

5. HISTORY OF ONTARIO'S AGRI-ENVIRONMENTAL PROGRAMS

5.1 Overview

As knowledge accumulates, we know that environmentally unsustainable farm practices can damage the natural resource base of an individual farm, of adjacent land and the wider environment as well. Non-point source pollution deriving from agriculture is a major environmental problem in the United States, where it affects a large number of surface and groundwater bodies (e.g. Rosenbaum, 2002, p. 213). It is also a problem in Canada and Ontario (e.g. McRae *et al.*, 2001). This section relates the various approaches used in Ontario to mitigate or prevent agri-environmental degradation through promotion of voluntary stewardship.

Various incentive programs have been implemented in Ontario to financially assist farmers and other rural landowners in environmental projects. This section will:

- Give a brief history of Ontario's activity in conservation and the agri-environment within the wider context of government intervention in agriculture, the legal and jurisdictional framework within which it occurs and citizen activity;
- List and describe the chronology of past public programs which have been implemented in Ontario. A full description of current programs is contained in section 6: Current Incentive Programs Operating in Ontario – Details;
- Provide an assessment of early programs in Ontario.

5.2 Legal, Jurisdictional and Federal/Provincial Governmental Background

5.2.1 The United States

The United States federal government has had a strong interest in soil and water conservation issues since the late 19th century. At that time a number of forest conservation programs were in effect whose aim included soil and water conservation. There are several reasons for a strong American federal role in agriculture and the environment. One is from the authority given to it by the U.S. Constitution. Another is because much forest, farm and rangeland in the western United States has always been publicly-owned and under federal jurisdiction.

Yet another reason for the importance of American federal interest in agriculture stems from a legacy of American federal public welfare interest, especially through the New Deal programs put in place by President F.D. Roosevelt in the 1930s. These programs helped farmers and many others survive the Great Depression. As a result, the United States Department of Agriculture (USDA) still administers the US federal School Lunch program and Food Stamp program as forms of public welfare.

The influence of environmentalism in the US beginning in the 1970s led to the creation of the Environmental Protection Agency (EPA). This is a federal agency which works for the broad public good. From these beginnings, both the USDA and the EPA now have a strong federal influence in the agri-environment.

5.2.2 Canada

The context is rather different in Canada. First, Canadian provinces have a different constitutional standing within our federal state than American states have in the

US. Responsibility for agriculture, the environment and many inland waters in Canada is shared between the federal and provincial governments. The meshing of jurisdictions between federal/provincial interests is a matter of ongoing negotiation, especially since these interests are seldom identical.

Canada, like the United States, also has large amounts of public land, or Crown land, as it is called here. But unlike the United States, most Crown land in Canada lies north of the limits of commercial agriculture and ranching. As well, unlike most of the public land in the American west, Canadian Crown land can be either federal or provincial in any one province.

In regard to agri-environmental management and program development in Ontario, it is necessary to understand the special importance of the Great Lakes and the water quality within the huge watershed of this system. This is the largest fresh water ecosystem in the world and a crucial water resource for many millions of people.

The Great Lakes' watershed takes in most of Ontario's agricultural heartland but the Lakes themselves are a federal jurisdiction. Furthermore, the Great Lakes are subject to an international treaty between Canada and the United States. This treaty is administered through the International Joint Commission (IJC). For several decades the IJC has actively promoted the environmental rehabilitation of these major water bodies and has been important in promoting Canadian federal and federal/provincial intervention in the form of agri-environmental policy and programs.

5.2.3 The Legal Framework of Property Law in Ontario

The basic legal framework of Ontario is important in any discussion of the interaction between the private and public interest when it comes to the agri-environment. At the time of Confederation in 1867, Ontario, along with the other provinces outside Quebec, adopted English common law as the base of its legal system. According to doctrines of common law, the private land holder has almost complete authority and responsibility over his or her land as “real property,” just as for any other form of property. In common law, this theoretically includes the right to exploit, use, or abuse the land in any manner.

Common law doctrine does not strongly distinguish between types of real property; farmland, forest land, vacant land, developed land etc. are all real property. Common law doctrines underlie much of what are understood in lay terms as “private property” or “ownership” rights. But, under our legal system, these rights actually come in a bundle and can be separated into a large number of specific rights, each of which may be constrained, bequeathed or distributed in many different ways. It is through this “unbundling” that conservation easements, land trusts, limitations on inheritance etc. are created which affect the disposition of land as real property.

Common law property rights can be modified for the public good (or the “greater good” as it is sometimes put) through statutory legislation. In other words, statutes are enacted by legislatures which have the effect of over-riding common law doctrines relating to private property rights (or most anything else). Constitutional law can be invoked to over-ride federal or provincial statutes, but it is important to re-iterate that,

unlike American constitutional law, there are no private property provisions in Canada's constitutional law.

For various reasons, including a political culture which promotes individual private interests rather than a collective public interest, most Canadian governments have, until fairly recently, allowed private landowners to manage their land, including farmland, much as they saw fit. Until the modern era, little government intervention was made for conservation purposes and no notable legislation was introduced which had the effect of over-riding common law doctrines on property. It is only since about the 1970s that environmentalism has forced a change in outlook. Since that time, private property rights to use or abuse land are often challenged by those who wish to see effective government regulation of the land for the public good.

A notable exception to this hands-off policy occurred in Western Canada during and after the Great Depression of the 1930s. Paralleling events in the US, a number of Canadian federal programs were established to aid farmers during the prolonged western drought and economic crisis. Some of these programs, such as the Prairie Farm Rehabilitation Administration (PFRA), are still in effect. The PFRA is now involved in several agri-environmental programs relating to wind erosion of soil and irrigation, for example.

In the early 20th century some private landowners were known to be practising good stewardship of their land in Ontario but many were not. Some private interest groups were interested in conservation matters and took a hand in some local matters. The unique private/public activity of Ontario's Conservation Authorities is described next.

5.3 The State of Ontario's Agri-Environment in the Early 20th Century

5.3.1 The Conservation Movement in Ontario

The forerunners to modern agri-environmental programs derive from Ontario's experience in private and public initiatives in conservation of the natural environment and of farmland environment. Many of the problems and recommendations identified by the early conservation movement remain relevant today. Histories of this movement were written by: McConkey (1952), the Conservation Council of Ontario (1953) and by Richardson (1974), from which most of the following account is drawn.

Following clearing and settlement of the natural forest cover, by the early to mid-20th century, soil and other environmental degradation from inappropriate farming practices was widespread in southern Ontario. Just as in the US, concern in Ontario centred on conservation of soil and water resources but unlike the US, forest conservation was not notable in Ontario, except in the establishment of Algonquin Park as a forest reserve late in the 19th century.

Active conservation efforts by various private groups began in the early 1930s. Reports of the time described the need for better management practices to improve drainage, increase soil organic matter, restore fertility and prevent wind and water erosion by attention to soil cover. The 1953 Report of the Conservation Council of Ontario identified different regional needs for conservation: the need for drainage, mechanization and erosion control in Eastern Ontario and concern about fertility levels, erosion, soil structure and need for cover crops in Central and Western Ontario.

5.3.2 Call for Integrated Planning in Conservation

Today's integrated ecological outlook and emphasis on sustainability had not then been formulated, but the conservationists of the early 20th century understood that conservation of natural resources ought to be integrated with other land use and resource planning and treated at a comprehensive regional level. This would include urban and rural areas as a co-dependent system. The 1950 Report of the Select Committee on Conservation described the need for a comprehensive conservation program to include forests, soil, water and wildlife (Conservation Council of Ontario, 1953). A separate work written in the 1950s agreed:

Conservation calls for co-operation of city and country, industry and agriculture. Canadians should move together on a united front with the common objective of conserving and building the natural resources of Canada, not exploiting them.

McConkey, 1952, p. 202

5.3.3 The Central Place of Farmers in Conservation

Although the conservation problem deserved an integrated and comprehensive treatment, it was also well understood that since almost all farmland was held as private property, the stewardship initiatives of farmers themselves would be important to the success of conservation efforts:

...the Council visualizes the farmer as the key figure in conservation – the man who will have to do the actual work in the field. The successful solution of the problems of flood control, erosion, soil fertility and all other features on the conservation of soil, water and agricultural resources rests ultimately with the farmer.

