



4th National Habitat Workshop

Habitat conservation in the context of sustainable development “from words to action”

Workshop Proceedings

August 17-20, 1999
Loews Le Concorde Hotel, Québec City



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Acknowledgements

An event such as the fourth National Habitat Workshop is the fruit of much forethought, co-ordination and the mobilization of a whole team. The organizing committee would like to thank the many people who have made significant contributions to the success of this event.

Firstly, we acknowledge the crucial role of the speakers, who, through the quality of their presentations and choice of topics, whetted the interest of the participants. We would also like to thank Master of Ceremonies Raymond Sarrazin, the many moderators, particularly Art Hanson who skilfully directed the seminars, the seminar rapporteurs, and in particular the chief rapporteurs, Jamie Fortune, Caroline Caza and Suzan Dionne, who apprised the plenary session of the key ideas, issues and comments that had emerged in the seminars.

For sharing their knowledge during the excursions to the Saguenay-St. Lawrence Marine Park and the Lake St. Pierre area, we thank Marie-France Dalcourt (Fisheries and Oceans Canada), Nadia Ménard (Parks Canada), Denis Lehoux (Canadian Wildlife Service), Pierre Bertrand (ROCHE Ltd, consultants) and Jean-Pierre Laniel (Ducks Unlimited Canada), as well as such organizations as *Société d'initiative et de conservation du Bas-Richelieu* and *Société d'interprétation du milieu marin*, who helped organize these field trips.

Our thanks also go to Ducks Unlimited Canada for their assistance in organizing the silent auction held during the banquet at the Manoir Montmorency. This auction would not have been a success without the involvement of Yvon Mercier of the Canadian Wildlife Service, who led the proceedings, or the generosity of the individuals and organizations who donated the items put up for sale. The funds thus raised will go toward a habitat conservation project in the greater Quebec City area.

We are also grateful to the Department of the Secretary of State, whose interpreters enabled us to run the event in both official languages.

The logistics of the undertaking were handled with the help of *Société Duvetnor*, in particular André Nadeau.

Lastly, this event would not have been possible without the financial and technical backing of the following partners: Fisheries and Oceans Canada, Parks Canada, Wildlife Habitat Canada, the Quebec Wildlife and Parks Corporation, the Quebec Wildlife Foundation and Environment Canada.

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Preamble

This document is a synthesis of the presentations given and seminars held in the course of the 4th National Habitat Workshop.

The organizing committee has made no attempt to standardize the style, content or length of the texts appearing herein. The accounts therefore reflect the character of each speaker's presentation.

The plenary session, moderated by Art Hanson and the chief rapporteurs, summarizes the main ideas, comments and issues to emerge in each of the seminars as presented to the full assembly of participants.

Introduction

4th National Habitat Workshop

Since 1993, workshops on habitat conservation have been organized by the Canadian Wildlife Service in co-operation with its partners.

This initiative arose from the need to disseminate information on major conservation issues, with special reference to mechanisms, methods and techniques for conserving a diversity of natural environments and wild species on both a national and a regional scale.

Held every two years, the workshop also builds and sustains a network of individuals and agencies operating in these areas and serves as a forum for discussion among a wide range of organizations.

The workshop took as its theme «habitat conservation in a context of sustainable development: from words to action», with a focus on farmland, forest, marine, coastal and river ecosystems and the main principles of sustainable development. During the two days of seminars, the participants addressed the following questions: what are the main challenges we face in preserving natural habitats while fostering sustainable development? As the new century begins, who will be the leading agents in the field of conservation? Which approaches should be adopted for realistic application of integrated resource management?

More specifically, for each ecosystem (farmland, forest, marine, coastal and river), we have tried to define the conservation issues by identifying new developments in our knowledge, use and restoration of natural habitats, integrated resource management, community habitat conservation initiatives and protection of natural environments by non-governmental bodies.

Close to 280 people accepted the invitation to attend the workshop. This large number of participants meant that all the provinces and all the regions of Quebec were well represented. Among those present we noted representatives of many agencies, both governmental and non-governmental, operating in the field of conservation, but there was also a strong presence from other spheres of activity such as farming, forestry and fishing. Many observers pointed to this as a clear sign of an interest in these quarters in conservation issues.

CONFERENC SUMMARIES

DAY 2 • 9:05 AM • KEYNOTE ADDRESS

ROOM BORDUAS-KRIEGHOFF

Habitat Conservation & Sustainable Development



Trends, Issues & Strategies

Malcolm C. Mercer, Director, IUCN Canada Office

Loss and degradation of habitats and natural ecosystems is occurring at a speed and scale never seen before. Population and economic growth, expansion of agricultural land, urbanisation, increased use of natural resources and deforestation are the main drivers of these changes. Habitats are harmed or destroyed on a large scale on every continent, resulting in extinction rates 100 to 1000 times higher than in the pre-human period. However, expansion of protected areas which now represent 8% of the world's land area, growing knowledge of ecosystem's and species, as well as increasing success being achieved in the areas of ecosystem restoration and species reintroduction are encouraging signs. Everywhere in the world, new partnerships have been developed between governments, NGOs and the private sector for conservation projects, based on new approaches departing from traditional regulations and centring on proactive strategies, economic incentives and joint initiatives.

These positive trends are reflected in the various options and tools available to conservationists on the road to sustainable development. Habitat protection is a fundamental strategy for the preservation of biodiversity. It has recently evolved to include a large array of legal instruments, appropriate and varied levels of protected area status, and a variety of novel approaches and strategies. The development and dissemination of scientific knowledge and information on ecosystems must be at the basis of any conservation initiative. Geographical and sectoral integration are essential components of any ecosystem management approach. Partnerships with NGOs, the private sector, and local communities must be built to make conservation strategies successful. These partnerships can be supported by public awareness programs and multidisciplinary approaches which are two essential strategies to implement in conservation programmes.

New trends and issues are emerging as we approach the turn of the century. The impacts of climate change on ecosystems and the protection of ecosystems and species from invasive species as trade and tourism rapidly expand are two issues that will shape conservation in the next century. In addition, conservationist will increasingly consider economic issues, such as production and consumption patterns, in their attempts to preserve biodiversity. At the same time, new and improved strategies will offer innovative opportunities for the conservation of habitats and biodiversity. These are some of the challenges that IUCN and the whole conservation community will face in the next century.

DAY 2 • 10:15 AM • PLENARY SESSION

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
CONSERVATION ISSUES**

Pressures and conservation challenges related to natural habitats in the agricultural landscape: southern Québec, past and future

Luc Bélanger¹ et Yvon Pesant²

¹ *Canadian Wildlife Service - Québec Region*

² *Direction régionale Montérégie Est, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec*

Gaining a better understanding of land development and how it has affected the availability and quality of natural habitats is essential in the development of conservation strategies for habitats and biodiversity. This is especially important in areas where humans have extensively shaped the landscape such as the agricultural environment. Since the original landscape was mostly forested, an ideal way to document land use changes in the St. Lawrence Valley is to track the evolution of agriculture and deforestation in Quebec, based on the total area of land under cultivation. Our presentation will demonstrate the relationship between the different periods of forest clearing for agricultural purposes in southern Quebec and wildlife habitat losses. We will provide a historical overview of the effect that socio-economic development has had on the flora and fauna, and show the importance of understanding land development patterns in planning habitat conservation strategies.

DAY 2 • 10:45 AM • WORKSHOP A

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
STRATEGIES/ TRENDS**

Indicators of Habitat Availability on Farmland

Carrie Spencer

Agriculture and Agri-Food Canada

This presentation is based on the findings (not yet published) of Agriculture and Agri-Food Canada's 'Agri-Environmental Indicator' project, which makes use of data from Statistics Canada's national *Census of Agriculture*, as well as biological and ecological literature and interviews held with field biologists from across Canada.

The presentation will describe how an indicator is established, using 'habitat-use units' and land-use information, of trends in the availability of wildlife habitat on farmland for the seven main ecozones in which agriculture is practised in Canada.

The value of these findings in terms of developing and supporting decisions made with regard to the agricultural landscape will also be discussed. Included in this portion of the presentation will be how the findings of this project could be used to target voluntary initiatives which may be undertaken by farmers and ranchers in the future, in order to protect species which are at risk of extinction.

DAY 2 • 10:45 AM • WORKSHOP A

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
STRATEGIES/ TRENDS**

Using the Watershed-Based Management Approach to
Support Habitat Conservation in the Agricultural Environment

Stéphane Gariépy

*Engineer, M Sc (Water), Quebec Department of the Environment, Agricultural and Natural
Habitat Policy Branch*

Protecting and developing habitats in the agricultural environment pose a considerable challenge because of the often very significant deterioration of terrestrial and aquatic ecosystems, the wide variety of situations encountered and the complex relationships between the agricultural socio-economic sector and the environment.

The strategies adopted regarding habitats in the agricultural environment will depend on the extent to which they have been modified. In areas that have been only slightly affected, habitat conservation or restoration are appropriate. Where the intensity and persistence of socio-economic activities have led to widespread ecosystem degradation and habitat loss, the environment's potential can be improved to provide habitats for some species by rehabilitating certain natural processes. In the agricultural environment, rehabilitation is often the only feasible solution in view of the technological and socio-economic compromises required to protect or create habitats.

The goal of watershed-based management is to protect and restore water resources and their associated ecosystems in order to ensure that the watershed's various uses are preserved within its geographical boundaries. This approach provides an appropriate framework for wise habitat and water management that takes into account the various interests present in watersheds. It is generally an integrated, holistic approach that uses a problem-solving strategy to maintain or restore the physical, chemical and biological integrity of aquatic ecosystems, protect human health and support the sustainable development of human activities.

Starting from the basic tenet that the watershed is the most appropriate geographical unit for managing a body of water and its associated ecosystems, some of the recognized principles of watershed-based management are: a long-term perspective and the search for solutions in keeping with the concept of sustainable development; incorporating various viewpoints related to water management (environmental and ecosystem, economic, social and educational); a problem-solving process based on the latest scientific and technical knowledge and the best data available; consultation on objectives and methods and co-ordinating action; adapting the structure and roles of organizations to action at the watershed level; a bottom-up approach based on empowerment and the participation of local and regional stakeholders; and the coherent integration of activities from the smallest watershed to the largest.

After clarifying some of the limits of habitat conservation in the agricultural environment, this paper outlines the major principles of the watershed-based management approach, including an operational definition. An implementation framework for watershed-based management will then be presented, along with some of the approach's benefits. The conference text will be accompanied by a list of Web sites of interest on watershed-based management.

DAY 2 • 10:45 AM • WORKSHOP B

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
STRATEGIES/ TRENDS**

Forest Habitat Management Strategy for New Brunswick

Mike Sullivan

Forest Habitat Program Manager, Fish and Wildlife Branch, New Brunswick Department of Natural Resources

Since the inception of the Crown Lands and Forest Act in 1980, New Brunswick has implemented a five-year cycle of adaptive management planning across all three million hectares of public land. The first set of forest management plans were developed in 1982 and primarily focussed on achieving a sustainable fiber supply. Every five years, since 1982, the forest management plans are redone and new objectives are added and/or refinements are made to existing management objectives. Initially, to account for non-timber values, fifteen percent of each forest type was considered unavailable in order to account for areas with limited or no timber harvesting, such as riparian zones and deer wintering areas. The third set of management plans (1992) were the first to include quantitative, spatially explicit wildlife habitat objectives. These objectives were based on an assessment of the present and forecast forest structure, as indicated in the long term forest management plans, against the habitat requirements of vertebrate wildlife. A significant reduction in 60 year-old and older coniferous forest types was forecast within thirty years. Objectives for these forest types were developed and implemented in the 1992 forest management plans to accommodate vertebrate wildlife communities that inhabit them. In preparation for 2002 management plans, habitats have been defined to cover the range of vertebrate wildlife species inhabiting the forest. With a goal of supporting populations of native wildlife species throughout their natural distribution, threshold levels were established for each of the identified habitat types. The 2002 forest management plans are to maintain each of the habitat types above the threshold levels.

DAY 2 • 10:45 AM • WORKSHOP B

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
STRATEGIES/ TRENDS**

Forest Management Certification and Habitat Conservation

*Tony Rotherham, Director, Forests
Canadian Pulp and Paper Association*

Will Forest Management Certification Conserve Wildlife Habitats

It depends on the standard, policy, legislation and management objectives.

CERTIFICATION: Verification that your practices or management system conform to a standard

- ?? Standard
- ?? Implementation by an organization
- ?? Third party audit
- ?? Certification or registration

Types of Standards

- ?? Prescriptive
- ?? Detailed instructions on what to do and what not to do
- ?? Objective
- ? Clear objectives to be achieved
- ?? Management System – Generic
- ?? A clear set of steps to be taken to ensure good management and a good result
(ISO 14001 EMS)
- ?? Management System with Objectives
CSA Z808 / Z809 SFM

Habitat Conservation and Forest Management in Canada

- ?? 94% public ownership for forest lands
- ?? Comprehensive legislation and policy
- ?? SFM -- a national commitment

CCFM C & I

- ?? Biodiversity
- ?? Forest
- ?? Ecosystem
- ?? Soil & Water
- ?? Global Ecological Cycles
- ?? Multiple Benefits to Society
- ?? Society's Responsibility

Brisbane Conference Certification, SFM & Trade

Findings

- ?? Certification is not the key
- ?? Government policy & legislation is the key (especially in Canada)

- ✍ ~~A~~ management system is important
- ✍ ~~C~~ertification is a confirmation

ISO 14001 EMS A Generic Management System

- ?? Commitment
- ?? Comply with legislation
- ?? Environmental policy
- ?? Identification of environmental aspects
- ?? Planning and setting objectives & targets
- ?? Implementation / training Measurement & evaluation
- ?? Review & improvement
- ?? Continual improvement policy
- ?? 3rd party audit of EMS
- ?? Certification

CSA Z808 / Z809 Management System With Objectives

- ?? An EMS compatible with ISO 14001
- ?? Comply with legislation
- ?? Public participation
- ?? CCFM C & I for SFM
- ?? Forecasting
- ?? Third party audit of on-the-ground performance
- ?? Certification

Prescriptive Standards

- ?? Detailed
- ?? Limiting innovation
- ?? Limits continual improvement
- ?? How do we apply new knowledge
- ?? May conflict with legislation
- ?? Standards must change over time society, legislation and science changes
- ?? Changing a prescriptive standard is a tedious, complex process

Canadian Legislation and Habitat Conservation

- ?? Government policy
- ?? Legislation
- ?? Forest management objectives
- ?? Corporate commitment -- growing
- ?? Knowledge awareness -- growing
- ?? Environmental Management System (EMS) to ensure consistency

Role of Certification Promotes

Promotes:

- ?? Implementation of EMS
- ?? Identification of environmental aspects of operations
- ?? Establishment of performance objectives
- ?? Consistent achievement of objectives
- ?? Continual improvement

Which Standard ?

- ?? CSA Z808 / Z809 SFM
- ?? ISO 14001 EMS with Canada's policy and legislation

DAY 2 • 10:45 AM • WORKSHOP B

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
STRATEGIES/ TRENDS**

Mature and old-growth forests: a conservation challenge in the boreal forest

Pierre Drapeau¹ and Jean-Pierre Savard²

¹ *University of Quebec at Montreal, Biology Department, Interuniversity Forest Ecology Group (GREFI).*

² *Canadian Wildlife Service, Québec Region*

In Quebec, the boreal forest still encompasses extensive stands that originated from natural disturbances such as wildfires. Recent studies conducted by researchers with the Interuniversity Forest Ecology Research Group (GREFI) at UQAM show that a large proportion of the forest mosaic is made up of forests older than the rotation age (overmature and old-growth forests). The ever-increasing demand for timber, combined with a silvicultural regime based on shortened rotations, may lead to a serious shortage of such stands in the short-term. In contrast with the coniferous forests of the Pacific Coast and the Rockies, we do not have sufficient knowledge at present to assess the contribution that overmature and old-growth stands make to regional biodiversity in the boreal forest of Eastern Canada. Knowledge acquisition on the biodiversity of forests that are older than the silvicultural rotation age has direct implications for the forest management strategies that can be developed in a sustainable forest management framework. A study has been under way since 1997 on the biodiversity of mature and old-growth forests originating from natural disturbances. The study area, covering 25 000 km², encompasses the Quebec and Ontario portions of the extensive Clay Belt region in the Abitibi. The goal of our studies is to evaluate within the boreal forest (notably in black spruce stands) the contribution that overmature and old-growth forests make to regional biodiversity along an age gradient ranging from forests that have just burned to forests that have not burned for more than 200 years. Four taxonomic groups have been studied: vascular plants, nonvascular plants, insects and birds. The preliminary results of this research are outlined and discussed in relation to both present management strategies and the strategies that should be developed in a sustainable forest management context based on biodiversity maintenance.

DAY 2 • 10:15 AM • WORKSHOP C

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
STRATEGIES/ TRENDS**

Cutting through the confusion

Francine Mercier

National Parks Directorate

Parks Canada

During the last decade, Canada went from having one national programme dedicated to the conservation of the marine environment, to three: Parks Canada's National Marine Conservation Areas programme, Fisheries and Oceans' Marine Protected Areas programme and Environment Canada's marine programme which includes Migratory Bird Sanctuaries, National Wildlife Areas and Marine Wildlife Areas. Because all three programmes have seemingly burst onto the marine conservation scene, there is a great deal of confusion, for the public, and even for the agencies involved, as to what exactly the differences are between them. This presentation highlights those differences and shows that these marine protected area programmes are in fact distinct and complementary.

