

Biodiversity Initiatives

Canadian Agricultural Producers



Implementing the Canadian Biodiversity Strategy



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

Canada

Biodiversity Initiatives
Canadian Agricultural Producers

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By Joyce Greenfield and Nicole Richer

Environment Bureau
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Sir John Carling Building
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K1A 0C5

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1 Introduction

The purpose of this report is to inventory the involvement of agricultural producers in Canadian projects that address biodiversity initiatives through a literature review and through interviews of program administrators and staff. Activities affecting ecosystem biodiversity, specific plant and animal species, and genetic resources are profiled, in addition to non-regulatory guidelines intended to assist producers implementing environmentally sustainable agricultural practices.

The assembled inventory shows that Canadian agricultural producers are active participants in maintaining and enhancing biodiversity. Grasslands are being managed to maximize both wildlife habitat and forage production, riparian and woodlot habitats are being enhanced, and the impacts of agricultural activities on water resources are being actively mitigated. Producers are planning for their communities' future by participating in numerous research projects and by implementing environmental farm plans. Endangered wildlife species, such as the Burrowing Owl and the Swift Fox, are being re-introduced on private agricultural lands. Producer motivation varies depending upon the program and the individual; however, an interest in conservation and environmental stewardship is reflected in the number and diversity of activities documented in this report.

The inventory provided here is not comprehensive, in that other projects exist in Canada that positively influence biodiversity on agricultural lands. Furthermore, many agricultural producers have undertaken activities with biodiversity benefits outside of and without any established program or project. These private initiatives are not included in this document, although these efforts should not be underestimated.

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2 Ecosystem-based Projects

2.1 Range and Hay Lands

Many agricultural producers in Canada manage their range and hay lands using tools and practices that maintain or enhance biodiversity. By deferring use of native and non-native grasslands until late summer or fall, proponents of delayed grazing and haying practices provide numerous wildlife species with valuable cover, free from mechanical or livestock disturbances, until a time when offspring are less vulnerable. Native grasslands are further enhanced through the use of planned grazing systems such as rotational grazing. Rotational grazing is a management tool whereby the producer balances livestock use of the range resource by varying the intensity, frequency and rate of grazing with periods of rest. Maintaining the long-term health of rangelands favors plant biodiversity and can enhance the suitability of habitats for many wildlife species. Altered cropping practices include the planting and harvesting of crops so that migrating waterfowl are not attracted to swaths, thereby reducing agriculture/wildlife conflicts. Underseeding clover on lands seeded to cereal crops increases the amount of plant-available nitrogen in the soil in addition to providing ground cover and forage for wildlife.

2.1.1 Alberta Prairie CARE Projects

Under Alberta Prairie CARE, landowners have modified agricultural practices to benefit both wildlife and agricultural production objectives—practices such as rotational grazing, delayed haying, delayed grazing, or altered cropping. The Alberta Prairie CARE Program began in 1991 and is part of the province's commitment to the North America Waterfowl Management Plan (NAWMP). It is expected to continue throughout the 15-year period of the NAWMP agreement.

A total of 1.1 million hectares in the province's prairie grasslands, central aspen parkland and Peace parkland have been targeted for conservation work under the program. As of March 31, 1994, just under 100,000 hectares of uplands and wetlands were being co-managed for wildlife habitat and agricultural production with over 1,000 landowners participating in the program.

Some examples of projects that Alberta landowners or managers have undertaken to improve grazing management and pasture systems with the assistance of Alberta Prairie CARE are:

- a) *Minburn Grazing Reserve: Deferred Grazing Systems.* The Minburn Grazing Reserve Management Team has been working with Alberta Prairie CARE, Alberta Agriculture, Food and Rural Development, and Alberta Public Lands staff to improve the area for both cattle and wildlife production. The uplands that surround 67 hectares of wetlands have been put into a deferred grazing system. In addition, a total of 680 wetlands have been secured through the construction of dugouts and through the implementation of a grazing management pasture system.
- b) *Big Hay - Bittern Lakes: Delayed Hay Cutting.* Over 60 landowners in the Big Hay Bittern Lakes area south-east of Edmonton are using Prairie CARE programs to improve wildlife habitat while at the same time maximizing their agricultural production objectives. Some landowners have agreed to delay hay cutting in exchange for financial incentives.

- c) *Siksika Nation: Delayed Grazing.* Over 4,000 hectares of native grassland is being improved for both livestock grazing and wildlife habitat on Siksika First Nation lands. The Siksika Nation is implementing delayed grazing on an additional 930 hectares of uplands, and managing a 120-hectare wetland complex cooperatively with Prairie CARE.
- d) *Medicine Wheel: Implementing Delayed Grazing Rotation.* The Medicine Wheel is a 19,000 hectare parcel of native grasslands and water resources in southern Alberta. The Lomond Grazing Association, private leaseholders, Alberta Public Lands, and Alberta Prairie Care staff have implemented a planned grazing system to improve wildlife habitat and livestock grazing. A delayed grazing rotation is used on grasslands adjacent to wetlands to protect nesting habitat. Rotational grazing is used on the remainder of the area. Alternative watering systems have been installed to improve herd health and water quality. As a result of these combined practices, grassland and wetland conditions have been improved for both wildlife and cattle.
- e) *Sage Creek Grazing Reserve: Implementing Grazing Systems.* The Sage Creek Provincial Grazing Reserve in south-east Alberta has combined its wildlife habitat enhancement and cattle production objectives into a land management plan. Both Alberta Prairie CARE and Alberta Public Lands assisted in developing and implementing the plan. A planned grazing system is used to improve grassland conditions on upland habitats. A stockwater dam has been rehabilitated to enhance wetlands, and an abandoned farmstead with numerous trees and shrubs was fenced to exclude cattle.
- f) *Circle E Grazing Association: Rotational Grazing System.* Grasslands are being managed for both wildlife and livestock by the Circle - E Grazing Association near Brooks, Alberta. Work is underway under the Alberta Prairie CARE program to enhance 823 hectare of wetlands and almost 20,000 hectares of uplands by implementing a rotational grazing system.
- g) *Developing Farm-Specific Land Management Systems.* Unwilling to drain the 60 hectares of wetlands of his family's property, a Hythe (Alberta) farmer has devised a management system that benefits both wildlife and agricultural productivity. By planting a late-maturing malting barley, the farmer is able to harvest in a single pass, eliminating a swath that may attract migrating waterfowl onto his cropland. Lands immediately adjacent to the wetlands have been leased to Alberta Prairie CARE and planted with grasses to provide nesting cover. In addition to receiving lease payments, the agricultural producer grazes his cattle on a portion of the wetland meadows after nesting season has passed.
- h) *Information Sharing.* Alberta Prairie CARE hosts field days and tours for farmers, ranchers, and agricultural producer groups to learn more about the implementation of environmentally sustainable agricultural practices and wildlife habitat management.

Participants

Two agencies share primary responsibility for Alberta Prairie CARE: Alberta Environmental Protection (Fish and Wildlife Services); and Ducks Unlimited Canada. Over 72 government and non-government organizations help to deliver Prairie CARE projects in Alberta, including environmental groups, livestock/grazing associations, universities and irrigation districts.

Program/Contacts**Alberta Prairie CARE**

Ernie Awaschuk
Alberta NAWMP Center (403) 422-1040

Les Wetter
Ducks Unlimited Canada (403) 489-2002

2.1.2 Saskatchewan Prairie CARE Projects

Under the Saskatchewan Prairie CARE Program, agricultural producers are modifying their land management systems to include planned grazing systems, underseed clover, delayed haying, conversion of cropland to forage with delayed cut, and interpothole habitat restoration. Producers receive financial compensation for lands leased or sold under the program. Financial and technical assistance is available to farmers implementing modified agricultural practices on their private lands.

The following areas have been targeted for Saskatchewan Prairie CARE initiatives: Moose Mountain Uplands; Pheasant Hills; Quill Lakes/Touchwood/Beaver Hills; Allan/Tiger/Minichinas Hills; Thickwood Hills; Cut Knife Uplands; and Missouri Coteau.

As of March 31, 1994, planned grazing systems have been implemented on a total of 45,945 hectares through Saskatchewan. During the period of January 1, 1993, to March 31, 1994, 4,315 hectares were converted from cultivated land to permanent nesting cover. Other management techniques contributing to environmentally sustainable agriculture and wildlife habitat were practiced on an additional 1,117 hectares. These figures reflect lands that are subject to some form of agreement between landowners and Ducks Unlimited Canada. They do not reflect the total area of lands managed under environmentally sustainable practices by agricultural producers.

During the period of January 1, 1993, to March 31, 1994, 8,037 hectares of upland habitat were secured for exclusive wildlife use. In addition, a total of 15,165 hectares of wetlands have been secured in Saskatchewan since the inception of Prairie CARE. The above “secured” figures reflect lands that have been purchased, leased, or subject to some form of agreement between the landowner and Ducks Unlimited Canada. Figures relating to only those lands managed by agricultural producers under lease or other agreements are not available.

Participants

Ducks Unlimited Canada, Saskatchewan Wetland Conservation, Corporation North American Waterfowl Management Plan

Program/Contacts**Saskatchewan Prairie CARE**

Lee Motes
Ducks Unlimited Canada (306) 569-0424-111

2.1.3 Grazing and Pasture Technology Transfer: Saskatchewan

Ranchers and farmers throughout Saskatchewan are improving their range and forage management practices by participating in the *Grazing and Pasture Technology Program* initiated in 1991 by the *Saskatchewan Stock Growers Association*. Producers are provided with information on multiple rangeland use, environmental sustainability, and permanent cover programs through direct technical assistance, on-farm demonstrations, training programs, and research. Benefits realized through implementing such practices include increased forage production and improved wildlife habitat. The Grazing and Technology Program also promotes range management practices through its newsletter entitled "*The Grazing Gazette*".

Participants

Saskatchewan Stock Growers Association, Saskatchewan Agriculture and Food Extension Services, *Saskatchewan Wetlands Conservation Corporation*, Prairie Farm Rehabilitation Administration (PFRA), *Saskatchewan Forage Council*, North American Waterfowl Management Plan, Canada - Saskatchewan Agricultural Green Plan Agreement.

Program/Contact

Grazing and Pasture Technology Program

Tom Dill

Saskatchewan Stock Growers Association (306) 757-9499

2.1.4 Remnant Prairie Conservation Program: Saskatchewan

Native grassland prairie provides a wealth of plant genetic resources, microflora, fauna, and wildlife habitat. Representative samples of native prairie in the Moist Mixed Grassland and Aspen Parkland regions of Saskatchewan receive protection under the *Saskatchewan Wetland Conservation Corporation's* Remnant Prairie Conservation Program. Agricultural producers contribute to this program by either selling, leasing, or maximizing voluntary stewardship on the native grasslands in their holdings.

The program was first initiated in 1995. As a result, landowner contact to secure participation in the program has only recently begun. During the three-year phase of the Remnant Prairie Conservation Program, agricultural producers with qualifying lands in 144 rural municipalities within south-central Saskatchewan will be approached.

Participants

Saskatchewan Wetland Conservation Corporation, PFRA, National Fish and Wildlife Foundation.

Program/Contact

Saskatchewan Wetland Conservation Corporation

Stephen Davis (306) 787-0711

2.1.5 Manitoba Prairie CARE Projects

Under the Manitoba Prairie CARE Program, agricultural producers may select one or a combination of the following land management options to improve their upland habitats and sustainable agriculture practices: planned grazing systems; hay and pasture (forage) establishment for horses; forage establishment with delayed cut; and forage rotation with delayed cut. As with other Prairie CARE programs, landowners directly benefit from their participation through financial and/or technical assistance.

As of February 1995, managed grazing systems have been installed and implemented on 8,620 hectares.

Permanent cover was established on 1,902 hectares; delayed hay cut practiced on 1,093 hectares; forage rotations implemented on 324 hectares; and forages intended for horses seeded on 364 hectares. In addition, a total of 6,597 hectares of wetlands have been secured through either lease, sales, or other agreements between landowners and Ducks Unlimited Canada.

Participants

Ducks Unlimited Canada delivers projects for Manitoba Prairie CARE. As well, approximately 30 Conservation Areas, agricultural societies, soil and water associations, and other groups participate in the delivery of Manitoba Prairie CARE projects.

Program/Contacts

Manitoba Prairie CARE

Bill Poole

Ducks Unlimited Canada (204) 467-3000

2.1.6 Ontario Land CARE

Ontario Land CARE, initiated in 1993, is similar to Prairie CARE in that it offers agricultural producers a number of options to improve biodiversity. These include grazing management strategies, the implementation of permanent cover and buffer zones, forage management in the forms of seeding and delayed haying, flushing bars, and water management options.

Approximately 80 agricultural producers are using Land CARE programs to implement one or a combination of land management practices for the benefit of wildlife habitat and agricultural productivity. Over 1,200 hectares of land have either been seeded to permanent cover or put under a delayed hay or managed grazing system. Producers involved in this program receive financial and technical assistance dependent upon the option they have chosen to best suit their operations. Benefits to agricultural producers have included increased pasture productivity allowing for increases in herd size, access to expensive tillage equipment, reduced production costs, and improved wildlife habitat quality.

Through the Land CARE program, Ducks Unlimited has also assisted Ontario farmers in the formation of Conservation Tillage Clubs. Conservation Tillage Clubs are groups of five or more agricultural producers who collectively make use of conservation tillage equipment to improve their soil management practices. Almost 50 producers have joined Conservation Tillage Clubs, farming approximately 5,000 hectares under conservation tillage systems.

Participants

Ducks Unlimited Canada, Agriculture and Agri-Food Canada, Ontario Ministry of Agriculture, Food and Rural Affairs, Ontario Soil and Crop Improvement Association, Ontario Cattlemen's Association, North American Waterfowl Management Plan.

Program/Contacts**Ontario Land CARE, Ducks Unlimited Canada**

Nick Kinkel (705) 721-4444

Gary Dupuis (613) 389-0418

Doug Brook (705) 264-4218

2.2 Croplands

2.2.1 Permanent Cover: Prairies and British Columbia

Agriculture producers across the Prairies and in British Columbia have been converting cultivated land on fragile soils to permanent cover since 1988 through the Permanent Cover I and II Programs offered by the Prairie Farm Rehabilitation Administration (PFRA). The purpose of the programs is to reduce soil erosion and improve wildlife habitat. The planting of grasses and other forages provide ground cover and habitat for migratory birds, songbirds, waterfowl and upland game birds. Perennial forages also have a beneficial affect on soil organic matter levels and soil structure.

To date, 522,005 hectares have been conserved and removed from cultivation. Participating producers are compensated for losses in crop production in the form of lease payments, and are provided with partial financial assistance for initial seeding. A condition of the lease is the maintenance of the pertinent lands under permanent cover for periods of 10 to 21 years.

Participants

Producers in Alberta, Saskatchewan, Manitoba, British Columbia (Peace Region) and PFRA. Organizations also involved in the delivery of the Permanent Cover I and II programs include hail and crop insurance corporations, property assessment agencies and conservation agencies.