The Conservation Council of Ontario, 1953, p. 2

This appeal to private and voluntary stewardship remains the essential position of both Canada's and Ontario's governments today in regard to design and implementation of agri-environmental programs. Voluntary stewardship is now further encouraged by programs providing financial incentives; this being an important economic instrument for policy implementation.

The early reports on conservation in Ontario also understood the relationship between farm economics and management and conservation of natural resources. The issues remain familiar:

Economic factors are fundamental to conservation of the soil. When farm produce prices are low, the land suffers... Today there is too wide a spread between what the consumer pays for food, clothing, and housing and the amount paid to the farmer and the primary producers on the soil. This is a danger point in our soil resources and a prosperous permanent agriculture.

McConkey, 1952, p. 202

The importance of getting farmers involved in conservation was often highlighted. It was said that success would depend on encouraging conservation goals on each farm through well-trained extension personnel from the Department of Agriculture. The observers of the day understood the need for individual treatment of farms and also for demonstration farms. Conservation of the soil and water was thought to be best achieved by encouraging farmers to adopt a program of good farm management and land use. It would also be to the farmers' economic advantage since it was said that the expense of implementing the improved practices would be less than those they replaced (The Conservation Council of Ontario, 1953, p. 17).

Early analysts also knew that encouraging good practices through voluntary stewardship was often difficult, a problem which is still with us:

A large proportion of the farms that suffer most from the lack of sound conservation practices are in the hands of farmers who feel no obligation to take advantage of the services, information and advice that, from many sources, are already available to them. They do not attend the farmers' meetings, read the bulletins, or subscribe to the farm journal; and yet these farmers have definite problems which they are willing to discuss with anyone who will take the trouble to visit them.

The Conservation Council of Ontario, 1953, p. 14

5.3.4 The Relation between Forest Cover and Flooding

One important conservation problem related to the forest cover. Although much of Ontario's Crown land remained forested in the early 20th century, widespread deforestation for farming purposes had occurred early in Ontario's history in the private land holdings in the agricultural south. It was known even then that the removal of Ontario's natural vegetation for agriculture had caused extensive flooding and erosion in a number of major watersheds such as the Thames, Grand and Ganaraska Valleys. A minimum of 20% forest cover was considered necessary by European authorities to prevent erosion. From 1901-1943, the area of forested land in "Old Ontario" (meaning the southern settled agricultural area) had dropped from 16.6 % to 9.7% of the total land area. Large areas of sand blowouts and degraded farmland were reported in the Ganaraska Valley. Many other areas of Ontario suffered the same problems.

A free tree-planting program was established in the Ganaraska Valley as early as 1905. In some areas, such as Prescott-Russell, large reforestation projects were organized as Depression era make-work projects on degraded and sandy agricultural land. By 1936,

various forest and wildlife organizations such as the Federation of Ontario Naturalists and the Ontario Conservation and Reforestation Association became active in promoting conservation. A conference held in Guelph in 1941 was also influential. The early commentaries called for controlling water flow with forest management. Various forms of local and conservation activity followed, often through the initiatives of private interest groups. The importance of headwater swamps in regulating water was understood even at that time.

In 1944 Ontario established the Department of Planning and Development by an act of Legislature. An offshoot, the Department of Conservation, was established in 1945 which undertook the first provincial surveys in collaboration with the Department of Mines. In 1949 a Select Committee was appointed by government to carry out a detailed and exhaustive study of all aspects of conservation: soil, water, forestry, fish and wildlife, recreation, education, establishment of river valley authorities and federal/provincial co-operation and administration.

5.3.5 Establishment of Ontario's Conservation Authorities

Arthur Richardson's 1974 work tells of the local approach to conservation that Ontario adopted through the Conservation Authorities Acts of 1946 and 1954. The 1954 legislation followed the major flooding in many of the province's watersheds caused by Hurricane Hazel in the same year. Because of this storm, Conservation Authorities (CAs) for the Ausable watershed and Toronto area watersheds were added to the list of earlier valley authorities. The original basic principles of the CAs were that:

- they would result from local initiative and be a local responsibility;

- costs would be shared by municipalities in the Authority and the Provincial Government;
- their jurisdiction would be over one or more watersheds.

Later, recreational and educational functions were added to the CAs' original purpose of managing water and other natural resources.

In keeping with Ontario's conservative tradition, top-down governance by the province was not desirable. With the watershed as the basic spatial unit and the requirement that a CA spring from community initiative and operate through local input, regional and local flexibility were guaranteed. Because the CAs were local and cost-sharing with the province, volunteer community involvement and formation of partnerships became important. Conservation was meant to be "...a movement of, by, and for the people" (Richardson, 1974 p. 142).

5.3.6 The Little Valley Studies and the Question of Financial Assistance to Farmers¹

Beginning in 1952, some CAs made seven studies of small tributaries to the larger rivers in their respective watersheds. These were called the Little Valley Studies. The river valleys and their larger watersheds were: Avon River (Thames), Lutterell Creek (Speed/Grand), King Creek (Humber), North Creek (Big Creek), Black Creek (Credit), Denfield Creek (Ausable) and Horner Creek (Kenney/Whiteman's/Grand).

These Little Valley Studies are an early example of a practical initiative to directly involve individual farmers in conservation activities in a targeted watershed. The studies were to show individual farmers how better land use practices could contribute to

¹ I am grateful to David Wood, emeritus professor of Geography, York University for alerting me to the existence of the Little Valley Studies.

conservation. The reports on these little valleys included maps and illustrations and were distributed to each landowner in the valley concerned. Three studies were printed for wider distribution and included the farm plan of each owner and a colour aerial photograph showing the different land classes. Following the distribution of the reports, public meetings were held by the CAs to explain how conservation measures could be implemented. As part of this community participation activity, an economist from the US Soil Conservation Service came to discuss the American soil and water conservation activities at group and public meetings in south-western Ontario.

The question of the amount and the eligibility of financial assistance to farm owners was quickly raised during the Little Valley Studies, a question which remains relevant today:

The intent of this programme was well conceived, but to expect all the farmers in these little valleys to rearrange their farming business and conform with the recommendations of the reports without some financial assistance was an exercise in wishful thinking. One authority did consider giving financial assistance but on second thought declined; if assistance were extended to other little valleys in the authority the financial burden would have been astronomical. Nevertheless, the surveys and reports, especially the printed ones, served a useful purpose as a guide for the practice of conservation methods not only on the farms of the little valleys but throughout the whole authority.

Richardson, 1974, p 67

Although financial assistance to farmers was not feasible at the beginning, Richardson reports that by the late 1960s, the Grand River CA was trying to activate a program in its little valleys which included a public relations program and assistance for the farmers in the watershed (Richardson, 1974, p. 68).

From this beginning, we can see the antecedents to today's approach in Ontario. In places where voluntarism is the preferred approach and in areas, which rely on some combination of regulation and voluntarism, it is now generally considered necessary to provide financial or other incentive programs to farmers for on-farm stewardship practices.

5.3.7 Precedent for the Local Implementation of Agri-Environmental Programs

It seems that the way the CAs handled their activities and the experience of the Little Valley Studies set some important precedents in Ontario about private stewardship and the agri-environment. The Little Valley programs required direct, but still voluntary, participation of farmers in a community exercise. It was considered important that financial compensation be offered for their participation in conservation programs. This understanding and the early operational approach apparently still inspire some of the characteristics of current provincial agri-environmental programs and their style of delivery. These characteristics include:

- The choice of the watershed as the field of action;
- The emphasis on local initiative and voluntarism by members of the local community;
- Working directly with farmers and other landowners;
- The approach relying on cost/sharing between government and the CA.

The Little Valley Studies of the 1950s found that it was unrealistic to rely completely on voluntary stewardship for effective conservation for the public good. Financial incentives and/or compensation to farmers for on-farm projects would be

necessary. Today this is further extended to the concept of environmental payments for the value rendered to the environment and wider society by on-farm projects.