DAY 2 • 10:15 AM • WORKSHOP C

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
STRATEGIES/ TRENDS**

Integrated coastal zone management within everyone's reach:
a simple approach

Marie-France Dalcourt

Department of Fisheries and Oceans, Laurentian region

Integrated Coastal Zone Management (ICZM) is a dynamic and continuous process of harmonization that supports decision-making about a given coastal region and associated uses and resources. This approach is ecosystem-based and subscribes to the principles of sustainable development, precaution and integration of the concerns of all players. Integrated management seeks to replace fragmented decision-making based on spheres of activity (traditional mode of management) with a process of active participation engaging all users. Integrated coastal zone management involves balancing conflicting uses, assessing the impacts of development, integrating traditional knowledge and encouraging local stakeholders to take charge of activities. Although the ICZM concept is quite well known, concrete examples of its application are as yet few and far between.

In 1996, local organizations and the Department of Fisheries and Oceans (DFO) initiated a pilot project on the north shore of the St. Lawrence Estuary to develop a community-based approach to integrated coastal zone management. The study area is located in the Upper North Shore region, between the towns of Escoumins and Betsiamites, and encompasses some 100 km of coastline. By reviewing the results of this pilot project and other integrated management initiatives (watershed-based management, integrated forest resource management, etc.) DFO has endeavoured to identify the successful elements and incorporate them into a simple approach capable of stimulating community interest in drawing up and implementing ICZM plans. The approach will soon be described in a publication intended for local and regional stakeholders.

A few of the key ingredients in the success of integrated management initiatives are as follows:

- ?? Division of the coastal zone based on administrative boundaries (human environment) and ecological realms;
- ?? A coastal committee representing the different sectors of activity and geographic regions (ensuring equal participation);
- ?? A mode of operation based on consensus and mutual respect;
- ?? A shared vision of the targeted coastal zone;
- ?? Sharing of information (environmental, legal and socio-economic);
- ?? An ICZM plan that is realistic and feasible;

- ?? Support of the population;
- ?? Monitoring of actions and ecosystem health and dissemination of results;
- ?? Periodic review of the integrated management plan (ongoing process).

The support of public agencies from the different levels of government is essential as well. Such agencies have information, expertise, legal powers and resources without which the community-driven process would be constrained. In addition to promoting direct actions for a given region, community-based ICZM can serve as a catalyst for harmonizing government initiatives and promoting integrated management at the regional and national levels in order to address broader issues.

DFO's project to develop an ICZM approach comes under the Biodiversity component (Habitats) of the St. Lawrence Vision 2000 Action Plan, Phase III.

References:

Lalumière, R. and Jean Morisset. 1998. Pilot Project (Stage II). Reference Framework for the Integrated Management of the Les Escoumins - Rivière Betsiamites Coastal Zone. Joint report by Groupe-conseil Génivar and Fish Habitat Management, Fisheries and Oceans Canada, Laurentian Region.

Lalumière, R. and DFO. (in prep.). Approche méthodologique pour l'application de la gestion intégrée de la zone côtière à l'échelle communautaire (titre provisoire). Joint report by Groupe-conseil Génivar and Fish Habitat Management, Fisheries and Oceans Canada, Laurentian Region.

DAY 2 • 10:15 AM • WORKSHOP C

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
STRATEGIES/ TRENDS**

Habitat management, a community experience

*Gaétan Roy, Administrative Co-ordinator
Stratégies Saint-Laurent*

The St Lawrence Action Plan, launched in 1998, has promoted awareness among and empowered the communities located along the St Lawrence River. Dissatisfied about not being given a say on many aspects of the measures implemented by the federal and provincial governments, many representatives of these riverside communities and environmental groups including the Union québécoise pour la conservation de la nature (UQCN) instituted a program called Stratégies Saint-Laurent in order to provide a forum and a mechanism allowing communities to participate in important decision-making processes related to management of the river ecosystem and habitats. During Phase II of the Action Plan (SLV 2000), this program was given due recognition and included in the SLV 2000 activity components. Community involvement was officially recognized as an integral part of protecting and managing the St Lawrence, and a comprehensive program (ZIP Program) was set up to promote active community participation and empowerment. This initiative has been so successful that, at present, more than 150 projects to restore, conserve and enhance the St Lawrence and its habitats are either already under way or about to be started up by members of the different communities. The term «community» comprises all users of the St Lawrence, such as residents, industrial plants, fishers, farmers, environmental groups, municipal officials and environmental and other experts. Based on our recent experience, this is definitely an effective habitat protection tool? However, there are some constraints and these must be overcome in order to develop a truly effective tool for managing the St Lawrence and the environment in general that can be applied by citizens and users who lack the know-how and financial resources to do this.

DAY 2 • 1:30 PM • WORKSHOP D

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
ADVANCES IN KNOWLEDGE**

At what point can forest fragmentation be said to be occurring in agricultural environments: when 20, 40, 60 or 80% of the region is forested?

Luc Bélanger and Marcelle Grenier

Canadian Wildlife Service, Quebec Region

In this study using the boundaries of regional county municipalities as a sampling unit, we set out to provide a picture of the forest situation in the St. Lawrence Valley (encompassing over 17 million hectares). More specifically, high-resolution satellite images and a geographic information system were harnessed in order to assess the effect of different agricultural activities and extent of human land use in relation to the fragmentation process that is occurring. First, our results show that, on average, forest cover accounts for 45% of the total area of all the RCMs combined. However, the percentage of tree cover varies substantially from one RCM to the next, with a general trend of decreasing cover from east to west in southern Quebec. This variability is above all linked to the proportion of land devoted to agriculture, given that as agricultural land use increases, woodland density increases also, but mean woodlot area declines. There appears to be a fragmentation threshold corresponding to about 50% of total forest cover. Out of the 59 RCMs studied, 31 were found to have levels of fragmentation below this threshold. In addition, forest fragmentation appears to increase along a gradient from traditional agriculture characterized by dairy production to more intensive agriculture dominated by field crops. The authors report also that the forest discontinuity index, woodlot density and mean woodlot area are probably the best indicators of the process of forest fragmentation in the region. Furthermore, various predictors of forest fragmentation were used, such as forest cover as a percentage of total area of RCMs, the proportion of land devoted to agriculture, the relative importance of the different types of agricultural production and extent of human occupation; however, the latter variable showed the highest correlation with level of forest fragmentation.

DAY 2 • 1:30 PM • WORKSHOP D

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
ADVANCES IN KNOWLEDGE**

What effects does forest fragmentation have on wildlife in Quebec's agricultural environment?

Pierre Drapeau

University of Quebec at Montreal, Biology Department, Interuniversity Forest Ecology Group (GREFI)

Forest fragmentation associated with the expansion of agriculture is recognized as one of the main threats to biodiversity maintenance in the temperate hardwood forests of Eastern North America. For nearly 20 years now, various studies have focussed on forest fragmentation in the agricultural environment and the associated impacts on wildlife. This work has shown that owing to the reduced areal extent and increased isolation of forests in the agricultural landscape, forest-dwelling animal species encounter living conditions that could compromise the viability of their populations. The findings also indicate that, although the ecological factors affecting the wildlife of fragmented forests may occur in all of the hardwood forests of Eastern North America, the intensity of those factors and their interaction may vary widely depending on regional conditions. For example, the ecological factors influencing the distribution of animal populations in fragmented forests within agricultural landscapes of the St. Lawrence Valley are not necessarily the same as those affecting wildlife in the farm woodlots of southern Ontario or the State of New York. It is therefore difficult to transfer habitat conservation strategies to other regions without having knowledge of wildlife distribution in those regions and the ecological factors governing this distribution. This paper reviews the main ecological factors impinging on wildlife in fragmented agro-forestry landscapes; outlines the knowledge gaps related to the effects of fragmentation on wildlife in Quebec's agro-forestry environment; and puts in perspective the importance of adopting forest habitat conservation strategies for the agricultural environment that are based on in-depth knowledge of regional wildlife.

DAY 2 • 1:30 PM • WORKSHOP D

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
ADVANCES IN KNOWLEDGE**

Preserving forest corridors in the agricultural landscape

Sonia Duchesne¹, Mario Dion² et Luc Bélanger³

¹ *President of the Fondation Les oiseleurs du Québec inc.,*

² *Regional planner with the Lower Richelieu RCM*

³ *Biologist, Environment Canada, Canadian Wildlife Service, Québec Region*

Human use of the land has greatly modified forest landscapes in many areas of Quebec, particularly in the southwestern part of the province. Over the past few decades, farmland, cities, suburbs, highway infrastructure and industrial zones have steadily encroached on the forest, resulting in the loss of habitats suitable for flora and fauna. Human encroachment on the original forests has fragmented them into small islands, which are separated by ever-greater distances. Aside from reducing genetic exchanges among populations, this fragmentation has substantially reduced the ability of forest-dwelling species to colonize and travel between different habitats.

Recent studies have shown that flora and fauna use strategically positioned residual forest habitats (woodlots, hedgerows, groves of trees, etc.) in order to travel and disperse from one habitat to another. These habitats form what are known as forest corridors or greenways, which basically serve as ecological links in agricultural sectors that have undergone extensive development.

As a means of encouraging projects to conserve forest greenways in Quebec, the Fondation Les oiseleurs du Québec inc. and Environment Canada's Canadian Wildlife Service, Quebec Region recently developed a method for identifying and characterizing forest corridors in the agricultural landscape. It is based on research projects conducted around the world and in Quebec.

This presentation is divided in three parts. First, we deal with the ecological context of agricultural landscapes by briefly reviewing the concept of forest corridors; we also discuss the main roles and benefits of such corridors in agricultural environments. The second part of the presentation will focus on the method used in identifying and characterizing forest corridors (including the project context and the completion stages). We also describe a pilot project undertaken to conserve a forested corridor in the Lower Richelieu RCM, the first practical example of such an undertaking. A description is given of the selected corridor, the project phases, the conservation methods used and the role of the different stakeholders involved in preserving the corridor. In concluding, we also outline the development prospects for the project.

DAY 2 • 1:30 PM • WORKSHOP D

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
ADVANCES IN KNOWLEDGE**

Peatland conservation in south-eastern Canada

Monique Poulin

Phytology Department, Laval University, Québec

Peatlands constitute important, representative landscape elements of south-eastern Canada. However, peatlands are currently subjected to intensive habitat loss through anthropogenic activities. Studies conducted by the Peatland Ecological Research Group (<http://alpha.eru.ulaval.ca/gret-perg/>) allowed researchers to define decision rules regarding peatland conservation at both the peatland and regional scale. At the peatland scale, flora and bird species assemblages found in remnants left out by the peat industry in the margin of exploited peatlands differ from species assemblages found in natural peatlands. For instance, drainage reduces the abundance of many plant species, especially *Sphagnum* mosses, and isolation alter birds species assemblages, among others, reducing Palm warbler occurrences. Moreover, many plant species living in and around pools found in the center of natural peatlands are lost to exploitation because peatland remnants lack pools as they are generally located in the margin of exploited peatlands. At the regional scale, peatlands differ from surrounding habitats in terms of bird species assemblages and this difference increases from north to south in the meridional part of the province of Québec. Peatlands thus contribute to regional avifauna. Moreover, bigger peatlands have a greater bird species diversity than small peatlands and contain more rare bird species. Regional peatland plant distribution is presently being assessed through satellite imagery.

DAY 2 • 1:30 PM • WORKSHOP E

**FOREST ECOSYSTEM — ROOM BORDUAS-KRIEGHOFF
ADVANCES IN KNOWLEDGE**

Taking biodiversity conservation into account in private forest protection and enhancement plans: an approach proposed to forestry agencies

*Pierre Blanchette¹, Pierre LaRue¹, André Bouchard²,
Maurice Roy² and Josée Pâquet³*

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² *Ministère des Richesses naturelles du Québec*

³ *Fédération des producteurs de bois du Québec*

In preparing plans for forest protection and enhancement (PPMV), regional agencies involved in private forest development should take sustainable forest management criteria into account, as stipulated in the *Forest Act*. One such criterion involves ensuring biodiversity conservation. An approach involving land use analysis was proposed to officials responsible for drawing up forest protection plans as a means of identifying the problems and issues associated with maintaining biodiversity. This approach is based on the coarse filter–fine filter concept and uses the ecological and forestry data that are currently available to agencies.

The first step in the approach is to define the forest ecosystems based on the composition and structure of the forest cover and the physical environment. The databases linked to the ecoforest maps produced by the Quebec Department of Natural Resources can be tapped to quickly take stock of the different forest ecosystems that exist within a given agency's territory. Secondly, the habitats of the wildlife species that are representative of the different forest environments are also taken into consideration to assess the region from the standpoint of its fauna. An inventory of the forest ecosystems and the habitats of representative species is then drawn up to identify any elements of concern.

A subsequent stage involves assessing more specific aspects of a problematic nature that were not covered in previous analyses but deserve special attention. This includes threatened plant and animal species, exceptional forest ecosystems and critical wildlife habitats as defined in the *Act respecting the conservation and development of wildlife*. Protection objectives, entailing awareness-raising and information sessions for forestry advisors and private forest owners, are put forward to ensure the sustainability of these sensitive components.

DAY 2 • 1:30 PM • WORKSHOP E

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
ADVANCES IN KNOWLEDGE**

Black spruce forests: habitats that need a helping hand

Réjean Gagnon

University of Quebec at Chicoutimi

The boreal forests of Eastern Canada are largely dominated by black spruce (*Picea mariana*). This spruce species is unique to North America, and Ontario, Newfoundland and Quebec especially have the most extensive black spruce forests in the world. Recent studies, based on natural mechanisms of regeneration, have shown that closed forests of this species are undergoing a natural decline. One of the main causes of this decline is the occurrence of wildfires at a time when viable seeds are in short supply, such as in young stands consisting of immature trees. Given that seed germination conditions are not favourable after a fire (poor seed dispersal and seedbeds), black spruce fail to establish naturally on former growing sites, thus giving way to other species like aspen or jack pine. Alternatively, lichens may colonize the sites, resulting in open spruce forest. To counter this natural decline in black spruce forests and habitats, various measures, such as replanting, can be adopted to ensure the sustainability of black spruce stands. For more information, readers are invited to consult the documents at <http://dsf.uqac.quebec.ca/boreale>.

DAY 2 • 1:30 PM • WORKSHOP E

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
ADVANCES IN KNOWLEDGE**

Impact of logging on wildlife under Québec's present forestry standards

François Potvin

Société de la faune et des parcs du Québec

We studied the short-term response of wildlife to clearcutting in four blocks (52–114 km²) that were logged in 100–250 ha patches distributed in a clustered pattern. Surveys were conducted two years before and two years after logging on the relative abundance of 12 wildlife species and telemetry data were also gathered on four species. Small mammals, the group of species with the smallest home ranges (= 1 ha), either remained in the clearcut patches or occupied replacement habitat in the buffer strips. Most species with home ranges of up to 25 ha (spruce grouse *Canachites canadensis* Linné, snowshoe hare *Lepus americanus* Erxleben) disappeared from the clearcut areas. Species with home ranges = 5 km² (marten *Martes americana* Turton, moose *Alces alces* Linné) remained present in some residual forest patches dispersed throughout the clearcuts and in the adjacent uncut forest. Within their home ranges, both species avoided clearcut patches where the shrub layer and coniferous regeneration were not dense. Because many wildlife species depend on residual forest, the important issue is not the size of clearcut patches but the extent and configuration of the remaining forest. Instead of a clustered distribution of clearcut patches, we propose two harvest scenarios more compatible with integrated wildlife–forest management objectives on a local scale.

DAY 2 • 1:30 PM • WORKSHOP E

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
ADVANCES IN KNOWLEDGE**

Exceptional forest ecosystems in Quebec

Jean-François Bergeron

Quebec Department of Natural Resources

The Quebec Department of Natural Resources set up a working group on exceptional forest ecosystems in 1996 in order to come up with a definition of exceptional forest ecosystems and gather available information on the number of such forests and their locations in the province. Another aspect of the group's mandate involved exploring all possible ways of ensuring the continuity of these ecosystems within Quebec's forest landscape.

Three categories of exceptional forest ecosystems (EFE) were identified: old-growth forests, rare forest ecosystems and forests that provide refuge for threatened or vulnerable plant species. All of the information related to these EFEs has been consolidated in a data bank. From the resulting portrait of EFEs (1999), we were able to determine that 76% of them are deciduous forest, 13% mixed forest and 11% boreal forest. However, the latter type has not been studied much so far.

At present, 17% of the EFEs that are publicly owned are not protected by law although they have temporary protection under a ministerial directive. New legislative provisions are planned with the aim of providing longer-term protection.

Most of the privately-owned EFEs (55%) are deciduous forest, with 7% of these enjoying some form of protection (municipal parks, educational institutions, etc.). The working group on EFEs is currently preparing a framework for ministerial intervention so that measures can be adopted to facilitate maintenance of exceptional forest ecosystems on private lands.

DAY 2 • 1:30 PM • WORKSHOP E

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
ADVANCES IN KNOWLEDGE**

The Copper Lake Buffer Zone Study: A case study assessing the effectiveness of riparian no-harvest areas in mitigating effects of forest harvesting on salmonid populations and their habitats

D.A. Scruton¹, K.D. Clarke¹, J.H. McCarthy², and R.A. Curry³

¹ Fisheries and Oceans, Science Branch

² AGRA Earth and Environmental Ltd

³ University of New Brunswick, Cooperative Fish and Wildlife Unit

The Copper Lake Buffer Zone Study is a multi-year, multi-disciplinary research project, conducted under the auspices of the Western Newfoundland Model Forest, that was initiated to evaluate the effectiveness of a 20 meter 'no-harvest' or buffer zone in mitigating the detrimental effects of forest harvesting on small headwater streams in Newfoundland, Canada. The study was initiated in the summer of 1993 with pre-harvest conditions being studied from 1993 to 1995. A limited clear cut was conducted during the winter of 1995 with harvesting being completed during the summer of 1996. Streams within the watershed were harvested with one of three 'buffer' treatments; (i) clear cut to the water's edge (i.e. no buffer), (ii) with a 20 meter buffer or (iii) a 100 meter buffer which served as a control. Two years of post harvest study (1997 and 1998) have been conducted to assess changes in physical habitat parameters such as large organic debris, sedimentation, water temperature, water quality and hydrology over the course of the study. The effect of these physical changes on brook trout (*Salvelinus fontinalis*) densities, incubation habitat and migration patterns is discussed.