Program/Contacts**Permanent Cover I and II**

Gloria Wrubleski, PFRA (306) 780-7260

Don Sweet, PFRA (306) 780-5171

2.2.2 Agricultural Shelterbelts: Prairies

The benefits of agricultural shelterbelts on the Canadian prairies include soil conservation, the protection of crops and farmyards, and the enhancement of wildlife habitat. Since its start in 1901, the Shelter Belt Center in Indian Head, Saskatchewan has been helping agriculture producers plant and maintain field, farmstead, and wildlife shelterbelts. Approximately 500 million seedlings have been distributed to landowners and other groups in Alberta, Saskatchewan, Manitoba, and the Peace River region of British Columbia.

There has been an increasing interest on behalf of agricultural producers to include tree and shrub species that benefit wildlife in farmstead and shelterbelt plantings. This interest is attributable to a greater awareness and concern for environmental management on the landowner's private holdings. Producers are also diversifying their uses of shelterbelt and farmstead plantings to accommodate alternatives to rural development. Such examples include interests in harvestable berries, maple sugar, and wood for cabinet making and wood turning.

Participants

PFRA became responsible for the Shelterbelt Center in 1963, but federal and provincial government agencies, local non-government agencies, and others help to distribute seedlings. Agricultural producers are their major clients, receiving almost 100 percent of the seedlings produced.

Program/Contact

Agricultural Shelterbelt Program

John Sharpe

PFRA Shelterbelt Center (306) 695-2284

2.2.3 Multipurpose development of windbreak borders and hedges: Quebec

About 60 farmers in the St-Hyacinthe region are co-operating in research work to evaluate the importance of windbreak borders and hedges in controlling wind erosion. Windbreak borders play an important role for several native animal and plant species and ensure the maintenance of biodiversity in farming areas. Windbreak borders could also play a potential role in the biological control of insect pests and could be a tool in a management strategy for reducing the use of pesticides in certain crops.

The results of this research will guide farmers in soil conservation, in crop protection, and in improving wildlife habitats through managing and maintaining borders in farmland areas.

Partners

Canadian Wildlife Service; Department of Agriculture, Fisheries and Food of Quebec; and the plant science service, National Wildlife Research Centre, Environment Canada.

Contacts

Canadian Wildlife Service

Luc Bélanger (418) 649-6130

2.2.4 Introduction of new technologies: Quebec

Under the assistance program for the introduction of new technologies, farmers participate in demonstration projects that illustrate the use of various scientifically recognized techniques that are useful in developing and conserving biological resources in the context of sustainable agriculture.

Some examples of projects for which farmers can obtain financial assistance are the testing of forage crop plants that are resistant to erosion and trampling, the adaptation of direct seeding, the on-farm demonstration of composting systems, the selection of cover crops, and the adaptation of cultivators to incorporate solid manure in post-emergence applications. The adoption of new technologies must be part of an environmentally sound integrated management plan for the farm.

The new technologies must conform to the commitments of the Government of Quebec in its phytosanitary strategy, the objective of which is a 50 percent reduction in the use of pesticides by the year 2000. The program for the introduction of new technologies is an integral part of the umbrella program of the Department of Agriculture, Fisheries and Food of Quebec.

Partners

Department of Agriculture, Fisheries and Food of Quebec.

Contacts

Department of Agriculture, Fisheries and Food of Quebec, assistant directors of the regional offices.

2.2.5 Works and structures: Quebec

The farmers in 11 agricultural regions in Quebec are introducing works and structures on their farms in order to improve the quality of the water-soil resources. These works and structures promote the conservation of wildlife habitats and biodiversity. Ditching, seeding slopes, establishing watering areas, preparing windbreaks, reforesting eroded sites, and installing runoff collection ponds are just a few examples of more environmentally sound practices adopted by the farmers.

The farm producers receive financial assistance covering part of the costs related to the soil and water conservation and management work. The adoption of new practices must form part of an integrated farm management plan reflecting the concept of sustainable agriculture. The works and structures program is part of the umbrella program of the Department of Agriculture, Fisheries and Food of Quebec.

Partners

Department of Agriculture, Fisheries and Food of Quebec.

Contacts

Department of Agriculture, Fisheries and Food of Quebec, assistant directors of the regional offices.

2.2.6 Conservation practices: Quebec

Quebec's farm producers are bringing to their farms agricultural conservation practices concerned with improving the quality of water-soil resources. These practices favour the restoration and conservation of wildlife habitats and favour biodiversity.

Financial and technical assistance is provided to farms for the introduction of conservation practices in the following categories: management of crop residue, improvement of borders, introduction of green-manure crops, introduction of alternative crops, and reduction of pesticide use. The program of adoption of conservation practices is part of the umbrella program of the Department of Agriculture, Fisheries and Food of Quebec.

Partners

Department of Agriculture, Fisheries and Food of Quebec.

Contacts

Department of Agriculture, Fisheries and Food of Quebec, assistant directors of the regional offices.

2.2.7 Assistance program for technological innovation: Quebec

Under the Canada-Quebec Subsidiary Agreement on Sustainable Agriculture, about 150 farmers are co-operating in implementing projects to introduce or perfect new technologies or practices that favour the development of sustainable agriculture. The areas of activity in this program are water quality and nonpoint source pollution, resource conservation and integrated fertilization, plant protection, and wildlife-agriculture integration.

The farmers are taking part in various experimental projects (such as the reduction of agricultural pollution by treating runoff water from a bull yard, the testing of forage crop plants that are resistant to erosion, the testing and adaptation of cultivators and spreaders, the biological control of insect pests, and the use of farming practices that are conducive to the feeding and springtime nesting of wildfowl) that allow a diagnosis of the effectiveness and sustainability of each technique or practice tested. The knowledge acquired can be used by other agricultural producers. The projects funded must conform to Quebec's phytosanitary strategy, the objective of which is a 50 percent reduction in the use of pesticides by the year 2000.

Partners

Agriculture and Agri-Food Canada; Department of Agriculture, Fisheries and Food of Quebec; and various organizations (governmental and non-governmental), associations and environmental consultants.

Contacts

Department of Agriculture, Fisheries and Food of Quebec

Bruno Gosselin (418) 644-6503

Mireille Therrien (418) 644-6177

2.2.8 Wildlife Buffer Zones: Prince Edward Island

Wildlife buffer zones in the form of greenbelts provide important wildlife habitat and help to reduce soil erosion from adjacent fields. In Prince Edward Island, agricultural producers are working co-operatively with the province's Department of Environmental Resources to establish deciduous seedlings alongside riparian habitats. This activity is occurring under the stewardship of the Greenbelt Program. Since the program's inception in 1991, over 120 landowners in the Hillsborough River, Trigon River, Wilmot River, Orwell Cove, and Malpeque Bay areas have helped to establish approximately 50 km of wildlife buffer zones. Participating landowners are provided with the seedlings and planting labor. In return, they sign 15-year agreements pledging to protect the greenbelts.

Participants

Prince Edward Island Department of Environmental Resources, various employment foundations, North American Waterfowl Management Plan (NAWMP).

Program/Contact

Greenbelt Program

Tom Duffy

Prince Edward Island Department of Environmental Resources (902) 368-667

2.3 Land Set-Asides

2.3.1 Partners in Conservation: Alberta

Agricultural producers in the County of Barrhead, Alberta are idling privately owned upland nesting areas and natural woodlots in the interests of wildlife habitat conservation. In recognition of the landowners' commitment, the County of Barrhead provides tax rebates for the pertinent lands, and gate or site signs are installed by Alberta Fish and Wildlife. Enhancement projects such as restrictive fencing for livestock are done on the lands as necessary, with labour and fencing paid for by Alberta Fish and Wildlife. Additional benefits to the landowner, as a result of their involvement, are the maintenance of wildlife habitat, soil conservation, and improved or maintained water quality. Approximately 1,983 hectares of habitat have been secured under this program since its inception in 1989.

Participants

County of Barrhead, Agricultural Service Board, Alberta Environmental Protection, Fish and Wildlife Services, The Soil Conservation Association of Neerlandia, Ducks Unlimited Canada, The Northwest Peat Soils Association, The Barrhead Agricultural Society, Alberta Agriculture, Food and Rural Development

Program/Contact

Partners in Conservation

Marilyn Flock

County of Barrhead (403) 674-3331

Janice Young

Alberta Environmental Protection (403) 427-3574

2.3.2 Wildlife Tomorrow: Saskatchewan

Saskatchewan landowners have voluntarily agreed to set aside almost 161,880 hectares of their private lands for wildlife habitat. Under the Saskatchewan Wildlife Federation's Wildlife Tomorrow program, landowners execute agreements with the Federation that promise to maintain existing wildlife habitats. The producer retains title of the land, and receives recognition for his or her participation in the program in the form of gate or site signs. Since the program's inception in 1974, approximately 1,400 landowners have signed agreements.

Participants

Saskatchewan Environment and Resource Management (SERM) Saskatchewan Wildlife Federation

Contact Person

Wildlife Tomorrow

Clint Sanborn

Saskatchewan Wildlife Federation (306) 692-8812

2.3.3 Habitat Trust: Co-operators Program: Manitoba

In south-central Manitoba, agricultural producers and other landowners have pledged to retain 8,094 hectares of wildlife habitat through the MWF's Habitat Foundation's Co-operators Program. Participating farmers receive recognition for their commitment to wildlife habitat conservation through signs placed around the property and at the farmer's residence. Participants also receive bi-monthly landowner guides explaining wildlife habitat enhancement techniques. This program was first offered in 1982.

Participants

MWF Habitat Foundation, Manitoba Wildlife Federation, Manitoba Natural Resources, Forestry Branch:
Agro-Woodlot, Program private donations

Program/Contact

Habitat Trust: Co-Operator's Program

Jeff Stepaniuk

MWF Habitat Foundation (204) 633-5967

2.3.4 Restoration of Wetland and Interpothole Wildlife Habitats: Manitoba

Agricultural producers in the Minnedosa, Manitoba area are leasing small parcels of wetland and associated upland habitats to the *Delta Waterfowl Foundation*. The purpose of these lease agreements is to make it easier to enhance and conserve the lands for wildlife habitat. If necessary, the Foundation will enhance the wildlife production capability of the land by installing nesting structures or by working with the farmer to seed upland nesting cover. In addition to compensation via lease payments, producers may sign agreements entitling them to harvest the initial cover crop from the seeded lands, and a hay crop after a three-year establishment period.

To date, over 324 hectares of wetland and 1,214 hectares of upland wildlife habitat have been protected and enhanced by approximately 70 area farmers. The program was initiated in 1991 and is ongoing.

Participants

Delta Waterfowl Foundation, North American Waterfowl Management Plan (NAWMP), agricultural producers

Program/Contact

Adopt-A-Pothole

Jim Fisher

Delta Waterfowl Foundation (204) 239-1900

2.3.5 Co-Management of Wetland and Salt-Water Estuary Habitats: Newfoundland

The wetlands and salt-water estuaries of the Grand Codroy Estuary in Newfoundland provide internationally significant waterfowl and migratory bird habitat. Much of the area is privately owned by agricultural producers, whose interest and commitment to conservation stewardship is illustrated by their voluntary participation in "Good Stewardship Agreements". Under these agreements farmers pledge to manage their individual operations in such a way as to maintain or enhance the ecological integrity of the area. For example, farmers agree to refrain from burning crop stubble in waterfowl nesting habitat.

Participants

Newfoundland and Labrador Department of Natural Resources, Canadian Wildlife Service, Department of Fisheries and Oceans, Ducks Unlimited Canada, Wildlife Habitat Canada, North American Waterfowl Management Plan.

Program/Contact**Wetlands Habitat Conservation Project**

Mike Cahill

Newfoundland and Labrador, Department of Natural Resources (709) 729-2548

2.4 Wetlands

2.4.1 Interior Wetlands Program: British Columbia

Under the Interior Wetlands Program, producers are implementing planned grazing systems, installing alternative livestock watering systems, fencing riparian zones to restrict livestock access, and abandoning or relocating hay fields in Interior British Columbia. The program was initiated in 1992 and is ongoing.

There are currently 11 demonstration projects underway under the Interior Wetlands Program. Each of the projects include site research and monitoring to assist in evaluating environmentally sustainable agricultural management practices. Benefits attributed to these and other improvements, include increased wildlife use and productivity, better hay quality and more reliable production, and increased recreational and wildlife viewing opportunities.

Participants

Ducks Unlimited Canada, Environment Canada: Fraser River, Action Plan, Province of British, Columbia.

Program/Contact**Interior Wetlands Program**

Bruno Delesalle

Ducks Unlimited Canada (250) 374-8307

2.4.2 Enhancing Wetland and Upland Wildlife: British Columbia to Ontario

Prairie CARE and Land CARE programs offer agricultural producers in targeted areas of British Columbia (Peace River region), Alberta, Saskatchewan, Manitoba, and Ontario opportunities to enhance wildlife habitat on agricultural lands through land lease, sale, and/or other agreements. Areas eligible for CARE projects are those that provide, or have the potential to provide, valuable wetland and/or upland wildlife habitats. An example of wildlife habitat enhancement undertaken is the conversion of cultivated lands to forages. The forages provide the producers with occasional or late-season hay crops, in addition to improved upland nesting habitat for waterfowl and other species.

Participants

A variety of government and non-government agencies, producer groups, and conservation groups assist with the delivery of Prairie CARE and Land CARE projects. Detail regarding project participants are provided in Sections 2.1.1 through 2.1.4.

Program/Contacts**Alberta Prairie CARE**

Ernie Awaschuk

Alberta NAWMP Center (403)422-1040

Les Wetter

Ducks Unlimited Canada (403) 489-2002

Saskatchewan Prairie CARE

Lee Motes

Ducks Unlimited Canada (306) 569-0424

Manitoba Prairie CARE

Bill Poole

Ducks Unlimited Canada (204) 467-3000

Ontario Land CARE

Nick Kinkel

Ducks Unlimited Canada (705) 721-4444

Gary Dupuis

Ducks Unlimited Canada (613) 389-0418

Doug Brook

Ducks Unlimited Canada (705) 264-4218

2.4.3 Wetland Habitats for Endangered Wildlife Species: Saskatchewan

The Quill Lakes area in Saskatchewan is internationally recognized for its biodiversity. Designated in 1994 as a Western Hemisphere Shorebird Reserve Network (WHSRN) site, this complex of fresh and saline lakes, marshes, potholes, and native prairie provides exceptional wildlife habitat. Nearly one million migratory birds use the area, including several endangered or threatened species such as the Whooping Crane, Burrowing Owls, Baird's Sparrow, and the Piping Plover.

Four grazing co-operatives are participating in an initiative to conserve and enhance wildlife habitat for wetland-dependent species around Big Quill Lake. Shorelines have been fenced and alternative watering systems have been installed in order to restrict cattle access to sensitive shoreline areas. Assistance for these activities is provided through the Prairie Shores Program. Offered by the Saskatchewan Wetland Conservation Corporation, Prairie Shores was initiated 1991.