5.4 Conservation Authorities Today

There are now 38 CAs and more than 300 conservation areas in Ontario. They comprise the watersheds in which 90% of the population reside (Conservation Ontario website, 2002). Their modern objectives are:

- To ensure that Ontario's rivers, lakes and streams are properly safeguarded, managed and restored;
- To develop and maintain programs that will protect life and property from natural hazards such as flooding and erosion;
- To provide opportunities for the public to enjoy, learn from and respect Ontario's natural environment (Conservation Ontario website, 2002: <http://www/cpservation-ontario.on.ca/profile/profile.htm>)

Today Ontario's CAs initiate or deliver a wide range of programs such as: purchasing floodplain land for flood-control and planning, dam maintenance, soil erosion, reforestation, and provision of conservation areas for recreation and public education. CAs which were very pro-active in the early years, such as the Grand River and Upper Thames, continue to be in the vanguard. These two, along with the South Nation and others now deliver provincial agri-environmental programs whenever water quality or quantity is the major concern. They have initiated a number of logistical or funding partnerships with municipalities and private interests to assist their agri-environmental programs. Being neither quite public, nor quite private but having

responsibility for delivery of public environmental and resource policy, the CAs can be considered quangos (quasi non-governmental organizations) or para-statal organizations in Ontario.

Other agencies also deliver public agri-environmental incentive programs and many have to do with either soil or water quality. For example, the Ontario Soil and Crop Improvement Association (OSCIA) delivers the Environmental Farm Plan (EFP), a voluntary federal/provincial agri-environmental program (details of the EFP are given in section 6: Current Incentive Programs Operating in Ontario – Details). Ducks Unlimited Canada is another private organization which sponsors agri-environmental programs in Ontario and elsewhere.

From the above history, we see the origins of the emphasis on soil and water conservation in Ontario. This emphasis conforms to the US experience, but with some major differences, especially in the unique influence of Ontario's watershed-based CAs.

5.5 Timeline of Events in Ontario's Early Conservation History

1905: Mention of a free tree-planting program (in the Ganaraska watershed)

1936-37: Federal Department of Mines and Technical Surveys did first ground water surveys

1936-1954: Ontario Conservation and Reforestation Association became active, recommending reforestation to regulate water in 1936

1941: The Guelph Conference

1943: Ganaraska River Report

1944: Department of Planning and Development and its Conservation Branch

was established by the Ontario Legislature

- 1945: First water surveys by the (Ontario) Department of Planning and Development's Conservation Branch
- 1946: First Conservation Authorities Act and creation of Etobicoke, Ausable, the Upper Thames CAs
- 1949: Legislature passed a resolution leading to appointment of a Select Committee to study all aspects of conservation
- 1950: Report of the Select Committee on Conservation describes need for a comprehensive program to include forests, soils, water and wildlife
- 1952: Little Valley Studies inaugurated by some Conservation Authorities
- 1954: Hurricane Hazel and major flooding, which prompted the creation of the CAs and action in many river valleys for re-forestation and purchase of flood plains

5.6 Chronology of Past Programs

5.6.1 Ontario Farm Productivity Incentive, 1979

This section describes the major agri-environmental programs implemented in Ontario. The orientation of the first programs appears to have been towards soil conservation to maintain the productivity of productive farmland and hence the economic viability of farms and farmers. In 1979, the Ontario Farm Productivity Incentive Program was launched as an early example (Thompson, 1991).

5.6.2 Federal and Federal/Provincial Programs

Following are brief descriptions of past federal/provincial programs drawn from the more extensive summaries on Agriculture and Agri-Food Canada's (AAFC) website http://res2.agr.ca/london/pmrc/english/ag_env.html and in hard copy as appendices to this report. These programs were part of a concerted federal/provincial effort to deliver a series of programs to improve the sustainability of production agriculture in Ontario. The total funding was close to \$100 million.

5.6.3 Soil and Water Environmental Enhancement Program (SWEEP) 1986-1993

The impetus for this program was the Canada-US Great Lakes Water Quality Agreement, calling for a reduction in phosphorous pollution in the Lake Erie basin of 2000 tonnes per year. Canada agreed to reduce phosphorous run-off by 300 tonnes per year; 200 tonnes from cropland and 100 tonnes from industrial and municipal sources by 1990. To accomplish the agricultural commitment, Canada and Ontario carried out five-year programs of co-ordinated and complementary activities with farmers, farm and other organizations.

SWEEP Sub-programs

Federal: (Agriculture Canada)	Provincial (OMAF)
Technology Assessment Panel	Technical Assistance, Extension Services
Conservation Information Bureau	Soil Conservation Incentives (OSCEPAP II)
Socio-Economic Evaluation Component	On-Farm Demonstrations
Technology Evaluation & Development	Tillage-2000 (T-2000)
Farm Level Economic Analysis	Side-by-Side Demonstrations
Pilot Watershed Study	
Water Quality Monitoring	
Water Quantity Monitoring	

5.6.4 Land Stewardship Program I (LSI) 1987-1990

A three-year federal/provincial program to provide grants for adoption of conservation farming practices on Ontario farmland to enhance and sustain agricultural production and improve and protect soil and water resources by improving soil resources and water management, reducing soil erosion and compaction, restoring soil organic matter and tilth and reduce the potential for environmental contamination from agricultural practices. Assistance was provided to encourage farmers to adopt practical, cost-effective conservation farming systems and promote a long-term stewardship ethic.

According to Thompson (1991) the budget for the Land Stewardship Program was \$40 million. This was allocated as follows:

- \$31.3 million to farmers for assistance in the form of grants to encourage adoption of conservation practices;
- \$3.25 million to research;
- \$3.00 million to the delivery agencies;
- \$2.45 million to extension work.

Grants on a per acre basis were provided for: soil building and maintenance projects, structures, machinery and equipment, technical training. These were provided on a county/district basis by OMAF.

According to the AAFC website cited above, a maximum of \$30,000 was available for eligible applicants. Eligibility for an individual was determined by the following conditions:

- Be a resident of Ontario;

- Be a registered owner or lessee of the farm property in Ontario on which the eligible improvement would be made;
- Be a registered owner or lessee of land used in a farming enterprise that produces: i) at least \$12,000 in agricultural products or ii) less than \$12,000 where on-farm income exceeded off-farm income or where the value of agricultural products was reduced below \$12,000 because of exceptional circumstances (e.g. barn fire, herd disease, extreme weather);
- Complete an acceptable Land Stewardship Inventory and Action Plan detailing past land management practices, existing problems and planned future management practices that indicate a new and long-term land stewardship approach is being adopted.

In defining eligibility, partnerships and corporations controlled by Ontario residents were considered to be one applicant and were required to meet all the above conditions plus the following requirements:

- If an applicant for a grant had a shared interest in a grant already paid to another individual, a partnership or corporation, the amount of the new grant will be reduced by the applicant's share of the earlier grant;
- Applicants which are partnerships or corporations must complete a special section of the application form, listing company name, registration number and names of all partners or shareholders.

Any applicant's acreage could not exceed his or her tillable acres farmed on September 1, 1987. The incentive program consisted of four parts:

1. Soil Structure-Improvement and Maintenance;

2. Erosion Control Structures;
3. Conservation Equipment
4. Conservation Technology

Grants were available for crop rotation, residue and crop cover, tree planting, stewardship lease, erosion control structures (including municipal drains), conservation equipment, conservation training and technology.