DAY 2 • 1:30 PM • WORKSHOP F

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
ADVANCES IN KNOWLEDGE**

Tools and products of the Canadian Hydrographic Service (CHS), precious aids to habitats management and sustainable development

Richard Sanfaçon

Canadian Hydrographic Service, Fisheries and Oceans Canada, Laurentian Region

The Canadian Hydrographic Service uses tools and makes products contributing to the enhancement of information and knowledge on marine territory. The speaker will briefly describe the organisation, its mandate, mission and vision. He will elaborate on a list of tools as the Coastal and Oceanographic Water Level Information System (COWLIS), and the multibeam sonars, installed on different boats, and used in depth measurement (bathymetry). More time will be spent on water level measuring systems and on bathymetric surveys and the products of sonar imagery. Examples of these services and products will be presented through many projects, related to habitats management, regional as much as international. Finally, there will be a reminder on the essentials products like the Marine charts, Sailing directions, Tide tables and Currents atlas. If marine habitats management and sustainable development required better information and knowledge on the marine territory, CHS can help you.

DAY 2 • 1:30 PM • WORKSHOP F

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
ADVANCES IN KNOWLEDGE**

Bioremediation / Phytoremediation of Oil Spills in Wetlands

Kenneth Lee

*Habitat Management and Environmental Sciences Division, Maurice Lamontagne Institute,
Fisheries and Oceans Canada*

Despite advances in preventative measures, recent events have demonstrated that accidental oil spills at sea will still occur. While physical (e.g. booms and skimmers) and chemical (e.g. chemical dispersants) methods have been developed to recover and/or disperse oil spilled at sea, they are not 100% effective and are frequently limited by operational constraints attributed to sea state and/or nature of the contaminant. As a result, oil spills frequently impact shoreline environments including wetlands. These sites of ecological significance are among the most sensitive and most difficult to clean. Application of traditional oil spill cleanup techniques within these habitats may cause more damage than the oil itself as foot and mechanical traffic will damage vegetation and drive the hydrocarbons into the anaerobic layer of the sediments where petroleum hydrocarbons may persist for decades. Knowledge on natural recovery (no-treatment) rates and less intrusive but effective oil spill countermeasures are clearly required for wetland habitats.

In situ bioremediation, by the addition of substances (e.g., nutrient enrichment) or modification of habitat at contaminated sites (e.g. phytoremediation by vegetative transplantation) to accelerate natural biodegradation processes is now being considered as a potential oil spill response technology for the remediation of wetland sites. This treatment strategy has an operational advantage in that it breaks down and/or removes the residual contaminants in place. Laboratory experiments and field trials have demonstrated the feasibility and success of bioremediation strategies such as nutrient enrichment to enhance bacterial degradation of oil on cobble, sand beach and salt marsh environments. To evaluate the potential of these treatment strategies in a wetland environment, in the summer of 1999, a controlled oil spill experiment has been initiated at St. Croix, Quebec, Canada.

DAY 2 • 1:30 PM • WORKSHOP F

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
ADVANCES IN KNOWLEDGE**

Modelling abiotic and biotic factors for use in quantifying fish habitat, in the freshwater part of the St Lawrence

Mingelbier Marc¹ and Jean Morin²

¹ *Société de la faune et des parcs du Québec*

² *Atmospheric Environment Division, Environment Canada*

Lake St Pierre has long been considered a homogeneous floodplain. After several sessions of intensive sampling, it was determined that this riverine lake exhibits strong spatial heterogeneity from a biological standpoint. The first attempts at providing a physical description of the lake also reveal this strong heterogeneity.

Paradoxically, the intensive biological sampling efforts carried out in the St Lawrence since the early 1970s provided only a sketchy description of the physical habitat of fishes. This is surprising since heterogeneity in the distribution of fish species is highly dependent on habitat and hence the physical configuration of the river. We set out to simulate a posteriori the physical habitat corresponding to each sampling period by using major biotic variables such as flow (current, water level), waves, topometry (bathymetry, relief and shoreline contours), substrate and presence of macrophyte assemblages. Given the very fine spatial resolution that we used (about 50 m), which was finer than that previously applied to the St Lawrence, the physical description of the river should not constrain the present biological analysis.

We think that these results will help to refine our understanding of the physical habitat needs of several fish species and of the dynamics of fish communities, by providing a precise idea of the proportion of the spatial variability in fish populations that can be attributed to the river's physical configuration. Once this method has been perfected at Lake St Pierre, we hope to apply it to other stretches of the St Lawrence.

DAY 2 • 1:30 PM • WORKSHOP F

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
ADVANCES IN KNOWLEDGE**

The quality of riparian strips and the integrity of fish and benthic communities in fluvial ecosystems

Yvon Richard

Aquatic Ecosystems Branch, Ministère de l'Environnement du Québec

The Quebec Department of the Environment has developed an index for assessing the effectiveness of riparian strips in mitigating the effects of diffuse agricultural pollution on water quality and the biotic integrity of communities of fish and benthic organisms. The main index components are forest, shrubs, herbaceous meadow, cutovers, crops, fallow land and pasture, infrastructure, bare soil and bedrock. The influence that the different components have on the index depends on their respective share of riverbank area and on their ability to provide the ecological functions necessary for maintaining and protecting aquatic life.

When applied to the Chaudière River, the index showed that 40% of the banks had been altered and lost their natural vegetation cover, mainly as a result of encroachment by agricultural activities and urban development along the river. In sectors where the riparian strip was of lower quality, water turbidity was found to increase, probably because bank erosion and soil leaching exceeded the system's adaptive capacity. An impoverishment of the benthic community was also noted, along with a decrease in the density of insectivorous cyprinids. This phenomenon can be explained by the reduction in aquatic habitat complexity resulting from siltation of the riverbed (clogging of interstitial spaces) and by the decrease in the density of woody debris that falls into the water. Woody debris is known to provide favourable habitat for benthos and fish, which use the fibre as a food source.

The riparian strip quality index developed through this study provides a tool for the rapid and comprehensive assessment of the ecological condition of riverbanks and the associated effect on the integrity of the aquatic environment. It can readily be used to assess other rivers.

DAY 2 • 1:30 PM • WORKSHOP F

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
ADVANCES IN KNOWLEDGE**

Effect of underwater activities on the benthic marine landscape in Saguenay—St. Lawrence Marine Park

Frédéric Guichard and Mathieu Cusson

Explos-Nature, Division Recherche

Diving sites are an important tourist attraction in the Escoumins region. Studies conducted there have shown diving-associated deterioration in benthic marine habitats, particularly in relation to the frilled anemone, *Metridium senile*. Since this type of anemone is integral to the beauty of the marine landscape, its declining abundance may jeopardize the economic value of the sites over the medium and long term. To manage diving sites, it is necessary to know the rate at which species disturbed by divers are able to recolonize sites. We assessed recolonization by benthic species at two diving sites and at three sites not frequented by divers. The results showed that frilled anemone recolonization of a deliberately devegetated habitat was slowed by the presence of divers. A series of measures were subsequently designed incorporating the experimental findings: (1) a long-term monitoring protocol based on using frilled anemone as an indicator species, (2) a science-based tourism program allowing sports divers to take part in the long-term monitoring of disturbed habitats, (3) a survey of sports divers aimed at quantifying the economic depreciation in disturbed habitats and (4) development of a computerized tool (*i. e.* geographic information system) for managing and disseminating popularized information on frequented benthic marine habitats that incorporates all the ecological and socio-economic knowledge acquired on underwater activities in the region.

DAY 2 • 3:45 PM • WORKSHOP G

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
WILDLIFE MANAGEMENT**

Gilbert Island, Saint John River, N.B.

An experiment in best land use for agriculture and wildlife

Colin MacKinnon¹ and Sara Richard²

¹ *Wildlife Biologist, Canadian Wildlife Service, Atlantic Region*

² *EHJV Program Manager, New Brunswick Department of Natural Resources and Energy*

Gilbert Island, located in the Saint John River approximately 25 km downstream of Fredericton, New Brunswick, is a biologically unique floodplain island. This Island is important to breeding and migrating waterfowl and other wildlife as it contains productive wetlands. The floodplain hardwood forest (especially the oldgrowth stands of butternut, elm, silver maple, and basswood) is of significance in regional biodiversity. The butternut trees on Gilbert Island have been recognized as one of the most significant stands in eastern North America.

The Island is approximately 600 acres with the majority of it owned by the New Brunswick Department of Agriculture and Rural Development (NBDARD) and the remaining 150 acres jointly owned by the Canadian Wildlife Service (CWS) and the New Brunswick Department of Natural Resources and Energy (NBDNRE). Since the 1960s NBDARD has leased their portion of the Island for cattle pasture and the present leaseholder is the Sussex and Studholm Agricultural Society (SSAS). Over the past thirty years there has been numerous conflicts between agriculture and wildlife interests. In 1995, a representative from NBDARD was added to the NB Eastern Habitat Joint Venture (EHJV) Steering Committee. Since CWS and NBDNRE are partners in the EHJV, the issue of Gilbert Island was raised. In 1996, the Gilbert Island Steering Committee was formed with one representative from each stakeholder group (CWS, NBDARD, NBDNRE, and SSAS). With this group it was decided to hire a consultant to discuss management options of the Island that would be suitable to all groups. The consultant recommended fencing the more sensitive areas of the Island to exclude cattle and the implementation of a rotational grazing.

It was agreed by the Steering Committee to fence off the interior wetlands from cattle thus benefitting both wetlands and forest by preventing cattle access and grazing. Fencing would also benefit agricultural interests since the farmers could control access to the pasture and that weight gain on the cattle should be increased because less time would be spent in the wetlands and grazing on trees.

During the fall of 1997, test sections for the fence were put up to see how the fence would endure to spring floods and ice buildups. In May 1998 the fence was completed prior to putting the cattle back on the Island. It is estimated that the fence will protect approximately 350 acres of wetlands and floodplain forest and 250 acres would be left for pasture. The response from this project from both agriculture and wildlife interests has been quite positive. In New Brunswick, projects involving integrated land use with both wildlife and agriculture have been initiated during the past few years. It is hoped that Gilbert Island will be used as a successful demonstration of multiple land use.

DAY 2 • 3:45 PM • WORKSHOP G

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
WILDLIFE MANAGEMENT**

An evaluation of level ditches as waterfowl brood habitat
in the Saint John River floodplain

*Alan R. Hanson¹, Andrew R. MacInnis², Susan M. Bowes³ and J. Bruce
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³ *Fish & Wildlife Branch, Department of Natural Resources & Energy*

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Level ditching has been suggested as a method to provide waterfowl brood-rearing habitat along floodplains. Level ditches were excavated in 1988 and 1989 at three sites along the Saint John River near Fredericton, New Brunswick. Level ditches were designed to be sinuous in shape, 6 m wide, with a 2:1 slope on the sides of the ditch, with the centre 2.5 m section being 0.9 m in depth. We quantified the use of level ditches along the Saint John River floodplain by waterfowl broods during 1990-1995. The suitability of the habitat was evaluated in relation to water chemistry, algal biomass, vegetative community and invertebrate abundance.

Mean brood density was 0.23, 1.24 and 0.93 broods per hectare of open water for the Ash Swamp, Scovil Point, and Upper Hampstead level ditching sites respectively. High water levels in 1992, 1993, and 1994 forced cancellation of brood surveys during these years. Brood densities at Scovil Point and Upper Hampstead were comparable to those reported for floodplain impoundments, whereas brood densities at Ash Swamp were comparatively low.

Based on phosphorous and chlorophyll-a concentrations, the level ditches ranged from mesotrophic to eutrophic. Both emergent and submergent vegetation was prevalent in the ditches. Activity trap and sweep net samples indicated that invertebrate food resources were comparable to other floodplain wetlands and higher than that reported for inland wetlands. In general, level ditches have similar water chemistry, vegetative and invertebrate communities, compared to other floodplain wetlands. These basic measures of wetland quality suggest that food resources within the level ditches are likely adequate for duck production. Morphometry of the ditches, easy access to escape cover by broods, and the availability of adjacent nesting habitat may be the key factors which determine the suitability of level ditches as brood-rearing habitat. Future implementation of the technique should utilize level ditches in conjunction with ponds and adjacent nesting habitat.

DAY 2 • 3:45 PM • WORKSHOP G

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
WILDLIFE MANAGEMENT**

Wildlife use of natural and managed floodplain marshes
of the Saint John River, New Brunswick

Kevin Connor

New Brunswick Department of Natural Resources and Energy

The lower Saint John River wetland complex comprises the most productive wetland habitats in New Brunswick. There are over 20,000 ha of wetlands along the main river and its tributaries that make up 7 % of the total provincial wetland base. These wetlands are a focus of conservation efforts under the Eastern Habitat Joint Venture (EHJV) of the North American Waterfowl Management Plan (NAWMP) in New Brunswick. To date, management has focused on water level control through impoundment to increase the amount of available brood rearing habitat for waterfowl. Currently, impounded wetlands make up nearly 11% of the Saint John River Floodplain complex. The benefits of habitat enhancement efforts for many wildlife species differ and were largely unknown for the region. We assessed the use of seasonally flooded (natural) and impounded (managed) wetlands by amphibians, obligate water birds and songbirds through breeding call surveys in 1998. Differences in species richness and relative density occurred for various species between habitat types. Determining the impacts of existing management techniques will aid in the management of future activities to ensure conservation of sensitive habitats together with maximum benefits to waterfowl and other wetland-obligate species.

DAY 2 • 3:45 PM • WORKSHOP G

AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ WILDLIFE MANAGEMENT

Fish habitat optimization in managed floodplain marshes: more progress!

Suzanne Lepage

Aquatic Wildlife Service, Wildlife and Habitat Branch, Société de la faune et des parcs du Québec

In Quebec, floodplain enhancement work first began in the 1970s with the advent of Ducks Unlimited. Most of the enhancements carried out along the banks of the St. Lawrence and the Ottawa River were designed for waterfowl, although they are beneficial to the other wildlife species that inhabit wetlands.

It is currently known that numerous species of fish use managed marshes. Indeed, studies done since 1988 have yielded some astonishing information about the use of marsh habitats by fish fauna. The original goal of the research was to document and find a solution to the serious problem of winter fishkill observed annually in managed marsh habitat.

The study results reveal some drawbacks of floodplain enhancements, as well as the advantages associated with enhancing such habitats, which make them the process worthwhile. Maintaining the water level after the spring flood has dissipated is an approach benefiting spawners that have already deposited their eggs or are about to do so. The shallow water, the rapid rate of warming and the dense aquatic vegetation are all factors conducive to the reproduction of the fish species concerned. So far, 9 to 40 fish species have been inventoried at each enhancement, such as the yellow perch (*Perca flavescens*), northern pike (*Esox lucius*), brown bullhead (*Ameiurus nebulosus*), pumpkinseed (*Lepomis gibbosus*) and golden shiner (*Notemigonus crysoleucas*).

In light of this finding, various solutions were tested at some of the 22 sites where the water level presented a problem. The work dealt with technical aspects of structures as well as with the management and design of the enhancements. Since managed sites differ in terms of their specific characteristics, the most suitable solutions vary from one habitat to the next.

This case-by-case approach does not mean that the expertise acquired over time through testing and experimentation cannot be applied to new situations. Some of the most promising approaches consist in flushing water from channels and installing an outfall for downriver migration along with fish passes. Obvious benefits arise from incorporating improvements into the design of new enhancements, some of which stem from knowledge of practical limitations.

Successes and failures guide continuing research in this field. In view of the major decline that has occurred in the areal extent of natural and managed wetlands and the great importance of such habitats to a wide diversity of species, it is essential that ways be found to maximize their ability to meet the needs of fauna.

DAY 2 • 3:45 PM • WORKSHOP I

MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN HABITAT RESTORATION

Erosion problems associated with riparian habitats along the St. Lawrence

Denis Lehoux

Canadian Wildlife Service, Québec Region

Research programs conducted in recent years by Environment Canada and various associates in the course of the St. Lawrence Plan have brought new light on the problematics of shore erosion along the St. Lawrence River, particularly in the river section between Cornwall and Quebec city. These studies indicated that approximately 400 km, or 25% of the 1 500 km of shoreline investigated, showed traces of erosion. More detailed analyses reveal that 50% of the 146 islands found in the Montreal-lake Saint-Pierre section, representing the equivalent of 240 km of shoreline, present shoreline receding rates ranging from low (? 1m/year) to high (? 3m/year). It is estimated that almost 1 500 ha of island shores habitats have been lost during the last 35 years between Montreal and lake Saint-Pierre alone.

It is difficult to quantify the total habitat losses due to shore erosion between Cornwall and Quebec city, other than island shorelines, since no systematic studies have been conducted. However, these losses are thought to be in the range of 500 ha, for a total habitat loss of 2 000 ha in the study area. The cost of replacing lost habitats, using for example dredged material, would be in the order of 300 millions dollars, assuming a cost of 15\$/ m³. Several factors are responsible for shore erosion among which are ship and small boats-induced waves, water level variations, wind-induced waves, ice and river currents.

If nothing is attempted to stabilize the eroding shores, if the extend of erosion does not decrease in the near future, if an equilibrium is not reached soon and if the spring water levels become high again for several weeks, it can be assumed that major impacts will occur in coming years. Thus, some islands could have totally disappeared within 10 to 40 years. Several islands within the St-Lawrence River are considered prime waterfowl nesting habitats, particularly for dabbling ducks at a mean density of 1.3 nest per hectare. Thus, it can be assumed that a loss of 1 500 ha of island shrore habitats or 40 ha/year over the past 35 years prevented the building of almost 40 000 nests. Several islands provide protection to river marsh habitats from the negative effects of waves and currents.