Participants

Saskatchewan Wetland Conservation Corporation, SaskPower, North American Waterfowl Management Plan.

Program/Contact**Prairie Shores Program**

Stephen Davis

Saskatchewan Wetland Conservation Corporation (306) 787-0711

2.4.4 Intensive pasture management and integrated wildlife-agriculture management: Quebec

The intensive development of the land along the banks of the St. Lawrence River has caused a significant reduction in the area of wetlands, floodplains, and other high ground available to wildlife. There are more than 200 islands totalling 5,000 hectares of wildlife habitat. However, the plant cover potential of many of these islands is limited because of certain farming practices, including community pasture land.

Approximately ten farmers are taking part in research work on different techniques for manipulating plant cover (intensive management of pasture or development of dense cover) to promote wildfowl nesting. The work funded by Ducks Unlimited Canada has been carried out on various islands in the St. Lawrence River between Montreal and Trois-Rivières.

This work will add to our knowledge about techniques for manipulating plant cover in farmland areas and for demonstrating their ecological and economic value for farmers. The Varennes archipelago is used as a demonstration area for local farm producers.

Partners

Canadian Wildlife Service; Ducks Unlimited Canada; and the University of Quebec at Montreal.

Contacts

Canadian Wildlife Service

Luc Bélanger (418) 649-6130

Ducks Unlimited Canada

Bernard Filion or Jean-Pierre Laniel (418) 623-1650

2.4.5 Management of water levels in agricultural floodplains: Quebec

The purpose of this project is to compare the use by migrating ducks in the spring of habitats in agricultural floodplains under different management systems (diked wetlands permanently under water, migratory stopping areas with controlled water levels, and fish habitats with natural water fluctuations). Farmers in the Trois-Rivières region are co-operating in this study, which will identify various conservation and management options in farmland areas and evaluate the wildlife value of improvements.

Nearly 4,000 hectares of agricultural floodplain have been developed and/or are being monitored under this project.

Partners

Canadian Wildlife Service; and the University of Quebec at Trois-Rivières.

Contacts

Canadian Wildlife Service

Luc Bélanger (418) 649-6130

2.4.6 Wetland Habitat Construction

Agricultural producers are using constructed wetlands on their property as a means to treat barnyard runoff and milkhouse wastewater. An additional benefit of the wetlands is the creation or enhancement of wildlife habitat. Two examples of projects incorporating constructed wetlands into agricultural by-product management are profiled below.

2.4.6.1 Constructing Wetlands: Ontario

A constructed wetland is being used to treat barnyard runoff on a dairy farm in Fullarton Township, Ontario. Originally implemented in 1992, this was the first wetland constructed in Ontario that is specifically designed to manage agricultural wastes. The results have shown that the wetland has been extremely effective. For example, levels of faecal bacteria have been reduced by more than 99 percent. The use of the wetland is cost-effective for the producer and provides an improved area for wildlife production. In addition, the wetland is used as a demonstration site, with local, national, and international visitors attending tours of the project.

A spin-off of this constructed wetland project is a province-wide study to determine the practicality and effectiveness of constructed wetlands in other regions of Ontario. Twelve additional constructed wetlands involving 10 Conservation Authorities and participating agriculturists are to be installed and monitored.

Participants

Ontario Ministry of the Environment and Energy, Agriculture and Agri-Food Canada, Canada Trust, Centralia College.

Program/Contact

Constructed Wetlands

Craig Merkley

Upper Thames River Conservation Authority (519) 451-2800

2.4.6.2 Creation of wetlands in a farmland area: Quebec

Under the St. Lawrence Vision 2000 Action Plan (environment restoration component), a farmer in the Sainte-Marie-de-Beauce region is participating in a demonstration project illustrating the use of an artificial wetland to treat dairy wastewater and liquid manure. In addition to purifying the water, the artificial wetland allows the creation and/or improvement of wildlife habitats, primarily for wildfowl.

The development work, funded by the St. Lawrence Vision 2000 Action Plan, began in November 1995. The creation of this wetland has allowed the development of new conservation technologies and provided a favourable habitat for duck reproduction.

While this purifying wetland technology has been around for a few years in other regions of Canada, mainly in Ontario, the creation of wetlands in farmland for the combined purposes of treating liquid manure and/or dairy wastewater and of promoting wildlife is a first for Quebec. The project will be evaluated over a three-year period. If the results are satisfactory, the development of artificial wetlands could be adapted to other agricultural environments.

Partners

Fermes Turmel Inc.; Canadian Wildlife Service; St. Lawrence Vision 2000; Ducks Unlimited Canada; Department of Transport of Quebec; and Argus Group Inc.

Contacts**Canadian Wildlife Service**

Denis Lehoux (418) 648-2544

Argus Group Inc.

Mylène D'Aoust (418) 654-9638.

2.4.6.3 Constructing Wetlands: Prince Edward Island

Two Prince Edward Island dairy producers are participating in a demonstration project to illustrate the use of constructed wetlands in treating manure and milkhouse wastewater. The intent of the project is to show that constructed wetlands can be used to remove solids, nutrients, detergents and bacteria from these agricultural by-products in a cost effective manner. The cleaner water being discharged into rivers and streams will result in improved wildlife habitat along the Hillsborough River and may directly impact the counts of faecal coliform bacteria that determine the edibility of shellfish. The impact will be evaluated through an ongoing monitoring project after construction of the wetlands in 1995. The construction of the wetlands on the two dairy farms will be financed by the participating agencies. The farmers' contribution to the project will be to construct containment sites for the solid manure.

Participants

Prince Edward Island Department of Agriculture, Fisheries and Forestry, Prince Edward Island Department of Environmental Resources, Atlantic Canada Landscape Improvement Contractors Association, Ducks Unlimited Canada.

Program/Contact**Constructed Wetlands**

Ron DeHaan

Prince Edward Island Department of Agriculture, Fisheries and Forestry (902) 368-5661

2.5 Riparian Areas

2.5.1 Riparian Habitat Management Program: Alberta

Five agricultural producers in south-west Alberta are adapting their livestock grazing systems to reflect the complementary objectives of increased forage production and improved riparian wildlife habitat. The revised grazing management plans are designed on a site-specific basis to most accurately address variable ecological factors such as soil condition, vegetation type, fisheries habitat, and wildlife habitat use. By varying the duration, intensity, and season of livestock use of riparian areas, the proponents hope to illustrate practical management options that positively influence riparian ecosystems and forage values for livestock.

This project began in 1993 and monitoring of the sites is ongoing. Results indicate that the implemented grazing systems have had positive effects on water quality, forage production, and fishing and recreational opportunities.

Participants

Alberta Cattle Commission, Trout Unlimited Canada, Canadian Cattlemen's Association, Alberta Agriculture, Food and Rural Development, Alberta Environmental Protection, Fish and Wildlife Services.

Program/Contacts

Riparian Habitat Management Program

Peggy Strankman

Canadian Cattlemen's Association

(403) 275-8558

Barry Adams

Alberta Agriculture, Food and Rural Development

(403) 381-5486

2.5.2 Restoration of Native Grasses in Riparian Zones: Saskatchewan

Farmers in rural Saskatchewan are actively working to restore wetland habitats by seeding native grasses along riparian areas. To assist, the *Saskatchewan Wetland Conservation Corporation* (SWCC) will be providing interested landowners with five-pound sample bags of native seed. In 1995, 1,700 bags of seed were distributed to active farmers. This initiative is the continuation of an earlier pilot project in which SWCC provided producers with over 6,000 one pound bags of seed to encourage wetland/upland enhancement. The benefits of seeding riparian areas are the restoration of previously drained sloughs, improved productivity of saline areas, and the enhancement of existing sloughs. Additional benefits are increases and improvements in water quantity and quality for farm and domestic use, increases in hay and forage production, erosion control, and improved wildlife habitat. The duration of the Wetland Restoration Program is one year.

Participants

Saskatchewan Wetland Conservation Corporation, Canada-Saskatchewan Agriculture Green Plan Agreement, TransCanada Pipelines, NewField Seeds Company Ltd.

Program/Contact

Wetland Restoration Seed Program

Sharon Rodenbush

Saskatchewan Wetland Conservation Corporation (306) 787-0726

2.5.3 Development of Management Plans for Riparian Habitat: Manitoba

With the assistance of *Manitoba Habitat Heritage Corporation's* Greenbanks Program, agricultural producers in Manitoba are developing management/restoration plans for riparian areas on their lands. Activities to improve the wildlife habitat and rangeland productivity include fencing shorelines and installing alternative livestock sources, implementing planned grazing systems, and managing and restoring shoreline woodlots. Producers are provided with technical and some financial assistance to carry out these activities. The benefits of the program are anticipated to include improved wildlife habitat, water quality, and herd health, and the opportunity to incorporate sustainable grazing and woodlot management into farm plans. This program was initiated in 1995.

Participants

Manitoba Habitat Heritage Corporation, North American Waterfowl Management Plan.

Program/Contact**Greenbanks Program**

Herb Goulden

Brandon NAWMP Office (204) 729-3501

2.5.4 Project to restore the banks of the Bourbon River using plant techniques: Quebec

This project consists of reducing the transport of fine matter into watercourses. The fine matter can plug the watercourse gravel and, therefore, cause the deterioration of trout spawning areas. Approximately 15 or so farmers in the Bois-Francs region, whose properties border the Bourbon River, are taking part in developing bank protection techniques that maintain the integrity of wildlife habitats and improve their potential in terms of reproduction and shelter.

The farmers are co-operating in an experimental project that will provide an analysis of the effectiveness of each technique being tested in realizing the fishing potential of the Bourbon River. In addition, some farmers are providing technical assistance (loan of equipment) for improving the river banks.

Partners

Pro Faune; Association Chasse et Pêche de Plessisville Inc.; Town of Plessisville; Union des producteurs agricoles; and Fondation de la faune du Québec.

Contacts**Pro Faune**

Bruno Dumont (418) 688-3898

Fondation de la faune du Québec

Ghislaine St-André (418) 644-7926

Association Chasse et Pêche de Plessisville Inc. (819) 362-2167

2.5.5 Regeneration of river banks: a collective effort by the riparian owners along the Sainte-Anne River: Quebec

Some 60 farmers along the Noire River, a sub-watershed of the Sainte-Anne River, are taking part in the efforts to restore the banks of this watercourse. The objective of their conservation measures is to reduce rural organic pollution. A riparian buffer strip was developed by planting 30,000 shrubs in 1996-1997. This riparian strip will serve as a buffer zone and will favour the creation of riparian and aquatic wildlife habitats. In addition, the farmers have undertaken to restrict access by livestock to the watercourse by installing fences and buying water pumps.

The purchase of shrubs is funded by the federal government. However, participating farmers are providing technical assistance in installing the fences and financial assistance for purchasing the water pumps.

Partners

Environment Canada; Wildlife Habitat Canada; Department of Agriculture, Fisheries and Food of Quebec; Department of Environment and Wildlife of Quebec; Department of Natural Resources of Quebec; Corporation d'aménagement et de protection de la Sainte-Anne; Union des producteurs agricoles; riparian municipalities of the Sainte-Anne River; Caisses populaires of Portneuf County and Sainte-Anne de la Pérade; Tree Foundation; Quebec Region Wood Producers' Marketing Board; Fondation de la faune du Québec; Association des pêcheurs sportifs de saumon de l'Atlantique; and Hydro-Québec.

Contacts**Corporation d'aménagement et de protection de la Sainte-Anne**

Johanne Dagenais or Luce Trottier (418) 339-2688

Fondation de la faune du Québec

Ghislaine St-André (418) 644-7926

2.5.6 Improved trout-fishing section of the Nicolet River in the Bois-Francs region: Quebec

The development of riparian buffer strips is of the utmost importance in maintaining water quality and conserving agricultural soils. Buffer strips help to control water erosion, the flow of pesticides and the fall of sedimentary articles. They help to improve the quality of aquatic and riparian habitats.

About 50 agroforestry producers in the Bois-Francs region have become involved in restoring the banks of the Nicolet River. The farmers have reforested the banks on their land bordering the river, helping to preserve the habitat of the speckled trout.

Twenty kilometres of river bank were improved between 1993 and 1996.

Partners

Corporation de gestion des rivières des Bois-Francs; Human Resources Development Canada; Regional Office of Regional Development Canada; Department of Environment and Wildlife of Quebec; Ministère du Conseil exécutif (regional development secretariat); Fondation de la faune du Québec; Regional County Municipality of Arthabaska (Fonds Hydro-Québec); Fondation Héritage Faune et Moucheurs du Montréal Métropolitain.

Contacts**Corporation de gestion des rivières des Bois-Francs**

Léo Ouellet or Jocelyn Houde (819) 357-3388

Fondation de la faune du Québec

Ghislaine St-André (418) 644-7926

2.5.7 Improvement and integrated wildlife-agriculture management of Ronde Island, in the Berthier-Sorel Islands archipelago: Quebec

Ronde Island is used as pasture for about 60 cows and calves. More than 75 percent of the island's area consists of herbaceous grassland, while its eastern point is mixed forest dominated by silver maple and willow. The plant cover of Ronde Island has been degraded by excessive browsing and by the free access by the livestock to the surrounding banks and wetlands. The capacity of the grassland has clearly been exceeded.

The farmer using Ronde Island as pasture has agreed to modify his farming practices in three ways: (1) by eliminating livestock access to the sensitive areas (woods, ponds and stream banks) by installing fences; (2) by planting shrubs to reduce erosion; and (3) by creating two watering sites. The effect of these measures is to improve the plant cover of the sensitive areas, increase use by wildlife, reduce erosion of banks, and make farmers aware of the importance of conserving biological resources in farmland.

Partners

Canadian Wildlife Service; Environment Canada; Transport Canada; Association des chasseurs et pêcheurs de Sainte-Anne-de-Sorel; Ducks Unlimited Canada; and the farmer using Ronde Island.

Contacts

Canadian Wildlife Service

Serge Labonté (418) 648-7138

2.5.8 River Friendly Farming Annapolis River: Nova Scotia

Nova Scotia farmers along the Annapolis River and its tributaries are working to address issues of water quality and soil erosion. With the assistance of the Clean Annapolis River Project, area farmers are planting trees and shrubs along stream banks to stabilize soil and rejuvenate riparian vegetation. Livestock access to streams and brooks is being controlled through the installation of fences, alternative water sources for livestock, and special watercourse crossings. Agriculturists are also assisting in a water quality monitoring project by volunteering to collect water samples.

Participants

Department of Fisheries and Oceans, Nova Scotia Department of Fisheries, Environment Canada, Wildlife Habitat Canada.

Program/Contact

River Friendly Farming

Stephen Hawbolt

Clean Annapolis River Project, (902) 532-7533

2.5.9 Water quality

Agricultural producers are employing innovative solutions to address water contamination from agricultural sources. Examples of projects involving manure management, livestock access to watercourses, milkhouse wastewater management and others are listed below.

