer (measured by number of organizations each participant belonged to), participation in other environmental programs, educational background, perception of risk, incentives to participate in the program. Greater farm size and the use of rented land were both associated with a less thorough EFP assessment but the data do not indicate if these factors related to non-participation.

“We still have a long way to go. We said 40,000 in a decade and we are obviously not going to succeed in a decade... this project has been a wonderful educational tool. It has allowed for the identification of problems at the farm level... We are aware that there are a good number not coming forward to participate. I remain convinced that to attract them we need to link the EFP to existing programs... I hope that in the years ahead we will restructure property taxes ... lower taxes linked for those farmers who complete EFPs... similar to forestry who get benefits for filing management plans with the Ministry of Natural Resources. We are a fair way from that”.<sup>42</sup>

By March 1997 there was a projected surplus in the EFP budget because uptake of the incentive program lagged behind the assessment and action plan stages. An EFP Contract Committee was set up to select proposed projects. In the same year, the coalition established a Water Quality Working Group to specifically look

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<sup>42</sup> Personal interview conducted by E. Monpetit with Director, Christian Farmers Federation, March 13, 1997.

at water issues. The Water Quality Group has applied for funding and recommended two pilot projects proposing that municipalities divert some funds from sewage treatment plant upgrades to towards addressing rural non-point sources.

By 1998, CanAdapt funding had supported \$2.3 million in grants, some 1,719 claims and an additional \$7.5 million in farmer cash contributions.<sup>43</sup> “The program has been extended until the year 2000 with a target of another 2000 participants per year for the next three years. The program has never targeted specific problem areas... by linking up with other initiatives, this is happening. We have been delighted that there are programs that are now viewing the EFP program as an entry point to the farm community... we are dealing with the same clients so it makes a lot of sense”.<sup>44</sup> Some environmental groups and Conservation Authorities are now are very much wanting to partnering with us to gain access to farmers through the workshop process.<sup>45</sup>

There has been no data collected on the impacts of the EFP on water quality. Participation rates have been the primary indicator used to measure success of the EFP Program. To assess and estimate impacts, it is important to look at implementation of the program at the watershed level.

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<sup>43</sup> Segsworth, E., D. Armitage and A. Graham *Our Environmental Farm Agenda: What Has Been Accomplished 1992-1998*, paper presented at the Groundwater Conference, Canada Centre for Inland Waters, December 2-4, 1998.

<sup>44</sup> Personal interview with Program Advisor, Ontario Soil and Crop Improvement Association, Guelph, Ontario, September 18, 1997.

<sup>45</sup> Ibid.



### **The Subsidy-based BMP Policy Instrument Strategy at the Watershed Level: Caledon Creek Watershed, Peel Region, Ontario**

Caledon Creek is located in the larger Credit River Watershed. The Credit River itself is 90 kilometres long, supports over 1500 kilometres of creek and stream tributaries and covers an area of 1000 square kilometres.<sup>46</sup> There are an estimated 450,000 residents, 15 golf courses, 30 industries, 2 bottled water companies and numerous agricultural operations that rely on the water quality in the Credit River watershed.<sup>47</sup>

As outlined in the watershed map in Appendix 7-2, as part of the larger river basin, Caledon Creek falls within the Regional Municipality of Peel. Most of the watershed lies within the municipal boundaries of the Town of Caledon (population 45,000), downstream from Orangeville and upstream from the cities of Brampton and Mississauga. Proximity to major transportation routes (highways 401/403/407) has increased the development pressure and changed the land use. Over the next 25 years urban land use in the Credit River watershed is expected to increase from current 16 to 40% of the watershed area as population projections will reach an estimated 750,000 in the watershed by 2020.<sup>48</sup>

The land use in the Caledon Creek Watershed is in the north a mix of intensive and non-intensive agriculture with the remainder open space. In the

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<sup>46</sup> Credit Valley Conservation Authority, *A Business Plan for Watershed Management*, 1996: 10-11.

<sup>47</sup> Ibid: 7.

<sup>48</sup> Credit Valley Conservation Authority, *Business Plan*, 1996.

southern portions of the watershed there are significant active aggregate operations and urban uses dominating the character of land use (see land use map Appendix 7-3). Presently private and corporate landowners own 96% of the Credit River watershed which is representative of ownership throughout the watershed.<sup>49</sup>

### **Character of the Non-Point Source Pollution Problem in the Watershed**

In 1992, the Credit Valley Conservation Authority (CVC), in partnership with all area municipalities, the Ontario Ministry of Natural Resources and Environment completed a watershed study of the Credit River Watershed. The report recommended that the larger Credit River Watershed be subdivided into 20 subwatersheds and studies and action plans be developed in each subwatershed.<sup>50</sup> Caledon Creek (also called subwatershed 16), has been undergoing increased development pressures and the objective of the study was to determine the potential impacts on surface water quality.

The Regional Municipality of Peel funded the study which is useful in articulating the nature of the non-point source water pollution problem in the watershed. The Credit River watershed absorbs 24,000 cubic metres of effluent from sewage treatment plants (1 million flushes) each day. There are 30 landfill sites in the watershed, most of which are closed and unmonitored and over 7,000 wells used

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<sup>49</sup> Credit Valley Conservation Authority, *Business Plan*, 1996.

<sup>50</sup> Credit Valley Conservation Authority, *Caledon Creek Sub-watershed Study: Background Report*, July 1997: 1.

for water supply in the upper portions of the watershed.<sup>51</sup> The Credit River carries an average of 150 tonnes of soil each day from erosion of streambanks.<sup>52</sup>

Although the Regional municipality has had an indirect role in managing the watershed, primarily using land use regulation instrument strategies outlined in Chapter 5, the Credit River Watershed is managed on a watershed basis by the Credit Valley Conservation Authority (CVC).

Watershed data specific to the Caledon Creek watershed is less readily available. Caledon Creek faces similar NPS water pollution problems as the larger river basin. Its location in proximity to the headwaters makes the upstream watershed an important contributor to downstream water quality. Once again, it is important to examine the subsidy-based policy instrument strategy in action at the watershed level in order to examine the impacts the instrument and implementation arrangements have had.

### **The Subsidy-based Policy Instrument Strategy in Action at the Watershed Level**

The subsidy-based Environmental Farm Plan program which is based on improving agricultural practices through education and subsidies of best management practices, is not implemented on a watershed basis but rather on a county or regional basis. The EFP program is implemented in the Caledon Creek watershed by an EFP

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<sup>51</sup> Credit Valley Conservation Authority, *A Business Plan for Watershed Management*, 1996: 10-11.

<sup>52</sup> Ibid: 11.

Program Representative. The Program Representative, typically someone with an agricultural background, is hired by the Ontario Soil and Crop Improvement Association (the lead agency in implementing the EFP program in Ontario). Although there was one EFP Representative for each county at the beginning of the program, most EFP Representatives are now responsible for multiple counties. The current EFP Representative in the Caledon Creek watershed area is responsible for implementing the program and workshops for Peel, Halton, Dufferin, York, Simcoe and Muskoka Regions in Ontario. His responsibility covers a large number of farms in each region.

In the Caledon city area there are 490 farms according to 1996 Statistics Canada Data. In the Caledon Creek subwatershed there are a total of 101 farms, farmed by 57 farmers. Approximately half of the farms are below 200 acres and half larger than 200 acres.<sup>53</sup> In total there are 9057 acres of which 3090 acres are rented.<sup>54</sup> According to the EFP Representative, the total number of acres being leased by tenant farmers is increasing in the Caledon area as land south of Orangeville is increasingly owned by developers.<sup>55</sup> Farming in Peel Region is predominantly beef, dairy and cash crop with very minor horticulture, poultry and swine operations.

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<sup>53</sup> Data for Peel Region based on EFP participants from 1993-1998 aggregated by EFP Program Coordinator, Peel Region.

<sup>54</sup> Peel Region Environmental Farm Plan Statistics, collected from the Tax Assessment Database for farms over 50 acres by the EFP Program Coordinator for program contact purposes, 1998-99.

<sup>55</sup> Personal interview with Program Coordinator, Peel Region, Orangeville, Ontario, November 4, 1999.

In the Caledon Creek watershed most of the larger acreage farmers have participated in the EFP program but participation rates are an ongoing concern.

“In reality most larger acreage farmers are participating for the name, not for the financial incentive. I don’t think the amount of the financial incentive has had a negative impact in this area. I find the medium farm operators, with average ages of 60-65 are not interested in getting involved.

Implementation by farmers organizations really makes a difference... if it was run by the government nobody would participate... although this issue is not as important as it was when the program started. Some were scared that their information would end up in the government’s hands but now that some farmers have participated there is less concern about confidentiality. The political climate and the current government has also alleviated some of the concerns that existed in the early 1990s.

Participation definitely takes promotion and now we have an incentive-based payment scheme on top of a base salary which helps motivate Representatives. The biggest challenge is the same as it has always been... getting the farmers to participate. Most farmers who have participated to date are generally those farmers who participate in other initiatives and agriculture groups. The challenge is to reach those other farmers. The program is also open to other types of landowners such as golf course owners, nursery owners, equestrian operations but some types of landowners are not eligible for the EFP incentive.<sup>56</sup>

On March 31, 2000 the CanAdapt funding for EFP II ends. The coalition is presently trying to assess what is working and where the program should go. The OSCIA is currently undertaking a study with the University of Guelph to determine what impacts the program has had.<sup>57</sup>

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<sup>56</sup> Personal interview with Program Representative/Coordinator, Peel Region, Orangeville, Ontario, November 4, 1999.

<sup>57</sup> Fitzgibbon, J. et.al. *Environmental Farm Plan Indicator Survey* in press. Survey of EFP participants who have been through the peer review stage of the program.

### Indicators of Impacts

When asked what the primary impacts or outcomes of the program are, the representative responsible for implementation at the regional level responded:

“The main outcomes have been in terms of education. I view this as an educational program first and a subsidy-based program second. It is a self-assessment program. I think the technical foundation of the program and the longevity of the program and how it has evolved are two other positives. In terms of BMPs, manure storage improvement is the most common BMP installation. Second would be well closures and openings, then improvements to fuel storage. Installation of BMPs related to pesticide storage is less common since about 75% of farmers in this area do not store pesticides on site.<sup>58</sup>

In terms of water quality outcomes attributable to the subsidy-based BMPs under the Environmental Farm Plan in the Caledon Creek watershed there is no monitoring program in existence. Although the Ontario Soil and Crop Improvement Association responsible for implementation of the program collects data on the number of farm plans completed and BMPs installed, there is no collection of data on ecological impacts. The primary measure of impact of the EFP subsidy-based program is participation rates. There is no systematic collection of number and types of BMPs installed or the implications of these installation in terms of ecological improvements.

In the technical aspects of the program water quality issues are central. Most farmers do not test their wells or water sources for their livestock... this program makes these human health and environmental issues very clear and educates farmers

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<sup>58</sup>

Ibid.

about the importance of annual monitoring and testing. The first half of the workbook deals with water issues and the second half deals with soil and nutrient management issues.

Although the Ministry of Environment does maintain two water quality monitoring stations on the main stem of the Credit River, there is no monitoring of headwater tributaries including Caledon Creek.<sup>59</sup> The subwatershed study discussion report and terms of reference developed by the Credit River Conservation Authority for the study did articulate a need for water quality monitoring in the Caledon Creek watershed. The report recommended snapshot sampling of ambient conditions seasonally as well as collection of benthic macroinvertebrate organisms such as mayflies and stoneflies as biological indicators.<sup>60</sup>

As part of the watershed planning process, CVC is undertaking water quality base-line data collection in the Caledon Creek watershed. In 1996, samples of macroinvertebrates were collected at 37 locations in the watershed. In addition to collecting benthos, water temperature data, stream depth and width data, flow rate data and suspended and substrate particulate data were collected.<sup>61</sup> The diagnostic analysis using a biotic index indicated that some sections of Caledon Creek adjacent

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<sup>59</sup> Credit Valley Conservation Authority, *Caledon Creek Subwatershed Study: Background Report*, July 1997:27.

<sup>60</sup> Ibid: 27-28.

<sup>61</sup> Credit Valley Conservation Authority, *Caledon Creek Subwatershed Characterization Report*, prepared by CVC, Environmental Resources Group, Parish Geomorphic, Blackport Hydrogeologic and Water Systems Analysts, November 1999.

to aggregate operations, south of the town proper, those in proximity to Hwy 10 and some sites adjacent to intensive agriculture had poor water quality.<sup>62</sup> Stations in the headwater areas generally had better water quality based on the biotic index.<sup>63</sup> There was also a general relationship found between the biotic index value at each site and the type of fish communities present. Based on these findings the report concludes that benthos indicators should be used as monitoring tool in the future to reflect changes in water quality associated with changes in land use.<sup>64</sup>

In 1999, the CVC developed an Integrated Watershed Monitoring Program. The program is integrated in that water quality data would be collected under the following categories: chemical (nutrients, organics, DO levels, metals); physical (temperature, dissolved and suspended solids); biological (fish and macroinvertebrates) and microbiological (bacteria).<sup>65</sup> These indicators would be used to identify water quality stresses and establish water quality objectives in the context of Provincial Water Quality Objectives established by the Ministry of the Environment and Aquatic Health Objectives from the Ministry of Natural Resources.

The monitoring program is based on a two tier approach. Tier 1 involves

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<sup>62</sup> Ibid. Section 8.6.4

<sup>63</sup> Ibid. Section 8.6.5

<sup>64</sup> Credit Valley Conservation Authority, *Caledon Creek Subwatershed Characterization Report*, prepared by CVC, Environmental Resources Group, Parish Geomorphologic, Blackport Hydrogeologic and Water Systems Analysts, November 1999, Section 8.6.4.

<sup>65</sup> Credit Valley Conservation Authority, *Credit River Water Quality Strategy Terms of Reference*, 1999: Section 4.1.



ongoing cost-effective monitoring of reference locations in the watershed to monitor longitudinal changes in water quality. Tier 2 is more extensive monitoring if poor water quality or deterioration is observed.<sup>66</sup> The program started in the summer of 1999 and no data are yet available.

These water quality monitoring efforts are not connected to the subsidy-based EFP Program.

“There is very little interaction with the CVC. Farmers tend to not like Conservation Authorities very much ...because they are perceived as too regulatory ... to conservation oriented .. this applies to the Niagara Escarpment Commission ... they are viewed as part of the government ... I don't think this is a bad thing. I do promote their stewardship initiatives but do not work directly with them. If the Conservation Authorities were implementing this program they would get a certain percentage are conservation minded but that is it. Actually, the Grand River Conservation Authority tried to implement a program similar to EFP several years ago and they had some difficulties... now they have taken a partnership with the Region of Waterloo and EFP to make the program more appealing to farmers. It is really important in that region because of groundwater resources.

If monitoring or post-plan assessment resources were available and were to be done, EFP would do it however not likely in partnership with the Conservation Authorities. I think Conservation Authorities have lost a lot of power in the five or six years and have retreated to their original mandates. Instead of getting into other things that they really shouldn't be involved in”. I think it has been funding cuts more than anything else and they have lost a lot of staff. Even though they have stewardship outreach... there is not really a concern about landowner contact from multiple agencies.”

Although there are many stakeholders active in this watershed, none have NPS water quality management as their primary focus. Clearly there is evidence of multiple stakeholders with an interest in protecting water quality but the implementation of

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<sup>66</sup> Credit Valley Conservation Authority, *CVC Integrated Watershed Monitoring Program*, 1999.

a subsidy-based BMP policy instrument strategy has been a sector-based, voluntary approach. Table 7-1 summarizes the design principles of this policy instrument strategy in the Caledon Creek watershed.

**Table 7-1**  
**Summary of Subsidy-based Policy Instrument Strategy in Peel Region Ontario**  
**& The Caledon Creek Watershed Case 1993-1999**

Evaluative Dimensions	Summary
Instrument Design/Approach	<ul style="list-style-type: none"> <li>• voluntary</li> <li>• county/region based, not watershed based</li> <li>• sector specific (rural/agricultural)</li> <li>• designed by representatives from farmer organizations</li> </ul>
Implementation Agents	<ul style="list-style-type: none"> <li>• Coalition of farmer organizations (OSCIA in particular)</li> <li>• local EFP Representatives/Coordinators</li> <li>• local farmer Peer Review Committees</li> </ul>
Stakeholder Involvement	<ul style="list-style-type: none"> <li>• farmer organizations</li> <li>• low involvement of environmental stakeholders</li> <li>• no involvement of Conservation Authority</li> <li>• farmer contribution</li> </ul>
Resource Allocations	<ul style="list-style-type: none"> <li>• low provincial in-kind contribution</li> <li>• funded by federal Agriculture Canada and CanAdapt</li> <li>• personnel commitment at local level</li> <li>• high transaction costs to be eligible for subsidy</li> <li>• no funding at local level</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• focused on participation rates</li> <li>• no focus on BMP installation measures</li> <li>• no specific resource allocation for monitoring implementation or impacts</li> <li>• some monitoring by CVC but not linked to instrument strategy</li> <li>• recent CVC WQ monitoring program in the watershed, separate from subsidy-based policy instrument strategy</li> </ul>
Reported Effectiveness Outcomes	<ul style="list-style-type: none"> <li>• gradual increase in participation rates to 16,000 of 40,000 targeted</li> <li>• many participate for water quality reasons</li> <li>• educational / farmer awareness</li> </ul>
Reported Ecological Outcomes	<ul style="list-style-type: none"> <li>• none directly connected to the implementation of the instrument</li> </ul>
Sustainability Potential of PIS	<ul style="list-style-type: none"> <li>• focus on voluntary “sermons” approach</li> <li>• part-time personnel at local level</li> <li>• recent federal funding extension</li> <li>• commitment from farm organizations</li> </ul>

There is clearly some evidence in this case that institutional arrangements at the federal and provincial level have not created institutional incentives to facilitate the choice or design features of this policy instrument strategy in Ontario. The instrument and its design and implementation features were in large part determined by organized agricultural interests in the province. At the local, watershed level important stakeholders such as Conservation Authorities have not been involved in design or implementation of this policy instrument strategy.

**Table 7-2**  
**Analysis & Evaluation of the Policy Instrument Strategy**

<b>Institutional Capacity</b>	<b>Rating</b>
Vertical	Low
Horizontal	Low
Stakeholder	Medium
Monitoring & Evaluation	Low
<b>Outcomes</b>	
Effectiveness	Low

As outlined in Table 7-2, the vertical institutional capacity of the subsidy-based policy instrument strategy is “low”. The primary designers of the policy instrument strategy were a coalition of farmers’ organizations and the primary implementation agent, the Ontario Soil and Crop Improvement Association, has only an informal relationship with OMAFRA for technical and in-kind support and indirect accountability to Agriculture Canada as an arms-length, unconditional funding agency. There is also little vertical cooperation and institutional integration

with the Credit Valley Conservation Authority or municipal units of government involved in water pollution management. Vertical intergovernmental relations and horizontal institutional capacity is also low.

In terms of horizontal and stakeholder capacity, the policy instrument strategy itself does reflect “medium” levels of institutional capacity. The design features of the EFP program are comprehensive and cross-medium in orientation yet institutionally there is very little capacity between land use and water quality management agencies at the local or provincial level. Although the policy instrument strategy involves, farmers as one of the main stakeholder groups in water quality, in design and implementation of the policy instrument strategy, other important stakeholders are absent and institutional incentives for involvement of other key state and societal stakeholders are non-existent.

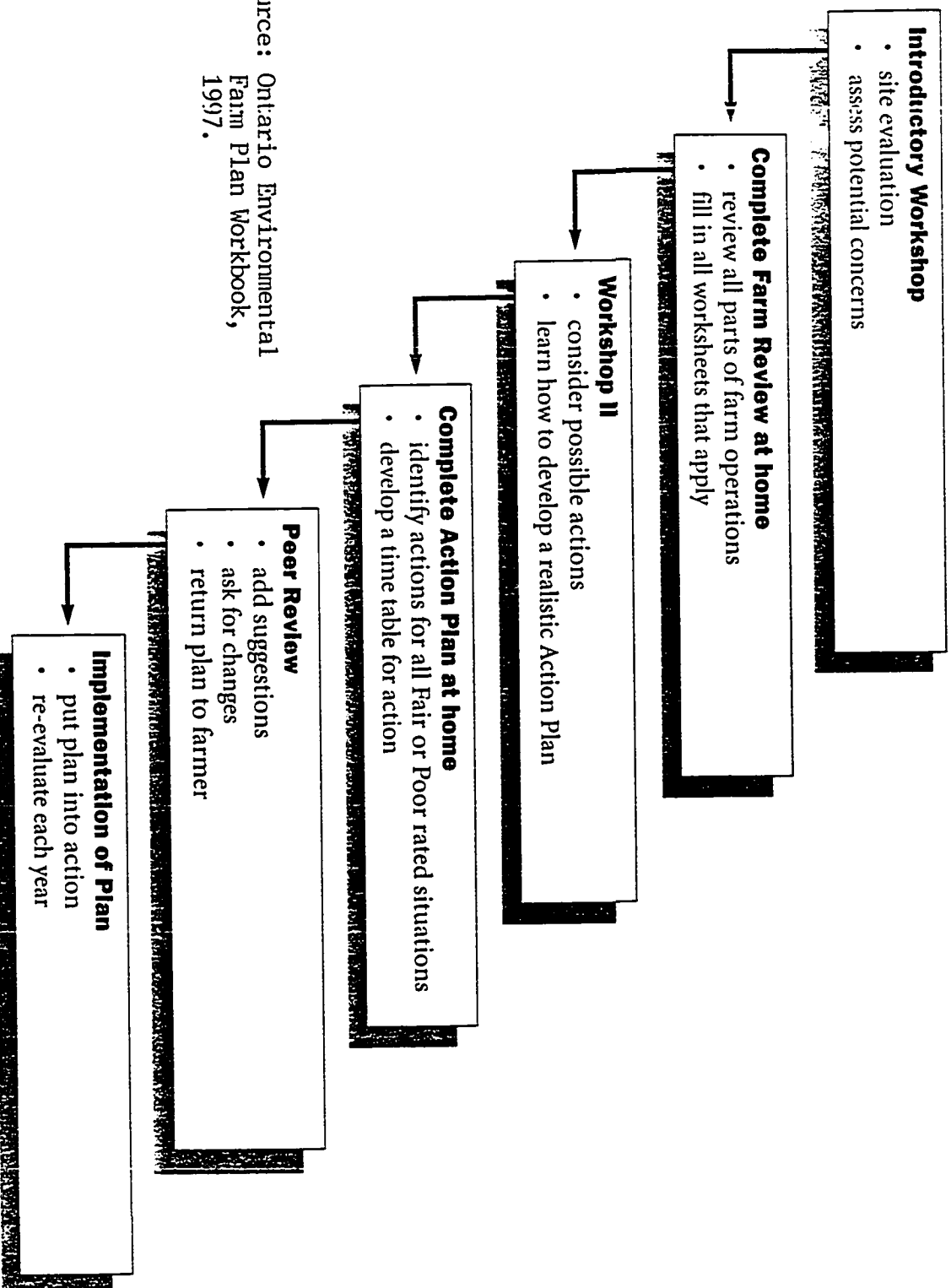
The case illustrates that institutional capacity of this subsidy-based policy instrument strategy in Ontario is low. Overall, the effectiveness of the instrument is also low. Although participation rates in EFP workshops are one indicator of successful performance of this program, there is very little evidence that the policy instrument strategy design exhibits effective institutional incentives for cooperative approaches to address NPS water pollution problems at the watershed, regional or provincial levels.

## **Conclusions**

The Caledon Creek watershed case provides evidence that a technically, well designed policy instrument strategy that is not supported by adequate levels of institutional capacity will have limited effectiveness. This is not a surprising finding when the institutional design features of the policy instrument strategy do not explicitly reflect goals of NPS water pollution management. These institutional limitations are even more evident when examined in contrast to the design and implementation of a similar policy instrument strategy in the previous chapter.