This is particularly the case for in the îles de la Paix and Contrecoeur archipelagos. Those marshes are important brood rearing sites for waterfowl and spawning sites for species like yellow perch, northern pike and brown bullhead. Erosion may induce the mid-term disappearance of those brood rearing and spawning areas. On some islands, rare or endangered species are found. Thus, ten species designated threatened or vulnerable have been collected in the îles de la Paix archipelago. These species may also dissappear from the area in the mid-term.

Considering the great biological and economical value of shore habitats and the major impacts caused by shore erosion, it is becoming urgent to stabilize and restore the shore habitats by erosion using mainly soft techniques which preserve global productivity. Considering the length of shoreline affected and the relatively high costs associated with stabilization (up to \$1 000/ m for the stabilization in the islands), priorities of intervention based mainly on specific biological elements must be established. Measures to reduce speed limits of ships along the navigation channel and small boats in some narrow channels of the Berthier-Sorel archipelago should also be put forward.

DAY 2 • 3:45 PM • WORKSHOP I

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
HABITAT RESTORATION**

Restoration and stabilization of banks using vegetable reinforcements

Pierre Bertrand

ROCHE LTÉE, Groupe-conseil

The erosion of banks is a known natural phenomenon. However the human interventions, hydrological modifications of the rivers, in agricultural medium in particular, as well as the abnormal pluviometric phenomena increasingly frequent generate, by erosion, of serious degradations of the bordering ecosystems. In many cases, these natural medium are lost forever, especially when the banks are the subject of massive enrockment.

This presentation aims at clarifying the recent development of the techniques of vegetable reinforcements for stage to the systematic use of the enrockment of banks like a tool for stabilization. The development and the standardization of the various vegetable technologies were developed within the framework of a development and research project which was spread out over 6 years.

The realization of these pilot projects made it possible to identify the technologies of vegetable stabilization best adapted to our hydro-climatic conditions, to select the vegetable species most favourable for the vegetable reinforcements and especially to be familiarized with the methods of establishment to the field: live staking, live fascine, brush-layer, branch-packing, live cribwall.

The results of this work are presented in the shape of a practical guide produced so as to make available the know-how developed within the framework from the research program. In a more concrete way, the specific estimates now available constitute the climax of the research project in the sense that they deliver to the promoters, in detail, the manner of making, to establish and follow the projects of stabilization and restoration which use such vegetable technologies.

It is the first time that these technologies are raised on the same level as the more conventional techniques of stabilization such as the enrockment, the sheeting piles, the armed ground, etc. The development of the technologies of stabilization using vegetable reinforcements now makes it possible to offer a true environmental alternative to the problems of erosion of banks of our rivers without neglecting the safety of the works or properties protected by the works from stabilization.

DAY 2 • 3:45 PM • WORKSHOP I

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
HABITAT RESTORATION**

Conserving Wetlands of the Great Lakes Basin

Lesley Dunn

Canadian Wildlife Service, Ontario Region

Wetlands serve essential ecological, economic and social roles in the Great Lakes ecosystem. However, they are also subject to a range of stresses. Some of North America's and the world's largest concentrations of industrial activity are located in the Great Lakes region. More than one-tenth of the U.S. and one-fourth of the Canadian population live in the basin and nearly 25 percent of Canadian and seven percent of American agricultural production are located in the basin. Being at the bottom of the watersheds supporting all this development puts Great Lakes coastal wetlands under tremendous stress. Land-use impacts, development pressures, contamination, and competing demands for resources all contribute to the loss and degradation seen in many wetlands. Over two-thirds of wetlands in southern Ontario have been lost, and many that remain are degraded. Yet some wetlands remain in relatively good health and have been recognized as Wetlands of International Importance and UNESCO Biosphere Reserves, including Long Point on Lake Erie. Others have been recognized as highly significant under the North American Waterfowl Management Plan.

The Great Lakes Wetlands Conservation Action Plan is a cooperative program that involves federal and provincial governments and non-government organizations in efforts to establish and comprehensive wetlands conservation program for Great Lakes wetlands. The Action Plan as well as some specific efforts and techniques used to rehabilitate degraded wetlands and their relative success will be discussed.

DAY 2 • 3:45 PM • WORKSHOP I

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
HABITAT RESTORATION**

The Bonaventure Barachois: from habitat restoration to concerted community action

André Babin

Association pour la revalorisation du barachois de Bonaventure

The ARBB, an association set up to restore the Bonaventure Barachois, has undertaken a variety of initiatives since its inception in 1990. These include designing and installing information panels, following up on the barachois restoration dossier in collaboration with the federal Department of Fisheries and Oceans, holding evening public consultation meetings and putting pressure on government authorities to enforce the regulations. Furthermore, the ARBB has conducted a clean-up campaign in co-operation with environmental protection organizations, served actively on the Bonaventure Barachois stakeholder committee, directed a study on the hydrodynamics of the barachois and raised public awareness of the importance of this natural site.

DAY 3 • 8:30 AM • WORKSHOP J

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
CONSERVATION AND INTEGRATED MANAGEMENT AT THE LOCAL SCALE**

Canadian Landowner Contact Programs for Habitat Conservation: A
Review

Peter Mitchell

Center for Land and Water Stewardship, University of Guelph

Landowner contact programs have been a primary tool used in promoting private stewardship for habitat conservation in recent years in Canada. They vary from programs using voluntary 'handshake' agreements, through programs seeking changed conservation practices on the ground, to those seeking long term legal agreements or actual property donations. In this paper, a review of landowner contact programs conducted by organizations across Canada is described, along with a preliminary survey of landowners themselves. Based on these results, some suggestions for the future of stewardship programs for habitat conservation are made.

DAY 3 • 8:30 AM • WORKSHOP J

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
CONSERVATION AND INTEGRATED MANAGEMENT AT THE LOCAL SCALE**

The Greater Snow Goose: an impediment to conservation in agricultural environments?

Marcel Laperle

The Greater Snow Goose of eastern North America is having an increasingly significant impact on the natural environments it frequents because of its demographic load. This situation is threatening the species' integrity and that of companion species that rely on the same habitats. As its population has grown, this herbivore species has gradually been forced to look for new food sources in agricultural environments outside its narrow migratory feeding grounds along the St Lawrence River. Secondary factors, such as a concomitant decrease in Canadian and US harvesting rates, have helped to accelerate its expansion.

Every spring for the past several years, the geese have inflicted damage on several thousand hectares of farmland, creating economic losses for hundreds of farming families. The phenomenon has spread to agricultural areas in the St Lawrence Valley, where the best farmland is located. This damage is imperilling conservation of wildlife resources and biodiversity in agricultural environments in a socio-environmental context where agricultural stakeholders are being asked to implement it.

The rapid change in the Greater Snow Goose's migratory behaviour and its occupation of farmland owing to exponential demographic growth requires action on the same scale as these changes. If this does not happen, integrated management of wildlife resources in agricultural environments could be compromised.

DAY 3 • 8:30 AM • WORKSHOP J

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
CONSERVATION AND INTEGRATED MANAGEMENT AT THE LOCAL SCALE**

Canadian Forces Base Suffield National Wildlife Area
Wildlife Dodges The Bullet

Garry C. Trottier

*Resource Conservation Division, Canadian Wildlife Service,
Prairie and Northern Region*

In 1992 the Department of National Defence by agreement with Environment Canada reserved approximately 458 Km² of prairie grassland at Canadian Forces Base Suffield in southeastern Alberta for designation as a National Wildlife Area under the Canada Wildlife Act. Here wildlife conservation takes priority but is innovatively integrated with petroleum development, livestock grazing, and military training exercises. By investing in comprehensive biological inventory, directed wildlife research, restoration practices, and environmental advisory committees, National Defence sustains a highly productive, ecologically complete mixed grassland ecosystem that stands as a nationally significant wildlife refuge. This presentation will describe a suite of approaches adopted by National Defence and Environment Canada to protect prairie wildlife and habitat.

DAY 3 • 8:30 AM • WORKSHOP J

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
CONSERVATION AND INTEGRATED MANAGEMENT AT THE LOCAL SCALE**

Securing keystone habitats

Joël Bonin

Director, Quebec office

The Nature Conservancy of Canada

Since 1962, the Nature conservancy of Canada has been involved in the conservation of unique natural features of the country. One of them is known as "The Gulf". This deep ravine of 195 m long, 53 m wide and 48 m deep, is one of the most spectacular examples of a glacial stream channel in Québec. It is located in the Adirondacks foothills, 65 km south of Montréal. In addition to its spectacular topography, this site is a refuge for a number of Appalachian salamanders which reach the limit of their northern distribution at The Gulf (e.g., the rare mountain dusky salamander, *Desmognathus ochrophaeus*).

Salamanders require specific hydrologic conditions to survive in mountain spring and stream habitats. Studies previously undertaken were useful to identify key components of these ecosystems in The Gulf. One of them is a peatland located upstream of the ravine. This peat land is a major contributor to the stream flow and underground water regime of the area, and thus is important for the survival of salamander populations. By acquiring this peatland, the Nature Conservancy has contributed to the preservation of habitats and rare species of the Adirondacks foothills.

DAY 3 • 8:30 AM • WORKSHOP K

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
CONSERVATION AND INTEGRATED MANAGEMENT AT THE LOCAL SCALE**

The Forest Stewardship Recognition Program *Building on Success*

François Blain

*National Coordinator, Forest Stewardship Recognition Program,
Wildlife Habitat Canada*

The goal of sustainable forestry can be achieved, in part, through people adopting a stewardship approach to the resource. This approach is based on the premise that people (land owners, forest workers, etc.) will do the right thing voluntarily if they have sufficient knowledge, and the required actions are reasonable. Stewardship includes the dissemination of new knowledge, skills and techniques, that can only be achieved through adaptive management - or a continual cycle of assessment, learning and adaptation. A key element of adaptive management is the positive reinforcement of accomplishments: a recognition of true innovation and leadership.

This is where the Forest Stewardship Recognition Program (FSRP) plays a much needed role. Launched at the National Forest Congress in 1998, the FSRP's goal is to stimulate awareness of, and appreciation for, stewardship - responsible land ownership and management - which commands a respect of the natural functions of the forest and a better understanding of how all living and non-living components work together. It is these "on-the-ground" sustainable practices and forest biodiversity conservation efforts that the FSRP is especially interested in recognizing. Individuals, teams, groups and organizations can all be nominated to win an FSRP award, as long as their achievements meet the program's criteria and satisfy its selection process.

Numerous forestry and conservation organizations have joined the major partners to support and deliver the program, which was successfully pilot-tested in Ontario in 1998. During that year, 36 winners were selected and were awarded a beautiful signed limited edition print of a painting by B.C. artist Don Li-Leger, which depicts a scene symbolizing forest stewardship. The award winners also received a signed certificate of appreciation from Canada's Governor General, the Right Honourable Roméo LeBlanc, official Patron of the program. Furthermore, public events were organized to give profile to award winners.

In 1999/2000, the FSRP will not only maintain its presence in Ontario but also expand to Quebec and the Maritime provinces. The FSRP is currently seeking partners and supporters in these provinces who share the program's vision of forest stewardship and biodiversity conservation, and who would be willing to help organize and deliver the program at a provincial or regional level. An invitation is also being extended to interested organizations in other provinces as the program's goal is to become fully national by 2001.

The deadline for submitting nominations is September 30. Those interested in obtaining a nomination form or in finding out how an organization can help support the program should contact the FSRP National Coordinator:

Phone:	Ottawa - (613) 722-2090	Montreal - (514) 683-0123
Fax:	Ottawa - (613) 722-3318	Montreal - (514) 683-0303
E-mail:	Ottawa - fblain@whc.org	Montreal - fblain@videotron.ca
Website :	http://stewardship.cppa.org	

DAY 3 • 8:30 AM • WORKSHOP K

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
CONSERVATION AND INTEGRATED MANAGEMENT AT THE LOCAL SCALE**

Protected area management in northern Canada

Kevin McCormick

Canadian Wildlife Service, Prairie and Northern Region

?? What is Sustainable Development?

?? Co-management is a fundamental element of northern land claims.

?

?? Co-management is Sustainable Development in Action.

?

?? Negotiation of Inuit Impact and Benefit Agreements are a prerequisite to the establishment of new protected areas.

?? Protected Areas are co-managed through Area Advisory Committees.

?? There is tremendous public pressure for northern-based employment.

?? Areas of greatest potential are mineral development and ecotourism.

?? Key habitat sites (bird colonies, etc.) are obvious attractions for tourist destinations.

?? There will be increasing pressure for actively managed protected areas in northern Canada.

DAY 3 • 8:30 AM • WORKSHOP K

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
CONSERVATION AND INTEGRATED MANAGEMENT AT THE LOCAL SCALE**

Integrated resource management in the Charlevoix-Bas-Saguenay region

Sylvie Bernier¹, Sylvain Bernier² et Pierre Dulude³

¹ *Biologist, M Sc, Director General, Association des Gestionnaires de Territoires Fauniques*

² *Wildlife Technician, Société de la faune et des parcs du Québec*

³ *Biologist, Société de la faune et des parcs du Québec*

The integrated resource management project in the Charlevoix-Lower Saguenay region was launched in 1995 by a group of wildlife area managers called the Association des Gestionnaires de Territoires Fauniques (AGTF) de Charlevoix-Bas-Saguenay inc. The organization's initial members represent three controlled harvesting zones (ZECs), 14 outfitting camps with exclusive rights, three salmon rivers and the local trappers' association. Bringing these individuals together made it easier to ensure representativeness, acquire funding and seek grants. The area in question is 1,500 km² of Crown land. A systematic analysis of the wildlife and habitats in each Department of Natural Resources compartment (an average of 10-15 km²), the basis of forest management in Quebec, was conducted using available databases and supplemented by the knowledge of managers and other players. The procedure identified the relevant elements to be protected or managed in each of the wildlife areas in question. These elements were then translated into opportunities for action adapted to the management plans of the various wildlife areas, so that each forest or wildlife activity involving land management and its various resources has the same information base, which limits disputes and makes it easier to understand everyone's concerns and needs and to work together. The presentation will cover the main aspects of the methodology used and then describe opportunities in the field where action has actually taken place. Finally, it will look at the strengths and weaknesses of the approach and the prospects for the future that are currently available.

DAY 3 • 8:30 AM • WORKSHOP K

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
CONSERVATION AND INTEGRATED MANAGEMENT AT THE LOCAL SCALE**

Experimental integrated forest resource management project in Portneuf

Gilles Beaupré¹ and Pierre Dulude²

¹ *Biologist, Société de la faune et des parcs du Québec*

² *Forest Engineer, Forêts Québec*

An experimental integrated resource management project with multiple objectives was implemented in 1998 in wildlife areas of the Portneuf management unit near Quebec City. Among the goals set forth by the stakeholders who joined together in the project were improving habitats for certain target species, setting up an integrated resource management team, salvaging residual fibre in a forest that is basically unprofitable owing to spruce budworm damage and maintaining access to the region for wildlife harvesting activities and silvicultural operations. In a preliminary stage, efforts were devoted to identifying the issues and the potential for certain species such as elk, beaver, brook trout, spruce grouse and ruffed grouse, in order to establish a framework for action and promote exchanges and alliances among the stakeholders. This work led to concrete action such as timber harvesting on south through west facing mesic sites and along some riparian strips, precommercial thinning operations taking into account wildlife concerns, measures aimed at improving ruffed grouse habitat and remedial action at water crossings that are a source of disturbance for brook trout spawning grounds. The presentation will trace the history of the different project stages and explain the work done and the follow-up, as well as outline prospects for the future.

DAY 3 • 8:30 AM • WORKSHOP L

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
CONSERVATION AND MANAGEMENT EXPERIENCES**

So what's the process anyway? A proposed approach to the identification and designation of a protected marine area under the Canada Wildlife Act - Scott Group Islands, British Columbia

Michael Dunn¹ and Ken Morgan²

¹ *Senior Habitat Conservation Coordinator, Pacific Wildlife Research Centre c/o Institute of Ocean Sciences*

² *Marine Ecosystem Biologist, Pacific Wildlife Research Centre c/o Institute of Ocean Sciences*

In the absence of a well-defined process for the Canadian Wildlife Service to identify and designate protected marine areas under the *Canada Wildlife Act*, this paper will put forward a possible approach, using the Scott Islands Group, of the steps required. We will briefly describe the following:

1. The context of the Joint Marine Protected Areas Strategy for the Pacific Coast of Canada - a federal-provincial process for MPAs. This includes minimum protection requirements and the application of proposed criteria for CWS MPAs;
2. The environmental context and information base for the area. The significance of the Scott Islands Group to the seabird populations the world, Canada and British Columbia. Also what we know about the surrounding marine ecosystems;
3. The setting of a boundary for a study area. A chronology of our adaptive thinking using our science information;
4. Existing and future uses of, and threats to, the area in question;
5. Who have interests and who have existing rights? This defines our stakeholder base for consultation;
6. The First Nations requirements and other potential requirements that need to be assessed and accounted for;
7. How might consultation and/or negotiation proceed under the auspices of the Joint MPA Strategy and meet our obligations;
8. The designation process as it might proceed; and,
9. Enforcement and monitoring issues. Are there real needs for conservation of this area? Are there alternatives to the traditional approaches?

It is hoped that this proposed approach could be used to stimulate discussion around CWS's role in marine area protection and remove some of the perceived barriers to a very significant and positive contribution to the conservation of Canada's ecological diversity.