2.5.9.1 Research Project Examining the Affects of Restricting Livestock Access on Riparian Systems: British Columbia

Research is being conducted on several Interior British Columbia ranches to determine how riparian ecosystems respond to restricted livestock access. Seven to nine ranchers in the Kamloops, B.C. area have volunteered to modify their historical grazing plans by using fencing to restrict their livestock from streams and lakes. Baseline data recording wildlife populations and habitat characteristics on the selected sites began in 1992 and will be compared to the data recorded subsequent to fencing. The fences have been installed with the assistance of the participating agencies, although one rancher volunteered to put the fences in himself.

Participants

British Columbia Ministry of Environment, Lands and Parks, Fish and Wildlife Division, Habitat Conservation Fund, Fraser Basin Green Plan, British Columbia Ministry of Agriculture, Food and Fisheries, British Columbia Ministry of Forests, Agriculture and Agri-Food Canada.

Program/Contact

Riparian Study

Dave Lowe

British Columbia Ministry of Environment, Lands & Parks (604) 371-6248

2.5.9.2 Feasibility Study of Alternative Irrigation Water Sources: British Columbia

Several ranchers near Kamloops, British Columbia have traditionally drawn irrigation water for forage crops from small, local lakes. This practice is thought to have contributed to fish die-offs in the lakes, as a result of lowered oxygen levels and increased water temperatures, which can occur in situations of lake irrigation drawdown. In an attempt to rectify this problem, ranchers are co-operating with provincial government staff to implement alternative irrigation water sources. Wells and pumps are being installed in return for ranchers' agreements to restrict direct use of the lakes for irrigation purposes. This project ended in spring 1997. A project entitled "Nicola Valley Education and Enhancement" (which is similar to projects in other parts of the province) assists ranchers in the Nicola Valley of British Columbia to convert from ditch irrigation to obtaining water from the larger Nicola Lake.

Participants

British Columbia Ministry of Environment, Lands & Parks, British Columbia Ministry of Agriculture, Food and Fisheries, British Columbia Forest Service.

Program/Contact

Ian McGregor

Habitat Conservation Fund.

British Columbia Ministry of Environment, Lands & Parks (250) 371-6200

Dean Watts

British Columbia Ministry of Environment, Lands & Parks (250) 371-6200

2.5.9.3 Vegetative Filter Strips: Ontario

Five cattle producers in Ontario are attempting to diversify their manure management options by using vegetative filter strips as a means to treat barnyard runoff. Initiated in 1994, it is hoped that these strips will prove to be a cost-effective means to improve water quality in and around farms.

This experimental project is producer-driven, with approximately 25 farmers applying to participate in the project. The five farms selected as study sites are in the Renfrew, Russell, Victoria, Dufferin, and Oxford counties of Ontario.

Participants

Ontario Cattlemen's Association Ontario Ministry Of Agriculture, Food and Rural Affairs.

Program/Contacts**Vegetative Filter Strips**

Peter Doris

Ontario Cattlemen's Association

(519) 824-0334

Mike Toombs

Ontario Ministry of Agriculture, Food and Rural Affairs,

(905) 895-4519

2.5.9.4 Research Project Investigating Non-fencing Options for Controlling Livestock: Ontario

Cattlemen in Ontario are participating in a research project to investigate non-fencing options for controlling livestock access to watercourses. The intent of the project is to determine cost-effective methods other than fencing that result in improved herd health, water, and wildlife habitat quality. Alternatives to fencing will be identified and refined for those situations where fencing is either unnecessary or unworkable. Examples of non-fencing alternatives to be studied include: providing alternate watering sources, salt, or shade away from the stream; reinforcing access points with gravel or other materials to reduce sediment loading when cattle are drinking; discouraging access at sensitive places by distributing coarse rock or concrete slabs adjacent to the stream. Cattle behaviour, water quality, and water quantity, will be monitored. This project was initiated in 1995.

Participants

Ontario Cattlemen's Association, University of Guelph, Ontario Ministry of Agriculture, Food and Rural Affairs, Agriculture and Agri-Food Canada.

Program/Contact**Cattle and Watercourse Management**

Dr. E. Ann Clark

Department of Crop Science, University of Guelph
(519) 824-4120

Peter Doris

Ontario Cattlemen's Association
(519) 824-0334**2.5.9.5 Clean Up Rural Beaches (CURB) Program: Ontario**

The Ontario CURB program assists agricultural producers in mitigating systems or situations on their property that may have a negative impact on water quality. Examples of on-farm projects completed under the program include the management of milkhouse wastewater and barnyard runoff, the improvement of rural household septic systems, and the fencing of livestock away from streams. Since CURB was initiated in 1991, 3,551 applications for projects have been received. These include 588 projects restricting livestock access to watercourses, 1,698 septic system improvement projects, 286 milkhouse wastewater management projects, and 979 manure management projects. Applications for additional on-farm water quality improvements will continue to be accepted until the year 2001.

Participants

Ontario Ministry of Environment and Energy, Local Conservation Authorities.

Program/Contact**CURB**

Peter Marr

Ontario Ministry of Environment and Energy (416) 323-5202

2.5.9.6 Upper Thames River Conservation Authority CURB Projects: Ontario

Under the Clean Up Rural Beaches (CURB) program in Ontario, landowners within the Fanshawe, Wildwood, and Pittcock watersheds can apply for funding to fix existing systems or situations that are affecting water quality. Of the 86 projects approved by the Upper Thames River Conservation Authority, 8 projects were funded to assist producers to restrict their livestock to streams.

Participants

Upper Thames River Conservation Authority, Ontario Ministry of Environment and Energy.

Program/Contact**CURB**

Peter Marr

Ontario Ministry of Environment and Energy (416) 327-7105

2.5.9.7 Joint Agricultural Soil and Water Conservation Program CURB Projects: Ontario

Agricultural producers in the Grand River watershed of Ontario are implementing management systems and structures to improve surface and groundwater quality. Sixty on-farm projects are underway and include activities such as restrictive fencing along streams, upgrades to septic systems, and improvements to milkhouse wastewater and manure handling systems. Individual farmers can apply to receive technical and financial assistance for up to four of the water quality options available under the program. This component of the Clean Up Rural Beaches (CURB) program was first offered in 1991 and ended in 1997.

Participants

Grand River Conservation Authority, Ontario Ministry of Environment and Energy.

Program/Contact

CURB

Tracey Ryan or Paul Fish
Grand River Conservation Authority
(519) 621-2761

Peter Marr
Ontario Ministry of Environment and Energy
(416) 327-7105

2.5.9.8 Assistance program for the improvement of manure management: Ontario

The assistance program for the improvement of manure management provides financial and technical assistance to farmers for the adoption and management of structures and systems that reduce the negative impact of certain farming practices on the quality of surface and ground water. Examples of projects financed by the program are the construction and/or improvement of manure storage structures, the management of surpluses, the purchase of spreading equipment, and the elimination of livestock access to watercourses.

The project includes a component for the on-farm promotion and demonstration of sustainable practices related to manure management. The program began in 1988 and will end in 1999.

Partners

Department of Agriculture, Fisheries and Food of Quebec.

Contacts

Department of Agriculture, Fisheries and Food of Quebec

Raymonde Fortin (418) 644-6508, or
Denis Nault (419) 644-6182, and the regional offices of the Department

2.5.9.9 Conservation and management of farm ponds: Quebec

Farm producers in the Quebec City region (Île d'Orléans and Boyer River) are taking part in this project, the objective of which is to improve our knowledge of the importance and value of farm ponds for wildlife. This knowledge will enable us to consider standards for integrated management to more effectively promote conservation of the quality of water-soil-fauna resources and more diversified use of farmland.

As a result of this project, conservation recommendations will be prepared and management options will be developed, for eventual use in an awareness and management program for farm producers.

This project began in 1995 and will continue until 1997.

Partners

Canadian Wildlife Service; and Department of Environment and Wildlife of Quebec.

Contacts**Canadian Wildlife Service**

Luc Bélanger (418) 649-6130

Department of Environment and Wildlife of Quebec

Charles Maisonneuve (418) 644-8115

2.5.9.10 Livestock Fencing and Watering Prince Edward Island

Agricultural producers in Prince Edward Island are using fencing to restrict livestock access to streams, ponds, and watercourses. A number of alternative watering technologies have also been tested by producers to assess the suitability of these technologies under a range of environmental and management situations. Farmers share the costs of the fencing with the various contributing agencies, and receive technical advice regarding fencing and alternative watering technologies.

As of March 31, 1995, a total of 80 private landowner projects were completed, with 13,875 meters of fencing directly protecting 135.1 hectares of wetlands and further influencing a total of 272.6 hectares. The project is ongoing.

Producers, not directly involved in the Livestock Fencing and Watering Project, have benefited from demonstration tours of the participating farms. As a result, several agriculturists have installed fences and alternative watering sources of their own initiative. The benefits of restricted access to watercourses in P.E.I. have been found to include improved water quality and herd health, in addition to the improved aesthetics of the landscape.

Participants

Prince Edward Soil and Crop Improvement Association, Agriculture and Agri-Food Canada, Environment Canada, Prince Edward Island Department of Agriculture, Fisheries and Forestry, Prince Edward Island Department of Environmental Resources, Wildlife Habitat Canada, Ducks Unlimited.

Program/Contact**Livestock Fencing And Watering Project**

Colin MacAulay, Chairman of the Board

Prince Edward Soil and Crop Improvement Association (902) 687-3663

2.6 Watersheds

2.6.1 Program for water management by watershed: Quebec

Farmers in two agricultural watersheds are contributing to the development of expertise in the area of measures for integrated water management. Through their commitment, they are helping to develop new areas of knowledge and planning tools for improving the quality of water and the environment. This program is part of the Canada-Quebec Subsidiary Agreement on Sustainable Agriculture.

Financial assistance is provided to pay the salary of an environmental consultant, as well as the costs of various measures enabling farmers to put the concept of sustainable agriculture into practice. By controlling soil erosion and nonpoint source pollution, farmers contribute to the conservation of biodiversity. The two watershed projects are:

- (a) *Bélair River watershed project (Turmel Creek sub-watershed)*: The farmers of the Turmel Creek sub-watershed, at Sainte-Marie-de-Beauce, have joined forces to improve the surface water quality in the sub-watershed and to develop a plan for restoring the wildlife on Turmel Creek. The farmers have undertaken to increase their environmental knowledge in the area of livestock effluent management, soil management, fertilizer use, development of riparian buffer strips, and protection of watercourses.
- (b) *Water management in the watershed of upper Saint-Esprit Creek*: About 30 farmers in Montcalm County have joined in an attempt to improve the environmental quality of their watershed by reducing erosion and by rationalizing their use of pesticides and fertilizers. The farmers are helping to assess the overall impact of changes in their farming practices on environmental quality.

Partners

Agriculture and Agri-Food Canada; Department of Agriculture, Fisheries and Food; St. Lawrence Vision 2000; (a) Corporation du ruisseau Turmel Inc.; Fondation de la faune du Québec; Laval University; and Consultants BPR; (b) McGill University; Argus Group Inc.; and Société d'agriculture du comté de Montcalm.

Contacts

Department of Agriculture, Fisheries and Food of Quebec

Bruno Gosselin (418) 644-6503

St. Lawrence Vision 2000

Henri Durocher (418) 644-3585 Esther Côté (418) 648-4820

(a) Fondation de la faune du Québec

Benoît Mercille (418) 644-7926

(b) Argus Group Inc.

Mylène D'Aoust (418) 654-9638

2.6.2 Program for water-soil resource management by watershed: Quebec

The eight farm producers in the Riendeau-Julien Creek watershed (sub-watershed of the Châteauguay River) will contribute to increase our knowledge in the area of integrated management of biological resource by watershed. The farmers are searching for solutions that will improve water quality. To accomplish this, crop and integrated fertilization plans will be prepared for each farm to reduce erosion and nonpoint source pollution.

Technical assistance is being provided to the farmers to enable them to take corrective measures and to put the concept of sustainable agriculture into practice. The adoption of new farming practices will begin in the summer of 1996.

By means of demonstration sites, the farmers will promote sustainable farming practices. The emphasis will be on soil conservation and water quality improvement.

Through their commitment, the farmers are helping to develop new areas of knowledge and planning tools for improving environmental quality and biodiversity conservation. They are also co-operating in the validation of a document prepared by the Department of Agriculture, Fisheries and Food of Quebec that will establish an agro-environmental diagnosis of their farms.

Partners

Union des producteurs agricoles; Société de conservation et d'aménagement du bassin versant de la Rivière Châteauguay; and Department of Agriculture, Fisheries and Food of Quebec.

Contacts

Union des producteurs agricoles

Steve Côté (514) 454-5115

Department of Agriculture, Fisheries and Food of Quebec

Robert Beaulieu (514) 427-2000

2.6.3 Collective agricultural action on the Boyer River: Quebec

Under the St. Lawrence Vision 2000 Action Plan, more than 200 farmers in the Quebec City region are co-operating in a project of agricultural rehabilitation and resource conservation. Participating farmers will establish an agro-environmental diagnosis of their farms. This diagnosis will be used as a customized management tool and will allow the development of action plans and support mechanisms to promote sustainable agriculture and conservation of the biodiversity of biological resources in the Boyer River watershed.

Limiting access by livestock to watercourses, installing watering areas, developing windbreaks, stabilizing river banks with buffer strips, and integrating fertilization are all initiatives to help control water erosion, promote water quality, and restore the spawning area of the rainbow smelt at the mouth of the Boyer River.

The farmers are taking an active part in a global approach to the conservation of agricultural ecosystems. This approach favours the assessment of environmental and wildlife benefits of various measures taken and tasks performed on the banks of watercourses to improve water quality. This global approach also provides support for action that can be adapted to other agricultural watersheds.

Partners

St. Lawrence Vision 2000; Environment Canada; Department of Agriculture, Fisheries and Food of Quebec; Department of Environment and Wildlife of Quebec; Union des producteurs agricoles; Canadian Wildlife Service; Club Richelieu; Association Belle Chasse et Pêche; riparian municipalities of the Boyer River; and Comité de priorités environnementales de Bellechasse.

Contacts**Department of Environment and Wildlife of Quebec**

Guy Trecia or Jean-Michel Gouin (418) 622-5151

Environment Canada

Daniel Robitaille (418) 648-3537

Union des producteurs agricoles

Pierre-Antoine Landry (418) 872-0770

2.7 Woodlands

2.7.1 Agro-Woodlot Habitat Management: Manitoba

Producers in south-western Manitoba are developing woodlot management plans as a means of achieving a broad range of wildlife/agriculture/forestry goals. With technical assistance and incentives provided through Manitoba Habitat Heritage Corporation's Agro-Woodlot Program, farmers are planting trees to provide wildlife habitat and economic diversification, and other benefits. Individual producer woodlot management objectives may incorporate one or a combination of improved wildlife habitat and/or aesthetics, improved soil and water conservation, and the production of harvestable goods such as lumber or maple sugar. This project was initiated in 1992 and is ongoing.

Participants

Manitoba Habitat Heritage Corporation, Woodlot Association of Manitoba, Manitoba Christmas Tree Growers Association, Canada-Manitoba Partnership Agreement in Forestry.