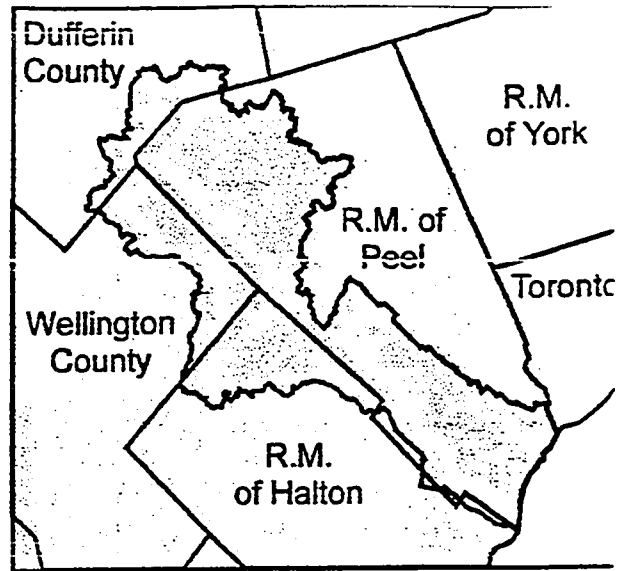
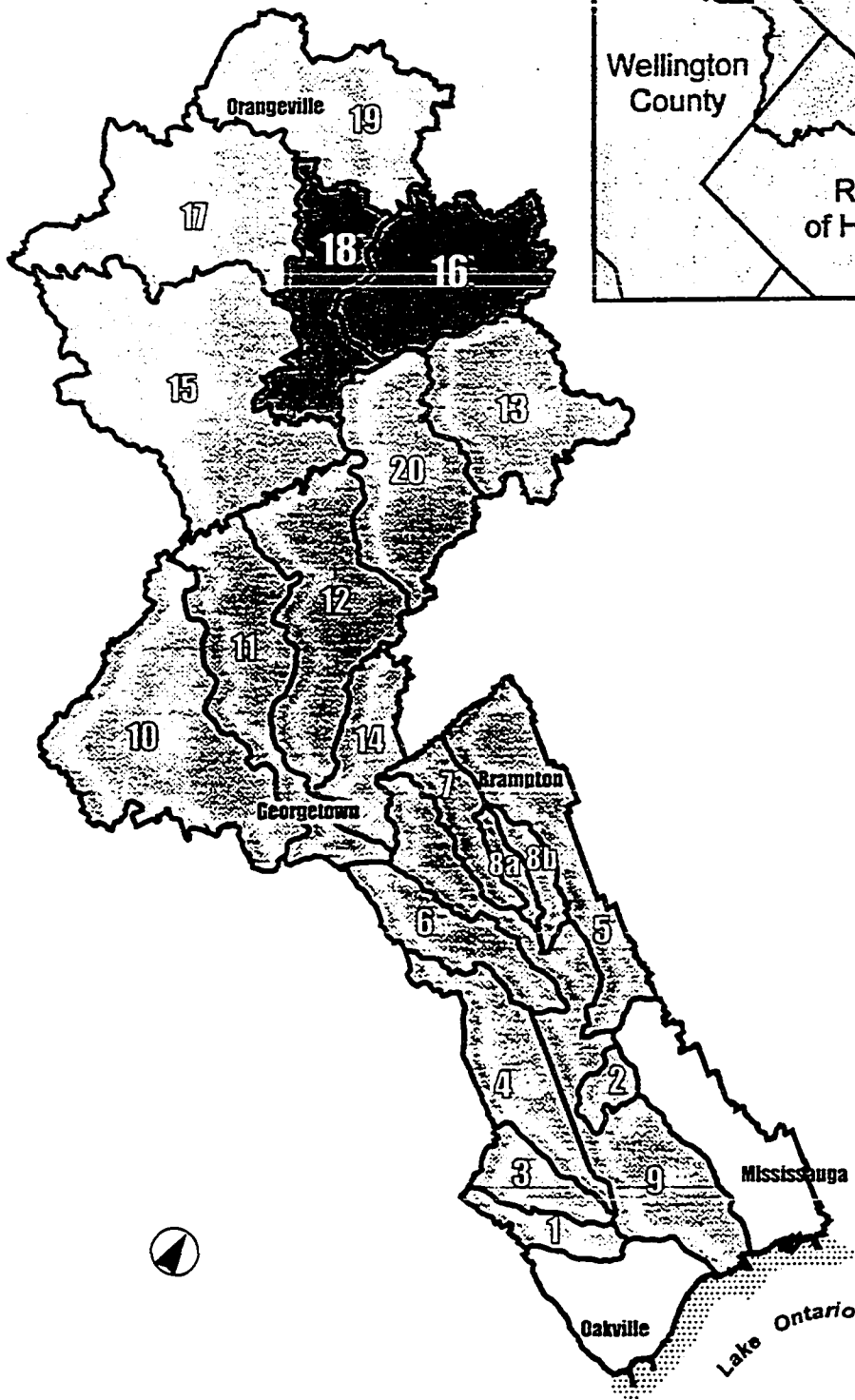
Chapter 10 will examine this case in contrast to the Wisconsin case in more detail using the analytical framework outlined in Chapter 2.. The next and final section of empirical chapters includes an examination and analysis of the third type of policy instrument strategy used to address NPS water pollution problems in Canada and the US - tax-based, incentive instruments.

# The Environmental Farm Plan Process



Source: Ontario Environmental  
Farm Plan Workbook,  
1997.

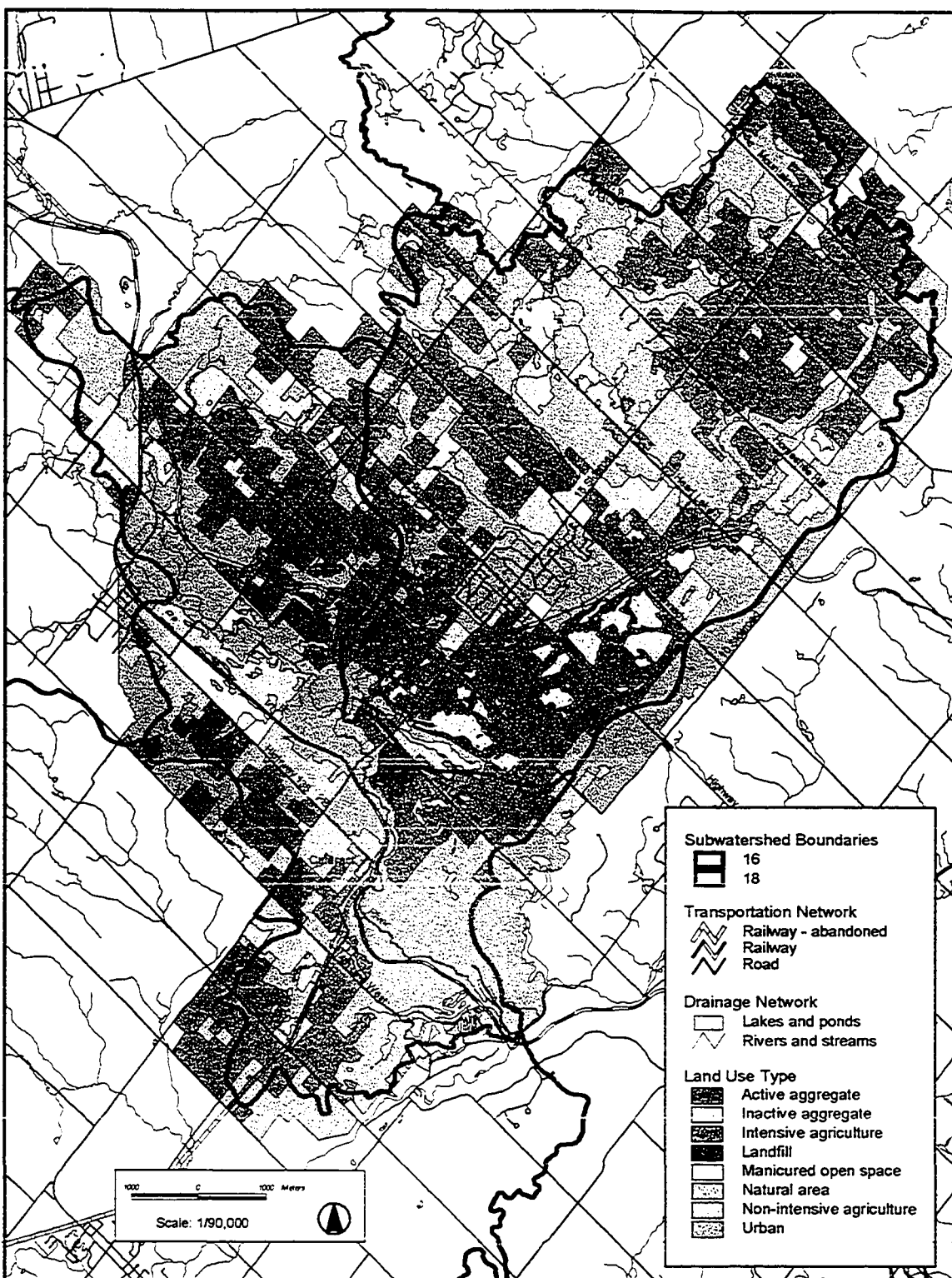
Appendix 7-2



Subwatersheds 16 and 18 within the Credit River Watershed



Appendix 7-3



Land Use

Sources: Credit Valley Conservation, 1997.



## SECTION IV

### Tax Incentive, Conservation Easement, Land Trust Policy Instrument Strategies

## **Chapter Eight**

### **Tax Incentives, Conservation Easements and Land Trusts As a Policy Instrument Strategy New York & The Eighteen Mile Creek Watershed Case**

#### **Introduction**

Although land use regulation and subsidy-based incentives are more common types of instruments used to address non-point source water pollution, other voluntary measures that have been used to protect water quality are tax incentives and conservation easements administered by public agencies or more commonly by private, not-for-profit organizations such as land trusts. These particular instrument strategies are evident in both Canada and the US but are more commonly found in the land management toolbox rather than the water quality management toolbox. Only recently have explicit linkages been made in using these tools to address non-point source water pollution problems.

In order to fully examine the use of tax policy instrument strategies in the management of NPS water pollution it is again necessary to use a case study approach. A watershed in New York State in this chapter and in Ontario in Chapter 9 will be used to examine the tax incentive policy instrument strategies in action. Again, an examination of institutional arrangements at the federal and sub-national levels is required to analyze the intergovernmental character of the instrument strategy in action at the watershed level.

#### **The Tax, Easement and Land Trust Policy Instrument Strategy at the State Level: New York State**

New York, like Michigan and Wisconsin, has a hierarchy of rules and institutions involved in NPS water pollution management. It is in this context that tax incentives and conservation easements as land and water use tools have proliferated. In order to examine the local implementation of these instrument strategies, it is important to understand the context in which the instruments are embedded.

New York, like other US states, has implemented a NPS Management Program in order to comply with the provisions of Sec. 319 in the Clean Water Act. Similar to Michigan and Wisconsin, the predominant policy tool for implementing the program has been subsidy-based incentives in the form of Best Management Practices projects on a watershed basis.

In comparison to other states in the Great Lakes area, New York lagged

behind Michigan and Wisconsin in establishing state level instrument strategies to address non-point source water pollution. Although several Bond Acts were passed in the 1960s to address water quality issues, the funding was almost exclusively targeted to assist municipalities in the construction and operation of sewage treatment facilities.<sup>1</sup> Following the enactment of the 1972 Clean Water Act there was also some effort in NY state to develop “basin plans” to comply with Sections 208 and 303E. “This was the first time we paid attention to non-point sources”.<sup>2</sup> The state had basically completed assessment and development of basin plans by 1983 and generally, “activity related to NPS then went into an hiatus”.<sup>3</sup> On interviewing a senior state official who had worked in water quality management for some 30 years, the reason cited for this lag in NPS initiatives was a change in administration in Washington and a removal of Section 208 appropriations from the federal budget.<sup>4</sup> According to the same official, “it was not until the 1987 amendments that a major reemphasis on NPS started with new federal appropriations”.

On re-focusing the NPS efforts in New York state in order to complete the required state assessment and documentation required by the EPA, the state took an inventory of ongoing initiatives related to NPS water pollution management and was

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<sup>1</sup> Personal interview with Director, Bureau of Watershed Management, Department of Environmental Conservation, Albany, New York, July 28, 1998.

<sup>2</sup> Personal interview with Director, Bureau of Watershed Management, Department of Environmental Conservation, Albany, New York, July 28, 1998.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

pleasantly surprised to find a variety of other agencies still actively involved in initiatives. “We did an extensive outreach effort to agencies and localities about NPS efforts and one of the interesting things we found ... it was kind of like people who started in the early 1980s were still out there trying to do things at the local level and we re-found them... it re-energized people”.<sup>5</sup> One of the institutional outcomes was an establishment of a NPS Coordinating Committee including representatives from the Department of Agriculture & Markets, the State Department of Environmental Conservation, the Department of State, the Department of Health, the US Geological Survey, Regional EPA, Natural Resources Conservation Service, Cornell University Extension and several local agencies.

Since federal approval of the state’s NPS Management Plan, New York state has been implementing BMP subsidy-based projects similar to Michigan and Wisconsin. In 1998 the state was receiving \$3.4 million in federal funding under the Sec.319 program. Approximately \$2 million was allocated to state staffing to implement the program and \$1.5 million to do projects.<sup>6</sup> It was not until 1996 that the state under Governor Pataki’s leadership enacted a Clean Air- Clean Water Bond Act to finance approximately \$500 million for water quality improvement projects over a 5-7 year period. The total estimated state allocation to the NPS Management Program in 1998 was approximately \$5 million from the State’s budget and

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<sup>5</sup> Ibid.

<sup>6</sup> Personal interview with Director, Bureau of Watershed Management, Department of Environmental Conservation, Albany, New York, July 28, 1998.

approximately \$4-5 million under the Bond Act.<sup>7</sup> With the funding increase under President Clinton's Clean Water Action Plan, New York State was scheduled to receive \$6.7 million in federal funding in fiscal year 2000.<sup>8</sup> This brought the combined program total to nearly \$15 million dollars annually, not including contributions of local units of government at the watershed level.

The responsibility for implementation of both the federal and state BMP programs in this area lies with the NY Bureau of Watershed Management under the Department of Environmental Conservation. The State of New York, similar to other states (including Wisconsin and Michigan), prioritizes water quality problems by watershed and type of problem. The primary method of prioritizing is based on determining use impairments. By 1997, the state had 50 NPS watershed-based projects underway.

Also similar to Wisconsin and Michigan, many watersheds in New York state attribute a high percentage of their water quality impairments to non-point sources. "Of the water quality problems we have identified in the state, about 85% of them are non-point source related.... here we are talking diffuse, runoff sources... agricultural and urban runoff and system failures".<sup>9</sup> Although the funding levels do not match

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<sup>7</sup> Personal interview with Director, Bureau of Watershed Management, Department of Environmental Conservation, Albany, New York, July 28, 1998.

<sup>8</sup> U.S. EPA Office of Water, *Supplemental Guidance for the Award of Section 319 Non-point Source Grants in Fiscal Year 2000* (<http://www.epa.gov/owow/nps/Section319/fy2000.html>)

<sup>9</sup> Personal interview with Director, Bureau of Watershed Management, Department of Environmental Conservation, July 28, 1998.

the scale of the problem, the official argued that “there are good reasons since point source solutions tend to be much more expensive”.

There is recognition that numerous efforts by agricultural agencies and local agencies complement the programming at the state level. In addition to subsidy-based BMP instruments, New York also employs land use regulation and educational instruments at the local level to encourage responsible land use and non-point source water pollution management at the local level. “DEC staff have worked directly with local governments explaining the advantages of local ordinances and assisting them in developing their own based on a model ordinance developed at the state level”.<sup>10</sup> Education and training of local officials, in partnership with the US Soil Conservation Service, has also been a unique thrust of the NPS Program in New York State.<sup>11</sup> Tax incentives and conservation easements have become another tool in the toolbox to address water pollution problems associated with land use.

In the US, tax incentives, conservation easements and private land trusts together form an interesting instrument strategy to address the interface between land use and non-point sources of water pollution. The basis of this policy instrument strategy stems in large part from federal income tax legislation and the development of private, not-for-profit land trusts or conservancies as holders and managers of conservation easements.

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<sup>10</sup> US, EPA. *Success Stories: New York* (<http://www.epa.gov/owow/nps>), 1997.

<sup>11</sup> Ibid.



Although historically tax incentive instruments have evolved as land management instruments, land trusts or conservancies are an increasingly important policy tool in managing water quality issues related to land use. Although they vary significantly in structure and function, land trusts are generally non-profit organizations involved in the implementation of voluntary measures to manage land for environmental purposes. The primary tool used to do this in the US is the private conservation easement.

"Conservation easements are essentially agreements which set out conservation obligations for a property and are then registered on the land title. As a result, landowners agree to be legally bound to these conservation obligations, which can then be enforced against current and future landowners by the holder. For example, an easement might restrict the development of land, the cutting of trees, or require the maintenance of fences to keep livestock out of a stream".<sup>12</sup>

"Easements are like a bundle of rights... different types of property rights are transferred to the land trust.. originally they included rights like the right to develop or clear land... but easements are getting very sophisticated... including language limiting use of pesticides, types of farming etc..."<sup>13</sup> Basically the landowner gives up certain rights in exchange for tax and ecological benefits. Partial interests - the individual sticks in the complex bundle of rights that constitute land ownership - can be identified and traded separately providing a means of formally valuing and

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<sup>12</sup> Attridge, Ian C. *Conservation Easement Valuation and Taxation in Canada*, Report No. 97-01 prepared for the North American Wetlands Conservation Council and the Habitat Conservation Division, Canadian Wildlife Service, Environment Canada, 1997: ix

<sup>13</sup> Personal interview Director, New York Land Trust Alliance, Saratoga NY, July 28, 1998.

protecting the diverse interests of multiple stakeholders in a particular parcel of land.<sup>14</sup> The primary implementation agent of these tools are non-profit organizations called land trusts.

Under common law, the first land trust in the US was recorded in Massachusetts in 1892. However, it was not until the 1970s that the notion of transferring property rights to an independent private organization (and the idea that the public could benefit from private conservation easements) was enacted into statute in many states. By 1980 over 40 states had legislation related to land trusts in place and by 1998 all but 2 states did not have similar legislation.<sup>15</sup>

A coalition of US land trusts first called the Land Trust Exchange and renamed in 1982 to the Land Trust Alliance (LTA) played an important role in promoting the concept of land trusts across many states. The LTA is based in Washington, employs 23 full-time personnel including a Director of Public Policy, two Policy Analysts and one lawyer. The LTA is made up of approximately 1,200 land trusts from across the US (see Appendix 8-1). The organization receives its resources from its member land trusts and from foundations, corporate and individual donations. By 1997, the LTA had total annual revenues of \$1.5 million and total annual expenditures of \$1.4 million.<sup>16</sup>

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<sup>14</sup> Wiebe, Keith D and R. Meinzen-Dick, "Property Rights as Policy Tools for Sustainable Development", *Land Use Policy*, 15:3, 1998: 203.

<sup>15</sup> Ibid.

<sup>16</sup> Land Trust Alliance, *Annual Report*, Washington DC, 1997.

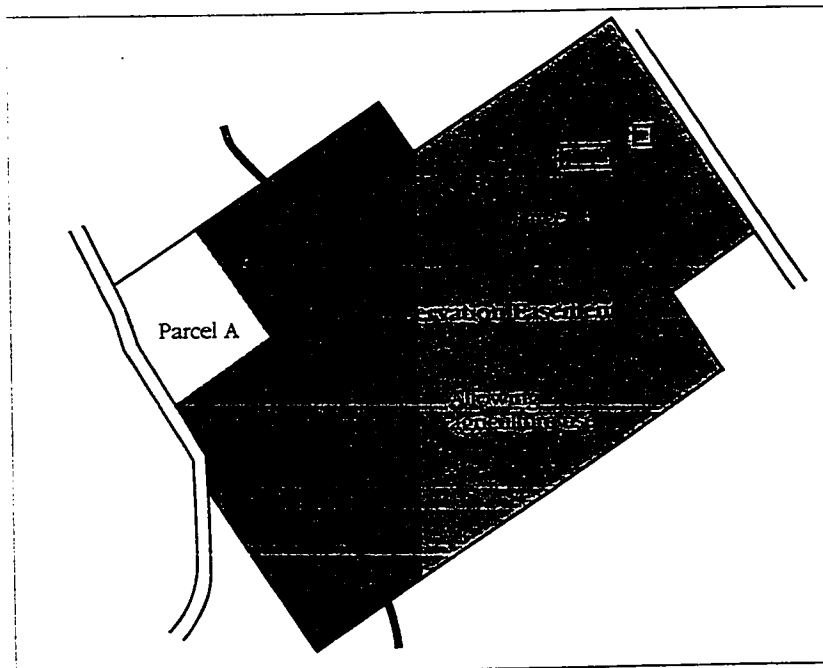
The LTA functions as an umbrella organization and is involved in various activities including fundraising, lobbying and program delivery on behalf of its member organizations. The organization provides all its member land trusts with important information on legislation, management practices and the legalities of holding conservation easements. Some of the information is distributed via the organization's website and via the organization's annual Land Trust Rally. The organization also drafted a model state statute called the "Universal Conservation Easement Act" that over time was amended and adopted by all but two states. More recently the organization has focused its lobbying efforts on the Farm Bill and amendments to the internal revenue code. The organization continues to support the land trust network in the US and lobbies for tax incentive improvements in the internal revenue code.

Amendments to federal tax law in 1969, 1976 and 1980 form the foundation of modern land trusts in the US. Since the final amendments in 1980, easements have qualified under Section 170 (h) of the Internal Revenue Code for an income tax deduction and the incentives have been in place for those property owners to view easements as a tax, estate planning and ecological protection tool.

Essentially, the landowner that places a conservation easement on his or her property is eligible for an income tax deduction under charitable gift provisions of the Internal Revenue Code. For example, the property below in Figure 8-1 illustrates the options a property owner has. In this example, the property owner can decide to keep Property A in proximity to the road for future development and or unrestricted

sale. He then can place an easement on the remainder of the property (Parcel B). The lands in close proximity to the stream can be designated as “no development” and another section can be designated to permit agricultural use.

**Figure 8-1** Example of Conservation Easement Options



There are a variety of configurations that allow the property owners to take advantage of tax incentives to varying degrees depending on the uses permitted on the land. By giving up potential development rights landowners can secure a reduction in their property values which can be written off as a federal and state

income tax deduction. Under the income tax provisions in Section 170(h) of the tax code, the landowner can deduct up to 30% of his or her adjusted gross income for the donation under a conservation easement.<sup>17</sup> If the value of the gift exceeds 30% the landowner can carry the excess forward for up to five additional years.<sup>18</sup>

For example, if a landowner donates a conservation easement with an assessed value of \$80,000 to a land trust and his adjusted gross income for the next five years is \$50,000 (assuming that his income remains constant) he could use the deduction as follows:

Based on annual adjusted gross income of \$50,000		
$\$50,000 \times 30\% = \$15,000$		
Easement Deduction	Year 1	\$15,000
	Year 2	\$15,000
	Year 3	\$15,000
	Year 4	\$15,000
	Year 5	\$15,000
	Year 6	\$ 5,000

In this example, the landowner would be able to deduct the entire value of the easement donation. If the easement's value would have exceeded \$90,000 the landowner could not have received a deduction for the full amount since the

<sup>17</sup> In addition, the code allows for a 50% deduction option based on the basis (original acquisition cost) for those landowners whose properties have not appreciated a lot in value.

<sup>18</sup> Land Trust Alliance, *Conservation Options: A Landowner's Guide*, Washington DC, 1996.

<sup>19</sup> Land Trust Alliance, *Conservation Options: A Landowner's Guide*, Washington, DC, 1996: 44.

limitation is directly tied to income level.

In addition to the income tax provisions, conservation easements can be donated by will and can be placed on properties inherited by bequest to reduce estate taxes.<sup>20</sup> Under the Taxpayer Relief Act passed by Congress in 1997, new estate tax incentives related to conservation easements were added under Section 2031(c) of the Internal Revenue Code. When a landowner dies, the value of the land for estate purposes is just a fraction of what it would have been at fair market value and the landowner's heirs avoid paying hefty estate taxes. The loss in value attributable to an easement can range from 20% to 90% of a property's market value depending on the extent of development rights that are given up. These can be significant tax savings since an average rural acre costs \$800 (US).<sup>21</sup>

In addition, under Section 212(3) of the Internal Revenue Code, most if not all of the donor's costs of creating the easement are deductible as tax preparation expenses.<sup>22</sup> Costs such as appraisal costs, accountant or attorney fees. The tax code also provides a full exemption from capital gains for donations of qualified lands and conservation easements.<sup>23</sup>

To qualify under the tax rules, the property has to meet certain criteria.