DAY 3 • 8:30 AM • WORKSHOP L

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
CONSERVATION AND MANAGEMENT EXPERIENCES**

Marine mammal-watching management in the Saguenay-St. Lawrence Marine Park: the challenge of integrating conservation and tourism

Nadia Ménard

Saguenay-St Lawrence Marine Park

The St Lawrence estuary is a remarkable place for watching marine mammals. The region's specific ecological conditions make it the preferred habitat of several species of seals and whales. The beluga and harbour seal are the only species that live in the estuary, the others being migratory species that frequent these exceptionally rich feeding grounds on a seasonal basis.

Over the past few years, the whale-watching tourism industry has experienced extraordinary growth around the Saguenay-St Lawrence Marine Park. This growth has been impressive in terms of numbers of boats and trips and the associated number of visitors and economic spin-offs. In light of the significant impact that the tourism industry is having on the socio-economic development of this coastal region, its survival now concerns the entire community.

This accelerated and sometimes uncontrolled development of various activities raises a number of concerns. Essentially, the problem can be boiled down to the continued presence of a large number of watercraft around marine mammals, particularly blue whales, and the protection of endangered species in the crush of human activities. The level of service given to visitors also varies in quality and their occasionally unsatisfying experiences could have a negative affect on the image of the marine park and the existing tourism industry.

Until quite recently, tools for managing these activities were limited. The *Saguenay-St Lawrence Marine Park Act* and the *Oceans Act* have now been adopted. These legislative tools enable us to introduce measures to manage the activities taking place in and around the marine park. However, a regulatory approach to managing whale watching is insufficient and ineffective without the involvement of everyone concerned. It is important to develop a common vision of the problem and management objectives, to create awareness and empower the industry and visitors, and to involve all the players concerned in introducing viable and acceptable solutions. To do so, the Saguenay-St Lawrence Marine Park has implemented a consultative approach in co-operation with these players. The presentation will describe this approach aimed at protecting marine mammals and sustaining marine mammal-watching activities.

DAY 3 • 8:30 AM • WORKSHOP I

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
CONSERVATION AND MANAGEMENT EXPERIENCES**

Selection of potential sites for an MPA taking into account seabird distribution and abundance

Gilles Chapdelaine

Canadian Wildlife Service, Quebec Region

Potential sites for establishing marine protected areas (MPAs) have been identified based on information contained in the BIOMQ (computerized database on Quebec seabirds), which is maintained by the Canadian Wildlife Service, Quebec Region. BIOMQ is an inventory of seabird distribution and abundance within the boundaries of Quebec. It contains a host of information such as the exact locations of colonies, the abundance of each species, times series of fluctuations in population size and survey sources and methods. By using a diversity and abundance index (?) applied to $1/2^{\circ} \times 1/2^{\circ}$ squares scattered throughout the Estuary and Gulf of St Lawrence, we produced a summary map showing the sites with the greatest potential for seabirds. Four potentially suitable areas were identified as a result of this analysis: (1) Bonaventure Island and Cap d'Espoir, (2) the Sainte-Marie group of islands, (3) Bird Rocks and Brion Island and (4) the Sept-Iles archipelago. The relative importance and characteristics of these sectors are discussed as well. The Estuary and Gulf of St Lawrence are marine ecosystems of prime importance for the Northern Gannet (*Morus bassanus*) and the Razorbill (*Alca torda*) in the North American context.

DAY 3 • 8:30 AM • WORKSHOP I

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
CONSERVATION AND MANAGEMENT EXPERIENCES**

Seaduck moulting sites : a neglected component of marine ecosystems

Savard, Jean-Pierre L. and Jean-François Rail
Canadian Wildlife Service

Each year, all waterfowl and geese undertake a moult migration towards remote moulting sites where they become flightless for a period of 3-4 weeks. Little is known of their ecology and habitat requirements during that period. Seaducks usually moult in salt waters, often concentrating in a few areas. Moulting occurs in all Canadian coasts but the exact locations of moulting sites are still unknown for several species. Because of the vulnerability of the birds during that time, special conservation measures may be needed for several of these areas. Possible threats to moulting seaducks include mollusk harvest, gill net fisheries, disturbance, hunting, oil spills, aqua-culture industry. Possible protection tools include marine protected areas, refuges, sanctuaries, exclusion zones, parks, ecological reserves, special hunting regulations. A comprehensive and pro-active approach is needed to ensure the long-term conservation of seaducks. Such an approach includes simultaneous efforts into monitoring, research, habitat protection and habitat management.

DAY 3 • 10:30 AM • WORKSHOP M

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
COMMUNITY INITIATIVES**

Environmental farm plans – from words to action

*Andrew Graham, Program Advisor
Ontario Soil and Crop Improvement Association*

The Environmental Farm Plan (EFP) was initiated through the Ontario Farm Environmental Coalition (Ontario Federation of Agriculture, Christian Farmers Federation of Ontario, AGCare (Agricultural Groups Concerned About Resources and the Environment), and Ontario Farm Animal Council). These four collectively represent more than 30 farm organizations, including the Ontario Soil and Crop Improvement Association (OSCIA).

« Our Farm Environmental Agenda » was released by OFEC in 1991 and documented agriculture's concerns and planned actions. It included encouragement for every farm to prepare an EFP. EFP is based on the knowledge that community education is an extremely effective vehicle to support and encourage environmental change.

The program is delivered at the county/district level by OSCIA in partnership with the Ontario Ministry of Agriculture, Food and Rural Affairs. Over 1000 workshops have been held since 1993 to introduce farm families to the voluntary program, and get them started on their own EFP. Program funding currently comes from Agriculture and Agri-Food Canada's CanAdapt Program, delivered by the Agricultural Adaptation Council. Almost \$19 million of federal dollars have been committed since 1992. Current funding lasts until March of 2000.

The EFP workbook allows participants to rate current management in up to 23 different areas of their farm (farmstead, field and natural areas). The worksheets highlight environmental strengths on the farm, and identify areas of environmental concern.

Once the self-assessment is complete, participants are encouraged to prepare an Action Plan. Participants analyze their situation, decide what they can do, and when it can be done. Priorities are set by the farm family with consideration for: family health and safety, legal requirements, the environmental risk and cost. Actions may be planned for immediately, or introduced over several years. The Best Management Practices of booklets (there are now 15 titles in the series) are some of the references available to help get ideas.

Good facilitation at the workshops help people deal better with change, find solutions that work, and accept new technology more readily. This kind of intervention – which encourages voluntary action and compliance – supported with incentives, is far preferred, and far more successful than regulation.

To August of 1999, over 16,000 farm families have participated in the international award-winning program. There are an average of 2300 farmers coming into the program each year. Participants to date manage about 5 million acres of farmland—about 1/3 of the provincial total.

EFP provides a \$1500 incentive grant to those who successfully complete peer review. The money is used to initiate an identified action. Over \$7.6 million has been claimed. Records confirm that for every federal dollar claimed, \$3 is invested by the farmer towards the same project on average.

EFP is all about anticipating potential problems, rather than un-doing environmental damage. Prevention is the most cost-effective approach to managing an environmental problem. EFP is also about profitable farming and healthy lifestyle gained through efficiencies, lower production costs, and diversification.

The involvement of OSCIA in the EFP has led directly to several related ventures including: drinking water well protection, new ideas in household septic systems, and restoration of the threatened American chestnut tree. With the help of partners, OSCIA has been in a good position to investigate the issues, collect answers through demonstration, generate interest, and boost awareness.

We can offer comprehensive environmental educational material very effectively through programs such as EFP. We can demonstrate practical options through projects such as Well Steward or the American chestnut restoration. We cannot make final decisions, or tell farmers how to manage their resources—those decisions will remain solely theirs. Keep in mind too that if there aren't good economic or other opportunities in the mind of the individual, things are not likely to happen.

For more information, telephone: (519) 826-4216, fax: (519) 826-4224, or e-mail: agraham@ontariosoilcrop.org

DAY 3 • 10:30 AM • WORKSHOP M

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
COMMUNITY INITIATIVES**

The agri-environmental shift from the standpoint of farmers

William G. Grenier

Club de fertilisation de la Beauce

- ?? What is an agri-environmental advisory club?
- ?? Objectives of agri-environmental advisory clubs
- ?? Areas of intervention
- ?? Fertilizer management
- ?? Crop management
- ?? Reduction in herbicide use
- ?? Agricultural conservation practices
- ?? Watercourse management and protection
- ?? Relationship between agronomists and producers
- ?? Projects
- ?? Types of enhancement carried out

DAY 3 • 10:30 AM • WORKSHOP M

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
COMMUNITY INITIATIVES**

Boyer River restoration using an agri-environmental approach

Guy Trenchia

Biologist, Société de la faune et des parcs du Québec

There are four genetically distinct rainbow smelt populations in the St Lawrence River, one of which has been identified in the southern portion of the estuary. A species of prey for predators such as the beluga and, formerly, the striped bass, it was very popular with sport fishers. It was also a desired catch of commercial fishers, whose harvest statistics went from 55 tonnes in 1964 to 1.5 tonnes in 1998.

The Boyer River watershed was once home to the largest spawning grounds for the southern estuary population and consists mainly of farmland (217 km², 60% of it cultivated, with 300 producers and 23,055 animal units, 55% of them hogs). Farming has a huge impact on water quality. It generates an annual surplus of 630 tonnes of nitrogen and 317 tonnes of phosphorus beyond what is taken up by plants. Some of this surplus runs off into the St Lawrence, a roughly \$360,000 loss in fertilizer.

A working group has been set up and initiated the first corrective steps, which include getting livestock out of rivers and streams, offering training courses and assistance to purchase fertilizing equipment, stabilizing portions of the riverbank and carrying out various communications activities. The St Lawrence Vision 2000 agreement will continue to provide support over the next few years to encourage the greatest possible participation of farmers in voluntary agro-environmental advisory clubs.

Public consultations are being prepared to awaken public interest in the river and get people involved in local enhancement projects in order to develop a feeling of belonging and a sense of pride in the area.

Managing such a project at the watershed level is a huge challenge as the possibility of correcting the problem is severely limited by the agricultural regulatory and administrative context (assistance programs). A variety of means would be required (information, assistance and restrictions) to simultaneously encourage those who are participating and urge on those who are not, thereby ensuring more equity for everyone. As well, the detailed information required to monitor changes in practices is not widely available, being spread out among a number of organizations. Finally, the club option is not specifically designed for a watershed-based approach; more than one club is needed to serve the 300 farmers in the area and innovative approaches have to be developed to help these clubs work together on the project. A critical mass of farming participants will eventually be required to influence water quality and reclaim lost uses.

DAY 3 • 10:30 AM • WORKSHOP N

**FOREST ECOSYSTEMS — ROOM BORDUAS-KRIEGHOFF
COMMUNITY INITIATIVES**

The Aigle Forest: an example of integrated resource management

Marc Beaudoin¹ and André Dumont²

¹ *Forest Engineer, Corporation de gestion de la forêt de l'Aigle*

² *Biologist, M.Sc., Corporation de gestion de la forêt de l'Aigle*

After private hunting and fishing clubs and forest concessions were successively abolished, a process of questioning began regarding the territory of the Forêt de l'Aigle and its future role. A number of organizations were keen to participate in managing it, including the Picanok forest co-op and forest industry members. In addition, the Quebec hardwood forest management institute (Institut québécois d'aménagement de la forêt feuillue) wanted to turn it into a teaching and research forest, while the Kitigan Zibi Anishinabeg First Nation hoped to annex the land.

Since April 1996, the Forêt de l'Aigle has been part of an inhabited forest pilot project. The Forest Management Corporation (C.G.F.A.) has a mandate from the Quebec government to manage the region in an integrated manner and harness the potential of all the forest's resources with a view to future development.

The Forest Management Corporation, which is composed of six members namely the C.G.F.A., the Pontiac Reserve Hunting and Fishing Association (Zec Pontiac), the Haute-Gatineau Silvicultural Corporation, the Kitigan Zibi Anishinabeg First Nation, a snowmobile club called "Les Ours Blancs" and the municipality of Cayamant, has established several goals, including habitat improvement, participation in the region's socio-economic development and integration of the forest's different functions.

Over the past three years or so, the Management Corporation has advanced from initial start-up through planning to the operational stage. The forest's exceptional qualities, combined with innovative social forestry strategies, have allowed stakeholders to reconcile the expectations of a number of interest groups.

DAY 3 • 10:30 AM • WORKSHOP N

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
COMMUNITY INITIATIVES**

Transfer of knowledge on wildlife habitat management in private forests

Sandie Poliquin

Fédération des producteurs de bois du Québec

Under the program to support projects by the Fondation de la faune du Québec with the aim of providing training and raising people's awareness of habitat issues and protection and development actions, the Quebec Fédération des producteurs de bois du Québec (FPBQ) undertook to explore the possibility of encouraging more private woodlot owners to take an interest in the wildlife resource, in the medium term, and that of promoting new forest management practices related to wildlife habitat.

Two approaches were tested in this project. One involved offering training and forest-wildlife management plan (PAFF) preparation sessions to a small number of woodlot owners likely to play an advocacy role with other forest stakeholders, and the other consisted in disseminating information on wildlife enhancement and management to private woodlot owners at large, in the newsletters published by wood marketing boards and in regional weeklies.

The first approach focussed on a small number of individuals who could serve as role models for other woodlot owners. It recognizes the role played by natural leaders in encouraging other members of their community to adopt new ways of working.

In the second approach, the goal was to reach all woodlot owners. It complemented the first step by promoting wildlife habitat management and development.

Meetings were subsequently held with participating owners to learn more about the clientele targeted by the project. This provided a clearer picture of the constraints on integrating wildlife management with forestry practices, and highlighted woodlot owners' concerns related to this change. In addition, the pilot project to provide training and forest-wildlife management plan (PAFF) preparation sessions provided the opportunity to identify training needs and the adjustments that would be necessary for future training sessions. Differences in perception were noted among woodlot owners with respect to their role in promoting wildlife management.

DAY 3 • 10:30 AM • WORKSHOP N

**AGRICULTURAL ECOSYSTEMS — ROOM SUZOR-CÔTÉ
COMMUNITY INITIATIVES**

An inventory and analysis method for establishing integrated wildlife–forest management plans

Martin Paulette

Director of the Groupement faunique du Triangle de Bellechasse

There is an ever-increasing push to ensure multiple use of forest resources. This goal requires planning forest ecosystem management to take account of forestry constraints, the habitat needs of fauna and biodiversity maintenance. For several years now, the Groupement faunique du Triangle de Bellechasse has been using an inventory protocol integrating the collection of variables on forest condition and on wildlife habitat status. Analysis of these data is also performed in an integrated manner, permitting the establishment of wildlife–forest management plans.

The main variables collected are:

- ?? stand stratification and forestry characteristics, vertical and horizontal structure, stand origin, disturbances and moisture balance;
- ?
- ?? composition of the upper and lower strata, lateral obstruction associated with the lower stratum and the distribution of commercial regeneration in the stand;
- ?
- ?? evaluation of the value of snags, woody debris, trees and specific elements as well as any aquatic environments;
- ?
- ?? signs of the presence of wildlife.

The analysis of these data reveals the target stand's characteristics and the links between it and other stands that have potential as wildlife habitats. The components of the surrounding environment are also taken into consideration. With this information, it is possible to provide a picture of the forests and wildlife in the study area and identify limiting factors. Fragile ecosystems are also delineated. The analysis phase also involves predicting the evolution of the forest and habitats.

The wildlife–forest management plan therefore provides a dynamic view of the evolution of forest ecosystems and wildlife habitats. As well, a comprehensive management proposal is established which allocates forestry operations in time and space, thereby helping to maintain existing wildlife habitats and create new ones, while minimizing timber losses.

DAY 3 • 10:30 AM • WORKSHOP O

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
COMMUNITY INITIATIVES**

A pilot marine protected area – Race Rocks – British Columbia

Marc B. Pakenham

Fisheries and Oceans Canada, Pacific Region

There is much to be learned when theory becomes practice and, so it is with Canada's fledgling Marine Protected Areas (MPA) initiative. By identifying a few selected areas as pilot Marine Protected Areas, policy and principle are tested through the reality of evolving partnerships and public consultation.

Race Rocks is located 17 km. southwest of Victoria, British Columbia (B.C.), approximately 1.5 kilometers off the extreme southern tip of Vancouver Island and at the eastern end of the Strait of Juan de Fuca on the Pacific Ocean. It is almost entirely subtidal, but includes nine islets, one of which is the site of a historic Coast Guard lighthouse. As a transition zone between the Pacific Ocean and coastal waters, the area is renowned for its exceptional diversity of marine life, including marine mammals, birds and fish.

The area's significance was reinforced when it was designated under British Columbia's Ecological Reserve Act in 1980. Local communities have long recognized the importance of the Race Rocks area. Lester B. Pearson College of the Pacific has provided tremendous support in preserving the area and, with B.C. Parks, produced a draft management plan for Race Rocks Ecological Reserve in 1998. Under Canada's Oceans Act, Race Rocks was recommended a pilot Marine Protected Area in September 1998. Fisheries and Oceans Canada and B.C. Parks are developing a joint action plan that includes renewed consultation, cooperative management and key strategies.

Pilot MPA's will provide a learning opportunity and a test-bed for different applications of identification, assessment, legal designation and management. Throughout the MPA pilot process, opportunities will be provided for public review and input. When the evaluation process is complete, formal designation may or may not occur, depending on the outcome of consultations with communities, First Nations, stakeholders and public.

The challenges are formidable. Inclusivity, fair representation of interests, issues of marine ecosystem health and new partnerships all require a delicate balance. The signs are encouraging. Canada's pilot Marine Protected Areas' initiative is charting new waters.