Program/Contact**Manitoba Agro-Woodlot Program**

Shane Thornholm

Manitoba Habitat Heritage Corporation (204) 522-8733

2.7.2 Riparian and Agro-Woodlot Habitat Enhancement: Ontario

Ontario agricultural producers are enhancing wildlife habitats through the Wetlands/Woodlands/Wildlife project. Examples of activities farmers have undertaken include the restriction of cattle access to waterways, the development of contiguous woodlands, and improvements to riparian and wild turkey habitats. The Wetlands/Woodlands/Wildlife was initiated in 1994 and ended in March 1997. A report will be available in 1998.

All of the projects carried out under the Wetlands/Woodlands/Wildlife program are producer-driven. To date, through related projects, approximately 100 agricultural producers have improved fish and wildlife habitat, herd health, water quality, soil conservation, and reduced crop depredations by waterfowl.

Participants

Agriculture and Agri-Food Canada, Canadian Wildlife Service, Ontario Agriculture Green Plan, Ontario Ministry of Natural Resources, Conservation Authorities, Producer Groups, Ontario Cattlemen's Association, others.

Program/Contacts

Wetlands/Woodlands/Wildlife

Laurie Maynard

Canadian Wildlife Service (519) 826-2093

Gary McCullough

Canadian Wildlife Service (519) 472-5750

2.7.3 Assistance program for the development of private woodlots: Quebec

Since the 1970s, farmers who own private woodlots of at least four hectares in size have ensured the sustainability of agroforestry areas by applying minimum standards of protection for woodlot resources and environmental functions, particularly with regard to the following components: planting, fill planting in areas of natural regeneration, enhancement of stands, maintenance of plantations, and other development work. The management of private woodlots improves the balance of the various components in the ecosystem affected (water, river banks, shorelines and floodplains, soil, wildlife habitats, landscapes, and sites of particular cultural or historical interest). Farmers participating in the program receive financial assistance for the development of agroforestry resources.

Partners

Department of Natural Resources of Quebec; local municipalities (UMQ) and regional county municipalities (UMRCQ); owners of private woodlots in Quebec (FPBQ and RESAM); the Quebec forest industry (QFIA and QLMA); and Canadian Federation of Woodlot Owners.

Contacts

Department of Natural Resources of Quebec

Gisèle Bélanger (418) 646-9102, and the regional offices of the Department

2.7.4 Model lot: Quebec

As part of the "inhabited forest" project to provide a sustainable development model, farm producers participate in the Groupement forestier de l'Est-du-Lac-Témiscouata Inc., which has established a site for demonstrating forestry practices that enhance various environmental resources (terrestrial fauna, aquatic fauna, and wood).

The model lot has an area of 88 hectares. The broad diversity of stands it contains is representative of Quebec's private woodlots. Enhancement of the stands, natural regeneration, sowing of herbaceous plants, improvement of wildlife shelter, and cleanup of small streams are some examples of activities in the model lot.

Partners

Forêt modèle du Bas Saint-Laurent Inc.; Groupement forestier de l'Est-du-Lac-Témiscouata Inc.; Fondation de la faune du Québec; Wildlife Habitat Canada; Department of Natural Resources of Quebec; and Forestry Canada.

Contacts

Groupement forestier de l'Est-du-Lac-Témiscouata Inc.

Robert Giguère (418) 899-6673

Fondation de la faune du Québec

Marcel Quirion (418) 644-7926

Forêt modèle du Bas Saint-Laurent Inc.

Robert Savoie (418) 722-7211

3 Species-based Projects

3.1 Re-introducing Burrowing Owls: British Columbia

In British Columbia, local ranchers are volunteering to have Burrowing Owls released onto their lands in an attempt to rejuvenate wild populations. Under the Burrowing Owl Recovery Program, captive-bred owls from the Kamloops Wildlife Park and Stanley Park are transported to locations of high-habitat quality and released near pre-installed artificial nesting boxes. Several of these release sites occur on grasslands owned and operated by five Interior B.C. ranches local to the Kamloops area. The ranchers further contribute to the program by providing valuable owl census information to local Fish and Wildlife biologists.

This program is positively influencing local owl populations. Captive-bred owls have successfully raised clutches in the wild, while others have paired with non-banded owls upon return from migration. Benefits to local ranchers include increased public profile and some insect and rodent control. There is no official recognition of landowner contributions in the form of signage or newsletters, nor do the ranchers receive any financial compensation. B.C. Fish and Wildlife staff have been releasing Burrowing Owls into the Kamloops area since 1979.

Participants

British Columbia Ministry of Environment, Kamloops Wildlife Park, Stanley Park Zoological Society, British Columbia Hydro, Shell, Petro Canada, National Trust.

Program/Contact

Burrowing Owl Recovery Program

Dave Lowe

British Columbia Ministry of Environment (604) 371-6248

3.2 Comox Valley Waterfowl Management Project: British Columbia

Fifteen percent of the world's population of Trumpeter Swans winter in the Comox Valley of British Columbia. In the past, agricultural producers have sustained considerable damage to their hay and forage crops from the feeding swans. Swans further impact agricultural fields by impairing drainage and causing soil cratering, which can lead to equipment damage and personal injury to the operator. Swans remaining in the area have also damaged corn crops.

Producers in the area have joined efforts with federal and provincial governments, local naturalists clubs, and others to find pro-active solutions to this situation. With the assistance of the Comox Waterfowl management Project, 40 area farmers have planted lure cover crops and/or applied hazing techniques in an attempt to manage the swan's feeding patterns, thereby minimizing the impacts on agricultural production. This program was initiated in 1991 and is ongoing.

Participants

Comox Valley Waterfowl Management Project, Canadian Wildlife Service, British Columbia Ministry of Agriculture, Fisheries and Food, Comox Valley Naturalists, Ducks Unlimited Canada.

Program/Contact

Graeme Fowler

Comox Waterfowl Management Project (250) 339-0673

3.3 Greenfields Project: British Columbia

The uplands and estuary of British Columbia's Fraser River Delta provide key wintering habitat for migratory birds of the Pacific Flyway. Delta farmers are planting winter cover crops in an attempt to disperse waterfowl grazing and reduce the impact of such waterfowl grazing on farm fields. Delta Farmland and Wildlife Trust shares the cost of putting in the cover crop. In addition to reducing waterfowl depredation, producers benefit from reduced wind and water erosion and better weed control. During 1994/95 a total of 976.8 hectares of wintercover was planted by 29 area farmers. The average area planted per farmer was 33.7 hectares.

Participants

Environment Canada: Fraser River Action Plan, Delta Farmland & Wildlife Trust, Canadian Wildlife Service, Ducks Unlimited Canada.

Program/Contact**Greenfields Project**

Susan Smith

Delta Farmland & Wildlife Trust (250) 946-7820

3.4 Burrowing Owls and Loggerhead Shrikes: Alberta

Agricultural producers in Alberta are assisting in the conservation of Burrowing Owls through the Operation Grassland Community program. Landowners maintain Burrowing Owl habitat, restrict the use of agricultural chemicals around nesting sites, and contribute to an annual census. Approximately 250 producers are voluntarily conserving 21,000 hectares of Burrowing Owl habitat.

The Loggerhead Shrike is another species targeted for assistance under Operation Grassland Community. Landowners with appropriate nesting habitat for these birds are being contacted to determine their interest in voluntary habitat maintenance and conservation. This initiative began in 1994.

Operation Grassland Community targets the Dry Mixed Grass, Fescue Prairie, and Aspen Parkland ecoregions of Alberta. Producers who participate in projects receive gate signs acknowledging their commitment to wildlife habitat conservation.

Participants

Alberta Fish and Game Association, Alberta Sports, Recreation Parks and Wildlife Foundation, Environmental Partners Fund, Wildlife Habitat Canada, Endangered Species Recovery Fund.

Program/Contact**Operation Grassland Community**

Dave Scobie (403) 362-4122

3.5 Re-establishing the Swift Fox on Prairie Grasslands

The Swift Fox is a prairie grassland species that was officially declared extirpated from Canada 1978. Ranchers in southern Alberta and Saskatchewan are contributing to the re-introduction of the Swift Foxes by permitting the release of the Foxes onto their rangelands. Producers further contribute to the success of the program by providing informal sighting information. Approximately 700 foxes have been released since 1983. At this time there are at least 40 pairs of foxes known to have re-established themselves as a result of the release program. The agricultural producers receive no financial compensation or formal recognition for their participation.

Participants

Canadian Wildlife Service, Alberta Environmental Protection, Natural Resources Service, Parks Canada, Saskatchewan Environment Resource Management.

Program/Contact**Swift Fox Re-introduction Program**

Steve Brechtel

Alberta Environmental Protection (403) 422-9533

3.6 Installing Nesting Structures for Mallard Ducks: Saskatchewan

Agricultural producers in Saskatchewan are helping to improve Mallard Duck nesting success by allowing artificial nesting structures to be placed on their lands. The tunnel style structures are installed by the Saskatchewan Wildlife Federation volunteers. Maintenance of the structures may be carried out by the landowner or by Saskatchewan Wildlife Federation volunteers, depending upon individual agreements. As part of the agreements, landowners ensure the nesting sites are protected from disturbances. There have been approximately 1,500 tunnel nesting structures installed under this program since its inception in 1989. The Nest Structure Program is offered anywhere in rural Saskatchewan where there are nesting Mallards.

Participants

Saskatchewan Wildlife Federation

Program/Contact**Nest Structure Program**

Clint Sanborn

Saskatchewan Wildlife Federation (306) 692-8812

3.7 Enhancement of Ferruginous Hawk Nesting Sites: Saskatchewan

Declines in Ferruginous Hawk populations across the Canadian prairies have been attributed, in part, to a lack of isolated grassland trees, which provide elevated nesting sites for the birds. Producers in south-central Saskatchewan are helping to address this problem through their participation in the Ferruginous Hawk Nesting Platform Project. The objective of the project is to create and protect artificial nesting platforms for Ferruginous hawks. Agricultural producers within areas targeted by SaskPower for aboveground powerline conversion to belowground powerlines have the option to retain the outdated powerpoles on their lands. Nesting structures for the raptors are then installed on the poles. More than 50 landowners have entered into agreements with SaskPower and Nature Saskatchewan, consenting to have powerpoles left standing and nesting structures installed on their private property. In the future, producers are expected to further contribute to Ferruginous Hawk conservation by contributing census information on the birds. The Ferruginous Hawk Nesting Platform Project started in 1992/93 and is ongoing. According to reports, agricultural producers participating in the program appreciate the natural control that the hawks assert over Richardsons Ground Squirrel populations.

Participants

Nature Saskatchewan, SaskPower

Program/Contact

Ferruginous Hawk Nesting Platform Project

Deanne Newkirk
SaskPower (306) 566-2885

Heather Dundas
Nature Saskatchewan (306) 780-9273

3.8 Burrowing Owls: Saskatchewan

The Burrowing Owl is an endangered prairie grassland species. Agricultural producers in southern Saskatchewan are actively contributing to Burrowing Owl conservation by maintaining nesting habitat, refraining from applying insecticides and rodenticides around nest sites, and by contributing to an annual Burrowing Owl census. Producer stewardship activities are co-ordinated under Operation Burrowing Owl. Approximately 500 landowners in the province participate in the program, receiving recognition in the form of gate signage and a nominal financial incentive if they have five or more pairs of Burrowing Owls on their property. Producers also have access to information on additional conservation activities they may choose to incorporate into their agricultural operations through Operation Burrowing Owl newsletters. Operation Burrowing Owl was initiated in 1977 and is an ongoing program.

Participants

Nature Saskatchewan, World Wildlife Fund, Long Point Bird, Observatory (LPBO), Saskatchewan Environment and Resource Management (SERM), Saskatchewan Lotteries, Saskatchewan Conservation Data Center (SCDC), The Optimist Society.

Program/Contact**Operation Burrowing Owl**

Heather Dundas

Nature Saskatchewan (306) 780-9273

3.9 Assistance program for the development of White-tailed deer yards (PAAR): Quebec

The severity of Quebec's climate has obliged the White-tailed Deer to adapt to the difficult environmental conditions by turning to a very particular type of habitat for the winter—the deeryard. The PAAR program shows private woodlot owners, including farmers, the potential of their properties as wildlife habitats, and assists them financially and technically to realize this potential. Nearly 700 woodlot owners within one of the selected deeryards have been involved in the conservation of coniferous and mixed stands, which provide deer shelter. Since 1989, more than 1,650 hectares have been improved and adapted to the needs of the White-tailed deer.

Partners

Fondation de la faune du Québec; Department of Natural Resources of Quebec; and Department of Environment and Wildlife of Quebec.

Contacts**Fondation de la faune du Québec**

Marcel Quirion (418) 644-7926

Department of Natural Resources

Gisèle Bélanger (418) 643-2427, and the regional offices of the Department

3.10 North American Waterfowl Management Plan/Eastern Habitat Joint Venture: Quebec

Since 1986, the North American Waterfowl Management Plan has worked to conserve and restore wetlands that are vital for the maintenance of wildfowl populations. Three years later, the governments of Quebec, Ontario, and the Maritime Provinces, with the federal government and Ducks Unlimited Canada, signed a 15-year agreement concerning the Eastern Habitat Joint Venture. As a result of the joint venture, the conservation of wetlands benefits wildfowl and some 700 species that use this type of environment.

Farmers in various regions of Quebec have signed protection agreements with Ducks Unlimited Canada whereby they undertake to use farming practices that are compatible with wildlife. The purpose of the planned developments is to create wetlands and to improve farmland. The main steps to be taken are the installation of windbreaks, the establishment of a rotational grazing system, the limiting of livestock access to watercourses, the seeding with species more tolerant to flooding, the establishment of dense herbaceous grasslands, and the delaying of the sowing period.

Partners

Fondation de la faune du Québec; Wildlife Habitat Canada; Ducks Unlimited Canada; Canadian Wildlife Service; Department of Environment and Wildlife of Quebec; Department of Agriculture, Fisheries and Food of Quebec; Union des producteurs agricoles; various American and Mexican government and private organizations; and Hydro-Québec.

Contacts**Fondation de la faune du Québec**

Guy Lépine (418) 644-7926

Ducks Unlimited Canada

Bernard Filion or Jean-Pierre Laniel (418) 623-1650

3.11 Improved aquatic habitat quality program/fish habitat restoration fund: Quebec

Farmers are taking part in the efforts to conserve various watercourses and to improve the general quality of aquatic habitat, the quality being judged by an increase in the quantity and size of each species of fauna present and by an increase in the ability of the habitat to support wildlife. Some examples of agricultural measures funded by the program are bank stabilization, watercourse cleanup, deflector construction and ditching, creation of aquatic and riparian shelter, and limiting of livestock access to watercourses.

Partners

Fondation de la faune du Québec; Environment Canada; Fisheries and Oceans Canada; Department of Environment and Wildlife of Quebec; various riparian municipalities; and various fishermen's associations.