Rates per acre varied across four groups in Ontario as follow:

LSPI

Counties/Districts		RATES – DOLLARS PER ACRE						
		Establishment Year		No Off-Farm Sales		OR	With Off-Farm Sales	
		Seeding	Over-wintering	Year 1	Year 2		Year 1	Year 2
GROUP I	Kent, Essex, Lambton, Elgin, Oxford, Middlesex	\$15	\$15	\$60	\$70	OR	\$25	\$35
GROUP II	Huron, Perth, Brant, Haldimand-Norfolk, Hamilton-Wentworth, Niagara, Waterloo	15	15	50	60	OR	20	30
GROUP III	Peel, Stormont, Dundas, Glengarry, Bruce, Prescott, Ottawa-Carleton, Grenville, Durham, York, Halton, Victoria, Northumberland, Wellington, Russell	15	15	40	50	OR	15	25
GROUP IV	Peterborough, Simcoe, Frontenac, Lanark, Lenox-Addington, Grey, Leeds, Hastings, Dufferin, Renfrew, Prince Edward, Parry Sound, Sudbury, Rainy River, Temiskaming, Nipissing, Haliburton, Manitoulin, Cochrane, Thunder Bay, Muskoka, Kenora, Algoma	15	15	30	40	OR	10	20

These are maximum rates Local O.S.C.I.A. county or district

http://res2.agr.ca/london/pmrc/english/env_prog/1sp/1spbroch.html

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5.6.5 Land Stewardship II (LSII) 1990-1994

This was a \$38 million, three-year continuation of the Land Stewardship Program having four major aspects:

- New emphasis on Conservation Farm Planning;
- Extension, Education and Technology Transfer field staff;
- Grants to:
 - Farmers who adopt practices or build structures as part of their conservation farm plan;
 - Organizations for on-farm demonstrations and evaluation;
 - Organizations for conservation promotion and education;
- Farmer-led administration: a grant to OSCIA to establish local Land Stewardship committees which would review and accept conservation farm plans and projects for funding and hire part-time staff to assist in program administration.

Per acre grants under an eligible conservation practice or for 50% of the eligible costs for installed conservation structures were given. The maximum for any individual, partnership or corporation was \$10,000 minus one-half of the total grants already received from the Ontario Soil Conservation and Environmental Protection Assistance program II (OSCEPAP II) and the original Land Stewardship Program. Grants were available to farmers to help implement components of their conservation farm plans as described in their project proposals. Conservation farm plans will outline farm resources, current practices and structures, degradation problems and alternative solutions. Project proposals will describe the combination of practices and/or structures that will address a specific soil and water resource degradation problem identified in the conservation farm plan.

Eligibility was similar to LS I but also required completion of an approved Land

Stewardship II conservation plan. Various limitations pertaining to timing of on-farm activities accompanied this program and funding from other programs. The program was delivered equitably on a county/district basis and grants were available for practices and structures which protect agricultural soil and water in Ontario from erosion and degradation. These were for:

- Residue management: up to \$20 per acre with at least 20% of the soil surface covered by the residue of the previous crop, with inspection and where up to 30% of the acres planted in the previous year to a maximum of 100 acres per applicant were eligible for each year of the program;
- Cover crops: up to \$30 per acre for establishment of over-wintering cover crops for up to 30% of acres planted the previous year, to a maximum of 100 acres. This excluded crops such as winter cereals and forages that were harvested or grazed;
- Strip cropping: up to \$10 per acre of accepted strip-cropping program. Up to 30% of the acres planted in the previous year, to a maximum of 100 acres per applicant. Grants to a maximum of \$1000 per applicant for 50% of costs of survey, design, layout and construction to establish crop strips were also available. Date constraints applied;
- Conservation equipment purchase, modification and rental: grants to a maximum of \$3,000 for 50% of the costs of conservation equipment, subject to local committee review and type of equipment bought, modified or rented;

- Soil conservation structures, e.g.: grassed waterways, water diversion, field terracing, water and sediment control basins, drop structures, channel bank reshaping, ditch bank stabilization structures, tile outlet protection, seepage control devices, mid-level, low flow ditch and stream crossings for machinery, fencing of watercourses, livestock watering devices adjacent to watercourses, field tree windbreaks. Grants provided 50% of eligible costs;
- Environmental protection: eligible grants for 50% of costs of establishing the environmental protection structures described in this section;
- Manure storage and handling: having a permanent barrier of five-foot minimum height and minimum 200-day storage for manure and liquid wastes, which comply with local by-laws. Eligible costs included professional fees;
- Milkhouse/milking parlour washwater disposal systems: having a permanent barrier of five-foot minimum height and 200-day capacity. Minimum volume of 4800 cubic feet (30,000 gal.), meeting all legal requirements including municipal by-laws and provincial statutes, with conditions as to soil type;
- Pesticide-handling facilities: grants for free-standing storage facilities, conforming to Pesticides Act, less than 150 square feet, and where mixing loading stations must be 150 feet from closest well or stream. Holding tanks and devices and earthen bermes were also eligible.

5.6.6 Great Lakes Water Quality Program (GLWQ) 1989-1994

GLWQ was part of the Great Lakes Water Quality Agreement Protocol to address agricultural pollution. The Great Lakes Action Plan was developed by participating federal agencies. This aimed for environmentally sustainable agriculture through the Canada-Ontario Green Plan described below.

5.6.7 National Soil Conservation Program (NSCP) (Ontario Component) 1991-1993

A national program recognizing the need for a coordinated approach from all levels of government in soil conservation. The aim was to implement appropriate soil resource management practices to maximize societal benefits and sustain the long-term productivity of the soil within practical economic limits and according to the soil's capability. It produced a number of Canada/Ontario agreements:

- Canada-Ontario Accord on Soil and Water Conservation – October 12, 1989;
- Canada-Ontario Agreement on Soil Conservation, April 9, 1990;
- Permanent Cover Program agreement with OSCIA, August 17, 1990;
- Canada/Ontario Environmental Sustainability Accord (COESA), October 27, 1992.

The \$8.2 million permanent cover component delivered by OSCIA in each of Ontario's 55 counties. OSCIA established a committee of local farmers to set local priorities and rule on applications and bids under the NSCP. The federal/provincial allocations for the permanent cover program were as follow:

The Federal NSCP Program

Program Elements	Federal (\$000)	Provincial (\$000)
Permanent Cover Program	8,250	0
Monitoring, Research And Soil Survey	2,400	0
Awareness	450	0
Research	0	750
Extension	0	500
Financial Assistance		9,850
Total	11,100	11,100

ACTUAL FEDERAL EXPENDITURES

Activity	1989-90	1990-91	1991-92	1992-93	Total
Permanent Cover Program	0	791,750	2,644,195	3,366,523	6,802,468
Monitoring Research And Soil Survey	0	530,000	960,000	909,500	2,399,500
Awareness	39,600	33,970	41,650	52,960	168,180
Sub-Total Federal	39,600	1,355,720	3,645,845	4,328,983	9,370,148

NSCP federal component: Up to \$10,000 per farmer was available for the 3-year program for retiring and protecting fragile land, especially farmland adjacent to streams and open ditches with permanent cover or trees. Long-term agreements were signed, 90% of which were for 15 years. Of the 2,000 bids submitted, 1226 were approved. These projects occurred on 5016 acres at an average cost of \$979 per acre. This meant a total expenditure of \$4,910,658 or 87.9% of the \$5.585 million originally allocated. An estimated 1000 miles of buffer strips were established. Some 74 projects retired 570 acres of flood plain. About 2.5 million trees were planted on fragile farmland. A total of 25 miles of windbreaks were planted. A total of 31 demonstration sites were funded (\$341,000) for various projects falling under the program aims.

NSCP provincial component: consisted of OMAF's contribution to one year of LSP, including extension for a total of \$11,210,000. A systematic and rigorous evaluation framework was established for the NSCP for both federal and provincial levels, but no information was made available to the federal government on any evaluation Ontario may have undertaken for this program.

5.6.8 Land Management Assistance Program (LMAP) 1991-1993

This was a federally funded program to:

“facilitate the adoption of effective resource management and environmental sustainable farming practices as a key to increasing the long-term financial returns to producers of grains and oilseeds and edible horticultural crops, sustainability of agriculture's resource base and competitiveness

of the Ontario agri-food sector.”

The federal commitment was \$15,242,000.