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<sup>20</sup> Land Trust Alliance, *Conservation Options: A Landowners Guide*, (Washington: Land Trust Alliance), 1996.

<sup>21</sup> "Asphalt is always the last crop", *Forbes Magazine*, June 15, 1998.

<sup>22</sup> Listserv correspondence from T.Mayo, Tax Lawyer, Amherst NH, June 16, 1998.

<sup>23</sup> Attridge, I. "Exempt Ecological Land Gifts from Capital Gains Tax", paper prepared for submission to the Federal Department of Finance, Canada, July 1999.

Generally it must have heritage or ecological value and in order to qualify for tax deductions, the easement must be “perpetual”. The incentives are higher in area where lands are under development pressures since property values are higher. Landowners have to show that there is a public benefit from the easement. Traditionally, the tax incentives and conservation easements were placed on large parcels but easements based on ecological significance are now being placed on small parcels in the one and two acre range.<sup>24</sup>

Under recent amendments to the Internal Revenue Code, a new section 6007 (g) under certain circumstances allows the inheritors of land to donate a conservation easement and take the same deduction from estate taxes as if the easement were placed on the property by the deceased owner prior to their death.<sup>25</sup> Prior to this legislative amendment, an incentive existed for inheritors of property to sever portions of the property to cover estate taxes.

The conservation easement as a tool has evolved from its original use for utility corridors, to a straight forward tool to prohibit development, to a complex and sophisticated tool that allows for the transfer of different types of land use rights. Conservation easements now typically outline a variety of permitted and prohibited land uses including specific requirements for land use in close proximity to watercourses. These restrictions become part of the title and are therefore perpetual.

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<sup>24</sup> *Conservation Easements Lighten Taxes*, Wall Street Journal, August 9, 1999.

<sup>25</sup> President Clinton signed the Internal Revenue Service Reform Act into law on July 22, 1998. The new provisions related to estate taxation and conservation easements are subject to limitations outlined in section 2031 (c) of the Internal Revenue Code.

On having the title surveyed through the registry of deeds, a prospective purchaser of land will become aware of the restrictions on that property. The technical sophistication of easements has in fact spawned an industry of appraisers and lawyers to document and ensure the details of the easement are upheld.

In terms of monitoring easements, most land trusts require a contribution from the landowner to an endowment fund. Typically these funds are used to monitor the property through site visits and documentation undertaken by volunteers. The other major use of the funds is for a legal defence fund in case easements are challenged in court.

In order to qualify for tax incentives, the easement must be held by a registered charitable organization. Land trusts and conservancies must therefore organize and meet certain institutional requirements to gain charitable status. One important criteria is that the organization is governed by a Board. Boards for land trusts vary significantly in size and composition. Some resemble hospital boards with memberships from the business and professional community while others are composed primarily of farmers.<sup>26</sup> Some have their roots in trying to save particular parcels in their counties and are composed of volunteers, others have broad mandates with full time staff. Some have significant fund raising capacity and active outreach programs to landowners.

Generally board members, community volunteers and a few professional

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<sup>26</sup> Personal interview Director, New York Land Trust Alliance, Saratoga NY, July 28, 1998. Note that no systematic data on membership across New York state was available.



employees are involved in managing the day to day activities. Almost every land trust has selection criteria for prioritizing lands in their area ranging from highly desirable acquisition parcels to lands they would like to encourage easements on. Therefore, land trusts and conservancies have evolved to fill a variety of ecological functions.

In addition to the incentives in the federal income tax legislation, some federal departments also have specific tax incentive programs related to land preservation. The federal Department of Agriculture administers the Conservation Reserve Program to purchase ten year easements from farmers to stop tillage of highly erodible lands in sensitive areas.<sup>27</sup> Although the primary objectives for this program are related to soil management and the sustainable productivity of land, these land management programs can have significant positive side effects for water quality.

In addition to federal income and estate incentives, some states have increased the deductions by integrating easement deductions with state income tax law and property tax law.<sup>28</sup> These provisions vary by state and locality. Progress in this area is slow because foregone revenues are contentious as many local

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<sup>27</sup> Listserve correspondence from Director of Public Policy, Land Trust Alliance, March 8, 1999.

<sup>28</sup> Federal income tax deduction allow for up to 30% of adjusted gross income the value of which can be carried forward or spread over 5 additional years. Estate tax law allows property owners that place a conservation easement on the land during the landowners' lifetime or donating it by will, lowers the value of the estate that is taxable above the \$600,000 unified transfer tax credit. See Land Trust Alliance, *Conservation Options: A Landowners' Guide* (Washington, 1996).

jurisdictions depend almost solely on these sources of tax revenues.<sup>29</sup> Property tax reductions in addition to the income and estate tax benefits seem to vary from county to county but there seems to be some support for the argument that a property with permanent prohibitions or restrictions on development should be assessed at a lower rate of property taxes than a similar property without such restrictions.

Increasingly local governments are realizing the role land trusts can play in managing land use-water use concerns. Municipalities can also hold conservation easements. However, most ecological easements are held by land trusts. There is no central database of conservation easements beyond the Registry of Deeds. Easements will turn up on searching a title but not necessarily under the municipal planning process for approvals of severance. In many states, registry is a county level function and land severance and development approval is a local level function. There is not much in the way of communication or coordination between private land trust organizations and local units of government on the land use planning end or the development approval process end.<sup>30</sup> The integration with county and local land use planning however is weak and varies considerably.<sup>31</sup> Again, the level of land use and watershed planning varies by municipality and state.

Some municipalities have also enacted property tax reductions under state

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<sup>29</sup> Personal interview Director, New York Land Trust Alliance, Saratoga NY, July 28, 1998.

<sup>30</sup> Personal interview Director, New York Land Trust Alliance, Saratoga NY, July 28, 1998.

<sup>31</sup> Personal interview Director, New York Land Trust Alliance, Saratoga NY, July 28, 1998.

“current use taxation programs”. In these cases, locally-based conservation easement programs allow owners to put a temporary (5-20 year) easement on their property in exchange for reductions in property taxes. While these easements are not necessarily to protect land use or water quality and do not meet the criteria for federal tax code reductions, they can result in property tax reductions.<sup>32</sup>

Easements have proven to be particularly flexible tools because they still allow the owner to continue using the land and controlling its transfer by sale, gift or bequest. As federal and state funding for land acquisition has declined in recent decades, land trusts have stepped in to fill the role of land protection and indirectly as water quality protection agents. Data from the 1998 National Land Trust Survey indicate that 52% of land trusts reported that they are primarily involved in protecting land in watersheds for the purpose of protecting or improving water quality.<sup>33</sup> Land trusts with explicit water quality protection and management mandates are rare but one trust has been established at the state level in Washington with a specific water quality protection and management mandate.<sup>34</sup>

Some land trusts have also received funding under federal and state programs to specifically address water quality problems. Some have received Sec.319 funds

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<sup>32</sup> Non-point Source Listserve correspondence from Director, NY Land Trust Alliance regarding two municipalities in New York state, November 30, 1998.

<sup>33</sup> Land Trust Alliance, *1998 National Land Trust Census*, Washington DC, 1999.

<sup>34</sup> The Washington Water Trust is a non-profit conservation organization founded in 1998 to preserve and restore rivers, creeks and streams in Washington. The Water Trust operates similar to land trusts but focuses on acquiring water rights through gift, lease, easement or purchase. Information posted on the land trust listserv ([landtrust@indiana.edu](mailto:landtrust@indiana.edu)).

in partnership with local agencies and more recently federal grants to states for Safe Drinking Water Act (SDWA) programs have been made available to land trusts.<sup>35</sup>

However, in terms of non-point source water quality management, land trusts and conservation easements are just beginning to formally acknowledge the connection.<sup>36</sup>

Depending on state law, it may or may not be possible for a land trust to acquire water rights for in-stream protection purposes. In most cases, it is most feasible to pursue conservation easements on lands in proximity to watercourses to address a non-point source or prevent water quality degradation. As traditional land conservation organizations become increasingly involved in water protection, there is every reason to believe that land trusts will have a significant role to play in water quality protection in the coming years.<sup>37</sup>

As a result of both federal and state legislation, in the past two decades there has been a proliferation of land trusts in the US. By 1998, there were 1213 land trusts in the US - protecting over 4.7 million acres of ecologically sensitive land and 1.3 million acres by conservation easement.<sup>38</sup> As outlined in Appendix I, many of these land trusts are located in the Eastern US states, predominantly in coastal states and those state in the Great Lakes Basin. New York State in particular holds a

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<sup>35</sup> Land Trust Alliance, *Federal Funds for Protecting Local Watersheds*, 1998: 1.

<sup>36</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

<sup>37</sup> Blout, J.T. and Scott Ferguson "Donating Water Rights to a Land Trust" in *The Back Forty Newsletter of Land Conservation Law*, September/October 1994.

<sup>38</sup> Land Trust Alliance, *1998 National Land Trust Census 1998* (<http://www.lta.org>).

significant number of acres under conservation easement. As indicated in Appendix 8-2, New York is one of a few US states that has used conservation easements extensively to manage land use for environmental protection purposes. It is for this reason that New York State was selected to study this policy instrument strategy at the watershed level.

#### **The Tax Incentive, Easement Policy Instrument Strategy at the Watershed Level: Eighteen Mile Creek Watershed, New York**

New York is home to 68 land trusts ranging in size from large well-established land trusts like the Hudson River Land Trust to recently established land trusts in smaller watersheds.<sup>39</sup> Collectively these land trusts manage 345,000 acres (191,00 under easement, 50,000 owned and 104,000 with local units of government).<sup>40</sup> Because of the large number of land trusts in New York and other Northeastern states, New York state is also home to a field office of the LTA called the Land Trust Alliance of New York since 1993. This state organization was the first field office of the national LTA located in Washington DC. The LTA of NY provides similar services to the land trusts operating in the state. The office employs one full-time director at an office in Saratoga Springs, New York.

One of the smaller land trusts in New York has been selected for cases

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<sup>39</sup> Land Trust Alliance, *1998 National Land Trust Census*, Washington DC, 1999.

<sup>40</sup> Ibid.

analysis because of its particular approach to protection of water quality in the Great Lakes area. Eighteen Mile Creek watershed drains approximately 118 square miles of land in Western New York. The main branch of the creek is 29 miles long but the total watershed including all streams and tributaries is 232 miles.<sup>41</sup> As indicated in the watershed map in Appendix 8-3, Eighteen Mile Creek is located predominantly in Erie County. Although located in one county, the watershed boundaries cover eight area municipalities including: Evans, Hamburg, Eden, Orchard Park, Boston, North Collins, Concord and a small area in Colden.

#### **The Character of NPS Water Pollution Problems in the Watershed**

The non-point source problems in the Eighteen Mile Creek watershed are largely defined by the changing character of land use in the watershed area. The towns of Hamburg and Orchard Park in the north have significant development pressures and as a result, the downstream, lower portions of the watershed are facing increased erosion impacts and loadings from development in proximity to the creek and its tributaries. The upstream portions of the watershed are still largely rural. There are also development plans for several golf courses in the Hamburg and Orchard Park areas.<sup>42</sup> In some areas the water quality is still quite pristine... thus the

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<sup>41</sup> Western New York Land Conservancy, *The Resource Newsletter of the Western New York Land Conservancy*, Spring/Summer 1998:5.

<sup>42</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

primary objectives of watershed management is prevention not remediation.<sup>43</sup> Besides the identified development pressures and significant agricultural activities in the watershed, there have been no scientific data collected on specific non-point sources of water pollution or base-line water quality data. Nonetheless, efforts are underway to collect water quality data and improve the management of the watershed.

Eighteen Mile Creek watershed is the focus of conservation and water quality protection efforts of the Western New York Land Conservancy (WNYLC). The creek has become the focus of the land trust's efforts in protecting land use and water quality. Somewhat distinct from other land trusts, the WNYLC has taken a broad, land use-water quality focus. As a relatively young land trust established in 1990, the land trust currently holds 2800 acres under conservation easement. Most recently it has been asked by area municipalities to hold an easement on a 1300 acre municipally acquired property.<sup>44</sup> Besides its primary function of monitoring and stewarding these easements, the land trust has prioritized its landowner contact and outreach program and its conservation easement efforts on lands in proximity to water resources.

In 1997 the WNYLC was the recipient of a national EPA Sec. 319 grant under the demonstration project funding allocations. The land trust received funding

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<sup>43</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

<sup>44</sup> Email correspondence, J. Whitley, Director, Western New York Land Conservancy, November 15, 1999.

for a three year period (on a one-year renewal basis) with the objective of setting up a Watershed Council in the region to make watershed management and protection a priority and demonstrate the potential for land trusts to foster watershed level cooperation. The project's primary goal was to "encourage sound stewardship of Eighteen Mile Creek watershed through use of education, land protection tools and presenting local stewardship options to local government and private land-owners. Preserving water quality through land stewardship within the watershed is a central theme".<sup>45</sup> One other important goal was to establish a watershed council encouraging partnerships between the eight towns located in the Eighteen Mile Creek watershed.

The impetus for applying for the EPA grant came from one of the active volunteer members of the land trust. A volunteer Project Manager, who is also a member of the Board and an ecologist, was very interested in exploring funding for the land trust to protect water resources. In addition, another founding member of the land trust who worked for the US Department of Agriculture (located in the same office building as the WNYLC) was also central to moving the application and the land trusts in this direction. The awarding of the EPA grant was a pleasant surprise.<sup>46</sup>

Through the EPA funding the WNYLC was able to hire a full-time Watershed Project Coordinator to head up the implementation of the Watershed Protection

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<sup>45</sup> Western New York Land Conservancy, *The Resource: Newsletter of the Western New York Land Conservancy*, Fall 1997.

<sup>46</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.



Project<sup>47</sup> The project is based on the idea that the key to sound land and water stewardship lies with the landowners and other stakeholders in the watershed.<sup>48</sup> In addition to re-focussing the WNYLC's efforts more explicitly on land use - water quality issues, the project is viewed as a demonstration project to experiment with new governance arrangements.

One goal of the project was to establish a watershed level council to attempt to collectively manage the ecosystem on a watershed level. One the challenges was to foster collective action between the stakeholders in the watershed area. There are a variety of stakeholders in the Eighteen Mile Creek watershed.

Of the eight towns in the watershed, five have Conservation Advisory Councils and Boards appointed by the town councils. Some of them are technically oriented and appointments are made based on expertise, others have more of an educational focus and the members come from various backgrounds.<sup>49</sup> Boards have authority to make recommendations to town councils on various issues related to conservation. The larger municipalities have these councils and some also have Planning Boards with related responsibilities in the watershed. In addition to the area municipalities, there are also agricultural districts with property tax zonings that

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<sup>47</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

<sup>48</sup> Western New York Land Conservancy, *The Resource: Newsletter of the Western New York Land Conservancy*, Fall 1997.

<sup>49</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

needed to be consulted. Under the Sec. 319 funding, it was the responsibility of the WNYLC to try and foster partnerships between these various stakeholders and promote sound land use and water quality stewardship in Eighteen Mile Creek.

Initially the land trust focused its efforts on bringing these stakeholders together. Unfortunately after eight months, little progress was made. Although relations with some agencies at the county level such as the Erie County Department of Environment and Planning were developing particularly in the areas related to [point-source] permitting, progress in forming partnerships was reportedly slow.<sup>50</sup> Although in the watershed there has been some movement towards open space planning, each locality handles land use and views easements and land trusts differently. Although New York state does have some classifications on certain streams with recommended development setbacks of 50 feet or greater, it is up to municipalities to formalize and implement these rules and initiate active outreach and stewardship programs.

There are no “no development” zones or specially protected areas in the watershed. Although some towns are starting to designate “critical environmental areas” in their land use planning regimes, these designations just “raise flags” during the development process.<sup>51</sup>

“We wanted to dive in and deal with planning boards and set aside areas that should be protected... but a lot of the communities are not ready for that

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<sup>50</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

<sup>51</sup> Ibid.

approach, they are only in the early stages of master plans. They are interest in NPS issues but favour educational approaches. We are becoming aware that each community is at a different stage of the game in terms of land use planning and conservation easements. Most have some type of master plan but the idea is that they view it as a document that they pull out when they need it, not as a guidance of daily operational decisions. We are now working to hold conservation easements in conjunction with municipalities... and that is a big step...any conservation easements undertaken in partnership are perpetual.<sup>52</sup>

Municipalities hesitate to get involved in these types of issues because altering property rights raises the whole issue of takings and municipalities do not want to have to compensate landowners for these types of initiatives.<sup>53</sup> The concept of land trusts, tax incentives, conservation easements and the potential role these organizations can play in partnering to manage land use and water quality initiatives is not well understood.

As of September 1999, two years after the land trust received EPA funding, little progress had been made in bringing the stakeholders together. "We have encouraged the collaboration of the local Conservation Advisory Boards and we are currently organizing a speaker/discussion series".<sup>54</sup> The WNYLC has not made much institutional progress in this area but one of the projects agreed on was the need for a water quality study. The organization has pursued funding from the area

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<sup>52</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

<sup>53</sup> Ibid.

<sup>54</sup> Correspondence with Watershed Project Coordinator, Western New York Land Conservancy, September 27, 1999.

municipalities and several community foundations to start this project in January 2000. The study will be done by volunteers in collaboration with the University of Buffalo and Buffalo State and the Erie County Health Department who has agreed to provide WYNLC with a reduced lab rate. "This will help us identify the problem areas to target land use efforts and landowner contacts".<sup>55</sup>

Other studies in New York state, in the Buffalo River area, have revealed that livestock agriculture and agriculture in general are not the only large sources, also important are runoff from development and septic systems. The Erie County Soil and Water Conservation District has also received some funding to specifically look at livestock farming practices and implement Sec. 319 Best Management Practices.

"So, currently some land trusts in New York, like WNYLC, are struggling with defining their focus.. should they stick with land protection through conservation easements or should they broaden their focus to watershed planning? In terms of conservation easements, the WNYLC is more of a "reactive" land trust not actively pursuing landowners for the time being, until particular lands can be identified through research as priority areas."<sup>56</sup>

The absence of data at the watershed level has presented challenges for the land trust. It is therefore difficult to assess the outcomes of this policy instrument strategy as developments in the Eighteen Mile Creek watershed have moved slowly.

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<sup>55</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

<sup>56</sup> Personal interview with Watershed Project Coordinator, Western New York Land Conservancy, East Aurora, NY, August 7, 1998.

### Indicators of Impacts

Similar to Michigan and Wisconsin, it is difficult to assess the impact of tax instruments and conservation easements in isolation of other instruments being used to address NPS water pollution in watersheds. Officials at the State Bureau of Watershed Management are also facing these challenges.

At the state level, “after ten years we are not yet able to link program initiatives or the number of implemented projects to water quality improvements or restorations... our ability to actually portray changes in water quality is much more difficult for these non-point sources and our monitoring programs have been particularly hard hit in the last 5-10 years. We have taken a technology approach to monitoring in certain watersheds...using demonstration projects...we take as an article of faith and good science that if you implement BMPs it will reduce the amount of pollutants entering the water and that over time we will be able to measure that benefit”..<sup>57</sup>

There is also some uncertainty about what instrument strategies provide the most potential to deal with land use and water quality protection.

“When I take off my land trust hat, there is some value in having land use protected through local planning regulations in a more comprehensive way... not only through private land trusts protecting a piece here and there... municipalities also have a lot more expertise... documenting, GIS [geographical information systems] mapping...as part of the municipal land use system you can get more protection benefits at less cost... and... it becomes a municipal monitoring and enforcement issue rather than a private monitoring and enforcement issue. The land trust protection over the last 30 years has been very piecemeal.”..<sup>58</sup>

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<sup>57</sup> Personal interview with Director, Bureau of Watershed Management, Department of Environmental Conservation, Albany NY, July 28, 1998.

<sup>58</sup> Personal interview Director, New York Land Trust Alliance, Saratoga NY, July 28, 1998.

“The state could play a role in developing land trusts. Quality and sustainability of land trusts is important. The culture of private support of land trusts is important. Tax incentives have contributed to this culture but the average person on the street still does not know what a land trust is... more recognize the role of the Nature Conservancy because of its size and large scale land acquisition program.”<sup>59</sup>

Indicators of impacts are even more difficult to collect at the watershed level. Eighteen Mile Creek watershed is an experiment in integrating land use, tax instruments, conservation easements and land trusts as instrument strategies to address non-point source water pollution. Water quality data for this watershed is only now being collected. In terms of institutional capacity, it is evident that not much progress has been made in developing partnerships at the watershed level to address land use and water quality issues. There is some indication that the grant from EPA has had an impact on broadening the focus of the WYNLC and moving the organization beyond a conservation easement for land use protection focus to a focus on watershed stewardship. It is difficult to determine if this strategy will be successful in addressing non-point source water pollution.

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Personal interview Director, New York Land Trust Alliance, Saratoga NY, July 28, 1998.

**Table 8-1**  
**Summary of the Tax Incentive, Conservation Easement & Land Trust Policy**  
**Instrument Strategy in New York & the Eighteen Mile Creek Watershed 1990-**  
**1999**

Evaluative Dimensions	Summary
Instrument Design/Approach	<ul style="list-style-type: none"> <li>• explicit watershed approach</li> <li>• approach influenced by Sec.319 funding guidelines</li> <li>• weakly integrated with primary strategy in the state</li> </ul>
Implementation Agents	<ul style="list-style-type: none"> <li>• land trust</li> <li>• municipal units of government</li> </ul>
Stakeholder Involvement	<ul style="list-style-type: none"> <li>• only recent involvement in problem definition (WNYLC, municipalities , University of Buffalo, Buffalo State University)</li> <li>• District Soil Conservation Service</li> </ul>
Resource Allocations	<ul style="list-style-type: none"> <li>• no state allocations</li> <li>• Watershed Project Coordinator at the local level</li> <li>• in-kind contributions from county, municipal units of government</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• project initiated in January 2000</li> </ul>
Reported Effectiveness Outcomes	<ul style="list-style-type: none"> <li>• no information collected on the watershed level</li> <li>• creation of local staff position</li> <li>• little progress in organizing for action on watershed level</li> <li>• no new conservation easements in the watershed</li> </ul>
Reported Ecological Outcomes	<ul style="list-style-type: none"> <li>• no water quality data yet collected</li> <li>• program in initial stages</li> </ul>
Sustainability Potential of PIS	<ul style="list-style-type: none"> <li>• focus on voluntary “sermons” approach</li> <li>• few incentives for county, municipal to collaborate with land trust organization</li> <li>• personnel at local level</li> </ul>

It is clear from this case study that institutional arrangements at the federal and state levels have facilitated the selection and design of this policy instrument strategy at the operational level. Federal provisions and incentives in the tax legislation have contributed to a proliferation of land trusts and the use of private conservation easements in the state. State policies and institutional support through the regional Land Trust Alliance has also promoted the use of these instruments. Although institutional incentives exist for the use of this policy instrument strategy, at the watershed level the case study clearly indicates that vertical institutional capacity remains low as the instruments are primarily voluntary in nature and implemented by non-profit organizations. State involvement in implementation of tax incentives through easements is low and there are few institutional incentives for municipal units of government to collaborate in the design and implementation of these instruments.

The Eighteen Mile Creek case study does however indicate the potential for horizontal institutional capacity to link traditional water pollution management institutions with innovative land use management institutions but progress has been slow. The findings summarized in Table 8-2 outline that these policy instrument strategies are land protection tools connected with land protection institutions. For this reason, stakeholder capacity is also low. Water pollution management stakeholders and land protection stakeholders are only beginning to see the potential for tax incentives, conservation easements and land trusts to address NPS water pollution problems.



**Table 8-2**  
**Analysis & Evaluation of the Policy Instrument Strategy**

<b>Institutional Capacity</b>	<b>Rating</b>
Vertical	Low
Horizontal	Low
Stakeholder	Low
Monitoring & Evaluation	Low
<b>Outcomes</b>	
Effectiveness	Low

Not surprisingly, this low institutional capacity translates into low effectiveness due to the primary policy objectives of land protection and the secondary policy objectives of water quality management. The stakeholders involved in implementing these strategies in the Eighteen Mile Creek watershed clearly see the potential to improve the use and effectiveness of this policy instrument strategy but recognize the institutional barriers and challenges they must overcome.