Contacts**Fondation de la faune du Québec**

Benoît Mercille (418) 644-7926

3.12 Harmonization of farming practices on Crane Island with the needs of the Yellow Rail: Quebec

This harmonization project is part of the plan to re-establish the Yellow Rail in Quebec. Along the St. Lawrence River, Crane Island is one of the most important of the known sites of the Yellow Rail, a vulnerable bird species in Quebec. However, most of the high marshes on it are burned and/or mown each summer by the farmers there. These practices remove the dead vegetation cover, which the birds use for nesting and camouflage in the spring. The practices also reduce the area of available marshland for nesting.

The farmers on Crane Island have undertaken to leave intact certain parcels of land that are currently mown or burned over. This will increase the wetlands area on the island and will encourage new pairs of Rails to reproduce.

Partners

Canadian Wildlife Service.

Contacts**Canadian Wildlife Service**

Michel Robert or Pierre Laporte (418) 648-7225

3.13 Establishing Habitat Parameters for Blueberry Insect Pollinators: New Brunswick

Agricultural producers in New Brunswick are contributing to a project that evaluates the ecological requirements of insect pollinators on a site-specific basis. Producers with harvestable wild blueberry habitats are volunteering their lands as study sites. By matching inventories of pollinator species found at the sites against the ecological site characteristics, researchers hope to learn more about insect pollinator habitat requirements. This information may then be used to manage the production of blueberries to enhance their pollination by native insects. Initiated in 1995, the project was completed in March 1997. A report will be published in 1998.

Participants

New Brunswick Department of Agriculture and Rural, Canada-New Brunswick Agriculture Green Plan Agreement.

Program/Contact**Wild Bee Pollination in Blueberries**

John Argall

New Brunswick Department of Agriculture and Rural Development (506) 453-3480

4 Projects to Conserve Genetic Diversity

Agricultural producers are active in the maintenance and enhancement of plant and animal genetic stocks. Producer involvement in initiatives designed to conserve domestic and wild varieties, species and breeds are outlined below.

4.1 Native Prairie Plant Species Conservation: Manitoba

John and Carol Morgan of Argyle, Manitoba have been growing Tall Grass Prairie plant species on their farm since 1987. Concerned with the loss of native prairie ecosystems, the Morgans collect, propagate, and distribute native seeds and vegetative material as part of a commercial venture designed to increase the availability of native plants for prairie restoration projects. The Morgan family currently produces about 100 different species of plants. Mr. Morgan's expertise in native prairie restoration is well recognized by plant ecologists, and he is the author of a book on native prairie restoration. Included in this book is a list of individuals across Canada involved in the production of native plant seed stocks.

Participants

John and Carol Morgan

Program/Contact

Prairie Habitats

John Morgan (204) 467-9371

4.2 Conserving Endangered and Heirloom Food Crops

Agricultural producers are part of a network of individuals who grow and exchange endangered and heirloom species of food crops in an attempt to maintain genetic diversity. Numerous varieties of flowers, fruits, herbs, vegetables, trees, shrubs, and grains are being preserved through the Heritage Seed Program. Of these food crops, over 1,100 distinct varieties are grown and exchanged by approximately 100 individuals across Canada. The number of agricultural producers in the network is not known. The Heritage Seed Program began in 1984 as a Canadian Organic Growers initiative.

Participants

Canadian Organic Growers, Environment Canada (Biodiversity Convention Office), numerous farmers, gardeners, historical sites, botanical gardens, and horticultural historians.

Program/Contact

Heritage Seed Program

Garrett Pittenger (416) 923-8880

Evelyn Stroud (905) 623-0353

4.3 Conserving Livestock Breeds

Rare Breeds Canada is a national non-profit organization that actively involves agricultural producers in the conservation of rare, minority, and endangered livestock breeds. Through its Satellite Breeding Network, groups of animals are sent to member farms to establish small breeding populations. Thirty-four farms are currently involved in the breeding network, housing approximately 120 of the organization's 700 head of livestock. Participants are typically retired or are hobby farmers, who generally retain a proportion of the breeding stock to begin their own herd or flock. Examples of livestock breeds involved in the program include Jacob sheep, Canadienne cattle, Canadian horses, donkeys, and various flocks of heritage poultry, geese, and turkeys.

Participants

Rare Breeds Conservancy, Volunteer farms.

Program/Contact

Rare Breeds Canada

Jim Lawrence

Rare Breeds Conservancy (705) 653-0231

5 Tools/Information/Awareness Projects

5.1 Evaluating Environmental Performance Through Farm Plans

Agricultural producers in various regions of Canada are using Farm Plans to evaluate the environmental performance of their management practices and systems. The implementation of Farm Plans in Canada varies according to province: Ontario's well established process and Alberta's pilot process are detailed in the following section to illustrate producer's use of this management tool.

5.1.1 Alberta Farm Plans

Five Alberta agricultural producers are working with provincial government staff to develop and implement integrated farm conservation plans. An objective of the plans and the subsequent on-farm conservation improvements is to assist agricultural producers to manage their operations in an economically and environmentally sustainable manner. The plans specifically address practices affecting soil erosion, livestock performance, water quality, and wildlife habitat quality.

This pilot project began in 1994 and ran for one year. In order to provide representation for a diversity of farming situations, farms from a number of regions in the province were selected for participation. These areas were in the Warner, Big Valley, Fairview, Camrose, and Sedgewick regions. Benefits, such as increased livestock performance and improved water and wildlife habitat quality, have been attributed to modifications made in farm operations as a result of the plans. Another intended result is the adoption of integrated farm plans by other members of the agricultural community in Alberta.

Participants

Alberta Agriculture, Food and Rural Development, Wildlife Habitat Canada, North American Waterfowl Management Plan, Ducks Unlimited Canada.

Program/Contact

On Farm Integrated Management Planning

Gaylen Armstrong

Alberta Agriculture, Food and Rural Development (403) 381-5538

5.1.2 Ontario Environmental Farm Plans

Agricultural producers in Ontario have been evaluating the environmental performance of their operations through the use of Environmental Farm Plans since 1992. The Farm Plans are documents consisting of 23 risk assessment modules pertaining to farm activities as they relate to human and animal health and safety, ground and surface water quality, and legislation. By completing Farm Plans, producers can identify and mitigate those activities within their operations that are, or may potentially have, adverse environmental impacts. The program is offered to the farmers free-of-charge, and participants receive a certificate of recognition for their efforts. This is a producer-led initiative resulting from a commitment on behalf of the agricultural community to address environmental issues in a pro-active manner.

The Environmental Farm Plan process has three stages. First, interested producers attend a workshop to receive instructions for the completion of the risk assessment modules. The farmers then fill out these modules that pertain to their individual operations. Once the modules are finished, the Farm Plans are submitted for peer review. The purpose of the peer review is to assist the producer in the development of an Action Plan by which he or she may address problem areas or may enhance existing environmentally sound practices.

As of April 1995, over 5,000 farmers in 52 Ontario counties have participated in the Environmental Farm Plan process. Over 1,600 plans have been reviewed, with 1,534 of these deemed appropriate. Farmers who have submitted plans not considered to be appropriate are advised to seek further technical assistance. Upon completing the Farm Plans, the vast majority of participating farmers have found that their operations pose no risk to the environment.

The Ontario Farm Environmental Coalition's goal is to have every farm family in Ontario complete Environmental Farm Plans by the year 2,000.

Farmers may receive financial assistance for the implementation of mitigation measures under the Environmental Farm Plan Incentive Program. A maximum of \$500 per farm business is available through the program. A total of 264 applications have been received under this Incentive Program. Projects for which assistance was granted include the construction of pesticide storage facilities, manure storage structures, and a containment system for contaminated yard runoff, and the planting of grass buffer strips along watercourses.

Participants

Ontario Federation of Agriculture, Christian Farmers Federation of Ontario, AGCare (Agricultural Groups Concerned About Resources & the Environment), Ontario Farm Animal Council, Agriculture and Agri-Food Canada, Ontario Ministry of Agriculture and Food, Environment Canada, Ontario Ministry of Environment and Energy, Ontario Ministry of Natural Resources, University of Guelph, Conversation Authorities other interest groups.

Program/Contact

Environmental Farm Plans

W.M. (Don) Hill

Ontario Soil and Crop Improvement Association (519) 986-2040

5.2 Guidelines for Sustainable Agriculture Practices

Numerous non-regulatory publications are available to guide agricultural producers on how to incorporate sustainable agricultural practices into their management plans. The following sections describe some of these publications.

5.2.1 British Columbia

B.C. Livestock Watering Manual

Environmental Guidelines for Beef Producers in British Columbia

Contact

Brian McNeil

Warehousing and Asset Investment Recovery, (604) 356-8516

Best Agricultural Waste Management Plans

Best Soil Management Plans

Contact**British Columbia Ministry of Agriculture, Fisheries and Food**

Molly Marshall (604) 556-3100

5.2.2 Alberta*Code of Practice for the Safe and Economic Handling of Animal Manures***Contact**

Alberta Agriculture, Food and Rural Development Publications Office, (403) 427-0391.

Caring for the Green Zone: Riparian Areas and Grazing Management

Contact**Alberta Agriculture, Food and Rural Development**

Barry Adams (403) 381-5486

Alberta Environmental Protection

Lorne Fitch (403) 381-5281

5.2.3 Manitoba*Farm Practices Guidelines for Beef Producers in Manitoba**Farm Practice Guidelines for Dairy Producers in Manitoba**Farm Practice Guidelines for Hog Producers in Manitoba**Farm Practice Guidelines for Poultry Producers in Manitoba***Contact****Manitoba Department of Agriculture**

Cam Thang or Shelly Bartell (204) 945-3893

5.2.4 Western Canada*A Landowner's Guide: Conservation of Canadian Prairie Grasslands***Contact****Environment Canada**

Greta Laboucane (403) 951-8600

Environment Canada

Raymonde Giroux Lefebvre (403) 951-8720

5.2.5 Ontario

Best Management Practices Booklets:

Livestock and Poultry Waste Management

Field Crop Production

Horticultural Crops

Farm, Forestry and Habitat Management

A First Look: Practical Solutions for Soil and Water Problems

Water Management

Nutrient Management

Soil Management

Wildlife Management

Irrigation Management

Integrated Pest Management

Contact

Ontario Federation of Agriculture

Wendy Beaton (416) 485-3333

5.3 Awareness Initiatives

Knowledge and understanding of the various agro-environmental issues are essential if farmers are to adopt more environmentally responsible practices. Farm producers can participate in various awareness initiatives concerning sustainable agriculture and the conservation of biological resources.

5.3.1 Quebec week for resource conservation

Since 1989, the Table de concertation sur la conservation des ressources (“consultation committee for resource conservation”) has organized a “Quebec week for resource conservation”. During the week, farmers and others involved in agriculture discuss major issues in natural resource conservation and environmental protection. This event is a unique opportunity for farmers and urban dwellers to become familiar with research, new techniques and high-technology equipment, especially in the fields of resource protection and biodiversity conservation. New themes are discussed each year.

Partners

Table de concertation sur la conservation des ressources; Union des producteurs agricoles; Agriculture and Agri-Food Canada; Department of Agriculture, Fisheries and Food of Quebec; Faculty of Agricultural and Environmental Sciences of McGill University; Faculty of Agricultural and Food Sciences of Laval University; and Order of Agrologists of Quebec.

Contacts**Union des producteurs agricoles**

Daniel Bernier (514) 679-0530

Department of Agriculture, Fisheries and Food

Martine Boivin (418) 643-1151

5.3.2 Training assistance program: Quebec

The Canada-Quebec Subsidiary Agreement on Sustainable Agriculture funds initiatives aimed at developing new training activities for agricultural clients. The activity areas favoured are water quality and nonpoint source pollution, resource conservation and integrated fertilization, and plant protection.

One of the main projects is:

- (a) Toward sustainable choices: Innovative farmers in the Saguenay Lac-Saint-Jean region have taken part in the creation of a video containing their testimonials on concrete action they have taken on their farms to conserve environmental quality. The visual document is accompanied by an envelope of 21 booklets that provide information on various themes related to sustainable agriculture, including erosion control, energy conservation, soil conservation, water quality, and the protection of wildlife habitats. The educational material will be distributed through the Union des producteurs agricoles to nearly 2,000 farm producers in the region.

Partners

Department of Agriculture, Fisheries and Food of Quebec; Agriculture and Agri-Food Canada; Union des producteurs agricoles; and MADIE.

Contacts**Department of Agriculture, Fisheries and Food**

Bruno Gosselin (418) 644-6503

Union des producteurs agricoles

Robert Savard (418) 549-7353

5.4 Consultant clubs program: Quebec

The Consultant Clubs Program of the Canada-Quebec Subsidiary Agreement on Sustainable Agriculture has made possible the creation of twelve consultant clubs. Each club, consisting of between 20 and 30 farming enterprises, benefits from the services of a specialist who provides support for the farming enterprises in their conservation projects. The farmers develop a comprehensive approach in resource management, thus promoting sustainable agriculture.

The clubs began operation on August 1, 1993, and were subsidized until March 31, 1997. The 12 consultant clubs represent a total of 290 farms, and the total area managed is about 30,000 hectares. Financial assistance is provided to cover the salaries of the environmental consultants.

The main problem areas dealt with are the improvement of water quality and reduction of nonpoint source pollution, improved resource conservation and integrated fertilization, and the development of integrated control in crop protection.

The Consultant Clubs Program, in effect from 1993 to 1997, includes:

- (a) *Club Sols Vivants* : Most of the farmers in this consultant club are dairy producers. They promote the development of organic farming in the Lower St. Lawrence–Gaspé region. Their main concerns are manure management, livestock production, and the diversification of farming activities.
- (b) *Club agro-environnemental Beaurivage*: Pig and dairy production are the main activities of the members in this consultant club in the Quebec City region. Their primary interest is manure management and manure surplus.
- (c) *Club-conseil Bellechasse/Nouvelle-Beauce*: Dairy farmers and pig producers in the Quebec City region have formed this consultant club. They are interested in manure management.
- (d) *Club-conseil Beauce Agri-Nature*: This club in the Beauce–Appalachians region is concerned with various problems related to diversified production and manure management.
- (e) *Club de fertilization de Beauce*: Pig and dairy producers are seeking solutions to the problems of manure management and manure surplus in the Beauce–Appalachians region.
- (f) *Club Sol en main*: Dairy farming and field crops are the main activities of the members in this consultant club. These farmers in the Bois-Francs region are interested in, among other things, manure management, pesticide management, and soil conservation.
- (g) *Club-conseil Gestri-Sol*: Most of the farmers in this club in the Eastern Townships region are involved in pig and dairy production. Manure management and manure surplus, pesticide management, and soil conservation are the main problem areas being assessed by the club members.
- (h) *Agri-durable*: Most of the farmers are pig producers and/or field crop growers in the Richelieu–St-Hyacinthe region. Manure management, reduced use of herbicides and chemical fertilizers, and control of soil degradation are the members' primary concerns. The techniques used are direct seeding, plant residue on the soil in the fall, crop rotation, reduction of herbicide amounts by means of swath spraying, and re-establishment of windbreaks and riparian vegetation.
- (i) *Club Dura-club*: Dairy producers in the Richelieu–St-Hyacinthe region have joined to try to solve the problems of manure management, manure surplus, and pesticides.
- (j) *Club-conseil G.E.R.A.*: This club southwest of Montreal consists primarily of dairy producers and field crop growers concerned with manure management, pesticide management, and soil conservation.
- (k) *Club-conseil Sols légers de Lanaudière*: Tobacco and potato producers have formed this consultant club north of Montreal. They are seeking solutions to the problems of pesticide management and soil conservation.
- (l) *Club-conseil Pro-vert*: The members of this consultant club are dairy producers. They are interested in pesticide management, soil conservation and resource conservation in grain and potato crops in the Saguenay–Lac-St-Jean region.