LMAP Sub-programs:

- **High Crop Residue:** financial incentives to farmers to adopt conservation tillage systems. This \$4,822,248 sub-program was delivered by OSCIA through county/district committees. Grants were \$25 per acre, where 30-39% of soil surface was covered by residue from previous crops at the time of planting. A maximum of \$30 per acre was available where 40% or more of the soil surface was covered by residue from previous crops at time of planting. Up to 30% of an applicant’s total planted acres in 1991 crop year was eligible, to a maximum of 100 acres per program year. The maximum contribution by Agriculture Canada per applicant per program year was \$3000 (available for two years). A total of 3638 applications were accepted, from a total of 4348 submitted. A total of 158,650 residue acres were inspected. The total paid out was \$4,822,248 for an average of \$1462 per applicant;
- **Permanent Cover II:** Ontario’s allocation was \$15.242 million between 1992 and 1994. The program was delivered by OSCIA and had a duration of one year to March 1994. The total contributions to farmers was \$2,425,000; program administration costs were \$200,000; demonstration sites \$84,130, for a total expenditure of \$2,709,130. The main focus was protection of land sensitive to erosion through buffer strips along water courses and tree planting on fragile land;

- Rural Conservation Clubs Program: Provided up to 50% of costs for establishing partnerships between Ontario farmers and conservationists. Province-wide clubs qualified for up to \$50,000 per year and local clubs up to \$20,000 per year. A Selection Committee composed of both agricultural and environmental stakeholders evaluated all applications. About 127 proposals were approved. Total funds paid out were \$505,000.

The program continued under the Canada-Ontario Agriculture Green Plan where an estimated \$2,000,000 were planned to be allocated.

- Environmental Farm Plan Pilot Project: developed by OFEC to encourage farmers to adopt a pro-active position regarding environmental issues on their farms. Participation involved attending a workshop, completing a self-assessment workbook and preparing an action plan for peer review. Total funding of the program was \$589,000 for seven pilot counties/districts: Essex, Oxford, Huron, Niagara, Hastings, Russell and Timiskaming. A total of 451 farmers participated in the pilot project (compared to an objective of 500) and 261 completed their action plans for peer review. The shortfall was attributed to timing of workshops, concerns for confidentiality of information in completed workbooks and action plans and inadequate promotion. The evaluation of this pilot project recommended extending it to all counties/districts of the province. Additional funding from LMAP of \$600,000 was provided until EFP details were finalized under the Green Plan;

- Best Management Practices: production of best management practice booklets; funded for \$897,000. This program was continued under the Canada-Ontario Agriculture Green Plan;
- Ontario Farm Groundwater Quality Survey II (1992): to provide baseline information on groundwater contaminants commonly associated with agriculturally-developed areas. Funding of \$600,000 for re-sampling of earlier tests of 1300 drinking water wells of the Ontario Farm Groundwater Quality Survey conducted under ESI (see below). A total of 40% of all wells tested contained one or more of the target contaminants at concentrations above the previous provincial drinking water objectives (see original for more details);
- Ontario Waste Agricultural Pesticides Collection Program: program provided \$265,394 to assist farmers in safely disposing of de-registered, outdated or unwanted agricultural pesticides stored on their farms. Some 29 collection depots were established in Ontario and more than 960 farmers participated, bringing 35,000 kg and 59,000 litres of wastes. Information and advice was provided.
- A number of educational and research projects were conducted under LMAP.

5.6.9 Canada-Ontario Environmental Sustainability Initiative (ESI) 1991-1992

Designed to promote and support the adoption of sustainable agricultural practices in Ontario. The sub-programs were in accordance with eight environmental sustainability issues identified by the Federal-Provincial taskforce in its 1991 report.

ESI Sub-programs

- Ground water survey; program funded at \$710,000. OSCIA managed and co-ordinated the project and many other agencies were involved in implementation. Over 200 test wells in agricultural fields were installed to provide data to analyse the effects of agricultural practices on groundwater quality. There appear to have been no incentive programs with this program;
- Best Management Practices; funding of \$595,000 for development and production of 70,000 best management practice manuals. The OFA was contracted as third-party facilitator;
- Five other information transfer initiatives were created, including a stakeholder forum.

5.6.10 Canada-Ontario Agriculture Green Plan 1991-1997

An equally-shared federal-provincial program designed to encourage and assist farmers with the implementation of appropriate farm management practices within the framework of environmentally sustainable agriculture. Seemingly for the first time, an *ex*

ante evaluation (see Glossary) framework was established for the seven sub-program areas in Ontario.

Green Plan Sub-programs

- Best Management Practices; booklets;
- Environmental Farm Plans; voluntary self-awareness program with 23 work modules; Water Quality Working Group-Groundwater Quality Survey (1993); Pollution Prevention Project;
- Rural Conservation Clubs; 36 farmer-based clubs supporting innovative ideas and five projects on manure management;
- Research; 31 projects;
- Stewardship Information Bureau;
- Wetlands, Woodlands, Wildlife; 10 demonstration projects;
- Technology Transfer; integration, development, education, delivery;
- Environmental Farm Plan (EFP).

The EFP and its associated groups were continued under this program, delivered by OSCIA on behalf of the Canada-Ontario Agriculture Green Plan Program. AAFC committed \$3.9 million to deliver Environmental Farm Plans. An additional \$4.7 million was earmarked to deliver an incentive program, providing up to \$1500 per farm business for making positive changes identified in their EFP Action Plan. Eligibility criteria included registered owners who were residents of Canada with a farming enterprise which produced at least \$7000 in agricultural products in the previous year or who produced less than \$7000 in agricultural products in the previous production year because of exceptional circumstances. Those with a written lease of land for farming and

Natives under the Indian Act in possession of land on a reserve were also eligible. A partnership or corporation, controlled by Canadian residents is considered a single farm business and must meet all of the above conditions. “Actions” or “Compensating Factors” from an appropriate Action Plan are eligible for the incentive program except for household improvements and equipment repairs.

5.7 Assessment of Early Programs in Ontario

5.7.1 Program Aims

We see from the early programs how concern about pollution and eutrophication of the Great Lakes from soil erosion and phosphorus loading was translated into a series of programs to address this problem. We see that most early programs came about as a result of federal initiatives and were implemented in formal federal/provincial agreements. An exception was the provincial CURB program described below. The federal and many federal/provincial programs show a long-standing national commitment, part of Canada’s commitment to the IJC and international treaties. Tracing these: in 1986 the federal/provincial program Soil and Water Environment Enhancement Program (SWEEP) was launched. The programs of the Great Lakes Water Quality Program (GLWQ) of 1990 and today’s programs under the Great Lakes Sustainability Fund (GLSF) are two further programs in a series of federal and federal/provincial programs to decrease pollution of the Great Lakes.

Many of the incentive programs of the first federal and federal/provincial programs were intended to reduce point source and non-point source pollution to the Great Lakes through construction of pollution control structures or land use changes. Soil

erosion and surface and groundwater quality concerns have, therefore, been prominent. Financial incentives to adopt specific BMPs were available. Some programs provided performance incentives calculated on a yearly or per acre basis.

5.7.2 Evaluation of Programs

Very little has been found in the independent literature describing Ontario's general experience in agri-environmental programs in the past two decades. The federal website used for the review of programs contains some evaluations of these programs. As well, an internal OMAF program evaluation of Land Stewardship II is available. This section reviews the sources found.

LSP

Land Stewardship was locally-tailored and delivered by both OMAF and the Ontario Soil and Crop Improvement Association (OSCIA). OSCIA was given the authority to approve applications. Here, verbatim, is Thompson's 1991 description of the application and appeal process:

How the Program Worked:

Farm operators were left to determine their own individual Soil degradation problems (i.e. wind erosion, compaction, etc.). They then selected what they thought was the best possible solution based on their personal management system (i.e. windbreaks, residue, etc.). A three-year Land Inventory and Action Plan (LIAP) had to be completed by the farmer when applying for assistance. The plan was received and reviewed by a committee of county OSCIA members appointed by the county OSCIA executive. The committee consisted of a chairman and usually three members, all farm operators who were trained through and reported to the OSCIA provincial office. The guidelines were developed with flexibility. The

farmer's plan would be accepted or rejected in principal (sic). The applicants were notified in writing of the committee's politics and the grant money allocated if approval was received. If approved and the plan carried out: OSCIA field persons selected by the committee made an inspection to determine if the execution of the plan met the individual county requirements. If funding was approved by the committee and the inspection proved satisfactory, a request was forwarded to OMAF for payment. If funding was denied either initially or on the basis that execution of the plan did not meet the criteria, the operator could appeal. All applicants could appeal the local committee's decision by contacting the Guelph head office of the OSCIA. An independent liaison committee made up of OMAF, OSCIA and independent farm representative would then review the case.