### **Conclusions**

Although federal tax legislation and Sec. 319 funding did provide some institutional incentives to explore the potential of this policy instrument strategy as a NPS water pollution management approach, the effectiveness has been hindered by low levels of institutional capacity at the state and local levels. The seeds for developing institutional capacity are in place but there are significant institutional barriers at the state and local government levels that will have to be addressed in

order to improve the effectiveness of this policy instrument strategy in addressing NPS water pollution problems.

The next chapter in this section examines the use of tax incentive policy instrument strategies in the Canadian context. The case study will demonstrate that although tax incentive, conservation easement based policy instrument strategies implemented by private land trusts are a comparatively weak and ineffective instrument for addressing NPS water pollution problems in the US, the institutional capacity and potential to use these approaches effectively in the Canadian context is even more challenging.

# Land Trusts in the United States

Land Trust Alliance  
Northwest Program  
3517 NE 45th Street  
Seattle, WA 98105  
206-522-3134

LAND TRUST ALLIANCE  
1319 F Street, NW • Suite 501  
Washington, DC 20004-1106  
202-638-4725 • [www.lta.org](http://www.lta.org)

Land Trust Alliance  
New York Program  
P.O. Box 792  
110 Spring Street  
Saratoga Springs, NY 12866  
518-587-0774

Land Trust Alliance  
Southwest Program  
115 North Fifth Street, Suite 500  
Grand Junction, CO 81501  
970-243-5811

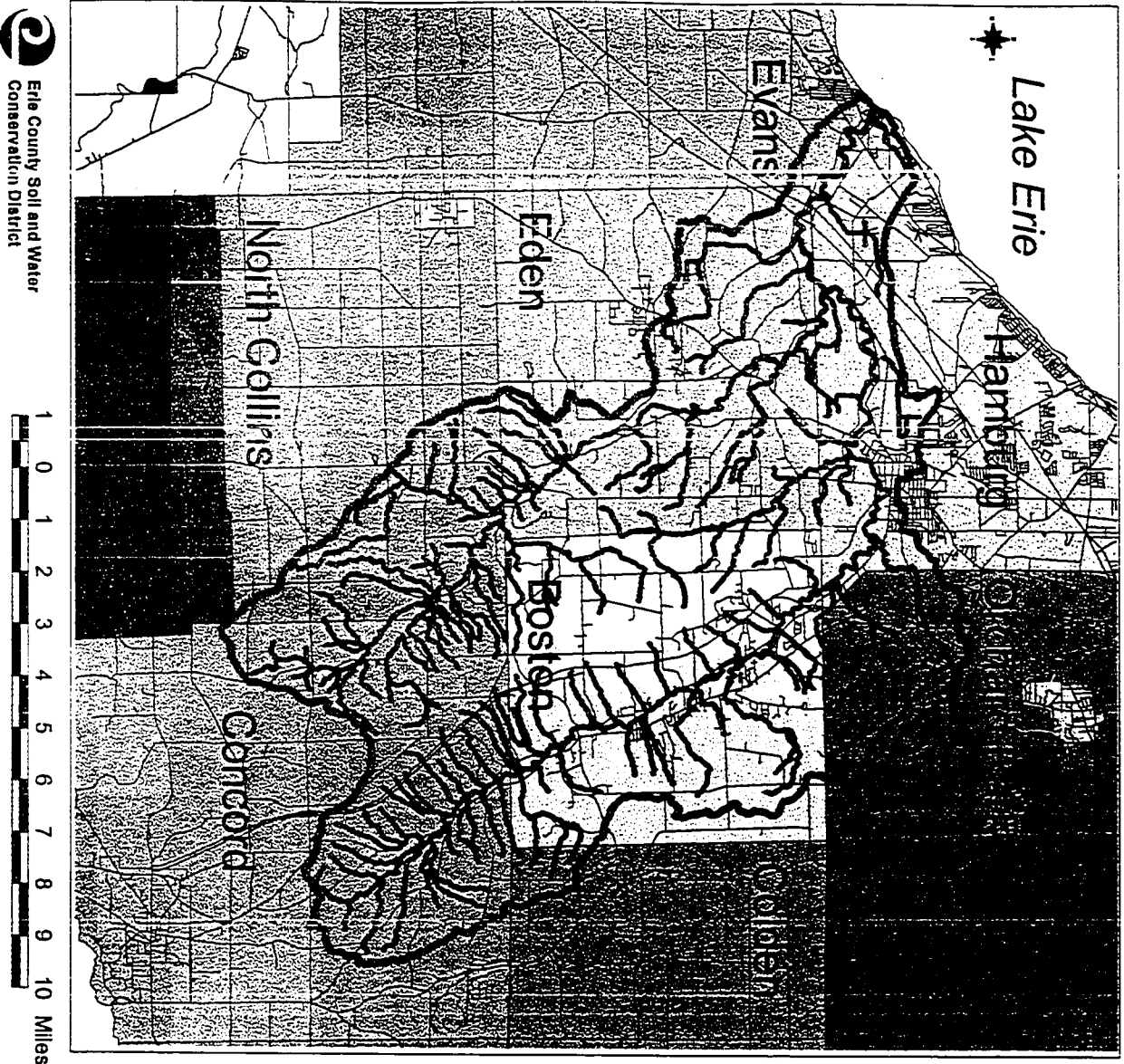
- Features Legend
- ★ Land Trusts
  - ▲ Regional Offices

Data from 1998 National Land Trust Census, Land Trust Alliance





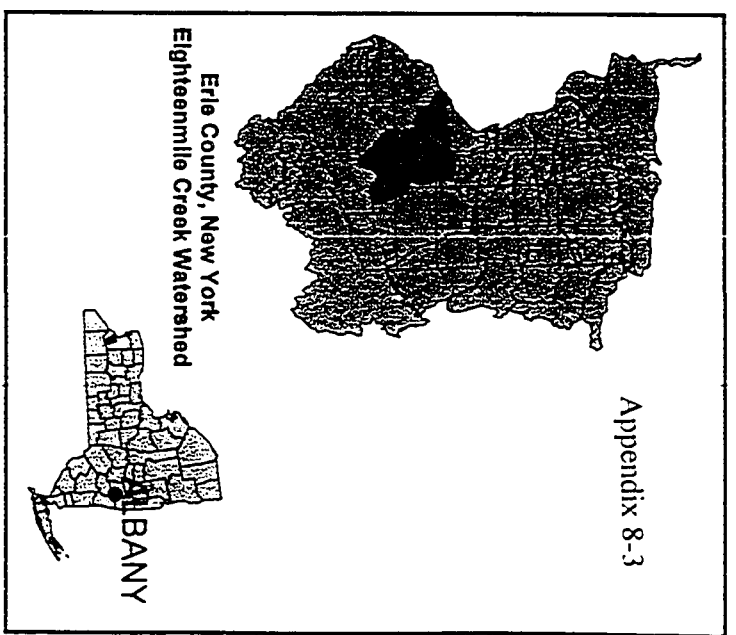
# 1999 Priority Area Assessment




  
 Erie County Soil and Water Conservation District


 USDA Natural Resources Conservation Service

Appendix 8-3



Objective: To treat critical water quality and erosion problems in the Eighteenmile Creek Watershed local priority area in Erie County, New York through local, state, and federal technical assistance programs.

-  Eighteenmile Creek and Tributaries
-  Eighteenmile Creek Watershed Boundary

Prepared by:  
 Erie County, New York  
 "Local Conservation Working Group"

June 9, 1997

## Chapter Nine

### **Tax-Incentives, Conservation Easements and Land Trusts As a Policy Instrument Strategy: Waterloo Region, Ontario & The Lower Grand River Watershed Case**

#### **Introduction**

The federal government in Canada has been slow to use tax instruments to address environmental policy and water resource pollution problems. Existing federal income tax and provincial property tax legislation has largely failed to encourage the use of land conservation and water quality management tools in Canada.<sup>1</sup> In 1995, the Minister of Finance announced the federal government's commitment to encouraging protection of ecologically sensitive lands in Canada. The proposed revisions to the tax law were a response to the federal government's

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<sup>1</sup> Attridge, Ian C. *Conservation Easement Valuation and Taxation in Canada*, Report No. 97-01 prepared for the North American Wetlands Conservation Council and the Habitat Conservation Division, Canadian Wildlife Service, Environment Canada, 1997: xv.

interest in exploring alternative environmental policy instruments based on several influential reports including the 1994 Final Report of the National Task Force on Economic Instruments and Disincentives to Environmental Practices.<sup>2</sup>

Although provisions in the federal income tax legislation have permitted donations of land to non-governmental registered charities and to municipalities, donors of such gifts were restricted to a maximum tax benefit of 20% of their income each year over a period of 6 years. Through changes to Sec.110.1(d) of the Income Tax Act in 1996, the 20% annual limit for ecological gifts was increased to 100% of income and can be used against the donor's income all at once or carried forward for up to five years.<sup>3</sup> The basis of obtaining these benefits is the market value appraisal system.<sup>4</sup> In Canada, the primary recipients of ecological gifts are municipalities and registered charitable organizations with environmental and naturalist mandates. In July 1997, recipient status was also extended to crown agencies.<sup>5</sup> Organizations such as Conservation Authorities and their spin-off foundations are the primary recipients

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<sup>2</sup> See also Denhez, M. *You Can't Give it Away: Tax Aspects of Ecologically Sensitive Lands*, North American Wetlands Conservation Council, Ottawa, Canada, 1992 and Silver, T.M. et.al. *Canadian Legislation for Conservation Covenants, Easements and Servitudes: The Current Situation*, North American Wetlands Conservation Council, Ottawa, Canada, 1995.

<sup>3</sup> Tax credits for "gifts to the crown" are deductible against up to 100% of annual income. Donors receive a federal tax credit of 17% of the first \$200, and 29% of the remaining value of the gift. Further benefits accrue through reduced federal surtaxes and provincial taxes which may increase the tax benefit to over 50% of the fair market value of the donated property.

<sup>4</sup> Ibid. Attridge, 1997: ix

<sup>5</sup> Canada, Environment Canada, Canadian Wildlife Service, *Ecological Gifts: Implementing Provisions of the Income Tax Act of Canada*, (Ottawa, September 1997: v).

in Ontario.<sup>6</sup>

In order to be eligible for a tax receipt, all donations of conservation easements must be certified by Environment Canada as “ecologically sensitive”. Environment Canada has designated six managers (the Director General of the Canadian Wildlife Service and five regional directors across the country) as officials responsible for certifying ecological gifts. Several provincial officials have been designated as certification authorities under federal-provincial agreements and implementation agreements between the federal government and several provinces have been developed. In Ontario however, federal officials continue to administer this initiative.<sup>7</sup> In addition, several Executive Directors in non-governmental organizations have been designated status as certification authorities. As of 1998, the Executive Vice-President of Ducks Unlimited, the President of the Nature Conservancy of Canada and the Directors of Nature Trusts in British Columbia and Nova Scotia had been given self-certification authority with respect to ecological gifts given to their own organizations.<sup>8</sup>

Certificates from authorized authorities must be submitted to Revenue Canada along with documentation outlining the value of the easement donated. Applications for certification can come directly from the landowner or through a

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<sup>6</sup> Canada, Environment Canada, Canadian Wildlife Service, *Ecological Gifts: Implementing Provisions of the Income Tax Act of Canada*, (Ottawa, September 1997: 6).

<sup>7</sup> Environment Canada, Canadian Wildlife Service, *Ecological Gifts: Implementing Provisions of the Income Tax Act of Canada*, (Ottawa, Revised May 1998).

<sup>8</sup> Ibid. p. 12



conservation organization such as a land trust which is the recipient of the donation. Environment Canada prefers those that come from land trusts based on credibility issues.<sup>9</sup> In Canada, non-profit land conservation organizations have welcomed this new role.

The Nature Conservancy of Canada, similar to its American counterpart, has played a role in preserving land for the protection of habitat and biological diversity since 1962. Presently the Conservancy owns over 800 properties protecting over 1.6 million acres across Canada.<sup>10</sup> The Federation of Ontario Naturalists (FON) has also worked since 1962 to acquire lands for protection in trust. FON currently owns and manages 14 properties in trust in Ontario.<sup>11</sup> Prior to recent legislative changes, landowners had only two options for long term land use protection: sell or donate.<sup>12</sup>

Land securement policies ranged from acquisition (high cost, low level of community involvement), to incentive programs (medium costs, medium levels of community involvement), to voluntary stewardship and education programs (low costs, high levels of community involvement). In terms of land use protection for

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<sup>9</sup> Presentation by N. Patterson, Program Implementor, Conservation Strategies Division, Environmental Conservation Branch, Ontario Region, Environment Canada presentation at the annual conference of the Ontario Nature Trust Alliance, November 13, 1999.

<sup>10</sup> Nature Conservancy of Canada, *Landowner's Guide to Conservation Agreements, Background*, February 1999.

<sup>11</sup> Hilts, Stewart and Ron Reid, *Creative Conservation: A Handbook for Ontario Land Trusts*, Federation of Ontario Naturalists, 1994.

<sup>12</sup> Nature Conservancy of Canada, *Landowner's Guide to Conservation Agreements, Background*, February 1999.

other ecological goals such as protecting biodiversity<sup>13</sup> and water quality, the use of conservation easements and land trusts are a relatively new tool.

Land trusts and privately held conservation easements are a rare but emerging instrument in Ontario and Canada. Research indicates that some provinces have more experience with these instruments than others.<sup>14</sup> British Columbia, in particular has employed these instruments for a variety of environmental conservation and protection objectives.<sup>15</sup>

Most land trusts have their organizational history in the land conservation movement. This is evident through an examination of the legislation under which they are governed and in the fact that some of the impetus for changes in tax legislation came from research undertaken by staff in the Canadian Wildlife Service unit within Environment Canada and the current program is implemented by the Environmental Conservation Branch, under the Conservation Strategies Division.

As the tax legislation specifically covers ecological lands, agricultural lands are not eligible. There is some discussion however for the need of tax reform to support the development of agricultural land trusts.<sup>16</sup> There are a few however that

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<sup>13</sup> Barla, P. et.al. "Protection of Habitat of Endangered Species and Biodiversity: An Analysis of Policy Instruments in Canada", forthcoming in *Canadian Public Policy*, 2000.

<sup>14</sup> Ibid.

<sup>15</sup> Barla, P. and J.D. Saphores, *Les mesures de protection des habitats fauniques en terres privées: les instruments économiques*, report prepared for Le Ministère de l'environnement et de la faune du Québec, 1997.

<sup>16</sup> A special session to discuss the need for agricultural land trusts at the provincial and local levels was a session at the recent Ontario Nature Trust Alliance Conference,

have been established with the protection of water resources and water quality as primary objectives. Similar to the US, most land trusts that have been established in Ontario, primarily since the early 1990s, have a land preservation focus. There are only a few that have been established with the protection of water resources as part of their mandate and even fewer with specific water quality management objectives.<sup>17</sup>

In the Canadian context, conservation easements are sometimes referred to as “covenant agreements” or “conservation agreements”. Similar to easements in the US, a conservation easement is a legal agreement by which a landowner voluntarily restricts or limits the type and amount of development that may take place on their land. Each agreement is tailored to the property and interests of the landowner. As in the US, easements or agreements may apply to the entire property or just to portions of a property.

With the recent changes in tax rules, Environment Canada does have a current objective of increasing the number of properties covered under the Ecological Gifts program. There are two categories of eligible lands. Category “A” lands are designated lands and category “B” lands which are land with ecological value but are

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November 13, 1999. Participants were discussing the legal and organizational issues around establishing an Ontario Farmland Trust.

<sup>17</sup> Of the land trust organizations in Ontario a few have been established to protect watersheds and basins: Blue Mountain Watershed Trust in Collingwood, Long Point Basin Land Trust, Rideau Waterway Land Trust in Ottawa area, the Speed River Land Trust in Guelph and Lower Grand River Land Trust in Cayuga, Ontario.

undesigned.<sup>18</sup> Since the programs inception in 1995, Environment Canada reports that some 90 gifts of land have been made in eight provinces totalling over \$25 million in value and 10, 280 hectares.<sup>19</sup> By 1999 there were 127 charitable organizations across Canada eligible to receive ecological gifts.<sup>20</sup>

Although the first few years of the program have been in some cases deemed successful, there are currently several outstanding issues that have been identified in order for the program to reach its goals. One of the implementation challenges is related to inter-agency responsibilities. Environment Canada has certification responsibilities and Revenue Canada administers the taxation component and issues tax receipt to donors. This reportedly has created some discussion related to the issues of assessment, valuation and capital gains.<sup>21</sup> According to one expert, the ecological gift tax incentives are being offset by the current capital gains rules.<sup>22</sup>

Under the existing tax rules, despite modifications to the tax credit side, a major barrier to capitalizing on this environmental protection opportunity remains the

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<sup>18</sup> Presentation by N. Patterson, Program Implementor, Conservation Strategies Division, Environmental Conservation Branch, Ontario Region, Environment Canada presentation at the annual conference of the Ontario Nature Trust Alliance, November 13, 1999.

<sup>19</sup> Environment Canada, C. Rubec, *Ecological Gifts: The First 90 Gifts* (Ottawa: Canadian Wildlife Service), 1999: 2-3.

<sup>20</sup> Ibid.

<sup>21</sup> Presentation by N. Patterson, Program Implementor, Conservation Strategies Division, Environmental Conservation Branch, Ontario Region, Environment Canada presentation at the annual conference of the Ontario Nature Trust Alliance, November 13, 1999.

<sup>22</sup> Interview with I. Attridge, Conservation Lawyer & Vice Chair of the Ontario Nature Trust Alliance, November 13, 1999.

levying of capital gains tax when property is donated.<sup>23</sup> Seventy-five percent of the increase in value of the land above acquisition cost is deemed under the Income Tax Act to constitute a capital gain when property owners sell or transfer the ownership of their properties. This places the option of donation in a significantly inferior position compared to the usual preference of selling the land.<sup>24</sup> Supporters of the ecological gifts tax credit provision argue that the Department of Finance should consider a full or partial capital gains exemption for donations of ecological gifts. It has been estimated that a full capital gains exemption measure would result in foregoing, at most, an average of \$11.25 million per year, in comparison to a predicted \$40 million in land value that could be protected annually.<sup>25</sup>

In addition to the current barrier existing in the tax law, the other major challenge to implementation of the recently new income tax rules is the communication of these options and incentives to landowners.<sup>26</sup> These provisions are not well known or publicized to private land owners in Canada.

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<sup>23</sup> Attridge, I. "Exempt Ecological Land Gifts from Capital Gains Tax", paper prepared for submission to the Canadian Federal Department of Finance, July 1999.

<sup>24</sup> Ibid.

<sup>25</sup> Nature Conservancy of Canada, "Canada's Conservation Challenge on Privately Held Lands", Submission to the House of Commons Standing Committee on Finance, November 17, 1998: 4.

<sup>26</sup> Ibid.

## **The Tax Incentive, Easement Instrument Strategy at the Provincial Level in Ontario**

In terms of using conservation easements as tools in Ontario there are two pieces of related legislation - the Ontario Heritage Act and the Conservation Land Act. The Ontario Heritage Act (YR) specifically provides the Ontario Heritage Foundation to enter into agreements, covenants and easements for the protection and preservation of 'heritage of Ontario'. This piece of legislation is specifically designed to preserve historical sites such as heritage building and lands. The Conservation Land Act (1990) allows a landowner in Ontario to grant an easement to, or enter into a covenant with, a conservation body, "for the conservation, maintenance, restoration and enhancement of all or a portion of the land or wildlife on the land, or, for access to the land for these purposes".<sup>27</sup> A conservation body is defined as a federal, provincial or municipal agency, an Indian band, a conservation authority or a registered charity under the Income Tax Act.<sup>28</sup> As indicated by the name of the article of legislation, Section 3.2 specifically defines the use of easements in the context of land use and habitat protection. However, the program designed to implement the legislation in relationship to tax incentives does allow for a broadening of the scope of the rules to include protection of water resources.

Section 2.2 (1) of the Conservation Lands Act grants the Minister the

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<sup>27</sup> Ontario. Conservation Land Act, Revised Statutes of Ontario, Chapter C.28, 1990, Section 3.2.

<sup>28</sup> Ontario. Conservation Land Act, Revised Statutes of Ontario, Chapter C.28, 1990.

authority to establish programs to recognize, encourage and support the stewardship of land.<sup>29</sup> It is under this provision of the Conservation Land Act that Ontario established and implemented the Conservation Land Tax Incentive Program (CLTIP), administered by the Department of Natural Resources. The CLTIP has been in existence since 1988 but has recently been revised under the Ontario Fair Municipal Finance Act.

Between 1988 and 1997 the program was based on a property tax rebate. Since 1998 the program has been based on a property tax exemption.<sup>30</sup> The Ministry of Natural Resources (MNR) determines which lands are eligible for the CLTIP. Typically eligible lands include five categories of eligibility: provincially designated wetlands; Areas of Natural and Scientific Interest (ANSIs); Niagara Escarpment areas; habitats of endangered species and “other conservation lands”.<sup>31</sup> In 1998, the MNR placed a moratorium on lands eligible as “other conservation lands”. The category is currently under review by the MNR and will likely be reinstated and the regulation amended based on the Ecological Gift categories in the federal income tax legislation.<sup>32</sup> Since expansions of the categories can mean reductions in taxes for

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<sup>29</sup> Ibid.

<sup>30</sup> Presentation on the Conservation Land Tax Incentive Program by F. McKay, Lands and Natural Heritage Branch, Ministry of Natural Resources, presentation at the annual conference of the Ontario Nature Trust Alliance, November 13, 1999.

<sup>31</sup> Ontario. Ministry of Natural Resources. *Conservation Land Tax Incentive Program*, 1999.

<sup>32</sup> Presentation on the Conservation Land Tax Incentive Program by F. McKay, Lands and Natural Heritage Branch, Ministry of Natural Resources, presentation at the annual conference of the Ontario Nature Trust Alliance, November 13, 1999.

municipal governments there is pressure to restrict categories and more stringently review applications.<sup>33</sup>

Once the MNR identifies land and maps areas under the categories, the Ontario Property Assessment Corporation's Regional Assessment Offices identify landowners with eligible lands of at least ½ acre in size and the Ministry of Municipal Affairs and Housing (MMAH) sends landowners an application.<sup>34</sup> Landowners must then complete the application, agree to maintain the property as conservation land and return it to MMAH. On approval, landowners receive a full property tax exemption.<sup>35</sup>

Landowners that participate in the program must allow authorized MNR officials to inspect their land to confirm the land is being maintained as conservation land. If the landowner is in violation of the agreement they will lose their exemption and for the years they received an invalid exemption the municipality can recover taxes not paid up to a maximum of five years.<sup>36</sup> Landowners must apply annually to receive the property tax exemption.<sup>37</sup>

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<sup>33</sup> Presentation on the Conservation Land Tax Incentive Program by F. McKay, Lands and Natural Heritage Branch, Ministry of Natural Resources, presentation at the annual conference of the Ontario Nature Trust Alliance, November 13, 1999.

<sup>34</sup> Ibid.

<sup>35</sup> Ontario. Ministry of Natural Resources. *Guide to Conservation Land Tax Incentive Program*, 1999.

<sup>36</sup> Ontario. Ministry of Natural Resources. *Guide to Conservation Land Tax Incentive Program*, 1999.

<sup>37</sup> Ibid.



There is also a channel for landowners to submit applications and supporting documentation under one of the eligible categories. This allows organizations like Conservation Authorities (who became ineligible in 1992 and are now eligible again) and land trusts to receive property tax exemptions for the lands they own. Most of these properties would be applications under the “other” eligibility category. It is this aspect of the provincial program that “has a lot of promise” for land trust organizations.<sup>38</sup>

In 1999, 11,000 landowners in Ontario were receiving property tax exemptions under this program covering 158,000 hectares (4,000 hectares of which were owned by conservation organizations).<sup>39</sup> Lands under conservation easements however do not qualify since currently property tax exemptions are granted only on lands owned.

Conservation easements are not fully integrated into federal income tax or provincial property tax incentive structures. The use of conservation easements has not been a popular land use and water quality choice for municipal governments and Conservation Authorities in Ontario. Only recently have these tools become important for non-governmental conservancy organizations and only recently have land trusts emerged as recipients and administrators of conservation easements under

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<sup>38</sup> Presentation on the Conservation Land Tax Incentive Program by F. McKay, Lands and Natural Heritage Branch, Ministry of Natural Resources, presentation at the annual conference of the Ontario Nature Trust Alliance, November 13, 1999.