DAY 3 • 10:30 AM • WORKSHOP O

**MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN
COMMUNITY INITIATIVES**

Lobster conservation and management at Eastport, Newfoundland

Gerry Ennis

Fisheries and Oceans Canada, Atlantic Region

The Eastport Peninsula Lobster Protection Committee, involving some 50 fishers from six neighboring communities, was formed in 1995. It was a response to heightened concerns about overfishing the resource associated with landings declines and effort increases following the northern cod moratorium. Timing coincided with the FRCC review of lobster conservation in Atlantic Canada and some of the key organizers had been involved in consultations that were part of that review.

Initially, through peer pressure exerted through the Committee, the focus was to achieve compliance with existing regulations and to encourage voluntary v-notching of egg-bearing females. Through MOU between the Committee and DFO, a boundary restricting Eastport fishers to the lobster grounds within and eliminating access by outsiders and two areas within closed to lobster fishing entirely were established starting with the 1997 fishing season.

Initiatives by the Committee also led to comprehensive fishery monitoring with logbooks and at-sea sampling as well as research involving DFO Science, MUN, and the Committee focused on evaluating the closed areas as a lobster conservation measure and establishing baseline indices of larval and juvenile abundance. The local school is involved in the processing and preliminary analysis of fishery data in an effort to encourage greater ongoing community involvement. The intention is to directly involve fishers in the interpretation of results utilizing their knowledge of year to year changes in local conditions and TEK. Their representatives would then be better prepared to participate in the advisory/consultative process leading to resource management decision making.

DAY 3 • 10:30 AM • WORKSHOP O

MARINE/ COASTAL AND FLUVIAL ECOSYSTEMS — ROOM LEDUC-FORTIN COMMUNITY INITIATIVES

The protected marine area pilot project: Manicouagan Peninsula area

Denis Cardinal and Danielle Saint-Laurent

Parc nature de Pointe-aux-Outardes

Did you know that:

- ?? The Department of Fisheries and Oceans' Marine Protected Areas (MPA) program constitutes ... ***A new management tool based on partnership, prevention and sustainable development!***
- ?? The purpose of a Marine Protected Area is to protect, conserve and enhance marine species, habitats and ecosystems where other existing laws cannot do so effectively... ***A legacy for future generations!***
- ?? Pilot projects are being set up to test and refine the framework for establishing and managing Marine Protected Areas... ***A local approach that is on the mark!***
- ?? The MPA pilot project in the Manicouagan Peninsula sector was chosen from 67 sites of interest in Quebec. The proposal from the Pointe aux Outardes nature park was chosen because of its ecological wealth and the possibility of enhancing two areas by adding the marine component (MPA). The park's roles (to educate, protect, mobilize and ensure management of a protected area) are also compatible with the aims of an MPA pilot project, another reason it was chosen... ***A role and experience that get results!***
- ?? The territory in question encompasses a wide variety of coastal and marine habitats and the fourth largest salt marsh in Quebec, with a high level of primary production and rich and diverse wildlife, including more than 200 species of birds...***An environment teeming with life!***
- ?? The community is invited to determine the relevance, form and scale of the project at numerous information and consultation sessions... ***A project that reflects us!***
- ?? Synergy among members of the community from the political, environmental, tourism, recreational and economic arenas could be created to give life to the project... ***A partnership representative of the various interests concerned!***
- ?? This pilot project would foster greater knowledge of our region (proposed study area: 450 km²)... ***An opportunity to explore our region close up!***
- ?? This pilot project would enable us to protect and enhance our resources and habitats for the benefit of current and future generations... ***A collective legacy to pass on to our children!***
- ?? This pilot project should have a positive impact on the tourism sector... ***A plethora of environmental spin-offs!***
- ?? Our region could serve as a model for similar MPAs to be set up and managed across Quebec... ***Our pioneering spirit at work!***

DAY 3 • 1:30 PM • WORKSHOP P

The Fondation de la faune du Québec plays a complementary role to the Société de la faune et des parcs du Québec

Bernard Beaudin, CEO
Fondation de la faune du Québec

The Fondation de la faune du Québec plays a direct role in habitat protection on privately owned land. It also plays an indirect role by providing financial support for private sector and municipal initiatives in the area of habitat conservation.

Over the past 12 years, this organization has conserved 2 500 ha making up 25 priority habitats that are among the most productive, most diverse and most threatened in Quebec. These consist primarily of wetlands located along the St Lawrence River and its tributaries.

These accomplishments have come about through negotiations with more than 600 private landowners under joint plans such as the North American Waterfowl Management Plan, the Fish Habitat Restoration Fund, the St Lawrence Action Plan and the Salmon Economic Development Program. The resultant acquisitions cost \$6.7 million, \$1 million of which came from the Fondation. This organization acts as a lead agency for such acquisitions and for voluntary conservation projects carried out under these programs.

During the same period, the Fondation helped municipalities and conservation organizations implement 86 other protection projects, such as conservation plans, acquisitions and voluntary conservation projects. The Fondation provided \$2.8 million in grants toward these projects, which cost a total of \$8 million.

The organization also provided \$22 million in grants, primarily to nongovernmental organizations, for 1,134 habitat conservation and enhancement projects, which cost a total of over \$91 million.

These initiatives consisted mainly in the restoration of degraded habitats in aquatic, terrestrial and wetland environments, located within agricultural, forestry, marine and urban landscapes (760 projects, \$17.3 million in grants). Some of the projects involved the provision of training and awareness raising related to habitats (227 projects, \$2.8 million in grants) while others centred on acquiring knowledge about habitats (125 projects, \$2.3 million in grants).

Two years ago, the Fondation set up a funding program that is aimed at conserving biodiversity and protecting the habitats used by nonharvested but threatened species; it has allocated \$750,000 to 64 projects of this type.

Over the past 16 months, the organization has helped to create 208 jobs in nongovernmental organizations working to conserve wildlife and habitats, with the support of the Fonds de lutte contre la pauvreté and of Emplois-Québec.

The Fondation's action strategy has borne fruit and complements the activities of FAPAQ. It has been successful in its efforts to conserve habitats on privately owned land. It supports the efforts of community organizations, which are developing an ever-increasing interest in and ability to conserve habitats and wildlife.

DAY 3 • 1:30 PM • WORKSHOP P

The Habitat Status Project: Laying the Groundwork for the Establishment of Habitat Objectives

David J. Neave

Executive Director, Wildlife Habitat Canada

How common are measurable conservation objectives for wildlife habitat in Canada? While there are some excellent examples, they are generally very rare, in part because it is difficult to set such objectives without measures of the status of habitat. Without comprehensive classifications, inventories, maps or monitoring programs to provide information on the supply of habitat across landscapes and through time, we cannot prepare a data-based assessment of habitat status in Canada. Knowing the status of habitat is critical to evaluating the effectiveness of current programs. It is difficult to justify present expenditures for habitat conservation, much less argue for increased expenditures, when we cannot demonstrate what we are achieving, relative to what is needed. Furthermore, it is difficult to provide adequate guidance, limits or targets for habitat conservation to those managing land and water resources for other objectives. When trade-offs must be made, knowing what we have and what we want helps to ensure that habitat is not disadvantaged relative to other social values.

Many of the current trends in conservation are laying a positive foundation for the work needed to address this key issue. One of these is the broadening of programs and approaches beyond single species to embrace biodiversity, ecosystems and watersheds. The popular concept of sustainable development recognizes the importance of conserving the environment (holistically) in any development scenario. The universal benefits of biodiversity conservation have been recognized through an international convention. The trend towards making responsible management more visible and accountable through the application of voluntary codes of practice and certification systems holds the promise of carrying the need for explicit objectives for habitat into the heart of resource operations. There are many more players actively involved in conservation today than in the past. Land owners, producers and resource harvesters are increasingly engaged in the development and delivery of conservation programs. They are also asking for the information and objectives that are necessary to support their efforts for habitat.

Despite the rise in use of concepts such as biodiversity conservation and ecosystem management, there is still a strong bias towards conservation programming at the species level. Public opinion polls consistently indicate that Canadians place a high value on wildlife and habitat. However, our operational capacity to meet their expectations continues to decline, eroded by reductions in the resources available for wildlife protection and management programs from governments struggling to reduce or eliminate their budget deficits. Similarly, most of the new policies, regulations, and communications products generated over the last 10 years to advance sustainable development and related

concepts, remain in the early stages of implementation. The lack of commitment to the research, inventory and monitoring efforts needed to support implementation leaves doubt as to whether these initiatives will ever evolve to the point where they yield on-the-ground benefits for habitat.

More fundamental than these policy and management issues are the changes that already appear to be taking place in the oceanic and atmospheric processes that determine the biological characteristics of the planet. In addition, the global transport of organisms, deliberately or incidentally as a result of human activities, is providing continuous opportunities for new species-environment interactions with largely unknown consequences. Not only does a changing environmental “baseline” affect habitat supply and availability, so does the manner in which we respond to the changes. This is particularly true with respect to resource development. A strong, clear focus on the habitat needed to maintain wildlife in the future becomes even more critical when considered against this backdrop of change.

The challenge to the conservation community is to define these habitat needs. We have to know what we want to be able to select the best mix of strategies for conservation. This has yet to be done, especially on a cost-effective basis. Wildlife Habitat Canada (WHC), with a mandate to protect, conserve and restore habitat, is responding to this challenge with the Habitat Status Project (HSP). At the core of the project is the belief that we must have measurable objectives for habitat to guide conservation. These objectives must be: defined in habitat terms; quantified for management purposes; and, explicitly linked to the species they support. The capacity to assess the status of habitat is critical for establishing credible objectives. WHC has built an analytical framework for the HSP (to be presented at the National Habitat Workshop), that identifies the types of information needed to answer key status questions: How much habitat is there and where is it? How is it changing over time? What are the major factors affecting it? Are current programs addressing these factors? If so, how?

The analytical framework for the project will be used on an ongoing basis by the organization. It is described in detail in a companion piece to this article available from WHC. In the framework, status information and habitat objectives are set within an adaptive process that allows the user to: revise objectives as new information becomes available; assess the effectiveness of programs or alternative approaches to conservation; design new programs; and, allocate resources to strengthen existing programs. WHC’s Board of Directors is also using the results of the project to identify key needs and gaps the organization will address through its program priorities in the coming years.

WHC has spent the last 10 months researching the project, gathering the information currently available on habitat in Canada from published and unpublished sources, Web sites and knowledgeable individuals. We have conducted workshops to discuss the results for three landscapes: forest, agriculture and coastal/marine. In the next step, we will take these results out into the conservation community through various fora (such as this National Habitat Workshop) to discuss the project’s goals, explore applications of the analytical framework and solicit feedback on the results to date to further develop conclusions and

recommendations.

WHC does not want the HSP to be a work in isolation. Many of its goals are shared by other conservation groups and we are looking for strategic partnerships to achieve the underlying objectives for habitat. The organization is not aiming to set up a national program to address the issues raised through the project but rather to continue to support the efforts of others, at all levels, that are consistent with the goals of the project. Within this context, there is both a long-term and a short-term dimension to the work. We recognize that, for the project to be successful, contributions from many individuals and agencies across the country are needed and we welcome the interest and involvement of others.

The HSP identifies opportunities for WHC to link to the initiatives of other organizations. Criteria and indicator initiatives, certification programs, information management and data centres, proposals for new environment funds and legislation are examples of activities to which WHC can contribute support to strengthen habitat conservation. In the short term there are a variety of activities to be undertaken in celebration of the millennium which also afford other opportunities, such as the wildlife status report which is being prepared at the request of the Canadian Council of Wildlife Ministers. WHC is also considering a millennium conference to generate momentum and awareness about the importance of habitat for wildlife in Canada, for without habitat, there will be no wildlife. It's that simple.

The support and active participation of the conservation community is crucial to the success of this project, which will provide a valuable tool that is currently missing from Canadian conservation programs.

WHC welcomes and encourages your participation in the HSP. If you would like more information on the project, including a summary of the analytical framework, please contact us.

DAY 3 • 13H30 • ATELIER P

Plenary Session — SALLE BORDUAS-KRIEGHOFF

Animator : Art Hanson

Chief rapporteurs : Caroline Caza (WHC), Suzan Dionne (Parks Canada), Jamie Fortune (WHC)

ART HANSON

I'd like to provide some opening comments, first of all to say that I think this has been a very interesting meeting. I am particularly happy to see so many people and so many people of the younger generation, upcoming scientists and managers. It's important that we expand the number of people who are interested in the issues of habitat conservation and sustainable development and also it is important to make sure that there is an orderly and good transition to the next generation.

But it's also been an interesting meeting because there is a degree of enthusiasm in the presentation which I very much enjoyed. I enjoyed listening to the case studies and the efforts that are sometimes made at local levels to change the way people behave and the way they interact with each other. I personally applaud and hope that every one that is working on the front line being the foot soldiers of habitat protection will keep that enthusiasm because we really need that.

What we will present this afternoon is not a summary of all the workshops but a synthesis based on the observations of the 3 chief-rapporteurs, each chief rapporteur being associated to one of the 3 main ecosystem blocks, agricultural ecosystems forest and marine and fluvial.

We will try to pull together a number of the key ideas that are emerging out of this workshop and also to try to identify some of the things that we think should have been discussed.

As I mentioned we do want to encourage discussion and reaction to the points that we raise. This afternoon session including a summary of the discussion from people in the room will be part of the meeting output but I should emphasize as well that it does not represent any kind of consensus among those of us on the stage here or any formal statement of the meeting.

The focus of the afternoon is on two key aspect of the meeting and these go back to the tittle of the meeting. The first is the link between habitat conservation and sustainable development and secondly the question of how we can transform words which is what this meeting is about into action.

Overview

First of all I'm going to give a brief overview of what we think are some general points that were comments of the discussion for the three key blocks of ecosystem and also to many of the comments that came out from the plenary speakers. Then a synthesis of information from each of those three ecosystems will be presented by the chief rapporteurs. Also, I'm going to talk about the link between sustainable development and habitat conservation.

And finally we're going to ask you three questions that we think are important questions arising out of the workshop and we hope that we can get a good level of discussion around the 3 questions.

Now there are 3 points that we felt deserve attention in this overview. The first is that it's clear that there are many more local partnerships emerging in this business of habitat protection. What's happening is, in a way, is that decision-making has been pushed down more towards the local level. We think that it probably reflects the feeling of many people in the room that perhaps the highlight of the meeting is both new and innovative ways of local participation.

The second point is that it's clear that we are seeing good beginnings towards better integration. There is a lot of interpretation with what we mean by integration and integrated strategies but it's clear that we are seeing more of these strategies emerge and that they are becoming more accepted and in some cases they are actually leading to action.

The third point that we raised is that there does appear to be a real implementation gap. We have sensed a great deal of frustration relative to the fact that we cannot do more with the experience that we already have.

?? Local participation - Partnerships - Co-management

The general flow is that we start with local participation and we move towards partnerships and eventually maybe even towards co-management and some people would also say that maybe we should use the word stewardship, stewardship in the sense of local responsibility and control.

An important point that emerges about that, is that it takes considerable time to do so, a minimum of 3 to 5 years and often it's much more. There are a lot of problems identified in that process. One is the burn out and power sharing issues that are common. Burn out among volunteers and also among the people that work for agencies that find it very difficult in trying to deal with large multi-stakeholder processes.

Another problem is the issue that was raised by a number of people about how you sustain funds because it may be possible to build up a lot of expectation and then not have an adequate strategy for actually funding them.

?? Trust Building : Awareness and sensitization-Information gathering-Vision

So how do we maintain these cooperative approaches The first step is critical and it is the trust building step that can be done by awareness building, sensitization and information gathering. An example of this is the use of a GIS information system where there is the combination of science and traditional knowledge. All of that is very important in the beginning stages to build this trust and to build a working relationship but ultimately it's not terribly useful unless something like a vision of what to do emerges out of it, taking those words and putting them to action.

?? Planification : Action plan- Formal partnerships-Initial financing

A second phase is this planning phase that can include the development of an action plan but also formal partnerships and also how does one go about building the initial financial base.

?? Action : Implementation of action plan-Review and modifications-Institutionalchanges - Co-management strategy - Permanent financing

Then we move to the next couple of items in this process and that is the action phase where one actually implements a plan and provides the necessary assessment and changes after that plan is actually underway. We heard a lot during the workshop about the need for knowledge, about the need for measuring progress, indicators and this is very important. We may need new ways of measuring and particularly convincing ways when you're dealing with people at the local level who have got a lot of priorities in their lives and they want to be sure that the time that they invest in these integrated planning efforts is really productive.

Finally, another element to consider in this process, is the institutional changes. We are seeing a lot of interesting cases and pilot projects where there is truly institutional change, where there is a move towards power sharing and co-management and perhaps in some instances towards stable funding bases not all of which will come from government.

?? **Integration**

Now the second point concerns integration. Integration means many things to many people and it is important that we recognize that there are at least 3 components when we talk about integration. One is the ecological component, another is the institutional component, trying to get institutions like provinces and federal government, like department of Fisheries Oceans and Environment Canada to be able to work together.

And thirdly there is the environment and economy component. These are interlocked, there's no question about that. During the workshop, we heard a lot about environment but we didn't hear as much about economy and maybe that says something about integration. For example, concerning financing, we heard about the fear that there's not enough money or that government isn't doing its business whichever that government might happen to be and that's a problem all right, but what kind of new financing approaches might be used, for example, the pension funds of this country are bursting at the seams almost, can some of that money be channeled in certain ways into habitat protection.

Another element in environment and economy (sustainable development) is that we try to get away from the use of the word balancing, trade off and so forth. What we are really searching for is a win win situation and perhaps we didn't hear enough in the meeting about the sorts of areas where we actually can have sustainable production systems whether agriculture forestry or ocean systems and habitat protection at the same time.

But there were also interesting discussion on the ecological integration for example corridors and forest management techniques. This kind of integration which we don't always think about as an integrated strategy is really quite important from an ecological perspective and perhaps even more important is the amount of discussion and the examples that were given.