Thompson, 1991, p. 17

Thompson notes that, in order to achieve rapid implementation, developing specific goals and objectives and evaluation of the program in terms of these goals were not part of the original program design. The delivery agency OSCIA was charged with this task only after a year into the program and Thompson reports the following as their list of goals:

- 1) To address a long-term commitment towards the reduction of soil degradation and water management problems by responding to the expressed needs of Ontario farmers for assistance to implement acceptable conservation practices.
- 2) To establish the OSCIA "grassroots" delivery system, allowing counties to determine their unique problems and establish their own program emphasis.
- 3) To establish an extension team to assist in all aspects of conservation technology and information transfer.
- 4) To encourage 5,000 participants in farm conservation programs on acres not previously under conservation by providing financial motivation for on-farm experimentation and adoption of acceptable conservation production practices on a limited basis.
- 5) To offer a variety of options so as not to limit the management

capabilities of the farmer.

6) To induce a long-term commitment on the part of farmers to a conservation ethic.

7) Increase awareness of agricultural soil degradation and erosion problems and alternative viable economic solutions on the part of farming industry and extension personnel.

Thompson, 1991, p. 30

Thompson's mid-term evaluation of LSP contained a number of criticisms. He found that it did not mesh well with an existing municipal drain program, and a reforestation program offered by the Ministry of Natural Resources. He also notes that payments were less than for the previous OSCEPAP program, which decreased participation.

He concluded that the LSP goal of stimulating conservation investment to combat productivity losses and minimize environmental damages was inappropriate, ineffective and an inefficient use of public funds. He notes that specific funding was not targeted to problem areas and also that the best farmers, who already were familiar with conservation practices, tended to make the most use of the program.

Thompson called for a publicly transparent performance evaluation of programs and their participants. He also advised including cost-benefit analysis and/or cost-effective analysis in the policy design stage in order to justify continued public spending on similar programs.

Thompson does note that the OSCIA grassroots delivery system was considered an overwhelming success by participants. As well, he concluded that those who did

participate could be expected to set a positive example for others to follow (Thompson, 1991, pp. 117-119).

Land Stewardship Program II (LSP II)

An OMAF team provided an *ex post* (see Glossary) evaluation of Ontario's share of the LSP II program in 1993 (Taylor and Myslik, 1993). An important component of this program was the conservation farm planning exercise which eventually led to the Environmental Farm Plan process in Ontario.

Clean Up Rural Beaches (CURB) Program

CURB was a program of the Ontario Ministry of Environment and Energy launched in 1991. Its general aim was to improve the water quality of targeted beaches in Ontario by encouraging improved rural land management practices to improve the water quality of selected rivers. It was cancelled in 1995 after a series of budget cuts by the provincial government.

Ryan and Shantz provide a Final Report of the Grand River Conservation Authority's component of CURB (Ryan and Shantz, 1996). The specific GRCA objectives were to:

- Reduce sources of rural water pollution;
- Assist landowners with management choices and remedial options to reduce pollution from identified sources;
- Promote local awareness of rural sources of water pollution and the impacts on watercourses and ground water;

- Administer the grant on a priority basis;
- Monitor water quality to document trends and measure improvement due to remedial measures.

The GRCA provided approximately \$1,105,000 for 221 projects to improve water quality in the Upper Speed, Conestogo and Nith River watersheds. These funds were matched by more than \$2 million from the landowners. All problems within the target sub-basin were eligible for submission to the review committee. From 1991 to 1995, the committee reviewed 307 proposals and recommended (81%) for funding; 221 were completed. Most funded projects were for manure storage. Septic system proposals were denied most often. Only 4 of the 39 applications for milkhouse waste projects were denied funding.

The program and the use of cost-sharing incentive payments were considered a success. One strength of the project that was mentioned was the technical assistance provided to landowners and the individual attention to the applicants. Water quality monitoring revealed that densities of *E. coli* bacteria and concentrations of total phosphorus decreased in areas of implementation. Nevertheless, water quality in most of the target watersheds failed to meet provincial standards. The authors mention the need for regular project follow up. In a personal communication in December, 2001, Ryan stated that monitoring to try to establish a cause and effect relationship between remedial activities and water quality is no longer done (although routine water monitoring continues in Ontario). Incentive grants continue to be made on a “good actor” basis with routine monitoring (see section 8.3 Agri-Environmental Indicators and Monitoring for a discussion).

Loeffler (1999) also reviewed the CURB program for the Ontario Ministry of the Environment and made recommendations on developing strategies for the development, implementation and monitoring of agricultural NPS pollution control programs for Ontario. Her review is summarized next.

CURB was designed on a watershed basis to reduce the impact of upstream pollution sources on rural swimming beaches in Ontario. The program provided guidelines and incentives for BMPs to improve rural water quality. It was funded by the Ontario Ministry of Environment following the study *Provincial Rural Beaches Strategy* of 1985. It was delivered by local conservation authorities who adapted the general aims to local conditions. CURB included grants to rural landowners to maintain private septic systems as part of a Water Quality Improvement Plan. Participation was voluntary and varied across three main projects:

Activities and works eligible for funding under CURB were:

Eligible items	Grant Rate	Grant Ceiling	Completion Rate	Cheques Issued
Private sewage systems	50%	\$2,000	86%	1,824
Livestock access restriction	75%	\$10,000	78%	946
Milkhouse washwater disposal systems	50%	\$5,000	79%	588
Manure management	50%	\$12,000	<u>85%</u>	<u>292</u>
Total			82%	3,650

The average capital cost to the landowner was \$14,549 whereas the average grant was \$5,719, including demonstration projects, which were funded at a higher rate.

Loeffler notes that participants tended to under-report capital costs since they only

submitted sufficient receipts and proofs of payment to obtain the maximum grant for which they were eligible. A quick calculation of her statistics shows that grants for the septic systems program covered 41% of the reported total capital costs; 75% for the livestock access program; 38% for the milkhouse wastewater program and 36% for the manure storage /runoff program. Various innovative demonstration projects were also funded by CURB at a 75% grant rate (maximum \$50,000).

CURB was the first program in Ontario to monitor effects of implementation of best management practices on water quality (Briggs, 1996). Originally scheduled to run from 1991 to 2001 before its cancellation in 1995, projects were to have been in effect for five years in each watershed.

Environmental monitoring during the CURB program was sketchy. Loeffler notes that data from many watersheds were wholly or partially unavailable for review. Nevertheless, CURB was attributed to the re-opening of three public swimming beaches in Ontario.

Canada-Ontario Agriculture Green Plan

The Canada-Ontario Agriculture Green Plan, begun in 1991, appears to have been a pivotal moment in agri-environmental programs in Canada. This program broadened the base of concern from soil and water quality to the relationship between agriculture and wildlife habitats, water quantity issues, inclusion of climate change and the high atmosphere ozone layer depletion, inefficient energy use and lack of economically viable alternatives to fossil fuels, pollution and waste management problems and concerns linked to genetic resources. Similar concerns now form the basis of areas for sustainable

agriculture at the federal level as revealed in the AFFC Report of the Agri-Environmental Indicator Project by McRae *et al.* (2000). This conforms to the international outlook as revealed in the OECD report *Environmental Indicators for Agriculture* (OECD, 2001) and also to American practice.

Ontario's Environmental Farm Plan

A notable example of public programs is Ontario's ongoing Environmental Farm Plan (EFP). While federally initiated and funded under the LSP programs, this remains a voluntary and largely self-directed program. It is a good example of a response to agri-environmental concern deriving from farm organizations themselves.

The Ontario Farm Environmental Coalition (OFEC) now oversees the EFP. Its governance provides an example of the contest between government regulation and the farm interest, with the winning of considerable power and influence by the farm interest. Gruden-Schuck (2000) recently described and interpreted these events and their impacts, noting particularly how the process was captured from OMAFRA's direct control by militancy within Ontario's many farm organizations.