<sup>39</sup> Ibid.

federal income tax rules.

Land trusts in Ontario are becoming increasingly organized. In 1997, a group of non-governmental organizations involved in land management for environmental protection formed the Ontario Nature Trust Alliance (ONTA). The organization was organized under the auspices of the Federation of Ontario Naturalists (FON). Since its inception ONTA has consisted of representatives from a number of member organizations including land trusts, conservancies and local naturalist groups. The Alliance fills several roles including sharing expertise, increasing public awareness and enhancing access to resources for member organizations. There are currently 20 member organizations.<sup>40</sup>

The organization published a Land Securement Manual in November 1999 with detailed contributions from volunteer representatives from provincial ministries, several municipalities in Ontario and several non-profit environmental organizations active in land conservation and easement management. This land securement manual is a valuable resource for existing and recently established land trust organizations. ONTA also has a voluntary registry of natural areas held by member organizations across the province. The goal of the registry is to create an inventory of protected lands and watershed areas in Ontario.

In order to analyze the operational level use of tax incentive, conservation easement and land trusts as a policy instrument strategy, it is once again helpful to

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<sup>40</sup> Ontario Nature Trust Alliance, *Members Directory*, November 1999.

analyze the instrument in action at the watershed level. For this case study, one of the land trusts with a water resources orientation in a watershed facing significant non-point source water pollution has been selected for analysis.

### **The Tax Incentives, Easement, Land Trust Policy Instrument Strategy at the Watershed Level: Grand River Watershed, Waterloo Region, Ontario**

In Ontario, one watershed that has been the focus of efforts to address NPS water pollution is the Grand River Watershed. The Grand River watershed is a 300 kilometer long watershed that covers a 7,000 square kilometer radius before entering into Lake Erie.<sup>41</sup> The northern upstream portions of the river run through a mixture of agriculture and urban lands. The main portion of the Grand runs through the Region of Waterloo including the cities of Waterloo and Kitchener. Several of its tributaries such as the Eramosa River and the Speed River run through the urban areas of Guelph and Cambridge respectively. The lower portions of the river run through a mix of agricultural and urban areas such as the cities of Caledonia, Cayuga and Dunnville. In total, the Grand River Watershed runs through 10 counties and 48 area municipalities (see Appendix 9-1 and 9-2).<sup>42</sup>

In the upper portions of the river, the Regional Municipality of Waterloo relies on the surface water of the Grand River and valuable groundwater sources to

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<sup>41</sup> Grand River Conservation Authority, *State of the Grand River Watershed: Focus on Watershed Issues 1996-1997*, re-printed September 1998.

<sup>42</sup> Ibid. p.9

service various activities of its growing population. Currently an estimated 800,000 people rely on the quantity and quality of water resources in the Grand River watershed area.<sup>43</sup> Since most of the residents and industries in the watershed rely on the river for water supply and wastewater disposal, point source regulation of municipal sewage treatment facilities and industrial outfalls have gone some way in improving water quality in the river and its tributaries.

The watershed is predominately characterized by agricultural land use with urban land uses concentrated in the central portion. Although considered an urban watershed, 81% of the population lives on 7% of the land area in the watershed.<sup>44</sup> The remaining 93% of the watershed is rural. In 1996, the basin's 787,000 residents lived predominantly in the cities of Kitchener, Waterloo, Cambridge, Guelph and Brantford and they placed high demands on the water supply.<sup>45</sup>

The organization primarily responsible for managing the watershed is the Grand River Conservation Authority (GRCA). The GRCA has played a leadership role in managing the watershed with several partners including 48 municipalities, 10 counties and regions and many community stakeholder organizations. Its 26 member board is composed of representatives appointed by the municipal councils in the watershed. It is supported by municipal levies (30%), provincial government grants

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<sup>43</sup> Grand River Conservation Authority, *State of the Grand River Watershed: Focus on Watershed Issues 1996-1997*, re-printed September 1998: 10.

<sup>44</sup> Grand River Conservation Authority, *State of the Grand River Watershed: Focus on Watershed Issues 1996-1997*, September 1998:4.

<sup>45</sup> *Ibid.*, p.10

(12%) and its own user fees and revenues (58%).<sup>46</sup> As outlined in Appendix 9-3, like other Conservation Authorities in Ontario, the organization has seen its revenue base from the Province of Ontario shrink from 40% to 12% in the past decade. This has resulted in an increasing reliance on self-generating revenues to finance programs and services.<sup>47</sup> Approximately \$2 million of the GRCA's \$16 million total budget in 1998 was allocated to water quality management efforts.<sup>48</sup> The primary funding source for programming in this area is municipal and not unlike other Conservation Authorities in Ontario, the emphasis has been on watershed planning and water resource management related to flood plain management.<sup>49</sup>

In 1982 the Ministries of Environment, Natural Resources, Agriculture, Municipal Affairs and Housing and the Grand River Conservation Authority completed a Basin Water Management Study to assess and prioritize, water quality, water supply and flooding issues. Recommendations and actions from this strategy in large part focused on point sources such as upgrading wastewater treatment facilities and improving flood protection and control operations. However, since that time the GRCA has focused on streambank rehabilitation.

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<sup>46</sup> Grand River Conservation Authority *State of the Grand River Watershed: Focus on Watershed Issues 1996-1997*, September 1998:9.

<sup>47</sup> Grand River Conservation Authority, *Programs and Services*, January 1998.

<sup>48</sup> *Ibid.* p.13

<sup>49</sup> Of the total budget allocated to water quality management by the GRCA, 73% is funded by municipal levies. \$1.2 million of the \$2 million water quality budget is allocated to watershed planning, coordination and dam operation and maintenance primarily associated with flood plain management. See GRCA, *Programs and Services*, January 1998: 13.

In 1994, the Grand River was designated as a Canadian Heritage River and the Grand River Conservation Authority began developing its “Grand Strategy” for protection of land and water resources in the watershed area. The “strategy” was not a comprehensive watershed plan including an assessment of water quality problems. It was a statement that included the recognition of the value of the Grand River watershed as a heritage river with significant natural and recreational features. Although the “Strategy” did not include a comprehensive, technical and scientific analysis of the watershed for management purposes, it did recognize the importance of non-point sources of surface and groundwater pollution. A recent report identified the major outstanding challenges in terms of water quality issues as non-point sources of water pollution. In 1996, the watershed population was 787,000 with projections of growth to 975,800 by 2011 and 1.1 million by 2021.<sup>50</sup> Most of the growth is expected to take place in the central and lower portions of the watershed along the Highway 401 and 403 corridor. Downstream communities in particular are concerned about upstream growth and changing land use.

There is serious concern about the receiving capacity of the watershed from both point sources (discharge from wastewater sewage treatment facilities serving 600,000 residents) and non-point source since the watershed is home to a large agricultural sector that is growing and intensifying. The main water quality problems are low dissolved oxygen levels, excessive phosphorous and nitrogen (from

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<sup>50</sup>

Grand River Conservation Authority, *State of the Grand River Watershed: Focus on Watershed Issues 1996-1997*, September 1998:10

wastewater treatment facilities, golf courses and agricultural runoff), high levels of bacteria (cryptosporidium and E-coli from animal waste runoff) and suspended solids from soil erosion. The GRCA estimates at least 50% of water pollution in the watershed is from non-point sources.<sup>51</sup> These estimates may indeed vary throughout the watercourse as cumulative impacts are typically more evident in downstream portions of the drainage basin.

The most recent watershed report highlights the priority of landowner contacts and stewardship in the watershed to address high pressure areas and non-point sources of pollution. These include highly tilled agricultural lands on the west central areas. The GRCA recognizes that landowner contact and land use management in the 93 % of the watershed that is rural is key to conservation and water quality efforts.<sup>52</sup>

In response to these realities, the GRCA in collaboration with the Regional Municipality of Waterloo established the Rural Water Quality Program in 1998. This program provides financial assistance to farmers above and beyond the funds available under the EFP program. The Regional Municipality of Waterloo has committed \$1.5 million in funding for the duration of the program which is scheduled for completion in 2002. In addition, Agriculture and Agri-Food Canada (CanAdapt) is providing an additional \$225,000 to the program through the National

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<sup>51</sup> Grand River Conservation Authority, *State of the Grand River Watershed: Focus on Watershed Issues 1996-1997*, September 1998:21

<sup>52</sup> Ibid., 28.

Soil and Water Conservation Program and the Grand River Conservation Authority is providing in-kind support in the form of program delivery and administration.<sup>53</sup> With resource commitments from several sources, a multi-stakeholder Steering Committee<sup>54</sup> was established to develop the Rural Water Quality Program.

“In developing the program, the member organizations represented on the Steering Committee entertained a number of ideas such as paying per kilogram of phosphorous or soil loading reduced or by kilometer of buffer strip installed ... in the end the farmers wanted a simple straight forward process that was easy to understand. There also is a reticence to put things on title as required by an easement”<sup>55</sup>

The outcome was a program that incorporates the existing Ontario Environmental Farm Plan program (as described in detail in Chapter 7) into the regional program. Farmers must complete an EFP to be eligible for funding under the municipal program. Under the Rural Water Quality Program farmers are eligible to receive up to \$25,000 for best management practices depending on the nature of the BMP project. The GRCA is the lead agency for the implementation of this BMP-based program in the Grand River watershed. The program was launched in April

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<sup>53</sup> Grand River Conservation Authority *The Rural Water Quality Program*, report prepared by T.Ryan, Grand River Conservation Authority, 1999.

<sup>54</sup> The Steering Committee consists of representatives from the following organizations: Ontario Federation of Agriculture; Ontario Soil and Crop Improvement Association; Christian Farmers Federation of Ontario; Waterloo Federation of Agriculture; various Waterloo agricultural producer associations; Regional Municipality of Waterloo; Grand River Conservation Authority; Ontario Ministry of Agriculture, Food and Rural Affairs, Ontario Ministry of Environment, Agriculture and Agrifood Canada; Waterloo Stewardship Network and others.

<sup>55</sup> Email correspondence with T. Ryan, Coordinator of the Rural Water Quality Program, October 6, 1999.



1998.

At the outset of the program it was realized that participation depends on the participation of landowners in the EFP program. "At the outset of the program less than 75 EFP had been completed in the watershed...this low uptake of the EFP program drastically reduces the number of potential applicants to the RWQP".<sup>56</sup> However preliminary data indicate that participation has increased in the Region of Waterloo since the Rural Water Quality Program (RWQP) was put into place. This is in contrast to other regions in Ontario that have had significantly higher rates of participation in the EFP since 1994 but have recently seen declining rates of participation.<sup>57</sup>

In 1998, 60 project applications were received by the Review Committee.<sup>58</sup> Forty-eight projects were approved and twenty-nine were completed and received \$125,000 in grants.<sup>59</sup> In 1999, 58 projects had been approved to receive grant monies with an anticipation that participation will increase annually.<sup>60</sup>

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<sup>56</sup> Grand River Conservation Authority *The Rural Water Quality Program*, report prepared by T.Ryan, Grand River Conservation Authority, 1999:6.

<sup>57</sup> Grand River Conservation Authority *The Rural Water Quality Program*, report prepared by T.Ryan, Grand River Conservation Authority, 1999: 6-8.

<sup>58</sup> The Review Committee consists of 2 local farmers, representatives from Ministry of Agriculture, Food & Rural Affairs and representatives from the Ontario Environmental Farm Coalition. The Review Committee was established from the Steering Committee and is Chaired by a representative from the Regional Municipality of Waterloo.

<sup>59</sup> Grand River Conservation Authority *The Rural Water Quality Program*, report prepared by T.Ryan, Grand River Conservation Authority, 1999: 6.

<sup>60</sup> Ibid.

A recent study indicates that the RWQP has acted to supplement and sustain the EFP program initiative - especially in terms of BMP project completions.<sup>61</sup> Another indicator of success of this program in the watershed is the fact that two other regional municipalities in Ontario are attempting to implement similar local programs to build on the provincial EFP program.<sup>62</sup>

Tax incentives and conservation easements have not been an integral part of the water quality initiatives in the Grand River watershed. Although municipalities, and Conservation Authorities are all eligible recipients under the new Income Tax provisions the regional and local units of government have not used these tools as primary components of their policy instrument strategy.

The GRCA which manages the watershed has not enthusiastically adopted conservation easements as part of its policy instrument strategy despite its eligibility under the federal Ecological Gifts tax provisions. The Grand River Conservation Authority has also had a sister association called the Grand River Foundation with charitable status since 1965. Although the foundation is an eligible recipient of easements in trust under the current income tax provisions, the foundation has not been the recipient of any land donations or conservation easements in this large watershed. Some of this is based on the inexperience of the GRCA with these types

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<sup>61</sup> Grand River Conservation Authority *The Rural Water Quality Program*, report prepared by T.Ryan, Grand River Conservation Authority, 1999.

<sup>62</sup> The Region of Wellington has committed \$1.35 million to a similar five-year program and the Region of Ottawa-Carleton has established a similar three year program committing \$765,000.

of instruments.<sup>63</sup> In terms of non-profit environmental protection organizations in the watershed, only recently has a land trust been established that may be able to fill this role.

### **Tax Incentive, Conservation Easements and the Lower Grand River Land Trust**

The Lower Grand River Land Trust (LGRLT) was established in 1993 to protect ecological resources in the downstream portions of the larger Grand River watershed. In 1994 the land trust was the recipient of a 1600 acre property and estate donation which was bequeathed to the organization. The property located near Cayuga, Ontario was considered a very important ecological and historical site due to the mansion on the property, its mature forest features, its inclusion of agricultural lands and wetlands and its shoreline on the Grand River.<sup>64</sup>

The donated lands were registered in 1996 and include an Ontario Heritage Foundation conservation easement on the title of the property. In 1997 this property was designated the Ruthven Park property, a National Historic Site. Not surprisingly, this large bequest has occupied the LGRLT's time for nearly five years as the property was designated a National Historic Site due to its ecological and heritage value. The energies of the volunteer trust have been focussed almost exclusively on renovating the mansion, fundraising, and working through the process of having the

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<sup>63</sup> Email correspondence with R. Steinberg, Manager of Properties and Business Development, Grand River Conservation Foundation, Grand River Conservation Authority, January 13, 2000.

<sup>64</sup> The Lower Grand River Land Trust, *Action Plan 2020*, April 1997.

lands designated as park lands.

In 1997 the organization began a strategic planning process to define its future directions. The trust defines its “area of interest” as the lower one-third of the Grand River watershed which includes one major urban centre, the City of Brantford, and a number of smaller towns (see Appendix 9-6). In addition to managing the flagship property, the trust has developed goals for the organization for the next twenty five years, five years and on an operational annual planning basis. In addition to hiring staff full-time, the organization hopes to develop protection criteria for the lower portions of the watershed and undertake a site analysis to identify target sites for protection.<sup>65</sup>

Like other newly formed land trusts in Ontario, the LGRLT does not have a specific water resource protection or water quality management mandate. The strategic plan developed by the organization clearly articulates the central function of the organization as a land conservation organization. The title of the document “Action Plan 2020: An Organizational Plan for Habitat and Heritage Conservation”, clearly indicates the primary mandate of the organization. However, the land trust strategic plan does include excerpts from Carolinian Canada’s publication related to water quality protection including goals of more than 75% of riparian habitat vegetation along streams and less than 15% of the watershed impervious, these are

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<sup>65</sup> Personal interview with Director, Lower Grand River Land Trust, November 13, 1999.

not explicit goals of the land trust.<sup>66</sup>

Although partnerships with other conservation organizations including the GRCA are documented as important components of the land trusts' plans, partnerships related to water resource management and water quality protection have not been institutionalized. The land trust reportedly has good working relations with staff members at the GRCA and would like to improve partnerships to protect the watershed in the future but to date there has been little progress.<sup>67</sup> The land trust has also not been the recipient of any donations under the ecological gifts provision of the federal income tax legislation.<sup>68</sup>

### **Indicators of Impacts**

Water quality monitoring is not done by the GRLT. The only monitoring being done related to NPS initiatives is done on a very limited basis by Conservation Authority staff associated with the Rural Water Quality Program. To date the GRCA does not have a designated monitoring budget. There is however a reported intent to do some upstream and downstream monitoring under the Rural Water Quality Program around project sites focusing on phosphorous, nitrogen and bacteria and

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<sup>66</sup> Ibid, Appendix 7, *Issues and Options: Towards a Conservation Strategy for Carolinian Canada*, 1996.

<sup>67</sup> Personal interview with Director, Executive Director, Lower Grand River Land Trust, November 13, 1999.

<sup>68</sup> Ibid.

some benthic monitoring where possible.<sup>69</sup> This monitoring is planned to begin in summer 2000.

Monitoring and evaluation of NPS water pollution is also not undertaken by units of municipal or provincial government. It is very difficult to determine the effectiveness of this policy instrument strategy in action at the watershed level as the policy instrument itself is so weakly institutionalized. As outlined in Table 9-1, the policy instrument strategy can only loosely be characterized as a policy instrument strategy to address NPS water pollution in the Grand River watershed.

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<sup>69</sup> Email correspondence with T.Ryan, Project Coordinator, Grand River Conservation Authority, October 6, 1999.

**Table 9-1**  
**Summary of the Tax Incentive, Conservation Easement and Land Trust Policy Instrument Strategy in Waterloo Region, Ontario & The Lower Grand River Watershed 1990-1999**

Evaluative Dimensions	Summary
Instrument Design/Approach	<ul style="list-style-type: none"> <li>• no explicit watershed approach</li> <li>• indirect, predominantly land use management orientation</li> </ul>
Implementation Agents	<ul style="list-style-type: none"> <li>• conservation authority</li> <li>• regional municipal government</li> <li>• land trust</li> </ul>
Stakeholder Involvement	<ul style="list-style-type: none"> <li>• low involvement of CA and land trust</li> <li>• no stakeholder involvement in design or implementation of the policy instrument strategy</li> </ul>
Resource Allocations	<ul style="list-style-type: none"> <li>• no specific allocations to design or implement the instrument</li> <li>• no stakeholder cooperation in developing the instrument</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>• no specific monitoring of impacts related to tax incentives and conservation easements in the watershed</li> <li>• no specific monitoring and enforcement role</li> <li>• no supportive monitoring program being implemented by other agencies in the watershed</li> </ul>
Reported Effectiveness Outcomes	<ul style="list-style-type: none"> <li>• no data on whether the tax incentives have stimulated a response from landowners in the watershed</li> <li>• no data to indicate that the instrument is effective using any measures</li> </ul>
Reported Ecological Outcomes	<ul style="list-style-type: none"> <li>• no data on whether implementation of easements to manage land use have positive ecological outcomes in terms of water quality in the watershed</li> </ul>
Sustainability Potential of PIS	<ul style="list-style-type: none"> <li>• high as a land use instrument, low as an instrument to address NPS water pollution</li> <li>• suggested as possible pilot watershed for MOE but no action</li> </ul>

Similar to the US, an evaluation of institutional capacity in this case indicates that institutional capacity is low across all four dimensions. As outlined in Table 9-2, this low institutional capacity has hindered the effectiveness of this policy instrument strategy in addressing NPS water pollution problems at the watershed level.

**Table 9-2**  
**Analysis and Evaluation of the Policy Instrument Strategy**

<b>Institutional Capacity</b>	<b>Rating</b>
Vertical	Low
Horizontal	Low
Stakeholder	Low
Monitoring & Evaluation	Low
<b>Outcomes</b>	
Effectiveness	Low

### **Conclusions**

Overall, the institutional capacity and effectiveness of tax incentives and conservation easements as a policy instrument strategy to address NPS water pollution at the operational level is comparatively low. Although there are tax incentives at the federal level, the incentives are currently offset by the capital gains limitations and landowner knowledge of these policy instrument strategies. The incentives for landowners to participate lies in the tax system and communication of these new provisions to those in close proximity to watersheds. The existence of property tax incentives at the provincial level is not related to conservation easements



and eligible lands are determined by the MNR. At present there is no institutional advocate of these instruments in the Grand River Watershed.

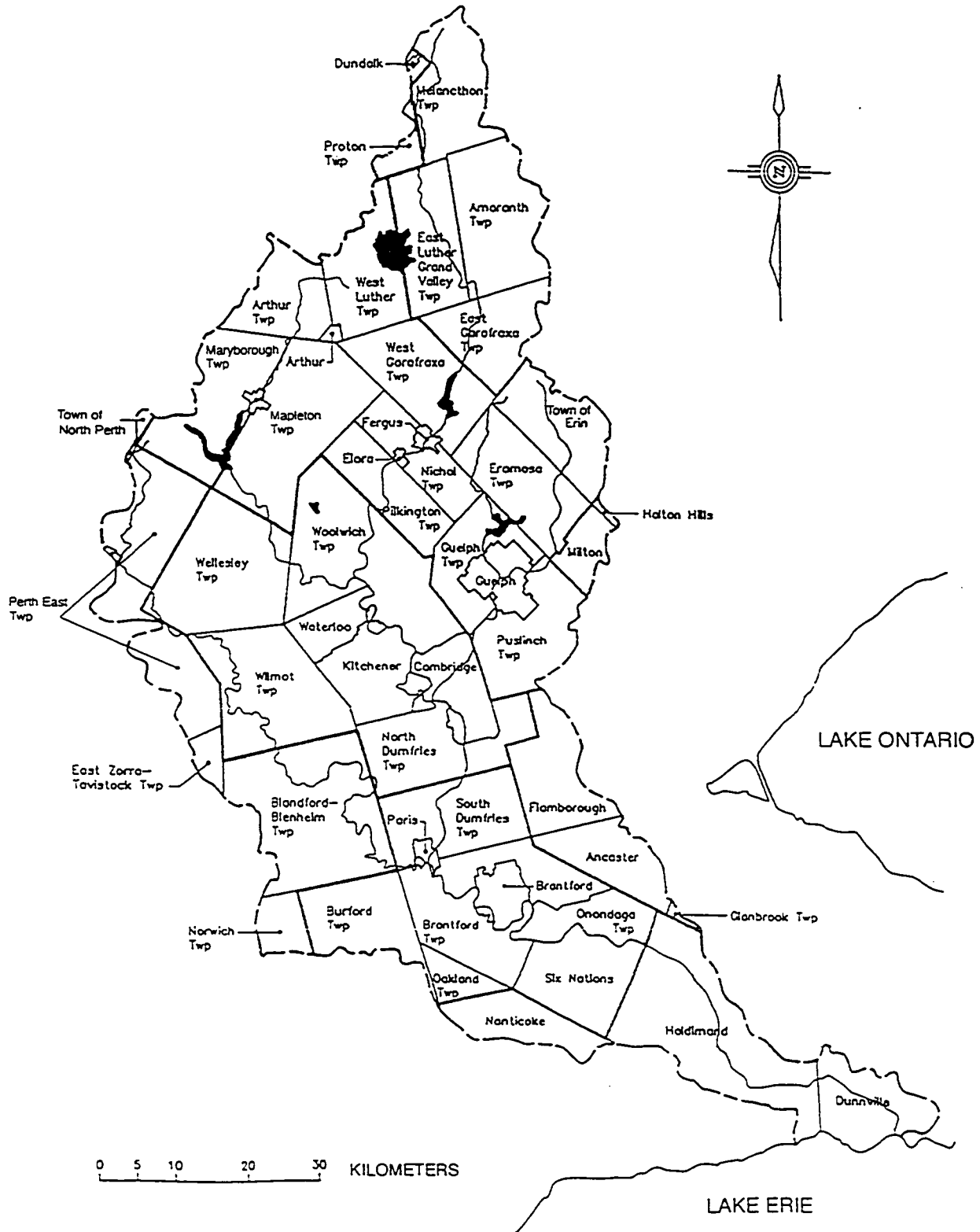
The recent tax revisions may see land trust organizations emerge in the future as part of water quality protection efforts but for now the LGRLT remains focused on land conservation. Direct promotion of these tax measures are still very much linked to land and habitat protection rather than water quality management efforts. Nonetheless, potential exists for these instruments and institutional arrangements to address NPS water pollution. The tax incentives seem to be fostering the development of land trust organizations as agents responsible for protection of ecologically sensitive lands but only very recently have these instruments and community-based organizations been viewed as potential implementation agents to address non-point sources of water pollution. Compared to the US case however, this potential is more limited due to lower levels of institutional capacity.