Partners

Department of Agriculture, Fisheries and Food of Quebec; Agriculture and Agri-Food Canada.

Contacts

Department of Agriculture, Fisheries and Food of Quebec

Pierre Beaudet (418) 644-5602, or Mireille Therrien (418) 644-6177

5.5 Promotion assistance program: Quebec

The purpose of this program is to assist promotional and awareness activities among farmers concerning new technologies and farming practices that have already been tested and will allow the development of sustainable agriculture. The program promotes technology transfer in disciplines related to water quality and nonpoint source pollution, in resource conservation and integrated fertilization, and in plant protection.

More than 150 groups of farmers have carried out projects to promote and provide information on new technologies and farming practices. Examples of projects are the planting and stabilization of river banks, the promotion and popularization of optimum management practices, the rationalization of fertilization and the reclamation of farm manure, and the alternative control of weeds. Information is disseminated in various ways (technical sheets or bulletins, videos, demonstration sites, seminars, information days, and so on).

Partners

Agriculture and Agri-Food Canada; Department of Agriculture, Fisheries and Food of Quebec; Union des producteurs agricoles; and various organizations (governmental and non-governmental), associations and environmental consultants.

Contacts

Department of Agriculture, Fisheries and Food of Quebec

Bruno Gosselin (418) 644-6503

Mireille Therrien (418) 644-6177

5.6 Technical supervision clubs: Quebec

The Technical Supervision Clubs Program has made possible the creation of about 50 clubs throughout the 11 agricultural regions of Quebec. Each club comprises at least five farming operations and receives the services of an advisor who provides support for the farming enterprises in their conservation efforts. The Technical Supervision Clubs are an integral part of the umbrella program of the Department of Agriculture, Fisheries and Food of Quebec.

The Technical Supervision Clubs work in the following disciplines, among others: soil conservation, plant protection (compliance with the principles developed in the Quebec government's phytosanitary strategy), and implementation of the principles and techniques of organic farming and crop management.

Partners

Department of Agriculture, Fisheries and Food of Quebec.

Contacts

Department of Agriculture, Fisheries and Food of Quebec, assistant directors of the regional offices.

Appendix A: Glossary of Terms

Alternative Watering Systems: Livestock watering systems such as pasture pumps or gravity flow systems that provide livestock with access to water spatially removed from riparian areas.

Biodiversity: “The variety of species and ecosystems, the variability of genes within the species and the ecological complexes of which they are a part” as defined by Agriculture and Agri-Food Canada, National Environment Strategy for Agriculture and Agri-Food.

Buffer Zones: A strip of land typically left ungrazed or uncultivated that separates agricultural land from areas of high wildlife productivity, such as a watercourse.

Conservation Tillage: Reducing or eliminating tillage practices on cropland in order to sustain crop production, reduce soil erosion, and provide wildlife habitat by increasing nesting and visual cover.

Cover Crops: Crops sown to protect the soil from erosion or nutrient losses.

Delayed Cut Delayed Haying: Delaying the mowing or swathing of hay or crop land until a time when the majority of ground-nesting birds have raised their young (usually mid or early July).

Delayed Grazing: Delaying livestock grazing of native or non-native pastures until the majority of ground-nesting birds have raised their young (usually early or mid-July).

Flushing Bars: Mechanical devices attached to tractors engaged in the mowing or swathing of hay for the purpose of scaring or “flushing” upland nesting birds and other wildlife out of ground cover, thereby reducing the incidence of injury and predation to the animals.

Forage: Plant material available to be eaten by livestock or wildlife species.

Milkhouse Wastewater: Water containing cleaning, rinsing and sanitizing agents left over after the cleaning and disinfecting of bulk milk storage tanks.

Permanent Cover: Grassland plant communities, either seeded or native, that are not harvested and plowed under at the end of a season, thereby providing a permanent cover on the soil surface.

Planned Grazing: The management of livestock grazing in a planned, systematic manner so that livestock productivity is balanced with the ability of the resource to withstand grazing.

Riparian Areas: Land areas immediately adjacent to waterbodies and/or watercourses, typified by water-tolerant vegetation communities, fine soils, and elevated water tables.

Rotational Grazing: A type of planned grazing system in which livestock use of pastures is limited by duration, intensity, and frequency, such that the plant communities are permitted time to recover between periods of use.

Sustainable Agriculture: “Agriculture and agri-food systems that are economically viable and meet society’s need for safe and nutritious food, while conserving or enhancing natural resources and the environment for future generations” as defined by the Agriculture and Agri-Food Canada, National Environment Strategy for Agriculture and Agri-Food.

Uplands: Land areas, spatially separate from waterbodies and/or watercourses so that emergent and wetland vegetation communities are replaced with plants more tolerant of drier sites.

Appendix B: Contact Persons

Adams, Barry
Regional Range Manager
Alberta Agriculture, Food and Rural Development
Public Lands Division
Agriculture Centre
Jail Road Bag 3014
Lethbridge, Alberta T1J 4C7
Telephone: (403) 381-5486
Fax: (403) 381-5792

Argall, John
Blueberry Specialist
New Brunswick Department of Agriculture and Rural
Development
P.O. Box 6000
Fredericton, New Brunswick E3B 5H1
Telephone: (506) 453-2108
Fax: (506) 453-7978

Armstrong, Gaylen
Alberta Agriculture, Food and Rural Development
Conservation and Development Branch
Bag 3014
Agriculture Centre
Lethbridge, Alberta T1J 4C7
Telephone: (403) 381-5538
Fax: (403) 381-5153

Association Chasse et Pêche de Plessisville inc.
2048 Saint-Jean
Plessisville, Québec G6L 1H1
Telephone: (819) 362-2167

Awaschuk, Ernie
Alberta NAWMP Center
550, 10011 - 109 Street
Edmonton, Alberta T5J 3S8
Telephone: (403) 422-1040
Fax: (403) 422-1045

Bartell, Shelly
Manitoba Department of Agriculture
Publications Branch
411 York Avenue
Winnipeg, Manitoba R3C 3M1
Telephone: 204) 945-3893
Fax: 204) 948-2498

Beaton, Wendy
Ontario Federation of Agriculture
40 Eglinton Avenue East, 5th Floor
Toronto, Ontario M4P 3B1
Telephone: (416) 485-3333
Fax: (416) 485-9027

Beaudet, Pierre
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
Direction de l'environnement et du développement durable
200-A chemin Ste-Foy, 9th Floor
Quebec City, Quebec G1R 4X6
Telephone: (418) 644-5602
Fax: (418) 528-0405

Beaulieu, Robert
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
177 rue Saint-Joseph
Sainte-Martine, Quebec J0S 1V0
Telephone: (514) 427-2000
Fax: (514) 427-0407

Bélanger, Bruno
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
Direction de l'environnement et du développement durable
200-A chemin Ste-Foy, 9th Floor
Quebec City, Quebec G1R 4X6
Telephone: (418) 643-3145
Fax: (418) 528-0405

Bélanger, Gisèle
Ministère des Ressources Naturelles du Québec
Service de mise en valeur des forêts privées
880 chemin Ste-Foy, 5th Floor
Quebec City, Quebec
Telephone: (418) 643-2427
Fax: (418) 646-9245

Bélanger, Luc
Canadian Wildlife Service
Environnement Canada
1141 route de l'église
9th Floor, P.O. Box 10100
Sainte-Foy, Quebec G1V 4H5
Telephone: (418) 649-6130
Fax: (418) 649-6475

Bernier, Daniel
Union des producteurs agricoles
555 boulevard Roland-Therrien
Longueuil, Quebec J4H 3Y9
Telephone: (514) 679-0530
Fax: (514) 679-4943

Bigg, Michelle
Cowichan Agripro
BC Ministry of Agriculture, Fisheries and Food
5785 Duncan Street
Duncan, BC V9L 5G2

Boivin, Martine
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
200-A chemin Ste-Foy, 12th Floor
Quebec City, Quebec G1R 4X6
Telephone: (418) 643-1151
Fax: (418) 646-1830

Boucher, Richard
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
Direction de l'environnement et du développement durable
200 chemin Ste-Foy, 9th Floor
Quebec City, Quebec G1R 4X6
Telephone: (418) 643-2450
Fax: (418) 528-0405

Brechtel, Steve
Alberta Environmental Protection
Natural Resources Service, Wildlife Management Division
7th Floor, O.S. Longman Building
6909 - 116 St.
Edmonton, Alberta T6H 4P2
Telephone: (403) 422-9533
Fax: (403) 422-9685

Brook, Doug
Box 1900, 33 Iroquois Road, Unit 5
Timmins, Ontario P4N 7X1
Telephone: (705) 264-4218
Fax: (705) 268-0377

Cahill, Mike
Acting Director of Conservation and Habitat
Newfoundland and Labrador Department of Wildlife Resources
Pleasantville, Building 810
Box 8700
Saint John's, Newfoundland A1B 4J6
Telephone: (709) 729-2548
Fax: (709) 729-6629

Clark, Dr. E. Ann
Department of Crop Science
University of Guelph
Telephone: (519) 824-4120
Fax: (519) 763-8933

Clément, Marc
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
390 rue Principale
Buckingham, Quebec J8L 2G7
Telephone: (819) 986-8541
Fax: (819) 986-9299

Côté, Esther
St. Lawrence Vision 2000
Agriculture and Agri-Food Canada
Champlain Harbour Station
901 Cap Diamant, Room 350-4
Quebec City, Quebec G1K 4K4
Telephone: (418) 648-4820
Fax: (418) 648-7342

Côté, Steve
Union des producteurs agricoles
6 rue Dumoulin
Saint-Rémy, Quebec G0L 2L0
Telephone: (514) 454-5115
Fax: (514) 454-6918

Dagenais, Johanne
Coordinator
Corporation d'aménagement et de protection de la
Sainte-Anne
80 rue Principale, P.O. Box 639
Sainte-Christine-d'Auvergne, Quebec G0A 1A0
Telephone: (418) 339-2688
Fax: (418) 329-3356

Davis, Stephen
Manager of Biological Services
Saskatchewan Wetland Conservation Corporation
#202 - 2080 Cornwall Street
Regina, Saskatchewan S4P 2K5
Telephone: (306) 787-0726
Fax: (306) 787-0780

D'Aoust, Mylène
Argus Groupe Inc.
3075 chemin des Quatre Bourgeois
Sainte-Foy, Quebec G1W 4Y4
Telephone: (418) 654-9638
Fax: (418) 654-9699

DeHaan, Ron
Prince Edward Island Department of Agriculture,
Fisheries and Forestry
P.O. Box 2000
Charlottetown, PEI C1A 7N8
Telephone: (902) 368-5661
Fax: (902) 368-5661

Delesalle, Bruno
Provincial Biologist
Ducks Unlimited Canada
954-A Laval Crescent
Kamloops, British Columbia V2C 5P5
Telephone: (250) 374-8307
Fax: (250) 374-6287

Dill, Tom
Saskatchewan Stock Growers Association
Exhibition Park
Canada Center Building
Box 4752
Regina, Saskatchewan S4P 3Y4
Telephone: (306) 757-9499
Fax: (306) 569-8799

Doris, Peter
Ontario Cattlemen's Association
130 Malcolm Road
Guelph, Ontario N1K 1B1
Telephone: (519) 824-0334
Fax: (519) 824-9101

Duffy, Tom
Wetland Stewardship Co-ordinator
Prince Edward Island Department of Environmental
Resources
Fish and Wildlife Division
P.O. Box 2000
Charlottetown, PEI C1A 7N8
Telephone: (902) 368-4667
Fax: (902) 368-5830

Dumont, Bruno
Pro Faune
2095 boulevard Charest Ouest, Room 219
Sainte-Foy, Quebec G1N 4L8
Telephone: (418) 688-3898
Fax: (418) 681-6914

Dundas, Heather
Nature Saskatchewan
Room 206 - 1860 Lorne Street
Regina, Saskatchewan S4P 2L7
Telephone: (306) 780-9273
Fax: (306) 781-6021

Dupuis, Gary
Unit 1 - 641 Norris Court
Kingston, Ontario K7P 2R9
Telephone: (613) 389-0418
Fax: (613) 389-0239

Durocher, Henri
St. Lawrence Vision 2000
Ministère de l'Environnement et de la Faune du Québec
2360 chemin Ste-Foy, 2nd Floor
Sainte-Foy, Quebec G1V 4H2
Telephone: (418) 644-3585
Fax: (418) 528-1035

Dysan, Ian
Prairie Conservation Action Plan
Alberta Environmental Protection
53014 WPM Place
530 - 8th Street South
Lethbridge, Alberta T1J 4C7

Filion, Bernard
Ducks Unlimited Canada
710 rue Bouvier, Room 260
Quebec City, Quebec G2J 1A7
Telephone: (418) 623-1650
Fax: (418) 623-0420

Fisher, Jim
Program Co-ordinator
Delta Waterfowl Foundation
37 - 11th St
Brandon, Manitoba R7A 4J2
Telephone: (204) 239-1900

Fitch, Lorne
Alberta Environmental Protection
Natural Resources Service:
Fish, Wildlife and Parks
YPM Place 530 - 8th Street South
Bag 3014
Lethbridge, Alberta T1J 4C4
Telephone: (403) 381-5281

Flock, Marilyn
County of Barrhead
Agricultural Service Board
5306 - 49th Street
Barrhead, Alberta T7N 1N5
Telephone: (403) 674-3331
Fax: (403) 674-2777

Fortin, Raymonde
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
Direction de l'environnement et du développement durable
200-A chemin Ste-Foy
Quebec City, Quebec G1R 4X6
Telephone: (418) 644-6508
Fax: (418) 644-0829

Fowler, Graeme
Project Co-ordinator
Comox Waterfowl Management Project
1405 Argus Place
Comox, British Columbia V9M 3B3
Telephone: (250) 339-0673
Fax: (250) 339-0643

Gaudreault, Léopold
Ministère de l'Environnement et de la Faune du Québec
Direction de la conservation et du patrimoine écologique
2360 chemin Ste-Foy
Sainte-Foy, Quebec G1V 4H2
Telephone: (418) 643-5397
Fax: (418) 646-6169