The EFP includes the payment of incentives, currently \$1500, for completion of an on-farm environmental project identified through a self-assessment process. While the management of Ontario's EFP remains largely from within the farm interest, funding remains public. This has been from several sources in the past, but is now mainly from the federal Canadian Adaptation and Rural Development Fund's (CARD) contribution to Ontario's Agricultural Adaptation Council (AAC). The OFA and OFEC are working to establish continuing funding for the EFP, preferably as part of a national program.

The EFP is AAC's largest single environmental project. From its origins in 1993 through June 2000, 17,050 farmers had participated in workshops, of which 16,151 had completed the workbook. As of that date, 10,826 had proceeded through the peer review process. Six thousand projects were documented. As of May, 2001, more than 20,000 farmers had participated in EFP by attending workshops (AAC website www.adaptcouncil.org/aacnew.html). Ontario's EFP has received wide international attention and is the model for an Australian program and another in the Atlantic provinces (Ontario-AAC-CanAdapt source).

While showing great promise as a voluntary mechanism for stewardship, the EFP guarantees confidentiality of those enrolled in the program and therefore public transparency is lacking. Although many farmers have participated in the workshops since 1993, the EFP remains under-subscribed. Even among those who participated in the workshops, many fewer actually completed their plans. As well, because its main aim remains to promote self-awareness and variable actions, rigorous evaluation of its environmental outcome is difficult, if not impossible.

5.8 General Characteristics of Ontario's Past Programs

5.8.1 Emphasis on Best Management Practices

After several decades of research and practice, a great deal of knowledge exists about ways to correct or improve the environmental impact of unsustainable farm management practices. Best management practices (BMPs) have evolved or been systematically developed to improve productivity, protect the farm's resource base and protect the wider environment. It is thought that, eventually, voluntary adoption of BMPs

will help raise the general level of the agri-environment and gradually reduce the negative effects of non-point source pollution. Benchmarking, or the identification of BMPs adopted in other areas, is now a part of Ontario's agri-environmental approach.

The term "best management practice" seems to have originated from the world of business management and administration. In 1992 the Harvard Business School created a consulting unit called Best Practices LLC. It now advises its clients to seek continuous improvement in business management by identifying and benchmarking best practices of successful businesses elsewhere. The concept of BMPs has spread to resource sectors and is used extensively in American agriculture, forestry and other resource and environmental management areas. A group at North Carolina State University describes their use in the agri-environment:

Best management practices are used to control the generation or delivery of pollutants from agricultural activities to water resources and to prevent impacts to the physical and biological integrity of surface and ground water. BMPs can be either structural (for example, waste lagoons, terraces, sediment basins, or fencing) or they can be managerial (for example, rotational grazing, fertilizer or pesticide management, or conservation tillage). Both types of BMPs require good management to be effective in reducing agricultural non-point source pollution.

Osmond, *et al.*, 1995

Governments, agricultural colleges and farm organizations promote the voluntary adoption of BMPs by farmers as "good actors." But BMPs can also form the practical basis of cost-sharing agri-environmental incentive programs. For example, Loeffler proposed integrating BMPs for the following activities into NPS pollution control programs in her 1999 report on the Clean Up Rural Beaches (CURB) program:

- Milkhouse treatment and washwater;
- Manure storage;
- Manure runoff control;
- Restriction of livestock to watercourses;
- Nutrient management plans;
- Septic systems;
- Chemical storage;
- Fuel storage;
- Erosion control structures;
 - grassed waterways
 - terraces
 - water and sediment control basins
 - drop inlets
- Stream bank stabilization;
- Stream buffer establishment;
- Fragile land retirement;
- Conservation tillage;
- Crop residue management;
- Strip cropping;
- Crop rotation;
- Cover crops.

Other BMPs may exist for activities described in section 4: Actual and Potential Agri-Environmental Benefits and some appear in programs described elsewhere in this section. Often then, it is the implementation of BMPs themselves which are subsidized in

agri-environmental programs, but because the adoption of BMPs is a voluntary decision, their implementation is likely quite variable.

5.8.2 Emphasis on Soil Conservation through Conservation Tillage

Ontario's responsibility in the SWEEP program was to launch the Ontario Soil Conservation and Environment Protection Assistance Program (OSCEPAP). Soil erosion and sedimentation into the Great Lakes were also targeted by the program to encourage conservation tillage. The Tillage 2000 program established conservation research trials and provision of soil conservation advisors. This emphasis takes place within a general national policy which encourages low-till or no-till cropping systems.

Conservation tillage technologies reduce the potential for soil erosion and some of the fuel expenditures associated with conventional tilling but they do require the purchase of specialized equipment and chemical inputs. Most no-till or low-till systems are dependant on herbicides. In consequence, there is a now well-advanced emphasis on biotechnology for the breeding and genetic modification of seeds to withstand the herbicides necessary for some conservation tillage practices. These technologies remain controversial not only for the possible health and environmental impacts of GMOs but for the added input costs from these powerful and concentrated upstream industries.

It can be demonstrated that most of the payments of those enrolled in Ontario's EFP have been to help defray the costs of equipment purchases (OSCIA data). Therefore, it must be said that the programs which encouraged conservation tillage also benefited agri-business industries such as equipment manufacturers, agri-chemical industries and, indirectly, the bio-technology industry.

Conservation tillage and nutrient reduction were important components of the Land Stewardship Programs (LSP I and LSP II). LSP was established in 1987 by OMAF (Ontario Ministry of Agriculture and Food) as a three-year program to address the loss of agricultural production from soil degradation. Its aim was to encourage and assist farmers to adopt approved soil and water conservation practices. It provided:

...grants for the adoption of conservation farming practices that will enhance and sustain agricultural production and improve soil resources and water management by reducing soil erosion and soil compaction: restoring soil organic matter and structure and minimizing potential for environmental contamination from agricultural practices.

OMAF, date?, (quoted in Thompson, 1991)

5.8.3 Publicly Funded and Voluntary

The first programs were funded from the general tax base. They were all voluntary. This base of support has evolved considerably and collaboration and partnerships are often encouraged in provincial programs. This means the base of financial support includes the municipal tax base in the case of some local or regional programs. Some private and/or philanthropic organizations sponsor and fund programs, especially those concerning conservation of the natural environment (see section 6: Current Incentive Programs Operating in Ontario – Details). Some of these organizations have partnered with public programs to provide support to municipal or regional agri-environmental programs. Industry sometimes contributes to agri-environmental programs as well (e.g. Parmalat, in the case of the South Nation/Ottawa water quality programs).

5.8.4 Eligibility and Participation in Ontario Programs

Eligibility for participation in agri-environmental programs has largely depended on program goals. Most of the early programs were designed to be universal in both geographic scope and eligibility but some are designed to target a specific watershed, or region, or to address a specific problem in the environment. This is particularly the case with the current Water Quality Programs, which are delivered by Ontario's Conservation Authorities and which are based on their watersheds.

Programs in Ontario have mainly operated as grant systems which disburse a finite amount of funding to eligible farm owners from an allocated budget. Many of these are cost-sharing arrangements and grants typically cover about one-third of the implementation costs. Many on-farm projects have concentrated on the construction of pollution control structures to prevent or mitigate NPS pollution. Incentives to adopt specific management practices are also possible, and purchase of equipment for conservation tillage is a major purchase among those enrolled in the EFP.

Ontario programs are voluntary, not mandatory. Farmers participate in them by choice. Some programs requiring the completion of an EFP have been introduced in some local programs (Waterloo and Wellington municipalities' water quality programs e.g.).

Eligibility for participation in programs has been broad in the past. It has tended to be tied to specific activities or practices themselves, not tied to types of farm or operation. A few programs have been targeted to specific regions or to specific farms. Details on eligibility for present programs are in section 6: Current Incentive Programs Operating in Ontario – Details.