The next section includes a comparative analysis of the three different policy instrument strategies used to address NPS water pollution in the context of the analytical framework and core research questions outlined in Chapter 2. Chapter 10 focuses on comparing institutional capacity of different policy instrument strategies in Canada and the US and demonstrates the importance of institutional capacity in the selection, design and effectiveness of each policy instrument strategy. Chapter 11 re-aggregates the findings from the six cases and Chapter 3 in order to assess the contributions of the research to theory and policy studies in the water pollution management area.



# Grand River Conservation Authority Watershed Map

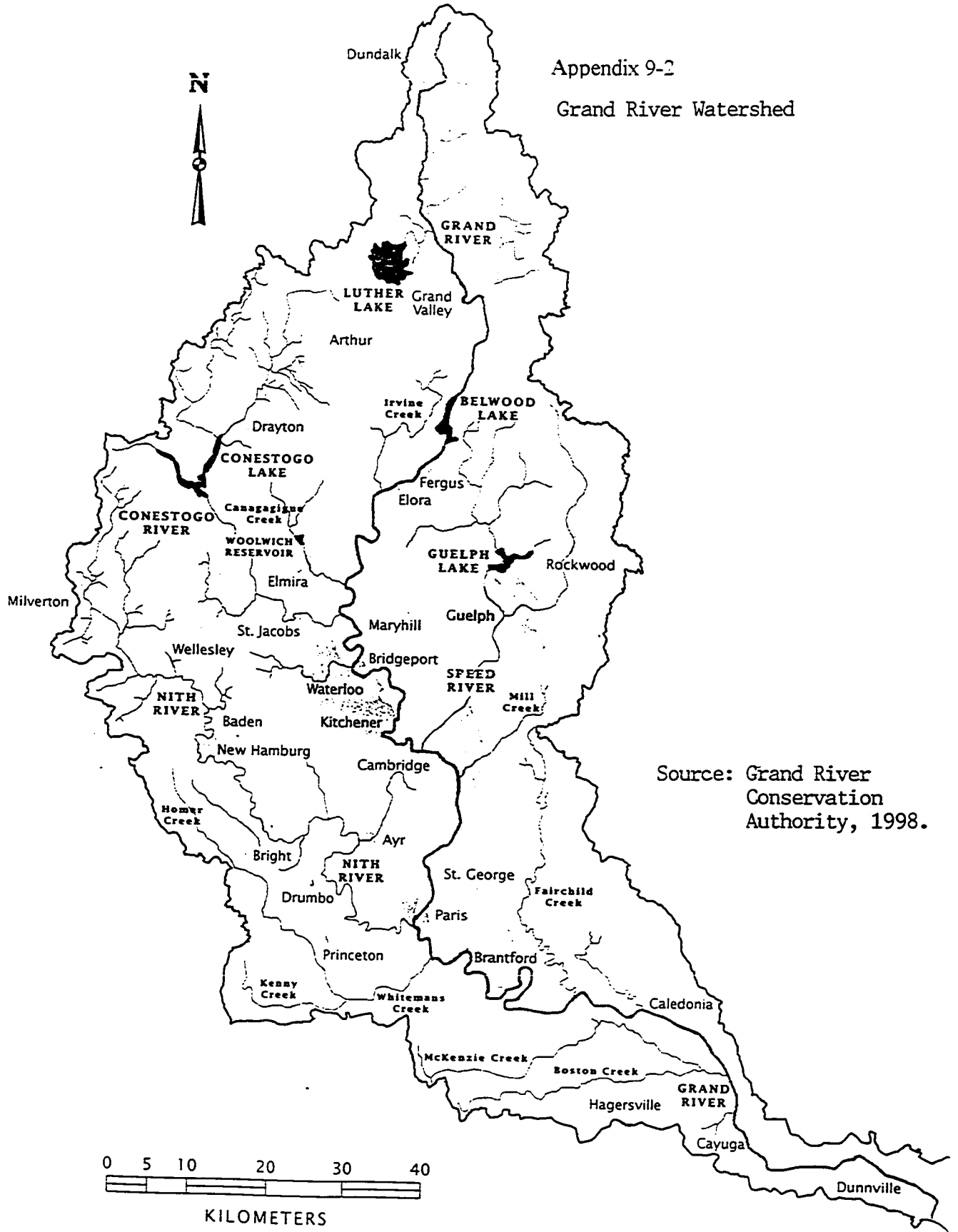
Appendix 9-1



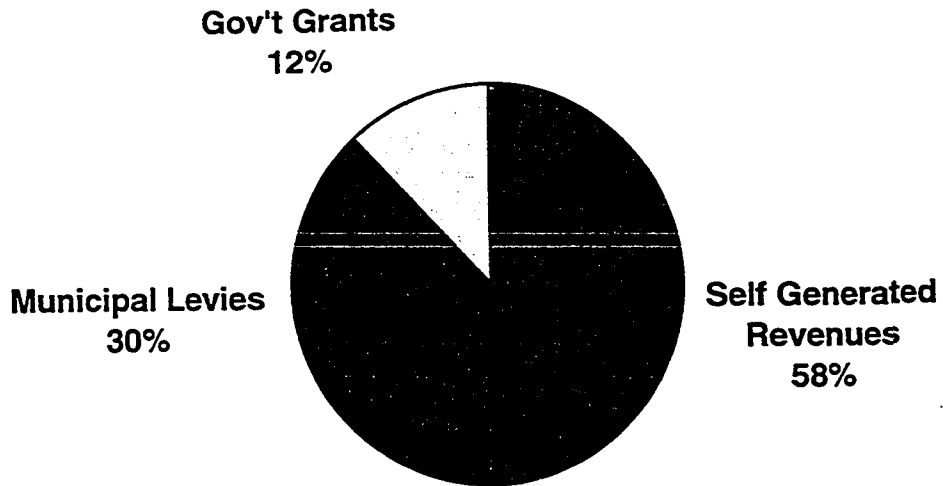
Source: Grand River Conservation Authority, Programs and Services Report, 1998.

Appendix 9-2

Grand River Watershed

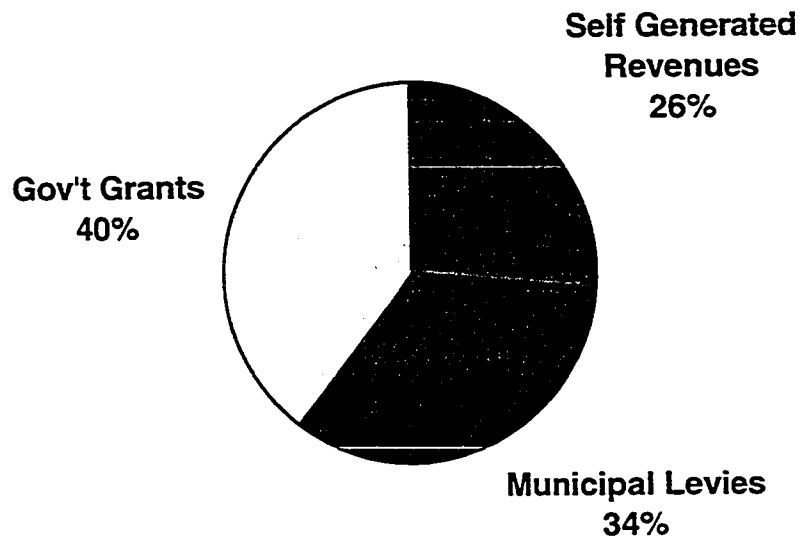


## Revenue Source Comparison (1998 vs 1988)



### **Revenue Sources 1998 (Preliminary)**

Total Revenue = \$ 12.3 Million

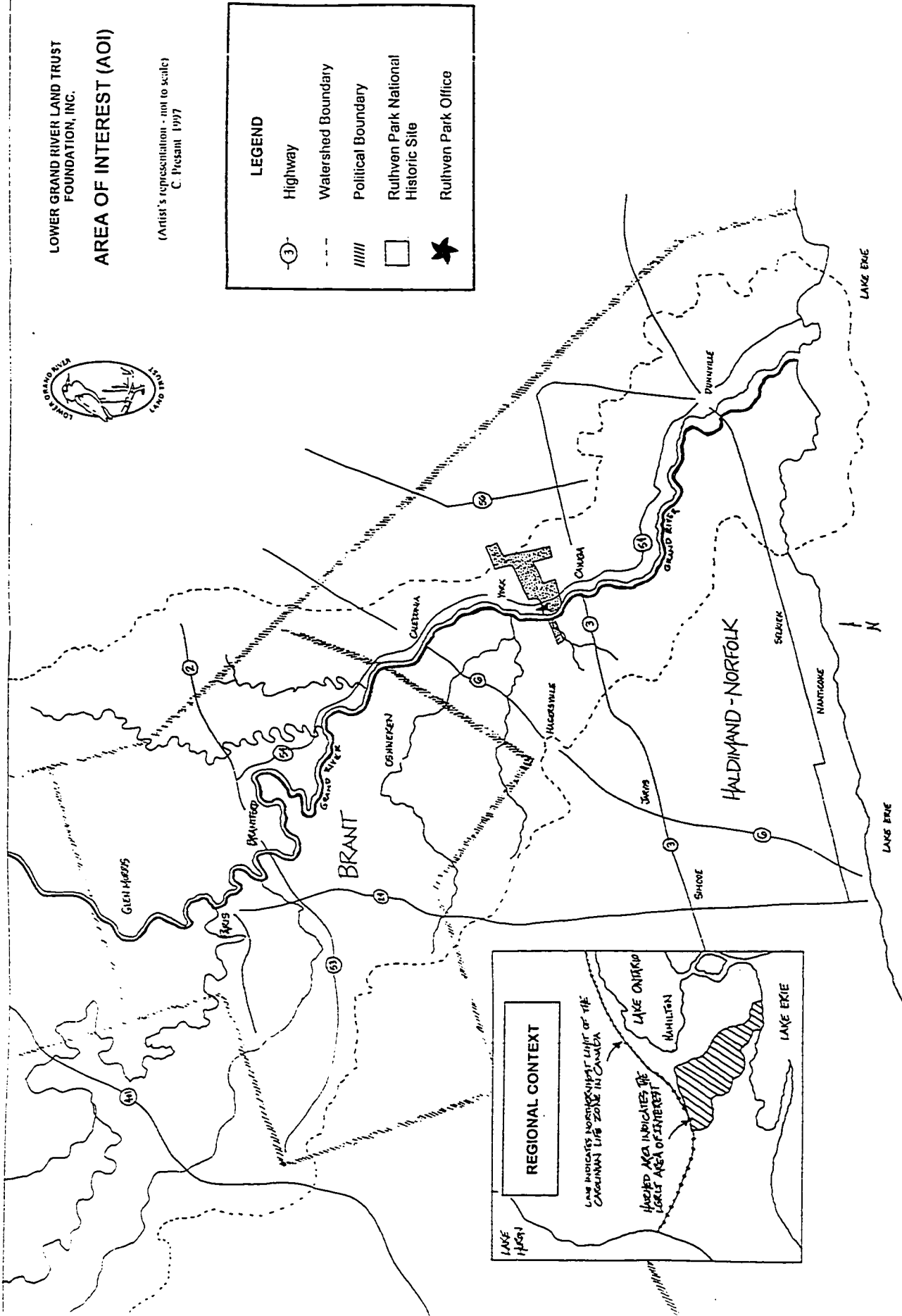


### **Revenue Sources 1988**

Total Revenue = \$ 16.7 Million

In 1998, it will only cost about \$4.70 per watershed resident for the programs and services of the Grand River Conservation Authority.

Source: Grand River Conservation Authority, Programs and Services Report, 1998.



Source: Lower Grand River Land Trust, Action Plan 2020, 1997.

## SECTION V

### Comparative Analysis & Conclusions

## **Chapter Ten**

### **Comparative Analysis of Policy Instrument Strategies Used to Manage Non-Point Source Water Pollution in Canada and the US**

#### **Introduction**

In Chapter 3, the three general questions that framed the development of the analytical framework were analyzed in the context how of policy has evolved in both countries to address NPS water pollution. In addition to describing what policy instrument strategies have been developed and implemented in Canada and the US to address NPS water pollution problems, the institutional analysis in Chapter 3 assisted in the identification of three policy instrument strategies that formed the basis of data collection in Chapters 4 through 9. It is through these empirical chapters that the analytical framework was employed to specifically analyze the implications of institutional arrangements on the selection, design and performance of policy instrument strategies in this policy area.

In this chapter, the research findings are analyzed in comparative context

using the analytical framework outlined in Chapter 2. This comparative chapter allows for the analysis of the three different policy instrument strategies used in Canada and the US to address NPS water pollution. The chapter includes a section comparing the findings on each policy instrument strategy at the operational level, an analysis of each policy instrument strategy in the broader intergovernmental context and concludes with a comparison of all three policy instrument strategies.

### **Comparative Analysis of Land Use Regulation as a Policy Instrument Strategy to Address NPS Water Pollution in the US and Canada**

It is evident from the cases that both watersheds examined in Chapters 4 and 5 face similar NPS problems primarily from urbanizing pressures and development pressures. Although the Sixteen Mile Creek Watershed is comparatively more heavily populated than the Bear Creek watershed in Michigan, both watersheds face a similar mix of NPS pollution sources and both are predominantly owned and used by private property owners. There is some evidence that in the US case, the character of the NPS pollution problems in the watershed contributed to the decision to supplement the dominant subsidy-based instrument strategy in Michigan with land use regulations that specifically addressed the nature of the NPS problems in Bear Creek. In the Canadian case, the land use regulation instruments have been in place for some time to protect Sixteen Mile Creek but the selection of the policy instrument strategy evolved to protect natural areas in the region, not specifically to address NPS water pollution problems.



Problem definition in the US case was facilitated by the incentive to participate in the state/federal NPS program. Characterizing the features of the Bear Creek watershed was also enhanced by the strong partnership role of Grand Valley State University's Water Resources Institute. In contrast, problem definition in Sixteen Mile Creek has evolved from land use policy, not water quality policy. Although the Regional Municipality did fund a watershed study in 1992, the data collected were primarily for purposes of modelling impacts of different development scenarios in the region, not to define and characterize water pollution problems and sources in the watershed. The Halton Region Conservation Authority has played a minor role in problem definition in Sixteen Mile Creek and its capacity to manage water quality has been eroded recently under provincially imposed financial constraints. There are no provincial directives or incentives to focus or prioritize specific WQ problems in provincial watersheds.

Comparison of this particular policy instrument strategy at the watershed level indicates that vertical, intergovernmental rules and incentives to use land use regulation policy instrument strategies are low in both cases. In the US case, the issue of property rights did seem to limit the capacity of policy makers to more fully utilize a land use regulatory policy instrument strategy in the Bear Creek watershed. In the US, this in large part stems from constitutional limitations outlined in the fifth Amendment and the importance of the "takings" issue to policy makers. These higher level rules have had implications for instrument choice and use at the watershed level.

In the Canadian case, limitations on development and property rights have existed for some time in the land use planning context and were therefore not specifically evident as barriers to using land use regulation policy instruments to address water quality issues in a more direct way. In some ways, this may indicate potential to more fully develop land use regulation as a policy instrument strategy to address NPS water pollution in the future.

In the US case, there were clearly articulated NPS problems and a watershed approach was explicitly used in the policy instrument strategy, this seemingly contributed to a more effective integration of land use and water quality, cross-medium approaches. Although subsidy-based policy instrument strategies remain the instrument strategy of choice in Michigan, the explicit watershed approach has contributed to some basic integration of land use rules into the broader policy instrument strategy. In addition, these linkages have contributed to higher levels of horizontal capacity as policy makers in the Bear Creek case clearly articulated the need for cross-medium approaches.

In the Canadian case, land use rules are not specific to a particular watershed but apply across several watersheds on a regional level. Regional designations of Environmentally Sensitive Areas (ESAs), however, do include most watersheds. Although Conservation Authorities in Ontario are generally regarded as managers of water resources on a watershed basis, the Halton Region Conservation Authority is organized on a regional level and its management activities, although framed using

an ecosystem and watershed perspective, do not have a specific NPS water pollution mandate in Sixteen Mile Creek or other watersheds in the region.

### **Institutional Analysis**

In both cases, there is evidence that the selection and design of policy instrument strategies was impacted by the institutional context in which they evolved. The land use policy instrument strategy in the Bear Creek watershed case was directly influenced by the rules and instrument strategy at the state level in Michigan. In addition to adopting design features based on the federal Sec. 319 program guidelines, both constitutional and statute law had an impact on the design and implementation of the land use regulation policy instrument strategy. Although there is generally a high level of vertical integration in NPS programming in Michigan through strong federal and state incentives, the vertical capacity related to land use regulation is low. The land use regulation policy instrument strategy was predominantly designed by state actors at the local level with some input from community organizations like Grand Valley State University's Water Resources Institute. Although the broader policy instrument strategy design was shared between state and local levels, design and implementation of the land use regulation component was at the local, watershed level.

In the Canadian case, there is very little presence of the Federal Government in this policy instrument strategy, unless impacts on fisheries resources in the Sixteen Mile Creek watershed were threatened. The Ontario Government, although involved

in the review of official plans, the appeal process and in defining the mandates of Conservation Authorities, is not involved in the design and implementation of land use regulations in the region. The primary responsibility for designing, reviewing and implementing land use regulations related to Sixteen Mile Creek as a designated Environmentally Sensitive Area in the Regional Official Plan lies with the Regional Municipality of Halton. The Halton Region Conservation Authority only plays a review and advisory role in the land use regulation process. The low vertical institutional capacity in this case illustrates that the management of land use as an instrument to address non-point sources of water pollution in Sixteen Mile Creek watershed is left up to the Regional municipality which has land use policy authority but very little water quality management authority.

This low vertical institutional capacity in Sixteen Mile Creek is related to the low horizontal institutional capacity to integrate medium based institutions in the watershed. Just as there are no vertical incentives to foster an intergovernmental approach to the implementation of a land use policy instrument strategy to address NPS water pollution problems, there are no provincial incentives to integrate land use and water quality policies on a regional or watershed basis. Horizontal capacity is low in terms of formally integrating land use policy goals with water quality goals but medium in terms of integration at an operational level as the protection of Sixteen Mile Creek as a designated ESA, integrates the review of development impacts using an ecosystem approach including potential impacts on land, water quality, habitat, species diversity and other ecological features.

In terms of horizontal institutional capacity, the Bear Creek case illustrated that land use policies, although weak, were integrated with water quality policies. This seems to have been reinforced by an explicit watershed focus and a focus on NPS problems. Although the land use policy instrument strategy did to some degree integrate medium-based institutions and rules, the strategy did not fully integrate land use and water quality regimes in the Bear Creek case. The emphasis remained on water quality institutions as land use components were only a minor part of a larger state-driven, subsidy-based policy instrument strategy.

The stakeholder capacity in the US case can also be characterized as medium. Although a limited number of local stakeholders were involved in the land use regulation policy instrument strategy, one community-based partner (GVSU-WRD) did play an important role, particularly in implementation. In terms of other stakeholder involvement, an anti-development resident group played a role in stimulating the consideration of land use rules in the county, the county public health department also filled a minor one-parameter water quality role and organizations like the Boy Scouts participated in implementation through a planting program. In the broader context of the Bear Creek watershed plan, community stakeholders were not more actively involved in a formal way in problem definition, watershed planning, instrument design or implementation of the land use regulation component of the policy instrument strategy in the watershed.

In terms of stakeholder capacity in Sixteen Mile Creek, the permanent input of a volunteer technical advisory committee ensures that all development applications

in or in close proximity to Sixteen Mile Creek watershed undergo a community-based review. Although a formal mechanism involves community stakeholders in the land regulation process as technical reviewers and advisors to the Planning Department, stakeholders from the Sixteen Mile Creek watershed were not specifically involved as the instrument does not have an explicit watershed focus. The Niagara Escarpment Commission and the Halton Region Conservation Authority did fill a development review function to ensure land use in proximity to ESAs was reviewed.

In terms of monitoring and evaluation capacity, in both cases the presence of monitoring and evaluation of the impact of the policy instrument strategy is low. In the Bear Creek watershed case, no pre or post program monitoring of water quality was evident. Admittedly the adoption of the land use ordinance was recent but no formal monitoring and evaluation process was instituted for this component of the broader policy instrument strategy. Although resources were allocated for monitoring and evaluation in the Bear Creek project, the resources were directed at collecting program output data such as number and type of BMPs installed. No resources were allocated to collecting pre and post water quality data in the watershed.

Monitoring and evaluation capacity in Sixteen Mile Creek is also low. There is no ongoing monitoring by the Regional government, Conservation Authorities or community-based agencies. No data or performance measures are collected to determine if land use regulation in the region has protected or improved water quality

in the Sixteen Mile Creek Watershed. Conditions of development approval are monitored and enforced by an Environmental Inspector but no specific data is collected on a watershed basis including Sixteen Mile Creek. Based on these data limitations it is very difficult to evaluate the performance of the land use policy instrument strategies at the watershed level. It is however possible to evaluate the effectiveness of the policy instrument strategies in a comparative context.

**Table 10-1**  
**Comparative Analysis of Land Use Regulation Policy Instrument Strategies in the Two Cases**

COMPARATIVE DIMENSION	Michigan & the Bear Creek Watershed	Halton Region, Ontario & the Sixteen Mile Creek Watershed
Vertical Capacity	LOW	LOW
Horizontal Capacity	MEDIUM	LOW
Stakeholder Capacity	MEDIUM	MEDIUM
Monitoring & Evaluation Capacity	LOW	LOW
Effectiveness	LOW	LOW

In summary, in both cases there is evidence that institutional capacity impacted on instrument choice, design features and effectiveness. Although land use regulation as a policy instrument strategy in both cases exhibits low levels of capacity along most of the dimensions, the strategy did seem to perform comparatively well in terms of stakeholder capacity. In the Bear Creek case, an explicit watershed approach and funding from higher levels of government also seemed to foster a

medium level of horizontal capacity.

Although in Ontario there is seemingly more potential to use this policy instrument strategy to integrate land use and water quality management approaches, in the Sixteen Mile Creek case the utility of this policy instrument strategy is limited by the low vertical incentives to view this instrument as part of the water quality management toolbox. In the US, the limitations of this instrument stem from the institutional limitations on regulation related to property rights.

In both cases, there is no evidence that explicit watershed approaches lead to more effective policy instrument strategies but in the Bear Creek case there is some indication that an explicit watershed approach can lead to more horizontal capacity. In both cases the low monitoring and evaluation capacity may be inherent in the design features of the regulatory policy instrument strategy. This capacity was low in terms of land use and water quality outcomes. Arguably, specific NPS water pollution management goals could improve these deficiencies. In the Bear Creek case however, even NPS goals were not supported by monitoring and evaluation regimes to measure progress of the policy instrument strategy and its various components.



### **Comparative Analysis of Subsidy-based Policy Instrument Strategies to Address NPS Water Pollution in the US and Canada**

It is evident from the case studies that the Cedar Creek watershed in Wisconsin and Caledon Creek watershed in Ontario face similar NPS problems primarily from urbanizing pressures and development pressures on upstream agricultural lands. Both watersheds are upstream sub-watersheds of larger river basins which empty into the Great Lakes. Both watersheds are moderately populated and face a similar mix of NPS pollution sources - primarily agricultural.

In the Wisconsin case, Cedar Creek is an upstream, largely agricultural sub-watershed of the Milwaukee River Basin. Efforts to identify NPS sources and define the pollution problems in the watershed were stimulated by the state's identification of the watershed as a "priority watershed" in 1984. Although the watershed was already identified as facing non-point source pollution problems, primarily from agricultural sources, it was not until 1992 that the state funded the development and implementation of a NPS watershed plan.

In the Caledon Creek case, an upstream watershed in the larger Credit River basin, problem definition has not identified specific non-point sources. There is some evidence that agricultural runoff, aggregate operations and urban runoff are the major non-point sources. The problem definition in this watershed is being undertaken by the Credit Valley Conservation Authority but the subsidy-based policy instrument strategy is being implemented on a regional rather than watershed basis. Problem definition at the watershed level has not driven the design features or the

implementation strategies of the sector-specific, agricultural, subsidy-based policy instrument strategy. The instrument being implemented at the watershed level is the same instrument being implemented across the province with no specific environmental goals. Analysis of this instrument in action was done recognizing the indirect character of the policy instrument strategy.