?? **Implementation gap**

We sense, we know that there's not enough scientific knowledge but even with our available knowledge, available tools and experience, this still exceeds the political will and funding for action and that, I think, is a source of most of the frustration that we could hear as an undercurrent in the room.

We know there are institutional barriers. I won't elaborate on that right now because I'd like to come back to that point during the discussion. And finally, cooperation comes gradually either from the private sector within the government or with local participation. People have to be brought on board and it doesn't happen overnight and it's often a very fragile kind of cooperation at first.

So these are some of the factors that go into this implementation gap, the big question and issue is how do we overcome the implementation gap and I'd like to come back to that as part of our discussion.

Now the final point before our chief-rapporteurs present their summaries is about sustainable development.

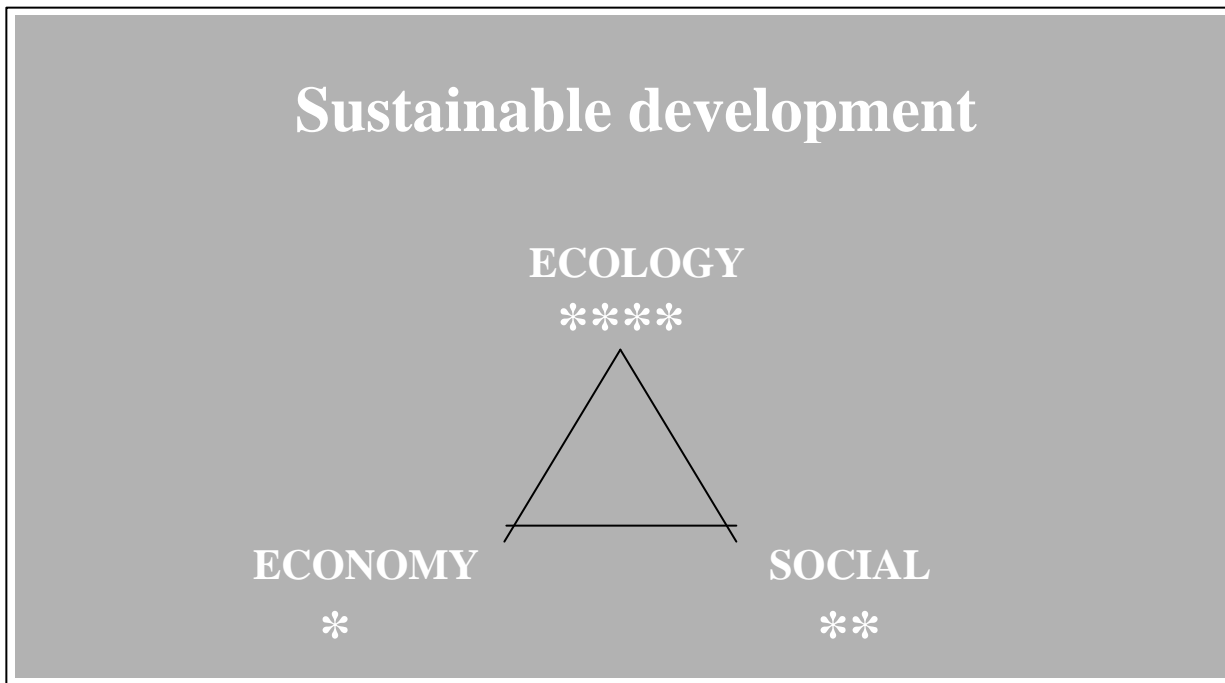


Figure 1 triangle---- linking environment, economy and social.

?? Sustainable development

Now sustainable development has to draw upon the knowledge from each of those areas but it also has to understand the linkages among them, that's a fundamental point. The discussion was heavily weighed on the environmental aspect of this during this meeting. Perhaps that is not surprising given the nature of the meeting but it also does reflect an imbalance that is indicative of some of the reason for the implementation gap. If we are serious about trying to link habitat conservation and sustainable development we are going to need to look into the two lower points in the triangle (economy and social) and then figure out how we tie them together (**Figure 1**) .

Review of ecosystems

Now what we are going to do next and is have our 3 chief-rapporteurs present their ecosystem review. We are going to start with the agriculture ecosystem with Jamie Fortune, then the forest ecosystem with Caroline Caza and then finally the marine and coastal ecosystem with Suzan Dionne. There is one key issue we should keep in mind and that is what can each sector learn from the experience of the others.

Agricultural Ecosystems

Jamie Fortune, chief-rapporteur

Thank you very much. I'm going to try to synthesize an awful lot of excellent work by some very dedicated people.

Global pressures - local responses

?? Agriculture has economic objectives

Agriculture is a complex system. We have global pressures really driving it here in Canada and responses are being develop locally. Agriculture has economic goals established by the agriculture ministers and those goals are to double the exports, value and agriculture by the year 2005. That's a lot of production. However, we are committed in Agriculture and Agri-Food Canada to sustainability so I wonder if there is a disconnect there between an economic goal and sustainability.

?? Agriculture is supported at the provincial and regional level

Agriculture is supported at provincial levels by government and local communities. People like farming, it's part of a healthy landscape. Farmers are passionate about their business. There are not a lot of farmers here at the workshop but if they had been here, in some of the session we would have heard about it.

?? Local problems - global solutions

Global pressures related to agriculture forces local responses. There also some significant local problems that can be solved their but they will need to be pushed up and dealt with at higher levels. The institution and structures are good at downloading but not so good at taking things back up.

?? Farmlands are habitat

A very important discovery, in the past couple of years, is that farmland is habitat, maybe not all great habitat but still, it's habitat.

?? Development of national indicators by the agriculture sector

The federal government (agricultural sector) is developing national indicators. There's a lot of good data that's involved in that assessment and it picks up the economic element of our society, it looks at the environmental aspects and also the social dimension.

?? Sources of data

What comes out of the national census is an incredible amount of conservation literature, publications, journals that are all being looked at. There are also monitoring programs underway, like the breeding bird survey or the remote sensing work. All that is very important. It is some of the only baseline information that is available to help connect with habitat.

?? Issues : crop depredation, endangered species

There are also issues associated with habitat on farmland and we heard about them. We heard quite a bit on crop depredation, endangered species and agriculture.

?? Innovative local partnerships - Communication between sectors

They are many partnerships going on in agriculture to conserve habitat. Extremely innovative, local partnerships. There are a lot of efforts that are put into these partnerships and they are important because they facilitate communication in communities at a local levels, they also facilitate communication in the provinces between the different sectors.

?? Effective programming

This is reflected in the development of effective programming. We see a movement in these programs, from individual conservation and activities focusing on one farmer to networks of farmers in communities and from individual farms to ecosystem and watersheds.

Programs need to continue and successful programming has involved a lot of good relationships build on trust. They are able to demonstrate results for habitat, results for agriculture and therefore are able to attract more resources and continue to build.

Perhaps some programs have trouble with funding because they are unable to demonstrate some success. One of the fundamental requirements in successful initiatives is to have habitat goals. The North American Waterfowl Plan, a major plan driven by need and that need can be communicated and understood, so that when you go to cabinet to get money they say this is how much I need.

?? Agriculture economics versus economics of habitat conservation

We heard a bit about economics well we can say that the economics of agriculture is pretty well known, we know input, cost, output, profitability whenever wildlife grazes on a crop, we know what is the economic impact. But we don't have a lot of knowledge about the economics and the benefits of habitat conservation. We need to describe within the same systems, the benefits of habitat conservation.

So that's an overview of the issues of what's going on in the agricultural ecosystem and the second part of my presentation will present what we need to move forward to in this agriculture and ecosystem partnership to conserve habitat.

? To go forward ... from the ecological point of view

?? Habitat programs need specific objectives

First of all, conservation programs require specific objectives and If you go back to the agriculture ministers defining the objectives for agriculture, that is doubling the production by the year 2005, well where is our habitat objective ?

?? Use landscape approach, ecological principles

We need to move forward, work through landscape approaches, with inclusive processes based on ecological principles.

?? Quantify needs for habitat

That isn't always easy but in order to have agriculture ecologically sustainable it has to be done that way. We need to quantify the needs of habitat, needs in dollar terms. In discussions on policy debates when you're trying to get resources, you need to know how much money you need, how much is a capital gain exemption going to cost ? what are easement going to cost if we give you tax breaks on them ?

?? Continue and extend monitoring programs

Another important point, is the necessity to continue and expand monitoring programs such as the breeding bird survey, remote sensing and water quality monitoring. We need to get resources for it is critical.

? To go forward... from the social point of view

?? Engage the residents in the agricultural ecosystems

From the social point of view, we need to engage the residents in the agriculture ecosystem on their own terms. We need to put forward approaches (bottom up) which are inclusive. Also, we need to communicate in a very compelling way what we want done and explain the science.

?? Investigate the human responses to programs

We should be investigating the human responses to programs. We know what ducks do when we make crooked ditches, straight ditches, big ponds, little ponds and that's excellent because that program needs that information. But we don't have the same level of information about the clients or the people that we're trying to engage in the process to actually conserve the habitat. This information could help in designing programs strategically and strategic programming would likely be more effective. We need to move from individual to community and then from property levels to ecosystems in order to build more participation and support at local levels.

? To go forward...from the economic point of view

?? Evaluate habitat needs and economic value of habitat

We need economic valuation of habitat and quantify habitat needs in dollars. A program must demonstrate that it is effective economically and that it is efficient. In our system, competition for resources is fierce therefore, we need to know the consequences and impacts on agriculture or habitat conservation.

? To go forward... globally

?? Transfer knowledge : need for a network

There are a lot of issues, strategies, and programming in all the different provinces and in the different jurisdictions. We need to find ways to transfer the knowledge and experience to help everyone move forward more quickly.

So that's a summary thank all the presenters, that an overview of the agriculture landscape in the presentation. Thank you.

Forest Ecosystems

Caroline Caza, chief rapporteur

Good afternoon, my task is to summarize some of the ideas and themes that came out of the forested ecosystem set of papers over the last two days. As Art mentioned I've been assisted in this task by a whole group of « rapporteurs » that I would like to thank once again. They provided me with a lot of information and some thoughtful discussion about some of the presentations. As Jamie said the talks, in forest landscape were also excellent and there was a lot of energy and obviously there is a lot of attention being paid to forest issues in Quebec, right now and that seems to be stimulating a lot of debate about current programs, current policies and the state of habitat conservation, I think that the discussion over the last 2 days benefited from that a lot. I've organized my comments a little differently, the themes in the program for the workshop focused on strategies and trends in work in forest ecosystems and I've organize my comments along those lines.

?? Forest ecosystems strategies

There were a number of strategies for incorporating habitat conservation into both forest management and perhaps more broadly landscape management that were illustrated through a number of talks. Among these were integrated resource management, there seems to be a renewed interest in that and lot of excellent examples of integrated resource management projects are underway currently in the province of Quebec.

There was also presentations addressing other habitat conservation strategies, forest certification systems, co-environmental, co-management processes and protected areas strategies. One topic that wasn't discussed was, if we step back and look at all these strategies in relationship to habitat needs, which strategies are most appropriate or how can we combine them and other strategies effectively to address the different issues that we face in habitat conservation.

There are also a number of issues that were very clearly brought forward, that bear upon our understanding of how to move forward with some of these strategies. I want to approach these issues from the point of view about what we need politicians to do, what we need institutions to do, what we would like communities to do, I want to talk about these issues from the perspective of, perhaps what we collectively as a community working on various aspects of habitat conservation, what we can do in relationship to these issues, because I think that is what also emerged from a lot of the talks.

I think from the perspective of habitat, we need to think a bit more about conservation. We are engaged in variety of programs some of which are focused on conservation of wildlife resources for their traditional economics benefits we are engaged in a variety of programs for the conservation of biodiversity, we are engaged in a variety of projects for the conservation of natural areas but we are not engaged in as many project for the conservation of all forest values and I think that relates to the theme of integration.

The talks over the last 2 days tended to focus on one or the other aspects of conservation without considering how they come together to affect the various stakeholders who are involved in managing land and its resources. I think one example of this, is the various definition that are still given to the term wildlife, wildlife was variously interpreted as traditional fishing game resources, more broadly as the biodiversity of conservation of living things.

There was a lot of references in the forest landscape, the forest workshops to the film « Richard Desjardins » on the boreal forest. It was indicated that this has resulted in a great increase in media awareness of issues related to forest conservation, when the media comes to us and asks what do we need to do about that, we need I think as a community to be able to talk about our goals and our objectives for conservation in the forest and I think that collectively more thinking about that would help us to take advantage of the opportunities that are presented like that.

There was a clear recognition of the need to acknowledge and celebrate our achievements and our successes in conservation. That is important to be able to reinforce and engage all of the new players that are interested in willing to help us with our conservation goals.

?? **Forest ecosystems : Trends**

There were also a number of trends that emerge clearly from over the course of the 2 days, I have only identified a few of them here and I guess I should also acknowledge that it's very apparent that all of the trends, the strategies, the issues are connected. But some of the trends that formed the subject of much of the discussion in the workshops were the variety of new programs and new players that are involved in conservation, a theme that was identified also in the agriculture ecosystem workshop.

Wildlife habitat conservation is no longer restricted to the traditional habitat managers. More and more, it is being done by other groups and we saw clear evidence of that in the projects and the issues brought forward in the last couple of days. As Jamie mentioned, one of the challenges we face, is providing the information and the tools to those players to make their involvement in conservation effective and rewarding. We were presented some new information on research in the boreal forest, there has been a lot of attention lately paid to the issue of boreal forest conservation in Canada and globally. This has all a sudden revealed to us the superficiality of our knowledge about the boreal forest. In a way we are scrambling to acquire the information we need to meet some of the current requirements of conservation. The new inventories and research programs are doing that and I just hope that they can produce that information in a way and at a rate that can effectively inform the conservation issues and the conservation needs.

It's not entirely clear whether that will happen yet there is a disjunction. Even at this meeting, people tended to talk about research, or they talked about management program, or they talked about policy, but the challenge of talking about these things all together in a way that is directly linked to the issues that we face still seems somewhat illusive.

Another trend is the move from enforcement to cooperation, I don't know how many people here are long time wildlife habitat managers or long time conservationists but it is clear now that enforcement, although it is a necessary foundation and framework for management, it is no longer where we are likely to make the gains in what we want for conservation so the move away from issues of stronger regulations, better enforcement, I'm not saying those aren't issues but they were not the subject of discussion at this workshop, the issue was on cooperation, new forms of management that involves the people who own and manage the resources and who can willingly participate and help us achieve mutual objectives for conservation.

What are some of the issues related to these trends ? one of them is the need to link

research management programs and policies in ways that are more effectively addressing key issues. There is no one recipe for conservation and the breath of tools, the breath of strategies that we are engaged in when you first look at it from the outside may seem confusing but in fact, it is I think an implicit recognition that there is no one way to achieve what we want. There are many ways and those ways will depend on the people involved, their goals, the vision that we have and our understanding of the ecology and the environment in which we are operating.

One of the speakers said that one of the key aspects of success in an integrated management project was knowing the territory and I think that's related to that issue. Clearly in the forested ecosystem talks, there was a lot of recognition of those levels of resources that is needed to do this new cooperative approaches to management and they are extensive among the resources that we were required in addition to the usual ones of money was a lot of time, a lot of patience, a lot of energy, a considerable amount of information and sustaining as others have mentioned, sustaining this level of resources is a major challenge that we face in taking programs as Art said from the pilot phase to the mainstream phase. And we, perhaps need to do some more thinking and working collectively on how that can happen.

?? Forest ecosystems : gaps

There were a number of gaps that emerged, that I think form some of the key areas that we need to work on as a community in order to take advantage of the strategies and trends that are underway in forest conservation.

The need to develop some new mechanisms, as one participant said, concrete action to stimulate people, so we have to work on, we have to be less concerned on whether our actions are right and more concerned on whether we can learn from them. The implementation gap has many facets in forest conservation, integrating economics, social and environmental objectives, not just issues but actually objectives for management on the land, some of the most successful wildlife conservation projects that have taken place within the framework of integrated resource management have been successful because land owners or resource owners were able to see the economic benefits from habitat conservation

So far though, those economic benefits have been defined mainly in terms of the traditional wildlife resources, so we have to do some thinking about the economic benefits related to the non-traditional to biodiversity conservation ecosystem conservation.

We need on the ground measures of success for policies and programs. Related to that is the issue of monitoring because monitoring is key to being able to report and demonstrate success and the effectiveness, the efficiency of delivering programs as we get more ideas, more tools, more players, there is a real. We are already suffering from this lack of efficiency and that is an issue.

There is a need for leadership at all levels. Even a consensus process needs leadership and it needs a vision to guide it. Another characteristic of successful integrated resource management, a point which was made over and over again was that common objectives and a common vision helps guide people through the rough parts of building a cooperative program.

And lastly we have new knowledge, we have new approaches, improved approaches but we have many of the same issues and somehow we are missing the links between them. We all have a role to play in linking these things so that we can remove the obstacles and move forward on habitat conservation.

So that's some of the observations that came out of the forested workshops. Thank you.

Marine, coastal and fluvial ecosystems

Suzan Dionne, Chief Rapporteur

We were treated to some very interesting presentations on marine, coastal and fluvial ecosystems, and I would like to thank both the speakers and the rapporteurs, whose contribution to this synthesis was invaluable. I would also like to thank those participants who commented and asked questions, thereby enriching the contributions of the speakers.

?? Marine, coastal and river habitats are considered a common resource.

As Aristotle said: «That which is common to the greatest number has the least care bestowed upon it.»

First, I would like to point out that the process has been applied to marine, coastal and fluvial ecosystems more recently than to agricultural or forest ecosystems. There are now a number of strategies and initiatives being implemented. A lot can be learned from the other seminars. On the other hand, these are different ecosystems, and people are evolving some very creative procedures.