Giguère, Robert
Groupe forestier de l'Est-du-Lac-Témiscouata inc.
49 rue du Clocher
Saint-Émile d'Auclair, Quebec GOL 1A0
Telephone: (418) 899-6673
Fax: (418) 899-2708

Giroux Lesebure, Raymonde
Environment Canada, Western and Northern Region
Communications Branch
Twin Atria II, 2nd Floor
4999 - 98 Avenue
Edmonton, Alberta T6B 2X3
Telephone: (403) 951-8720
Fax: (403) 495-2615

Gosselin, Bruno
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
Direction de l'environnement et du développement durable
200-A chemin Ste-Foy, 9th Floor
Quebec City, Quebec
G1R 4X6
Telephone: (418) 644-6503
Fax: (418) 528-0405

Gouin, Jean-Michel
Ministère de l'Environnement et de la Faune du Québec
Service de l'aménagement et de l'exploitation de la faune
9530 rue de la Faune, P.O. Box 7200
Charlesbourg, Quebec G1G 5H9
Telephone: (418) 622-5151
Fax: (418) 622-3014

Goulden, Herb
Brandon NAWMP Regional Office
2034 Currie Boulevard
Brandon, Manitoba R7A 5Y1
Telephone: (204) 729-3501

Hawbolt, Stephen
Program Director
Clean Annapolis River Project
P.O. Box 395
Annapolis Royal, Nova Scotia B0S 1A0
Telephone: (902) 532-7533
Fax: (902) 678-1253

Hill, W.M. (Don)
Program Co-ordinator
Ontario Soil and Crop Improvement Association
P.O. Box 496
Markdale, Ontario
Telephone: (519) 986-2040
Fax: (519) 986-3014

Hone, Francine
Canadian Wildlife Service
Environment Canada
1141 route de l'église
9th Floor, P.O. Box 10100
Sainte-Foy, Quebec G1V 4H5
Telephone: (418) 648-4554
Fax: (418) 649-6475

Houde, Jocelyn
President
Corporation de gestion des rivières des Bois-Francis
P.O. Box 456
Victoriaville, Quebec G6P 6T3
Telephone: (819) 357-3388
Fax: (819) 357-3389

Kinkel, Nick
566 Welham Road
Barrie, Ontario L4M 6E7
Telephone: (705) 721-4444
Fax: (705) 721-4999

Labonté, Serge
Canadian Wildlife Service
Environment Canada
1141 route de l'église
9th Floor, P.O. Box 10100
Sainte-Foy, Quebec G1V 4H5
Telephone: (418) 648-7138
Fax: (418) 649-6475

Laboucane, Greta
Environment Canada,
Western and Northern Region
Communications Branch
Twin Atria II, 2nd Floor
4999 - 98 Avenue
Edmonton, Alberta T6B 2X3
Telephone: (403) 951-8600
Fax: (403) 495-2615

Landry, Pierre-Antoine
Union des producteurs agricoles
5185 rue Rideau
P.O. Box 4000, Ancienne Lorette Stn.
Quebec City, Quebec G2E 5S2
Telephone: (418) 872-0770
Fax: (418) 872-3386

Laniel, Jean-Pierre
Ducks Unlimited Canada
710 rue Bouvier, Room 260
Quebec City, Quebec G2J 1A7
Telephone: (418) 623-1650
Fax: (418) 623-0420

Laporte, Pierre
Canadian Wildlife Service
Environment Canada
1141 route de l'église
9th Floor, P.O. Box 10100
Sainte-Foy, Quebec G1V 4H5
Telephone: (418) 648-7225
Fax: (418) 649-6475

Lawrence, Jim
G.M., Rare Breeds Conservancy
General Delivery
Cambellford, Ontario K0L 1L0
Telephone: (705) 653-0231
Fax: (705) 653-0232

Lehoux, Denis
Canadian Wildlife Service
Environment Canada
1141 route de l'église, P.O. Box 10100
Sainte-Foy, Quebec G1V 4H5
Telephone: (418) 648-2544
Fax: (418) 649-6475

Lépine, Guy
Fondation de la faune du Québec
Project Coordinator
Place Iberville II
1175 rue Lavigerie, Room 420
Sainte-Foy, Quebec G1V 4P1
Telephone: (418) 644-7926
Fax: (418) 643-7655

Lowe, Dave
British Columbia Ministry Of Environment, Lands & Parks
Fish and Wildlife Division
1259 Dalhousie
Kamloops, British Columbia V2C 5Z5
Telephone: (604) 371-6248

MacAulay, Colin
Chairman of the Board
Prince Edward Soil and Crop Improvement Association
Souris, R.R. #2
P.E.I. COA 2B0
Telephone: (902) 687-3663
Fax: (902) 687-1286

Maisonneuve, Charles
Ministère de l'Environnement et de la Faune du Québec
Direction de la faune et des habitats, 5th Floor
Quebec City, Quebec G1R 4Y1
Telephone: (418) 644-8115
Fax: (418) 646-6863

Marr, Peter
Rural Non-Point Pollution Specialist
Ontario Ministry of Environment and Energy
2 St. Clair Ave. West, 14th Floor
Toronto, Ontario M4V 1L5
Telephone: (416) 327-7105
Fax: (416) 323-5031

Marshall, Molly
British Columbia Ministry of Agriculture, Fisheries and Food
Resource Management Branch
1767 Angus Campbell Road
Abbotsford, British Columbia. V3G 2M3
Telephone: (604) 556-3100
Fax: (604) 556-3099

Matthies, Nolan
Saskatchewan Wetland Conservation Corporation
#110 - 2151 Scarth Street
Regina, Saskatchewan S4P 3Z3
Telephone: (306) 787-0726
Fax: (306) 787-0780

Maynard, Laurie
Program Manager
Canadian Wildlife Service
Environment Canada
75 Farquhar Street
Guelph, Ontario N1H 3N4
Telephone: (519) 826-2113
Fax: (519) 826-2113

McCullough, Gary
Program Coordinator
Canadian Wildlife Service
465 Gideon Dr. P.O. Box 490
Lambeth Station
London, Ontario N6P 1R1
Telephone: (519) 472-5750

McGregor, I.A. (Ian)
Fisheries Section Head
British Columbia Ministry of Environment, Lands & Parks
1259 Dalhousie Drive
Kamloops, B.C. V2C 5Z5
Telephone: (250) 371-6200
Fax: (250) 828-4000

McNeil, Brian
Warehousing and Asset Recovery
742 Vanalman Avenue
Victoria, British Columbia V8V 1X4
Telephone: (604) 356-8516

Mercille, Benoît
Fondation de la faune du Québec
Project Coordinator
Place Iberville II
1175 rue Lavigerie, Room 420
Sainte-Foy, Quebec G1V 4P1
Telephone: (418) 644-7926
Fax: (418) 643-7655

Merkley, Craig
Conservation Services Specialist
Upper Thames River Conservation Authority
R.R. #6 London, Ontario N6A 4C1
Telephone: (519) 451-2800
Fax: (519) 451-1188

Morgan, John
Box 1
Argyle, Manitoba R0C 0B0
Telephone: (204) 467-9371
Fax: (204) 467-5004

Motes, Lee
Ducks Unlimited Canada Regina Office
Box 4465, 1606-4th Avenue
Regina, Saskatchewan S4P 3W7
Telephone: (306) 569-0424
Fax: (306) 565-3699

Nault, Denis
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
Direction de l'environnement et du développement durable
200-A chemin Ste-Foy
Quebec City, Quebec G1R 4X6
Telephone: (418) 644-6182
Fax: (418) 646-0829

Newkirk, Deanne
Environmental Programs SaskPower
2025 Victoria Avenue
Regina, Saskatchewan S4P 0S1
Telephone: (306) 566-2885
Fax: (306) 566-3428

Ouellet, Léo
General Manager
Corporation de gestion des rivières des Bois-Francs
P.O. Box 456
Victoriaville, Quebec G6P 6T3
Telephone: (819) 357-3388
Fax: (819) 357-3389

Payer, Céline
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
Direction de l'analyse et de la coordination
200-A chemin Ste-Foy, 11th Floor
Quebec City, Quebec G1R 4X6
Telephone: (418) 644-6706
Fax: (418) 644-3049

Pittenger, Garrett
President
Heritage Seed Program
R.R. 3
Uxbridge, Ontario L9P 1R3
Telephone: (416) 923-8880

Poole, Bill
Ducks Unlimited Canada
Oak Hammock Marsh Conservation Center
1 Mallard Bay at Hwy. 220
P.O. Box 1160
Oak Hammock Marsh, Manitoba R0C 2Z0
Telephone: (204) 467-3000
Fax: (204) 467-9028

Quirion, Marcel
Fondation de la faune du Québec
Project Coordinator
Place Iberville II
1175 rue Lavigerie, Room 420
Sainte-Foy, Quebec G1V 4P1
Telephone: (418) 644-7926
Fax: (418) 643-7655

Robert, Michel
Canadian Wildlife Service
Environment Canada
1141 route de l'église
9th Floor, P.O. Box 10100
Sainte-Foy, Quebec G1V 4H5
Telephone: (418) 648-7225
Fax: (418) 649-6475

Robitaille, Daniel
St. Lawrence Vision 2000
Environment Canada
1141 route de l'église, P.O. Box 10100
Sainte-Foy, Quebec G1V 4H5
Telephone: (418) 648-3537
Fax: (418) 649-6213

Rodenbush, Sharon
Saskatchewan Wetland Conservation Corporation
#110 - 2151 Scarth Street
Regina, Saskatchewan S4P 3Z3
Telephone: (306) 787-0726
Fax: (306) 787-0780

Ryan, Tracey
Sr. Soil and Water Conservation Advisor
Grand River Conservation Authority
400 Clyde Road, Box 729
Cambridge, Ontario N1R 5W6
Telephone: (519) 621-2761
Fax: (519) 621-4844

Sanborn, Clint
Co-ordinator
Sask. Wildlife Federation
444 River Street West
Moose Jaw, Saskatchewan S6H 6J6
Telephone: (306) 692-8812
Fax: (306) 692-4370

Savard, Robert
Union des producteurs agricoles
422 rue Racine Est
Chicoutimi, Quebec G7H 1T3
Telephone: (418) 549-7353
Fax: (418) 543-4873

Savoie, Robert
Forêt modèle du Bas Saint-Laurent inc.
284 rue Potvin
Rimouski, Quebec G1L 7P5
Telephone: (418) 722-7211
Fax: (418) 723-6045

Scobie, David
Co-ordinator, Operation Grassland Community
Box 1829
Brooks, Alberta T1R 1C6
Telephone: (403) 362-4122
Fax: (403) 362-4122

Shantz, Christine
Technician, Grand River Conservation Authority
400 Clyde Road
Cambridge, Ontario N1R 5W6
Telephone: (519) 621-2761
Fax: (519) 621-4844

Sharpe, John
PFRA Shelterbelt Center
Indian Head, Saskatchewan S0G 2K0
Telephone: (306) 695-2284
Fax: (306) 695-2568

Silver, Rod
BC Ministry of Environment, Lands and Parks
Suite 300
1005 Broad Street
Victoria, BC V8W 2A1

Smith, Susan
Project Co-ordinator
Delta Farmland & Wildlife Trust
#203 - 4882 Delta St.
Delta, British Columbia V4K 2T8
Telephone: (604) 946-7820
Fax: (604) 940-3392

Sopuk, Tim
Manitoba Habitat Heritage Corporation
200 - 1555 St. James Street
Winnipeg, Manitoba R3H 1B5

St-André, Ghislaine
Fondation de la faune du Québec
Project Coordinator
Place Iberville II
1175 rue Lavigerie, Room 420
Sainte-Foy, Quebec G1V 4P1
Telephone: (418) 644-7926
Fax: (418) 643-7655

Stepaniuk, Jeff
General Manager, MWF Habitat Foundation
Operations Office
1770 Notre Dame Avenue
Winnipeg, Manitoba R3E 3K2
Telephone: (204) 633-5967

Strankman, Peggy
Manager, Environmental Affairs
Canadian Cattlemen's Association
#215, 6517 - 8th Street, NE
Calgary, Alberta T2E 7H7
Telephone: (403) 275-8558
Fax: (403) 274-5686

Stroud, Evelyn
Coordinator
Heritage Seed Program
R.R. 3
Uxbridge, Ontario L9P 1R3
Telephone: (905) 623-0353

Sweet, Don
Senior Land Representative
Prairie Farm Rehabilitation Administration (PFRA)
1800 Hamilton Street
Regina, Saskatchewan S4P 4L2
Telephone: (306) 780-5018
Fax: (306) 780-5171

Thang, Cam
Manitoba Department of Agriculture
Publications Branch
411 York Avenue
Winnipeg, Manitoba R3C 3M1
Telephone: (204) 945-3893
Fax: (204) 948-2498

Therrien, Mireille
Ministère de l'Agriculture, des Pêcheries et de
l'Alimentation du Québec
Direction de l'environnement et du développement durable
200-A chemin Ste-Foy, 9th Floor
Quebec City, Quebec G1R 4X6
Telephone: (418) 644-6177
Fax: (418) 528-0405

Thornbolm, Shane
Manitoba Habitat Heritage Corporation
P.O. Box 520
Melita, Manitoba R0M 1L0
Telephone: (204) 522-8733
Fax: (204) 522-3525

Toombs, Mike
Engineer
Ontario Ministry of Agriculture, Food and Rural Affairs
1110 Stellar Dr. Unit 102
New Market, Ontario L3Y 7B7
Telephone: (905) 895-4519
Fax: (905) 895-6739

Traversy, Normand
Ministère de l'Environnement et de la Faune du Québec
Direction de la faune et des habitats
150 boul. René-Lévesque Est, 5th Floor
Quebec City, Quebec G1R 4Y1
Telephone: (418) 644-8120
Fax: (418) 646-6863

Trencia, Guy
Ministère de l'Environnement et de la Faune du Québec
Service de l'aménagement et de l'exploitation de la faune
9530 rue de la Faune, P.O. Box 7200
Charlesbourg, Quebec G1G 5H9
Telephone: (418) 622-5151
Fax: (418) 622-3014

Watts, Dean
Fisheries Biologist
British Columbia Ministry of Environment, Lands & Parks
1259 Dalhousie Drive
Kamloops, B.C. V2C 5Z5
Telephone: (604) 371-6248
Fax: (604) 828-4000

Wetter, Les
Provincial Agrologist
Ducks Unlimited Canada
#202 10470 - 176 Street
Edmonton, Alberta T5S 1L3
Telephone: (403) 489-2002
Fax: (403) 489-1856

Wrubleski, Gloria
Prairie Farm Rehabilitation Administration (PFRA)
1800 Hamilton Street
Regina, Saskatchewan S4P 4L2
Telephone: (306) 780-7260
Fax: (306) 780-5018

Young, Janice
Wildlife Technician
Alberta Environmental Protection
Natural Resources Service
Wildlife Management Division
14515 - 122 Avenue
Edmonton, Alberta T5L 2W4
Telephone: (403) 427-3574
Fax: (403) 427-5695

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