Problem definition in the Cedar Creek watershed case was not solely facilitated by the incentive to participate in the federal Sec.319 NPS program. The State of Wisconsin already had a well developed NPS Abatement Program in place based explicitly on a watershed approach. Design features of the subsidy-based instrument were not directly framed by the Sec. 319 funding guidance as the State of Wisconsin's program was one of the models for the national program. Development of the policy instrument strategy in Cedar Creek watershed did therefore not have any difficulties to meet the requirements for state and federal funding.

Predominantly state actors were involved in the NPS problem definition, watershed planning and instrument design from the outset of the project. The Advisory Sub-committee consisted of 28 representatives from state and local units of government, a representative from the University of Wisconsin and a citizen from each of the municipalities in the watershed. Although the sub-committee had significant input into the design and features of the policy instrument strategy for the Cedar Creek project, the problem definition and instrument preferences were pre-selected at the state level based on Wisconsin's NPS Program and to some degree the federal Sec. 319 funding guidance. The participation of community-stakeholders in

the development and implementation of the watershed NPS project was noticeably absent. In the recent program re-design to improve the management of the program and introduce regulatory components was in large part stimulated by elected state representatives and internal auditors.

The instrument design features in the Ontario case were developed by a coalition of farmers' organizations with the technical support and in-kind contributions from the provincial Ministry of Agriculture, Food and Rural Affairs. This core group, organized into a Steering Committee, consisted of provincial representatives from the Ministry of Environment and Ministry of Natural Resources, but environmental groups were noticeably absent. At the local level, the subsidy-based instrument strategy was implemented by an individual hired by a farmer's organization designated the responsibility for implementing the program province-wide. Community stakeholders in the Caledon Creek watershed, including the Credit Valley Conservation Authority, did not have any input into the design features or implementation strategy. Problem definition evolved from an agro-environmental approach. Although comprehensive, in that the instrument was designed and implemented integrating land use, water quality and soil dimensions locally, the instrument was not designed to be implemented on a watershed basis or to specifically address NPS water pollution problems.

The Conservation Authority has more recently taken an active role in defining the nature of the water quality problems in the Caledon Creek sub-watershed through a sub-watershed assessment and planning process. Although the federal government

(first, under the Green Plan and later through Agriculture Canada) have been the primary funding sources for the instrument strategy, the federal agency has not played a role in design or implementation.

Property ownership and rights did not seem to play a significant role in the design stage but did seem to play an important role in how the policy instrument strategy was implemented in both watersheds. Based on a voluntary approach and using financial incentives, in the US case the program was implemented by Local Conservation Districts rather than state officials. There was not a problem generating participant landowners at the local level based on the generosity of the BMP subsidies. In fact, the program signed more cost-sharing agreements that it could fund.

In the Caledon Creek case, the lack of trust in state officials was an important factor in delegating a coalition of farmer's organizations as the primary implementation agents. The other cited reasons were the economic savings from this implementation arrangement and the lack of capacity in any of the provincial ministries.

### **Institutional Analysis**

In both cases, there is evidence that the selection and design of policy instrument strategies was impacted by the institutional context in which they evolved. The subsidy-based policy instrument strategy in the Cedar Creek watershed case was directly influenced by the rules and instrument strategy at the state level in

Wisconsin. There is a high level of vertical integration in NPS programming in Wisconsin reinforced by strong federal and state funding incentives and the preference state agents had for implementation by local units of government. In the Cedar Creek case there is some evidence that this vertical integration may have been too inflexible not allowing for the reallocation of funds between and within projects at the watershed level. This was largely tied to rules about surplus monied flowing back to the state, which as a result of pressure from the local Land Conservation Departments have recently been made more flexible and decision making decentralized.

In the Canadian case, the vertical institutional capacity is low. There is very little presence of the federal government in this policy instrument strategy beyond the funding from Agriculture Canada. The provincial government, although involved in an advisory role with representatives from the Ministries of Environment and Natural Resources and OMAFRA, OMAFRA officials only provide a technical support role in ensuring the workbooks and supporting documents are kept up to date in terms of BMPs.

The Credit Valley Conservation Authority, while a provincially mandated organization with a watershed focus, is not involved in the design and implementation of the subsidy-based, BMP-based, EFP instrument strategy. Local units of government are also not involved in the instrument strategy in the Caledon Creek case. This low vertical institutional capacity illustrates the low priority NPS water pollution management has in the province.

Interestingly, in terms of horizontal institutional capacity the subsidy-based instrument strategy being used in the agricultural sector does seem to have potential to integrate water quality management efforts across vertical agencies, and on a watershed basis. The technical foundation on which the EFP program is built is very comprehensive and effectively takes an ecosystem approach by integrating land, soil and water quality approaches. However, the gap between Conservation Authorities and the agricultural community seem to be a significant barrier to more effectively integrating the different stakeholders in the watershed and more fully integrating agricultural land use and water quality management policies. Just as there are no vertical incentives to foster an intergovernmental approach to the implementation of a subsidy-based policy instrument strategy to address NPS water pollution problems, there are no provincial incentives to integrate land use and water quality policies on a regional or watershed basis.

In terms of horizontal institutional capacity, the Cedar Creek case does integrate land use and water use policies at a watershed level. This is evident by the mix of agencies involved in implementation at the watershed level. Although the Land Conservation District plays the primary local role in the instrument strategy, representatives from the US Soil Conservation Service, Planning Commissions, County Environmental Health Departments and the State Department of Agriculture, Trade and Consumer Protection were participants in the development and implementation of the Cedar Creek watershed project. The primary role played by

local Land Conservation Districts increased the horizontal institutional capacity in this case.

The stakeholder capacity in the Cedar Creek case could also be characterized as medium. Although all of the above stakeholders were involved in the subsidy-based policy instrument strategy, other non-state stakeholders were not involved in the design or implementation. Landowners, as the primary agents, however did seem to participate in the program based on the subsidy levels. However, recent reports indicate that some of the polluting landowners designated as “critical sites” have not voluntarily participated in the program and were the stimulus for introducing more coercive elements to the policy instrument strategy in the recent program redesign.

In comparison, stakeholder capacity in the Caledon Creek watershed was lower but evaluated as medium as there was some level of stakeholder involvement in the design and implementation of the policy instrument strategy. Beyond the EFP Representative, employed by the Ontario Environmental Farm Coalition to implement the program, and the participation of farmers themselves in the workshops and the peer review process, other stakeholders were not involved in the policy instrument strategy. The absence of a watershed approach may be a determining factor. CVCA is actively involved in the watershed but not in the sector-specific, provincially designed policy instrument strategy.

Monitoring and evaluation capacity in Cedar Creek watershed case is “medium”. In terms of outputs, the high landowner participation rates are an indicator of some degree of success. Officials attributed these participation levels to

the local approach taken by the Land Conservation Departments and the awareness of the Department of Natural Resources backing. To some degree the “carrots” seemed to work because of local implementation backed by the threats of a reputable regulatory department in the state.

Although resources were allocated for monitoring and evaluation in the Cedar Creek project, the resources were directed at collecting program output data such as number and type of BMPs installed. Based on installations, impacts on water quality in Cedar Creek were extrapolated from the larger Milwaukee River Basin using a formula. Some loading reduction data was estimated based on the BMPs installed in Cedar Creek but eight years after the project began, data is still only being collected for a few parameters and the phosphorous loading and sediment loading targets have not been met.

Monitoring and evaluation capacity in Caledon Creek and the subsidy-based policy instrument strategy is low. The voluntary, subsidy-based policy instrument strategy’s performance is primarily measured in terms of participation rates, not ecological outcomes. Although there are 57 farmers operating 101 farms in the watershed, only 9 had completed the EFP program. On the provincial level the participation rates of 16,000 of 40,000 seem to indicate a degree of success but the data reflect only number of farmers who have attended an EFP workshop, not the number who have implemented BMPs and possibly improved water quality in their locales. The impacts on the ecological parameters in the watershed are not known. Although the CVCA is initiating a water quality monitoring program, no pre



instrument data has been collected so the measurable ecological impacts are indeterminate. In addition, the CVCA's water quality monitoring is independent of the subsidy-based policy instrument strategy.

**Table 10-2**  
**Comparative Analysis of Subsidy-based Policy Instrument Strategies in Two Cases**

COMPARATIVE DIMENSION	Wisconsin & the Cedar Creek Watershed	Peel Region, Ontario & the Caledon Creek Watershed
Vertical Capacity	HIGH	LOW
Horizontal Capacity	MEDIUM	LOW
Stakeholder Capacity	MEDIUM	MEDIUM
Monitoring and Evaluation Capacity	MEDIUM	LOW
Effectiveness	MEDIUM	LOW

In summary, in both cases there is evidence that institutional capacity has impacted on instrument choice and design. In the Cedar Creek case, the NPS programs at the state and federal levels created incentives for stakeholders at the watershed level to adopt and adapt the subsidy-based policy instrument strategy. This high level of vertical institutional capacity directly impacted on instrument choice and the design features of the policy instrument strategy. In the Caledon Creek watershed case in Ontario, the low vertical institutional capacity, and in particular the low capacity of state agencies, contributed to a policy instrument choice and design that was framed by farmers organizations.

Comparatively, the policy instrument strategy in Cedar Creek also exhibited higher levels of horizontal capacity. The explicit watershed approach seemed to allow policy designers and implementers to integrate land use incentives with water quality incentives through the subsidy-based policy instrument strategy based on BMPs. In both cases, the policy instrument strategy did exhibit medium levels of stakeholder capacity as both instruments were designed to create incentives for landowner participation in implementation and stakeholder participation in instrument design.

In terms of effectiveness, the Cedar Creek case study indicated slightly higher levels of landowner participation. This is in part explained by the comparatively higher level of available subsidy, but officials indicated it is also partially explained by the threat of the DNR backing the program. In the Caledon Creek watershed case, lower participation rates can be partially explained by the lower subsidy levels and the eventual recognition that state intervention and more coercive instrument options were not a perceived threat in Ontario.

Both policy instrument strategies rated low in terms of monitoring and evaluation capacity. In the Caledon Creek case, performance measures based on ecological improvements in water quality were non-existent. In the Cedar Creek case, some extrapolated measures and measures based on BMPs installed indicated the policy instrument strategy was having a gradual positive impact over the eight year period of the program but specific data on water quality parameters were not collected.

### **Comparative Analysis of Tax Incentives, Conservation Easements and Land Trust Policy Instrument Strategies in the US and Canada**

The cases selected to examine the use of tax incentives, conservation easements and land trusts as policy instrument strategies to manage NPS water pollution were selected for slightly different reasons than the primary reason of being of similar size and facing similar non-point source water pollution problems. While the Eighteen Mile Creek in New York and the Lower Grand River Watershed in Southern Ontario are facing similar non-point sources, both cases were selected because they provided an opportunity to examine the use of traditional land management tools to address water resource management issues. In many ways, the use of tax incentives based on donations and conservation easements implemented by a variety of stewardship organizations including land trusts, provide an interesting case to examine the evolution and development of a comparatively new policy instrument strategy in the water quality management area. Similar to the use of land use regulation, these policy instrument strategies are attempting to cross the boundaries between land use and water quality policies.

There is some evidence in both cases that tax incentives and conservation easements are increasingly viewed as flexible policy instruments that can be used to achieve a variety of environmental protection and prevention objectives. However, both case studies illustrate the immaturity of this policy instrument strategy as a cross-medium tool. In the US case, the Eighteen Mile Creek watershed illustrates how some land trusts are broadening their mandates to use a watershed approach

rather than a traditional land conservation approach. Similar to the land use regulation policy instrument strategies, this case again illustrates that this policy instrument strategy is seen as complementary to other strategies being implemented at the state level. In the Canadian case, the Lower Grand River Land Trust has its roots in land conservation and is attempting to build partnership alliances with other stakeholders in the watershed. However, it has not explicitly articulated a watershed protection or water quality management role. In the Canadian case, new tax provisions may be able to increase the popularity of this policy instrument strategy if the capital gains disincentive is “ironed out” with Revenue Canada and if the instrument is communicated to landowners. The communication role and stewardship are two functions that land trusts could perform through their landowner contact programs.

Similar to land use regulation instrument strategies, tax incentive and conservation easement strategies evolved to protect natural areas in the region, not specifically to address NPS water pollution problems. The major difference is the approach and the fact that tax incentives and conservation easements have not been identified as instruments by the provincial agencies with specific water pollution management mandates, namely MOE.

Problem definition in the Eighteen Mile Creek case was facilitated by the incentive to participate in an EPA funding program under Sec.319. Although the impact of this funding in terms of organizing efforts on a watershed basis has not progressed, the funding did reorient the WNYLC to a watershed approach and

allowed the organization to hire a full-time Watershed Coordinator. The recent water quality study being undertaken in partnership with the University of Buffalo and Buffalo State may allow the land trust to be more effective in bringing stakeholders together and targeting their landowner outreach and contact program.

Interestingly, problem definition in the Grand River watershed has in most part evolved from water quality policy not land use management policy. In terms of organizational design with a specific watershed approach, the GRCA does explicitly adopt a watershed approach and has focused on non-point sources of water pollution as a significant outstanding problem. However, defining the specific scientific dimensions of the NPS problem in the Grand River watershed has not been a priority. The regional government and GRCA have explicitly focused on water quality problems in the watershed and created some incentives for cooperation under the Rural Water Quality Management program. The use of tax incentive and easements as tools have however not been popular as these organizations do not have incentives to adopt them and reportedly are inexperienced in using them. Similar to the Halton Region Conservation Authority and the Credit Valley Conservation Authority, the GRCA has recently seen some of its capacity to manage water quality eroded under provincially imposed financial constraints. Instead, the stakeholders in the watershed have adopted subsidy-based instruments based on the provincial incentives under the Environmental Farm Plan program.

The Eighteen Mile Creek case illustrates that although tax incentives are well established in the US and land trusts are not a new organization involved in

environmental protection, the WNYLC is grappling with how to cross the boundary from being an easement holder and land manager to an organization with a watershed focus and water quality objectives.

### **Institutional Analysis**

In both cases, there is evidence that the selection and design of the policy instrument strategy was impacted by the institutional context in which they evolved. The tax rules at the federal level in Canada and the US have had direct implications for the design features of the policy instrument strategy at the watershed level.

In the Eighteen Mile Creek case in New York, the design of the instrument strategy was also influenced by the incentives of the EPA grant. In the Grand River watershed case the existence of federal tax incentives only very recently seems to be being realized by policy makers as having potential. Even so, neither the GRCA nor the land trust are aggressively advocating the use of tax incentives or easements as conservation and water resources management tools. The provincial land conservation property tax exemption rules seem to have less of an impact as the Ministry of Natural Resources narrowly determines eligibility. Although conservation authorities are now eligible again, land trusts and conservation easements are not eligible for provincial tax incentive programs.

In terms of vertical institutional capacity, in both cases the degree of federal, state, provincial and local collaboration is low for tax incentive, conservation easement policy instrument strategies. Although there is generally a high level of

vertical integration in NPS programming in New York through strong federal and state incentives, the vertical capacity related to the use of tax incentives and conservation easements is low. The tax incentives are designed at the federal level and model easements are encouraged through the existence of the Land Trust Alliance of New York, but the policy instrument strategy is predominantly designed by local actors at the watershed level so easements can be customized to fit very local purposes. Implementation responsibility in the US and the Eighteen Mile Creek case lies with the land trust. Local units of government are not actively involved in the use of easements as land conservation or water quality management tools.

In the Canadian case, there is some presence of the federal government in this policy instrument strategy. Environment Canada is trying to facilitate the implementation of the ecological gifts tax through conservation organizations such as land trusts and the Department of Finance has held hearings on how to improve the effectiveness of the instruments. Although involved in the determination of ecological lands that are eligible for property tax exemptions under the Conservation Incentive Tax Program, the centralized determination of eligible lands by the provincial government does not provide incentives for landowners and conservation organization to use this type of policy instrument strategy.

The GRCA, although an eligible recipient of conservation easements under the federal ecological gifts provision, has not pursued this policy instrument strategy to address non-point source water pollution problems. Officials consulted explained this as a capacity issue not related to resources but to experience. The Lower Grand

River Land Trust, while very interested in becoming more actively involved in the use of conservation easements and communicating the availability of the tax incentives to landowners, has been preoccupied with the size and scale of its first donation and has put its outreach initiatives on the back burner. Not surprisingly, there is very low vertical institutional capacity in this case.

This low vertical institutional capacity in the Grand River watershed is related to the low horizontal institutional capacity the policy instrument strategy provides to integrate medium based institutions in the watershed. Just as there are no vertical incentives to foster an intergovernmental approach to the implementation of tax incentive, conservation easement policy instrument strategies to address NPS water pollution problems, there are no incentives to integrate land use and water quality policies on a regional or watershed basis. Tax incentives, conservation easements and land trusts are all still primarily defined as land management and conservation strategies. Although in some instances there is integration of land use policy goals with water quality goals, horizontal institutional capacity is low.

In terms of horizontal institutional capacity, the Eighteen Mile Creek in New York has even lower horizontal institutional capacity. Land use policies are tightly held as the jurisdictional responsibilities of local units of government. Tax incentive and conservation easements are primarily implemented by land trust organizations which still remain focused on land management activities. The WNYLC is presently struggling with this low horizontal capacity as it attempts to broaden and define its mandate as a water quality management organization.



The stakeholder capacity in the Eighteen Mile Creek watershed area is also low. Although WNYLC was given a grant by EPA to facilitate a multi-stakeholder approach and establish a watershed council, progress has been extremely slow. A variety of reasons may explain this. One is the fact that problem definition in Eighteen Mile Creek has been weak. Another is that many local stakeholders do not perceive the role of the land trust as a watershed management organization and do not understand how tax incentives and easements can be a valuable tools to address non-point sources in the Eighteen Mile Creek watershed. Finally, local units of government hesitate to become involved with easements because of the potential to open the discussion on property tax incentives or reductions which is a political 'hot potato'. The water quality study initiated in January 2000 in collaboration with two local universities may facilitate more stakeholder capacity in the form of partnerships with local units of government and more landowner outreach activity by the land trust.

In the Grand River watershed case, stakeholder involvement with tax incentive, conservation easement instrument strategies has also been low. Stakeholder capacity in terms of problem definition, instrument design and implementation is low. Although there are several local units of government including the GRCA, the Regional Municipality and the Lower Grand River Land Trust involved in NPS water pollution management activities and stewardship, their involvement with the tax incentive, conservation easement instrument strategy is low.

It appears that lack of institutional incentives and inexperience with the instrument strategy are the most identifiable reasons.

In terms of monitoring and evaluation capacity, in both cases the presence of monitoring and evaluation of the impact of the policy instrument strategy is low. In the Eighteen Mile Creek watershed, only very recently have water quality data been collected. In the Grand River case, some water quality data is being collected related to the Rural Water Quality Program but not specifically related to the use of tax incentive and conservation easement policy instrument strategy. In both cases a small amount of resources have been allocated to collect water quality data.

Monitoring and evaluation capacity in terms of program outputs is also very low. In Eighteen Mile Creek in New York there is no evidence in terms of participation rates, or that number of acres under easement are linked to water quality improvements. In the Grand River watershed, although data are being collected on the participation rates in the subsidy-based policy instrument strategies under the Rural Water Quality Program, not surprisingly, no specific measures on the use of tax incentives or conservation easements are collected.

**Table 10-3**  
**Comparative Analysis of Tax Incentive, Conservation Easement and Land Trust Policy Instrument Strategies in Two Cases**

COMPARATIVE DIMENSION	New York & the Eighteen Mile Creek Watershed	Waterloo Region, Ontario & the Lower Grand River Watershed
Vertical Capacity	LOW	LOW
Horizontal Capacity	LOW	LOW
Stakeholder Capacity	LOW	LOW
Monitoring and Evaluation Capacity	LOW	LOW
Effectiveness	LOW	LOW

In summary, in comparing the two cases, institutional capacity is low across all dimensions. Although in both cases an explicit watershed approach was taken, neither clearly articulated NPS problems and explicitly has tried to use tax incentives or conservation easements to substantially integrate the dominant land use management rules in this policy instrument strategy. However, in both cases the potential exists to use these tools to customize approaches to specific watersheds and the dimensions of NPS water pollution problems.

The use of this strategy in both contexts is limited by low levels of institutional capacity. Comparison of this particular policy instrument strategy at the watershed level indicates that this policy instrument strategy remains indirect. Although there is more potential for use of this instrument strategy in the US based on institutional capacity in the form of land trusts, more favourable tax incentives and

more experience with managing conservation easements, significant medium-based institutional barriers exist and the policy instrument strategy remains indirect. Evaluation of the effectiveness of this policy instrument strategy, in both cases is premature.

In both cases at the operational level this policy instrument strategy is weak. Although there is potential to use conservation easements and tax incentives to address the land use sources of NPS water pollution, this instrument strategy remains embedded in the land use policy toolbox not the water quality management toolbox. If this policy instrument strategy is to become a serious policy option, there is a need to improve institutional capacity in both cases.

## **Conclusions**

It was hypothesized in Chapter 2 that preferences and selection of different policy instrument strategies would be determined in part by the nature of the pollution problems and institutional capacity. All six cases provide evidence that the nature of NPS pollution problems outlined in Chapter 1 has resulted in the preference for voluntary types of policy instrument strategies based on the need to create incentives for participation of stakeholders and property owners in proximity to watersheds.

In terms of the impact of institutional capacity on choice and design of policy instrument strategies, clearly in some cases the preference for certain types of instruments was determined by vertical incentives or limitations due to higher level

rules. Comparatively, subsidy-based policy instrument strategies in the US had the most vertical integration. Federal and state institutional incentives and leadership resulted in the preference for subsidy-based policy instrument strategies and the participation of local units of government and community stakeholders on a watershed basis as implementation agents.

There was also some evidence that higher levels of institutional capacity were associated with design features incorporating “sticks”. In the Wisconsin and Cedar Creek watershed case as institutional capacity developed, and policy implementers realized the limitations of voluntary instrument approaches and over time the policy instrument strategy incorporated more coercive elements. This may be interpreted as supportive evidence for traditional instrument choice theory which argues that over time instruments become more coercive.<sup>1</sup> In the cases in Ontario, selection of indirect policy instrument strategies did seem to be directly related to the low levels of institutional capacity in this policy area reflecting low levels of institutional capacity in water pollution management more generally.

Overall, a comparison of all three policy instrument strategies (see Table 10-4) indicates that in both countries, the institutional capacity to address NPS water pollution problems is low, especially in the broader context of institutional arrangements to deal with water pollution problems. The primary emphasis on PS water pollution problems has resulted in little comparative institutional capacity to

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<sup>1</sup> Doern, Bruce G. and V. Seymour Wilson eds. *Issues in Canadian Public Policy* (Toronto, MacMillan), 1974: 339.

address increasingly important non-point sources. Nonetheless, institutional capacity does vary depending on the policy instrument strategy.

**Table 10-4  
Comparison of Three Policy Instrument Strategies**

	Land Use Regulation		Subsidy-based		Tax Incentive, Conservation Easement, Land Trust	
	Michigan & the Bear Creek Watershed	Halton Region, Ontario & the Sixteen Mile Creek Watershed	Wisconsin & the Cedar Creek Watershed	Peel Region, Ontario & the Caledon Creek Watershed	New York & the Eighteen Mile Creek Watershed	Waterloo Region, Ontario & the Lower Grand River Watershed
Vertical Capacity	LOW	LOW	HIGH	LOW	LOW	LOW
Horizontal Capacity	MEDIUM	LOW	MEDIUM	LOW	LOW	LOW
Stakeholder Capacity	MEDIUM	MEDIUM	MEDIUM	MEDIUM	LOW	LOW
Monitoring and Evaluation Capacity	LOW	LOW	MEDIUM	LOW	LOW	LOW
Effectiveness	LOW	LOW	MEDIUM	LOW	LOW	LOW

A comparison of all three policy instrument strategies in Table 10-4 indicates that subsidy-based instruments based on BMPs have the most institutional capacity to address NPS water pollution problems in the US. This is not surprising given the high levels of vertical integration and medium levels of horizontal, stakeholder and monitoring and evaluation capacity. Beyond the comparatively high levels of institutional capacity evident in this policy instrument strategy, another factor in explaining the effectiveness of this approach, arguably is the maturity of the policy instrument strategy.