When we talk about collective resources, people tend to think that these are resources that everyone will take an interest in, but in reality few people are concerned; such resources could be managed better.

?? Administrative fragmentation versus ecological integration

A point that was frequently reiterated in presentations is that our institutions are becoming administratively fragmented. This fragmentation is also political and social and is reflected in the management and use of resources.

?? A co-operative management approach and integrated management initiatives

Some of the strategies proposed are aimed at establishing marine areas, fostering integrated management, etc. In general, these strategies are highly complex and dependent on a large number of agents.

A number of case studies were cited which stressed local participation, a broad range of partners and partners' values needing to be taken into account.

?? Public involvement

A theme that was addressed in several presentations was public involvement, the importance of public education and the role of the public as an engine of progress.

Another point brought out was the importance of co-ordination among all those involved and of having them all around the table to share their views and values.

As in the seminars on farmland and forest ecosystems, few economic interests were represented. There were very few fishermen or representatives of the ecotourism

industry or users of marine resources, all of whom are key players in conservation and habitat management.

The importance of an open, transparent process was apparent. Increasingly, as my colleagues and I have been saying, the notion of regulation is yielding to administrative strategies based on participation and empowerment, leading to better and healthier treatment of habitats and resources.

?? Protection of sensitive, unique or important areas versus interaction with marine and coastal activities versus the public's right of access

Some seminars dealt with habitat protection, management tools, the framework for ecological analysis and identification criteria, but few touched on the economic, social and political aspects of marine, coastal and river ecosystems. Indeed, as stated in other seminars, when it comes to application in the field, there are more than just ecological factors to be considered. Tools need to be developed to include these various aspects in our analytical framework.

Another point made in the seminars was the need for «good science» and the application of this science in our management strategies, policies, programs and program monitoring.

In marine and coastal environments, there is a learning cycle, a cyclical and iterative process. People start informing and educating those around them, and a distinctive vision emerges which is translated into action. The vision evolves, new projects are spawned, and progress gradually draws in new partners.

?? Conclusions

In our decision-making, we have to develop tools that integrate economic and social considerations. Local communities will have to be drawn into the process, and suitable communications tools will need to be developed;

Collective property is subject to social contract. The infrastructure encompassing such common property is very cumbersome and complex.

We have man-made economic and administrative systems which do not match natural ecosystems. We often attempt to align these systems with the natural ones, but without success. We will need to develop conversion tools to be able to carry discussion further. In each compartment, there are real people, and each person has a role to play.

This concludes the commentary synthesis for marine, coastal and river ecosystems. Thank you.

RAYMOND SARRAZIN

We will now have questions and discussion.

Question-1 Jean-Pierre Savard, Canadian Wildlife Service.

One comment on integrated resource management. In discussions of forest environments, exploitation of forest resources was linked with integrated management. There is another component that should be added now that the Biodiversity Convention has been signed, and that is preservation of biodiversity.

Biodiversity conservation is not necessarily compatible with integrated resource management, and this applies on various scales. Integrated management decisions are often made at the local level, while in general decisions on biodiversity and species in decline are made at higher levels, provincial or national, rather than local. We can hardly ask local groups to make decisions on species protection when the responsibility lies with provincial, national or international entities.

Question 2- Denis Haché, Fisheries and Oceans Canada

I think that local participation is very important, but on the other hand we should not forget that there are regulations and laws that have to be applied. I have the impression that there is a tendency to overlook the responsibility incumbent upon public servants to apply the legislation currently in force. There is also a need to change certain legislation that is poorly framed. We should not get the idea that whenever there is a conflict over habitat use local groups should necessarily have the last word.

In many cases, laws and regulations are needed and need to be enforced. There is a tendency to empower local groups to make decisions that really belong to administrators, and this is not necessarily very good. With respect to agriculture, I was surprised, and very dismayed, to see how some things are done in Quebec. It seems to me that farmers are being given economic encouragement for actions which partly result in environmental degradation and habitat destruction. Perhaps these practices need to be amended to give money only to those provinces or those farmers who respect farmland environments. This means empowering agencies and individuals and giving them economic incentives to protect the environment.

Question 3- André Babin, *Association pour la revalorisation du Barachois de Bonaventure*

In the same line of reasoning as Mr Haché, I feel that citizens and local groups are getting involved in restoring degraded habitats, only to find that in many cases the Department of the Environment and Wildlife is delegating powers to municipalities that have neither the staff nor the technology nor the means to apply laws and regulations. In addition to working on ecological restoration, we are forced to fight for compliance with laws and regulations. As a local organization, we can do a lot, but personally I would rather work on restoring natural environments than try to police legislation.

Question 4 - Guy Trecia, *Société de la faune et des parcs du Québec*

In the seminar on farmland ecosystems, stress was laid on two issues: crop degradation and threatened species. If we look at Quebec, and the farming regions of southern Quebec in particular, considerable efforts have been made to clean up municipal and industrial wastewater, so that point-source pollution has come to the fore. Yet we find that our rivers are, in many cases, in a deplorable state in terms of water quality, diffuse pollution from agricultural sources being the chief culprit today. This area has not been subject to the same measures as have applied to the municipal and industrial scene. I therefore feel that water quality is an issue that needs to be highlighted, since water is the integrator of all the assaults on our watershed lands.

Just now, Mr Haché responded to the presentation I gave this morning on the Boyer River. I cited three examples of government programs that conflict with conservation objectives, programs that actually run counter to the recommendations of the World Trade Organization. This organization, to judge from its portrayal by the media, is recommending a move away from farm production support measures in favour of farmland conservation measures. This is something where Quebec has not yet fully caught up. I am not saying that all assistance programs offered by the Department of Agriculture are bad — some, like PAYA¹, are very good — but I will give you three examples that are counterproductive.

They are harvest insurance, stabilization insurance and property tax reimbursement. Harvest insurance covers cultivated land and guarantees yields. The land covered includes shorelines and half the width of a watercourse where the farmer owns the watercourse. Agencies trying to promote conservation come up against a parapublic body that subsidizes cultivation of shorelines and watercourses.

Stabilization insurance guarantees a minimum price for animal production, regardless of whether this production is covered by an authorization certificate. I quoted the example of a farmer who can produce 1,000 head a year; he is compensated for low prices on his 1,000 head, but if he produces 100 or 200 more he is compensated for those too. How can we expect to see the carrying capacity of the land respected if government programs encourage production beyond what is legally authorized?

The third case is property tax reimbursement. The main purpose of this is to offset the cost of improvements made by municipalities along watercourses in farming areas. Municipal authorities undertake the improvements and add the costs to farmers' tax bills; the latter are then reimbursed by the Department of Agriculture to the tune of 70% or 80%, whether or not the improvement meets standards. These are three cases where programs run counter to conservation measures.

¹ Sigle à vérifier/Check acronym.

Question 5 - Jacques Prescott, Quebec Department of the Environment

Like all the participants, I am aware that we need to promote integration of sectoral policies and develop a comprehensive vision of the environment that would be shared by all economic, social and environmental interests. What is perhaps lacking in our awareness is that there are in Canada, and especially in Quebec, integrative tools of this kind. In Canada, we have the Canadian biodiversity strategy, an initiative for integrating sectoral visions into a common vision of biodiversity in Canada. What is missing from this strategy is an integrated action plan, for there are already sectoral action plans for each sector targeted by the Canadian biodiversity strategy. This means that there is work to be done on integrating national action plans.

In Quebec, on the other hand, we have both a biodiversity strategy encompassing all economic, social and environmental sectors and an integrated action plan, which has already been in force for three years; the third annual report will be published soon, detailing the results achieved. I feel bound to draw attention to the existence of this type of integration tool, the first of its kind in Canada and in Quebec specifically. Numerous provincial groups, such as the Fondation de la faune du Québec, the Union québécoise pour la conservation de la nature and the Quebec Wildlife Federation, have joined the Quebec government as official partners in implementing the biodiversity action plan.

Question 6- Denis Cardinal, Parc Nature de Pointe aux Outardes

I have been involved in habitat conservation for 20 years, specifically in a nature park on the Quebec North Shore. This is an ecosystem whose importance is universally recognized. Each year we ask ourselves this question: will we be able to continue our work this year? Will we be in the picture or not? I like the slogan «from words to action»; it speaks to my concerns. I am looking to be able to fulfill a dream. What I want to see is acknowledgement of our group's importance, of the importance of maintaining this site and of conserving it as a major contributor to biodiversity.

I would eventually like to see a program that officially recognizes our involvement as partners in conservation. It has to be understood that self-financing of education and conservation initiatives is extremely difficult for local organizations. Perhaps a renewable program could be introduced that would allow us to play our part. Meanwhile, we would still do public promotion and seek funding. We have been doing this for 20 years, and for 20 years we have not had adequate support to really fulfill our mission. I say to myself: if we are not around tomorrow, well, a very valuable habitat is going to be lost.

Question 7 - Claude Grondin, Fondation de la faune du Québec

I will tell you what I think I have detected in these last three comments. We are told that we have many tools, good ones, that we have a lot of information and know how we should proceed, and that consequently we are somewhat ahead of policy and decision-makers.

The question that occurs to me is: how can we collectively assist in policy-making and help decision-makers fall into line and give us more support? This ties in with Denis Cardinal's ideas; in other words: how can we ensure that decision-makers are told about the conclusions of a workshop of such importance? This is the third workshop that I have attended, and very good things always happen, but they seem to remain our secret. I would like to find a way to get the news out to decision-makers, the community, the public, telling them that we have managed to bring together 280 people who have thought seriously and produced good ideas, but it must not be left at that.

ART HANSON

I think that it's a very important point. The issue of communication and communicating a clear message back from an important gathering in a politically sensitive sort of way in other words so it is heard provincially, nationally and in some cases locally, I think goes to the heart and core of what some of our observations are. I think that question should stay with every one who is attending this meeting as you go back to your own institutions and keep that question in mind throughout the next year, getting ready for the next meeting.

This leads very nicely into what I would like to just finish off if I could.

? ? **Ecology**

?? **Ecological integrity**

We are addressing very well the issues of environmental integrity and ecological integrity and that's important. But we are not necessarily getting the message out properly, but we are getting an understanding of what this means.

?? **Good science**

We are presenting ideas that are fundamentally based on good science. This is something that supports the pre-cautionary approach, the pre-cautionary principle, which is just now finding its way into Canadian legislation, nationally and locally. A very important point that was highlighted by David Neave's presentation, and that is, we need to have a solid base when we approach decision makers and in a believable fashion.

?? **Protection of natural areas and biodiversity**

It is clear that we are giving emphasize to the preservation of representative areas to biodiversity.

?? **Sustainable production**

The fourth one which I didn't pick up as well in the presentations, but it was there certainly is we are starting to think more about sustainable production, production that takes into account the needs of habitat and wildlife other than logs and commercial fish. So I'd say we covered 4 very key areas under the ecological side of the triangle. Under the economic side, with some exceptions I feel we only covered one of what I would consider 4 key points.

? ? **Economy**

?? **Valorization of the environment**

The economic valuation of environment, and I know there are many arguments why you don't always want to do this, is particularly important. What is the cost of destroying an ecologically significant habitat, it is important that we start to think in those terms.

?? **Cost internalization**

The cost internalization, the issue of how it is that a forest company or a large farming operation really should take into account the externalities that they are creating. Now this obviously relates back to the first point but we have to approach this more rigorously in discussions about habitat.

?? **Incentives**

Thirdly, and it was so elegantly pointed out by one of the observers, is perverse incentives. The failure to take into account what the economic and incentives system does to habitat. In the prairies there are a lot of incentives that are now changed but the Western grains transportation Act, for example, meant that everybody would try to grow grain when they really shouldn't be.

Tax reform so that we can encourage people to turn habitat back into habitat that is good for wildlife rather than turning it into marginal farmland. In general, the economic incentive system is not well lined up with the ecological needs and that's why we've got to do much more work and it has to be much more specific. When you meet bureaucrats in Ottawa you need to have your facts and figures pretty well right and not only that, but you need to make a convincing case if, it's going to mean a hundred and fifty million dollars less going to the public coffers, you need to be able to demonstrate why that's a good thing.

Fourthly and this is just been alluded in this meeting except in the area of forest certification but the area of trade and sustainable development is a very important area with major, what I would call insidious effect on habitat. Jamie made the point that if we double agriculture exports what are we doing to habitat. There is a whole question about who's rules apply, do the rules of the WTO apply ? or the multilateral environment agreements like the biodiversity convention ?

? ? **Social**

?? **Transparency and participation**

In the social side we did pretty well in 2 areas, the area of transparency and the area of participation. I won't talk more about those but there is 2 other areas that I think are important that need more attention than we gave. One is the issue of equity and this comes back to a number of things, it comes back in some cases to issues that are involving average on people, it comes back to issues involving farm families and

what is right and proper, but also linking that to the notion of sustainable livelihoods which I understand was done in one of the workshops relating to woodlot owners in various part of Canada and it could be done in relation to coastal communities, it could be done in relation to farm communities throughout Canada, etc. But the issue of sustainable livelihoods is a very active one in sustainable development thinking and it's one of the ways that you either win friends among people who are close to the land or you loose them, if they think their livelihoods are threatened by habitat protection then you loose them.

And finally, we had a great debate about even how to translate this term subsidiarity which is a term that I'm sure some of you know and some of you probably don't know. It refers to something that goes back to Benedictine monks told by an Italian friend in the 10th century but more recently has been use very much in the European union and it refers to the idea that you should drive decision making to the lowest level were you can have an effective decision. If that wetland protection can be done strictly at the level of a local district or something like it doesn't require an elaborate chain of decisions above that, on the other some of the decisions hat are taken locally may go all the way to a regional or even to a global decision process. Whooping cranes would be an example of one that you have to worry very much about something its a migratory species, but this idea of subsidiarity is a very compelling and interesting one and it should be tied back to this idea of decentralization partnerships and so on, don't have time to talk about it but keep that idea in mind because it one that's very much being thought through in sustainable development.

Now, out of all of this, I'd just like to wrap up with a final comment and then present you the 3 questions. The comment is written as a question but it's an observation :

Are we going to be leaders or are we going to be followers ?

Let me give a couple of impressions that people who think about these things have said. One is the new commissioner for environment and sustainable development in Canada Mr. Brian Emmett. He believes that we are not following up on domestic action to meet our international obligations and that's true in the case of climate change. I suggest you consult the website of the Auditor General of Canada if you are interested in the work he has written on biodiversity.

The second comment I have summarized, is from William Thorsell. He is the editor of the Globe and Mail and he has been writing a lot about nature protection and preservation of ecosystems in Canada : « we need a 21st century national stewardship program that would first of all inspire us in a way that some other big challenges have inspired us in the past ». A program that will inspire us as Canadians occupying some of the most interesting and large real estate per capita in the world.

A program that will adequately protect our splendid natural heritage that we are fortunate enough to have throughout the country and that will unable us to truly demonstrate world

leadership on the process.

QUESTIONS :

1. How do we move to full-scale implementation from pilot projects?
2. How can we communicate more effectively to make habitat protection a higher priority?
3. What are the most important institutional barriers to action on habitat protection in Canada?

One that we really impresses us is how do we move to full scale implementation from all these pilot effort that we started. Learning from that experience is not going to be easy because you can expect that its not going to work as nicely as the pilot projects. That's a big question. What are the constraints there and what are the opportunities.

Secondly and this goes right back to that last question from the floor, how can we communicate more effectively to make habitat protection a higher priority. We're simply not doing the job, it is not working and the point that well the results are not going out to this meeting into the hands of politicians and to others is an important point but it's also what kind of information what is going to be effective with policy makers and decision makers and I think that should be a question that is really brood home in the planning for the next habitat meeting as to some of the more effective models that have either been used elsewhere or we found have worked in Canada. This question of communication of what is needed is important.

And the third question which has endless intricate channels attached to it I'm afraid is what are the most important institutional barriers to action on habitat protection in Canada ? I know that it's a very big topic but we all have to keep that one in front of us and I think the more we can clarify those, put them into these little boxes that we arrange for them, the environmental, economic or social or institutional in the stricter sense of bureaucratic institutions, they are important.

Finally, let me just say that going back to the first presentation which underlined the «to think locally, act globally, understand globally, act locally », I think that 's really important. And it has been reinforce a number of times during this workshop.

You've been a very patient group of people over this last while and I would like to thank Raymond, first of all and all of our chief rapporteurs for the hard work and there has been believe me a lot of hard work to put together these presentations. Also, I would like to thank Marie-France and all of you for your patience and I look forward to getting a chance to talk with you this evening over diner.

RAYMOND SARRAZIN

Thank you, Art.

Just a few words before I let you go. First, it is my great pleasure to announce that the next workshop, the fifth National Habitat Conservation Workshop, will be held in Ontario and will be hosted by Laury Maynard of the Canadian Wildlife Service - Ontario region.

I have the last word, and I would like to use the opportunity to thank, first, all of you and all the participants; the response has been remarkable, and we thank you sincerely. I would also like to thank the speakers, whose work has been outstanding, and I thank too all those who laboured during the workshop, the moderators, rapporteurs and the three chief rapporteurs, and lastly the organizing committee; here I would like to mention by name Marie-France Dalcourt of Fisheries and Oceans Canada, Clément Fortin of the Société Faune et Parcs du Québec, Jamie Fortune of Wildlife Habitat Canada, Guy Lépine of the Fondation de la faune du Québec, who unfortunately could not be with us, Sylvain Paradis of Parks Canada and last but not least, Francine Hone of the Canadian Wildlife Service, who co-ordinated the whole event. Please join me in giving them a hearty round of applause.

APPENDIX

APPENDIX 1 :

Workshop Programm

APPENDIX 2 :

List of participants

Appendix 2. List of participants

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