5.8.5 Program Delivery

While public programs originate with government, they are often delivered and/or monitored by non-governmental organizations (NGOs) or para-statal organizations. Some of these are OFEC, OSCIA, the CAs and the AAC. NGOs are quite variable in their mission, mandate or geographic reach. Many of these rely on peer review committees drawn from farmers, which has made this form of delivery very popular.

5.8.6 Regulation vs. Self-Regulation in the Agri-Environment

Instruments to implement public policy relating to the agri-environment form a spectrum from completely voluntary to fully regulatory, with powerful police sanctions against non-compliance. Ontario has relied mainly on financial incentives to promote voluntary adoption of specific activities or BMPs. This is possibly from the precedents set by Ontario's CAs and the long tradition of private land holding and stewardship in Ontario.

Many farmers and their organizations prefer self-regulation of the agri-environment and look for workable solutions from within the agricultural community. Government has tended to support this self-regulation by promoting voluntary measures and placing delivery of programs with local CAs or the farm organizations and coalitions. The formation of the Ontario Farm Environmental Coalition (OFEC), Agricultural Groups Concerned about Resources and the Environment (AGCare) and the history of the Environmental Farm Plan (EFP) are some examples of self-regulation by the farm interest for broader public goals.

As BMPs are systematically identified by science or are developed through practice, they sometimes address problems considered serious enough to be regulated by government through legislation. This is especially so for farm practices which concern public health and safety. Many pesticides are already regulated. The impending Nutrient Management Act (NMA) will set new standards for conformity. Forms of disincentive, such as cross-compliance as used in the US are not used in Ontario.

The voluntary adoption of best management practices (BMPs) is an important feature of self-regulation. Self-regulation is helpful in upholding the private property interest of farmers which would otherwise be constrained under statutory regulation. Still, concern for the agri-environment has become a public as well as a private interest in Ontario and this involves government intervention and regulation. The degree and form this takes depends much on the political agenda of the sitting government.

The proposed NMA is an example where the farm interest itself generally approves of government intervention to regulate a particular set of agri-environmental issues. Gauging compliance to either voluntary or mandatory BMPs is difficult because of farmers' desire for confidentiality regarding their voluntary self-regulation and the difficulties of surveillance and monitoring of regulations.

The two streams of concern, one for self-regulation through grass roots and/or local activity and one through public regulation, do not always work well together. Attempts to mediate difficulties occur through various forms of public consultation and discussion. These, along with mechanisms of conflict resolution and creative governance within and between organizations, are hoped to eventually achieve harmony among all

stakeholders. It is in the interest of the farm community to participate in this process of civil engagement and capacity-building among all social groups and across all levels.

5.8.7 Cross-Compliance with other Support Programs

Cross-compliance is one of several “economic instruments” available to government to encourage environmentally sustainable agricultural practices. It works by making eligibility for price and income supports contingent on enrolment in an environmental program of some kind. Cross compliance is used in both the US and in the European Union (EU) to achieve environmental planning outcomes.

Because of the high levels of American and European spending on agri-environmental supports, such programs are now considered by some observers (e.g. the Australian think tank ABARI, 2001) to contribute to international trade distortion. Australia and New Zealand, two members of the Cairns Group² of trading nations, have practically eliminated all public support to agriculture. Canada is a member of the Cairns Group and also supports an end to all trade-distorting agricultural subsidies among trading nations. But, the level of support has actually risen in recent years, although Canada spends far less per farm, or per farmer than the US, the EU or most other developed trading countries. Unlike the US and EU, Canada’s level of agri-environmental support does not attract criticism for any possible trade distorting effects.

In Canada, agri-environmental programs are de-coupled from other forms of domestic or export support. Cross-compliance between safety net support and environmental programs has not been popular in the past among Canadian farmers and

² The members of the Cairns Group as of writing are: Argentina, Australia, Bolivia, Brazil, Canada, Chile, Columbia, Costa Rica, Fiji, Guatemala, Indonesia, Malaysia, New Zealand, Paraguay, Philippines, South Africa, Thailand and Uruguay.

has not been invoked. Economists tend to favour cross-compliance, however (e.g. Symposium on Economic Instruments and Cross-Compliance, 1996). Debate on cross-compliance continues, especially in Quebec, where it is known as *eco-conditionalité* (borrowing from the European term).

At the present time, the federal government prefers that participation in agri-environmental programs remains voluntary. However, recent federal statements express the goal that every Canadian farm will eventually have an environmental farm plan, perhaps in anticipation of its use in cross-compliance schemes. Eligibility for the local Water Quality Programs is currently tied to completion of a project under Ontario's EFP program.

5.8.8 Monitoring, Public Transparency and Accountability

Being voluntary, agri-environmental programs are often meant to encourage "good actors" to do something beyond the ordinary, not to find fault in a single farm operator. Therefore rigorous scientific scrutiny and monitoring of the outcome at the farm level, or evaluation of the programs themselves on this basis, have been rare in Ontario. The problem of obtaining rigorous proof of cause and effect in the environment is outlined in section 8.3: Agri-Environmental Indicators and Monitoring.

A marked feature of some early programs is the lack of accessible information pertaining to their design, goals and systematic evaluation of their outcomes. This information gap is apparent from the published literature searched to date, and from personal communication with various academics, experts and civil servants. The federal NSCP source used above notes that no information was available on NSCP evaluation

work undertaken in Ontario although survey results for other conservation initiatives in Ontario were available.

Such lack of transparency and public accountability for government activity and spending is considered a serious breach of civil liberties by many. A more recent problem in free accessibility of Ontario's record of environmental monitoring was revealed by researchers for the Canadian Institute for Environmental Law and Policy. They were severely critical of recent cuts to the existing environmental monitoring system and inadequate public reporting of findings (Clark *et al.*, 2000; Molot *et al.*, 2001).

An effective agri-environmental program should have clearly defined goals and an *ex ante* (see Glossary) method to evaluate its outcome in terms of its goals in place well before implementation. An *ex post* (see Glossary) evaluation of the environmental outcome is difficult, even when sufficient base-line information has been obtained and consistent monitoring has been done. The programs under the Canada-Ontario Agriculture Green Plan appear to have been the first to have been developed with a thorough *ex ante* evaluation process. Modern techniques of design, implementation and evaluation of general environmental programs are moving towards a more integrative, flexible and transparent approach.

In the present situation, Ontario is not considered leading edge in the management of its environment by one major independent review (Gibbons, 2001). As well, the recent Report of the Walkerton Inquiry points to government spending cuts to the Ministry of the Environment and their reliance on voluntary compliance with minimum regulatory requirements as contributing to the series of failures which led to the epidemic in 2000

which began with the contamination of municipal well water by animal manure (O'Connor, 2002, p. 30).

Because the agri-environment is everyone's business, there is always the demand for accountability and openness in its governance. Because public spending by government occurs in programs, transparent (open and public) accountability for both spending and its outcome is desirable. This poses an essential contradiction between the need for transparency and the fact that many agri-environmental programs are undertaken voluntarily by individuals and delivered with local flexibility by NGOs. Projects are reviewed by peer review among members of the farm interest, often behind closed doors.

The delivery of public agri-environmental incentive programs by NGOs was examined by Reed (1997) for the Squamish Forest district in British Columbia. She cautions that with more reliance on NGOs to undertake stewardship roles and planning, accountability, fairness and continuity of data and programs may become problematical:

Over time, some groups might come to dominate on the basis of influence gained through access to financial and logistical resources offered by government agencies.

Reed, 1997, p. 193

A number of agri-environmental incentive programs in Ontario are delivered by NGOs such as Ducks Unlimited, the Ontario Farm Environmental Coalition (OFEC), OSCIA or by a para-statal organization such as the CAs. At present, it is not known whether problems such as Reed mentions have been encountered in Ontario.

Apart from financial accounting, setting environmental goals and monitoring change associated with incentive programs require scientific modelling, measurement and analysis. It is a reality that even though both economics and science demand objective,

rational and precise measurement, this rigor is difficult to either justify or obtain on the ground. This is something difficult for both specialists and non-specialists to come to grips with. The section 8.3: Agri-Environmental Indicators and Monitoring discusses these problems more fully.