In contrast, none of the policy instrument strategies to address NPS water pollution problems in Canada rank highly in institutional capacity. Again, this is not surprising since none of them specifically address NPS water pollution problems. The use of the subsidy-based BMP approach in Ontario is the only instrument with specific design features to address significant non-point sources. Although sector specific, if one retraces the evolution of subsidy-based policy instrument strategies in the US, those designed and implemented early on in states like Wisconsin focused on agricultural sources. Over time, these sector specific strategies became more comprehensive. This may indicate promise for this type of policy instrument strategy if institutional capacity can be improved.

Although the land use policy instrument strategy appears to rank next in terms of institutional capacity, there are significant institutional constraints at the state, federal and constitutional level that may limit the utility and effectiveness of this instrument in the future. The EPA has very recently adopted model ordinances



related to NPS water pollution management<sup>2</sup>, but the Michigan and Bear Creek watershed case illustrates that land use regulation policy instrument strategies are minor components of the dominant policy instrument strategy and will likely remain so due to the institutional limitations surrounding property rights and takings issues at the operational level. In comparative context, these policy instrument strategies have more potential in Ontario as the institutional disincentives are weaker and policy makers have more authority to use these more intrusive and coercive instruments. Nonetheless, in Ontario, there are no direct basis of authority to use land use regulation for water quality objectives.

Tax incentive and conservation easement instrument strategies are comparatively the weakest instruments for addressing NPS water pollution. The institutional capacity of tax incentive, conservation easement and land trust policy instrument strategy is low across all dimensions but arguably this policy instrument strategy holds more promise if horizontal capacity in particular can be built. Although in both Canada and the US the tools offer flexibility to be customized to meet local needs, they remain firmly grounded in the land use policy toolbox and have not been directly designed to address non-point sources of water pollution. In Canada, additional barriers exist in the form of weaker tax incentives and weak institutional arrangements like land trusts as implementation agents. The US is clearly more institutionally endowed to rise to this challenge in the future.

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<sup>2</sup> US, Environmental Protection Agency, Office of Water, *Model Ordinances for Non-point Source Water Pollution Management* (<http://www.epa.gov/owow/NPS/ordinance.htm>), 2000.

In terms of effectiveness, the findings are not very positive. Comparatively only subsidy-based policy instruments are seemingly having an impact but it is very difficult to assess the individual effectiveness of different policy instrument strategies as monitoring and evaluation capacity is weak in all cases. Subsidy-based instrument strategies in the US have some positive documented and reported impacts in terms of landowner participation, number of BMPs installed and reported institutional successes like staffing and sustainable contributions at the local level. These outcomes were also reported in Michigan and New York at the state level. Although participation rates were reportedly positive in Wisconsin, the recent program redesign towards incorporation of more coercive components in the policy instrument strategy indicates they are not satisfactory for policy makers, implementers and stakeholders.

In terms of comparative performance, using the general definition of effectiveness as those policy instruments that integrate stakeholders in the watershed to solve NPS water pollution problems, four of the five cases exhibit medium levels of stakeholder capacity but only one performed comparatively better. Noting that the nature of stakeholder involvement in policy instrument strategies varied across each of the cases, there is some evidence that vertical institutional capacity and the cooperation of federal, sub-national and local units of government may make considerable difference in terms of effectiveness.

In terms of stakeholder capacity, it is interesting to note that in all three US cases, implementation was supported by a partnership with a local university - typically the extension unit or unit with water resource expertise. In the Canadian

cases, university partnerships were not a component of implementation in any of the cases. Expertise in the Canadian cases was drawn from farmers organizations, volunteer advisory council members and in some instances consultants. Generally, the source of community expertise and implementation partnerships were different. In Canada, both land use regulation strategies and subsidy-based instruments exhibited some degree of stakeholder involvement but the capacity was not fostered at the watershed level. Comparatively, stakeholder capacity on a watershed basis was lower in the Canadian cases where NPS water pollution management was not the focus of agencies or stakeholder organizations.

The concluding chapter will allow for a more detailed analysis of why policy instrument strategies in the US and Canada differ in the context of findings from Chapters 3 through 9 and current comparative public policy theory and research.

## Chapter Eleven

### Conclusion

*“Just as an environmental problem may be caused by non-point sources, so too the solutions to a set of interactive problems will be non-point solutions. This is the essence of systemic strategies.”<sup>1</sup>*

#### Introduction

This chapter concludes with some general comparative findings related to the policy instrument strategies analyzed in Chapter 10 in the context of the broader core research questions posed in Chapter 2. This chapter also aggregates some of the findings from Chapters 3 through 10 in an attempt to assess contributions to comparative theory and research in the water pollution management policy area. Although cautious of the limitations of generalizing from a limited number of cases at the operational level, an integration of findings from the top-down analysis in Chapter 3 and the intergovernmental analysis in Chapters 4 through 9, can assist in

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<sup>1</sup> Honadle, George. *How Context Matters: Linking Environmental Policy to People and Place*, (West Hartford, Conn: Kumarian Press, 1999), 19.

answering (or partially answering) some of the core research questions outlined in Chapter 2. In addition, this chapter provides an opportunity to reflect on policy implications, outstanding policy challenges and research questions.

By integrating the analysis from Chapter 3 and from the case studies of policy instrument strategies in action, some comparative conclusions can be made about NPS water pollution management in Canada and the US at an aggregate level. The cases, while few in number and not selected to represent all jurisdictions in Canada and the US trying to manage non-point sources of water pollution, nonetheless provide an in-depth analysis of instruments and implementation arrangements in these two countries. The findings provide a basis to comparatively analyze why institutional capacity and effectiveness of these policy instrument strategies differ in Canada and the US in the context of comparative public policy theory and research.

As outlined in Chapter 1, there have been some interesting theoretical debates about the relative importance of institutional arrangements in explaining differences between environmental policy approaches, instruments and outcomes. Nonetheless, institutional differences in Canada and the US, especially at the sub-national, implementation level have been neglected as important policy variables. Combined with traditional institutional differences in the context of federalism, institutional differences examined here at the operational level reflect the importance of institutional capacity as an important determinant of policy instrument choice, design and effectiveness in the implementation stage of the policy process.

**NPS Water Pollution Management:  
An Analysis of Policy Instrument Strategies in the US**

In the US, the federal government's initiative in terms of legislation and policy involvement in NPS water pollution management has been comparatively high. The US federal government has taken a more active role in NPS water pollution management by requiring state compliance with Sec. 319 and by enticing state participation through the federal NPS conditional grant program. It is very evident that the federal funding guidance in particular had significant design implications for policy instrument strategies in all three of the US cases. This was particularly evident in terms of subsidy-based instruments based on BMPs. This can be partially explained by the comparatively high level of federal government involvement and vertical institutional capacity in water pollution management generally.

In many ways, the institutional capacity and intergovernmental cooperation that evolved for the administration of point source water pollution management regimes has made intergovernmental involvement in NPS water pollution efforts easier as some level of institutional capacity existed and was developing at the state level. Although for some states federal involvement in this policy area only added to state efforts that were underway, for many states the federal Non-Point Source Management Program under Sec. 319 was the stimulus for action. Of the three states analyzed, Wisconsin developed legislation and implementation capacity to deal with non-point sources of water pollution prior to the federal amendments of the Clean

Water Act. New York and Michigan only developed this capacity after federal reporting requirements and incentives were institutionalized. Thus, the cases indicate that the impact of the federal leadership role varied across the three states.

In contrast to the “conjoint approach” in point source water pollution management efforts, where states simply implement policies in accordance with federal standards, this case analysis confirms that NPS water pollution management exhibits a more cooperative approach based on voluntary state implementation stimulated by federal incentives.<sup>2</sup> Although a mixture of carrots, sticks and sermons are evident, clearly the preferred instruments are carrots in the form of subsidy-based policy instrument strategies implemented locally by public agencies. Involvement of community stakeholders and an explicit watershed approach were conditions of the federal funding guidance and it is therefore not surprising that BMP subsidy based instruments based on state-societal partnership approaches at the watershed level is the primary policy instrument strategy in all three of the states.

In all cases, some of the institutional capacity at the state and even local levels arguably stems from the legislative, technical and administrative capacity of the EPA. In general, there has been a modest trend in NPS water pollution funding since 1987 to improve the financial commitment on part of the federal government, centralize technical support to standardize BMPs nationally and to grant states and localities more autonomy in implementation.

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<sup>2</sup> Kincaid, John. "Intergovernmental Costs and Coordination in US Environmental Protection" in Holland, K.M. et.al. ed. *Federalism and the Environment: Environmental Policy Making in Australia, Canada and the US*, (Westport: Greenwood Press, 1996).

Of all the instruments that US government agencies have at their disposal to address non-point sources of water pollution, land use regulation is the weakest instrument and is not strongly integrated with other NPS water pollution efforts. Horizontal, cross-medium institutional capacity was low across all cases, except the subsidy based BMP policy instrument strategy. Based on the constitutional primacy of property rights and local provision of these instruments, there is virtually no federal and state involvement in land use regulation, particularly for the purposes of water quality protection and improvement. The model ordinances recently developed by the EPA for voluntary use at the state and local level indicate the federal recognition that the land use-water quality interface will become increasingly important in the management of NPS water pollution in the future. The institutional analysis of this policy instrument strategy however suggests that there are significant institutional barriers that may hinder progress in the use of land use regulatory approaches.

While some land trusts have received federal and state resources to address NPS water pollution problems, these private non-profit organizations which primarily use tax incentives to protect land, have only indirectly contributed to water quality efforts. Nonetheless, with well developed tax incentives and non-profit land trusts present in many communities across the US, the institutional potential is there to be tapped. Land trusts with water quality protection mandates and specific “water trusts” recently established may prove to be innovative policy instrument strategies in the future.



There is also some evidence that the character of NPS water pollution problems in different states and watersheds has facilitated the necessity to shift implementation from federal to state and local levels and from bureaucratic agencies to community-based partnership arrangements. However, the evolution from an initially centrally-driven approach to a more cooperative decentralized approach was also likely fostered by the maturation of capacity at the state and local levels<sup>3</sup> and by broader administrative reform efforts under the Clinton Administration.

In summary, intergovernmental cooperation and vertical institutional capacity to address NPS source water pollution problems is comparatively high and is arguably the most important dimension influencing policy instrument strategy choice, design and effectiveness. Policy making and implementation based initially on federally directed "coercive incentives" has evolved into intergovernmental relations based on "cooperative incentives". Analysis of programs and instruments in this policy area clearly indicates that state policy implementers continue to follow the lead of the EPA and that leadership, resource allocations and incentives at the federal level have resulted in a diffusion of preferred policy instrument strategies across states based on a prioritizing watershed approach. There is evidence that instrument choice in this policy area has been directly influenced by institutional incentives in the American federal system.

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<sup>3</sup> James P. Lester "A New Federalism? Environmental Policy in the States" in Norman J. Vig and Michael E. Kraft ed. *Environmental Policy in the 1990s* (Washington DC: Congressional Quarterly Press, 1990), 59-80.

**NPS Water Pollution Management:  
An Analysis of Policy Instrument Strategies in Canada**

Similar to the US, the Canadian government's initial and primary water pollution policy and management efforts focused on point sources. Comparatively, water pollution problems are still predominantly defined in these terms at the federal and provincial levels. Federal involvement has been both low and indirect. Not unlike other environmental policy areas, "in striking contrast to the US, the Canadian federal government has not subsidized provincial administration of environmental programs, either conditionally or unconditionally".<sup>4</sup> Reflecting findings in other policy studies, there is a distinct absence of federal leadership in this policy area.<sup>5</sup> The federal government and its agencies (primarily Environment Canada, the Department of Fisheries and Oceans and Agriculture Canada) have only indirectly addressed NPS water pollution problems through research, some Areas of Concern under the Great Lakes Water Quality Agreement, through low levels of funding for agro-environmental programs and through the rhetoric of pollution prevention and the ecosystem approach. As outlined in the Ontario cases, it remains to be seen if the recent ecological gift tax provisions will be linked to water quality objectives.

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<sup>4</sup> Harrison, K. *Passing the Buck: Federalism and Canadian Environmental Policy*, (Vancouver: University of British Columbia Press, 1996), 41.

<sup>5</sup> Harrison, K. "The Origins of National Standards: Comparing Federal Government Involvement in Environmental Policy in Canada and the United States", in Fafard, P. and K. Harrison *Managing the Environmental Union: Intergovernmental Relations and Environmental Policy In Canada*, (Kingston: Queen's University Press, 2000), 49-80. See also Hessing H. and M. Howlett, *Canadian Natural Resource and Environmental Policy*, 1997, Chapter 9.

To date there has not been a concerted policy effort in this area to develop policy instrument strategies at either level of government.

Similar to the US, efforts in this area are variable at the sub-national level. Generally, provincial action in this area has also been weak and indirect. Only British Columbia has initiated a province-wide action plan to specifically address NPS of water pollution in the context of water quality goals. Ontario has continued to approach water quality problems based on point source problem definition. An explicit policy to address NPS water pollution at the provincial level is non-existent and potential to build institutional capacity is highly unlikely given the decline in resources allocated to the two primary water management agencies in the province - the Ministry of the Environment and Conservation Authorities.

Although sector-specific programs such as the Ontario Environmental Farm Plan program are addressing, non-point sources such as agricultural run-off through subsidy-based BMPs instrument strategies, it remains to be seen if and how this program can contribute to water quality objectives. Beyond participation rates in the EFP workshops, to date there is very little evidence that this policy instrument strategy has had any impact on water quality improvements at the watershed level.

Comparatively, land use planning and regulation instruments, tax incentives, conservation easements, and the use of private land trust instruments have the potential to address NPS water pollution problems but are weakly linked to water quality objectives. "Sermons" have failed to communicate the potential of these instruments to local policy makers, stakeholders and landowners. The analysis

confirms previous findings in the Canadian context that where administrative capacity is low and state policy implementers have few organizational, informational or other resources, they will tend to utilize instruments such as incentives and propaganda or rely on existing voluntary or community-based instruments to achieve policy ends".<sup>6</sup> In the cases examined in Ontario, the policy instrument strategies are indirect and will remain so unless institutional capacity is improved. The lack of federal and provincial institutional incentives do not indicate Canadian jurisdictions will be making progress in this policy area in the near future. It remains to be seen whether the recent tragedy in Walkerton, Ontario and the establishment of a public inquiry will provide a policy window to broaden problem definition and build institutional capacity to address non-point sources of water pollution in the province.<sup>7</sup>

### **Revisiting the Core Research Questions**

Does variation in institutional capacity in Canada and the US account for differences in instrument choice and design? As outlined in Chapter 2, the hypothesized explanation for differences in choice and design of policy instrument strategies can be partially explained by institutional arrangements - in particular, the four dimensions of institutional capacity. The analysis indicates that the dimensions

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<sup>6</sup> Howlett, M. and M. Ramesh, *Studying Public Policy: Policy Cycles and Policy Subsystems*, (Toronto: Oxford University Press, 1995).

<sup>7</sup> The O'Connor Inquiry was established in June 2000 to investigate the E-Coli contamination in Walkerton, Ontario that killed six people. The Commissioner was also granted the authority to investigate the policy and management failures associated with this water pollution event.

and nature of NPS water pollution problems do define the range of policy instrument strategies available in Canada and the US. The analysis also indicates that the selection and design of policy instrument strategies does depend on the institutional capacity of different state and societal stakeholders involved in managing the water resource. In addition, there is some supporting evidence in each of the six cases that policy makers and implementers in Canada and the US find more voluntary, market-based, “procedural” instruments based on state-society partnerships more feasible in the context of the administrative reform initiatives of the past decade.<sup>8</sup>

Does variation in institutional capacity in Canada and the US account for differences in effectiveness of different policy instrument strategies? The findings do indicate in a less quantifiable way that institutional capacity has an impact on the effectiveness of different policy instrument strategies. In terms of identifying conditions that contribute to policy effectiveness, theoretically each of the dimensions of institutional capacity should contribute to better policy outcomes. All of the policy instrument strategies examined in the US allow for design features that specifically address the nature of NPS water pollution problems. The dimensions of institutional capacity however limit the choice, design features and effectiveness of certain instruments. Confirming some of the theoretical work of common property resource management theorists, there is evidence that those policy instrument strategies that take the local character of the NPS pollution problem, create incentives for

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<sup>8</sup> Howlett, M. *Beyond Legalism? Policy Instruments, Implementation Styles and Convergence in Canadian and US Environmental Policy*, paper presented at the Annual Meeting of the Western Economics Association, San Diego, California, July 7, 1999.

stakeholder involvement, involve all levels of government, integrate land and water resources management approaches and have high levels of monitoring capacity more effectively address NPS water pollution problems as common property resource problems. This is a tall order and comparison of the effectiveness of the three policy instrument strategies reflect the outstanding institutional challenges. Nonetheless, the cases provide evidence that those policy instrument strategies that exhibit high levels of institutional capacity along these four dimensions will have a better chance of overcoming the collective action dilemmas associated with NPS water pollution management.

## **Conclusion**

In many ways, water pollution problems are complex multifaceted problems being defined and addressed according to eighteenth century rules and institutions. Both Canada and the US have addressed most water pollution problems using existing institutional arrangements and traditional policy instrument strategies. In both states, water pollution policy has been dominated by an emphasis on point source water pollution. The secondary priority of NPS water pollution management in Canada and the US is easy to understand in political terms. Point source pollution controls provide opportunities for highly visible legislative actions as well as the traditional political distributive benefits of sewage treatment plant construction and upgrade funding. In addition, regulatory policies "fit" within existing institutional arrangements and include administrative incentives for state implementation agencies.

This analysis indicates that both countries have defined water quality problems similarly by prioritizing point sources. The importance of NPS water pollution is still not reflected in policy or bureaucratic institutions despite the recognition that non-point sources are the outstanding policy challenge in terms of meeting water quality objectives in both countries and in other modern industrialized states.<sup>9</sup>

Studies of bureaucratic structures involved in environmental management indicate that in the US and Canada, traditional institutions have evolved based on traditional definitions of environmental problems.<sup>10</sup> Both countries have used a hybrid of instruments to address NPS water pollution problems. The reliance on "carrots" implemented locally as the preferred instrument strategy reflect the nature of NPS water pollution problems and comparative institutional capacity. Combined with "sermons", "carrots" and other voluntary measures will likely continue to be the preferred policy instrument strategies in the future in both countries.

Firstly, the land use interface of NPS water pollution problems is firmly established in statutory law at the sub-national level in Canada and the US. Secondly, the nature of the good and complex character of these water pollution problems makes standards and rules across jurisdictions difficult to establish, monitor and

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<sup>9</sup> Organization for Economic Cooperation and Development, *Environmental Performance Review*, (Paris: OECD, 1996)

<sup>10</sup> See Doern, B. and T. Conway *The Greening of Canada: Federal Institutions and Decisions* (Toronto, University of Toronto Press, 1994); Rosenbaum, Walter A. "The Bureaucracy and Environmental Policy" in James P. Lester ed. *Environmental Politics and Policy: Theories and Evidence* (London: Duke University Press, 1989); Fiorino, Daniel J. *Making Environmental Policy* (University of California Press, 1995).

enforce. Thirdly, solutions to NPS pollution problems often require local land use controls and management that require local knowledge of pollution problems and institutions based on community action. Fourthly, the cost of monitoring and enforcement associated with regulation is becoming far more influential in shaping how policy makers evaluate existing policies, define alternative policy options and select and design different policy instrument strategies.

There is also some evidence confirming earlier findings that US policy efforts in the area of water pollution management have been stronger and more centralized than efforts in Canada.<sup>11</sup> This analysis indicates it is because the US is institutionally endowed in the area of water pollution management that progress in the area of NPS water pollution has been more integrated and concerted. The cases however suggest that there has been decentralization in the past decade.

This changing character of “conjoint” federalism based on cooperative implementation incentives in the US case arguably enhances capacity. There is evidence in the US cases that some degree of centralization does create incentives for state and local entrepreneurship<sup>12</sup>, but elements of decentralization in the policy instrument strategies do allow stakeholders to adapt the policy instrument strategy to meet local needs. This was evident in the Michigan case where stakeholders in Bear

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<sup>11</sup> Hoberg, G. “Comparing Canadian Performance in Environmental Policy” in Boardman, R. ed. *Canadian Environmental Policy: Ecosystems, Politics and Process* (Toronto: Oxford University Press, 1992).

<sup>12</sup> Rabe, Barry G. “Federalism and Entrepreneurship: Explaining American and Canadian Innovation in Pollution Prevention and Regulatory Integration”, *Policy Studies Journal*, 27:2, 1999: 288-306.



Creek were able to incorporate land use regulation into the dominant subsidy-based policy instrument strategy. However, the implications of this changing nature of intergovernmental implementation arrangements needs to be further explored in terms of effectiveness.

This analysis also indicates that policy makers in Canada and the US continue to define and address pollution problems using medium-based approaches. The rhetoric of ecosystem, watershed and pollution prevention approaches in the past decade does not seem to have significantly changed this institutional reality. Although there is some indication that land use and water use policies are being more comprehensively defined in the US cases and explicit watershed approaches facilitate cross-medium approaches, policy makers in both countries continue to formulate policies and implementation strategies for land and water separately. Institutional arrangements in each country continue to reflect and reinforce this medium-based approach limiting the development of horizontal capacity. A medium-based approach also acts as an impediment to pollution prevention approaches and the use of alternative policy instrument strategies such as conservation easements and land trusts.<sup>13</sup> Recent policy research provides some supporting evidence to suggest that US states are ahead of Canadian provinces in moving towards pollution prevention, cross-media policy integration and are attempting to more comprehensively measure

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<sup>13</sup> Davies, Clarence J. and J. Mazurek, *Pollution Control in the United States: Evaluating the System*, (Washington: Resources for the Future), 1998.

environmental outcomes.<sup>14</sup>

In terms of measuring outcomes, there is some evidence that policy makers in the US are ahead of their Canadian counterparts in terms of measuring the water quality impacts of BMP installations and trying to integrate point and non-point source measures under the TMDL provisions of the Clean Water Act. However, the cases illustrate that operationally, both jurisdictions exhibit low levels of monitoring and evaluation capacity. Moving beyond a characterization of policy instrument strategies to an evaluation in terms of ecological outcomes remains an important outstanding policy and research challenge. Policy makers will need to address this “data deficit” if policy analysts wish to evaluate alternative policy instrument strategies.<sup>15</sup>

Arguably, as the nature of policy definition shifts from point source pollution to non-point source pollution and water pollution is more comprehensively defined, provincial and local governance structures (in particular community-based, intergovernmental systems) will become increasingly important if policy makers want to achieve water quality objectives. In both countries, there is evidence that state-society implementation partnerships have become increasingly important in addressing water pollution problems. Policy designers will need to pay particular attention to designing and adapting institutional arrangements to build stakeholder capacity.

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<sup>14</sup> Ibid, Rabe 1999.

<sup>15</sup> Davies, Clarence J. and J. Mazurek, *Pollution Control in the United States: Evaluating the System*, (Washington: Resources for the Future), 1998.

Non-point source water pollution problems require different policy approaches, instruments and institutional arrangements. Problem definition, instruments and implementation arrangements are linked in policy instrument strategies. Policy makers and implementers in the US have more tightly coupled these dimensions than their counterparts in Canada. The US cases illustrate that comparatively, policy makers have developed more institutional capacity to address these complex water pollution problems in the future. Nonetheless, significant institutional challenges remain in both countries and other industrial democracies.

Many OECD countries face similar water pollution management challenges. A recent report indicated that many countries are facing similar challenges integrating land, soil, and water management; upstream and downstream interests; surface and groundwater management; and quantity and quality issues.<sup>16</sup> Although the report notes that progress has been made through basin, watershed and other “place-based” approaches, practice is not always in accordance with the spirit of integrative legislation and “in some countries capacity at the sub-national levels in particular is not always sufficient to allow adequate implementation of integrated water management policies”.<sup>17</sup> The capacity to manage horizontally and the ability to build new organizational infrastructure to address these complex public policy problems remains a very important policy implementation challenge.<sup>18</sup>

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<sup>16</sup> Organization for Economic Cooperation and Development, *Water Management: Performance and Challenges in OECD Countries*, (Paris: OECD, 1998), 13.

<sup>17</sup> Ibid.p.13

<sup>18</sup> O’Toole, L.J. et.al. “Managing Implementation Processes in Networks” in Kickert, Walter J.M. et.al. ed. *Managing Complex Networks: Strategies for the Public Sector*, (London: Sage Publications, 1997), 137-151.

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