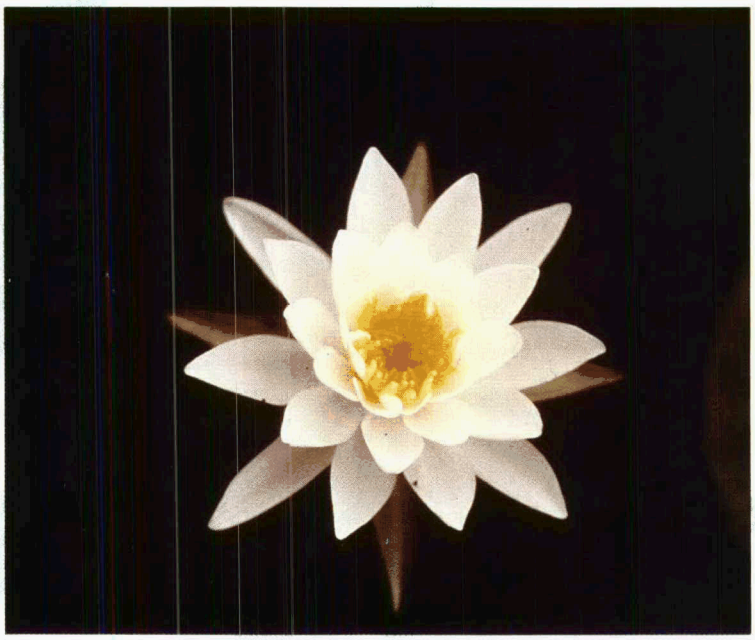
NO NET LOSS

IMPLEMENTING "NO NET LOSS" GOALS TO CONSERVE WETLANDS IN CANADA



SUSTAINING wetlands

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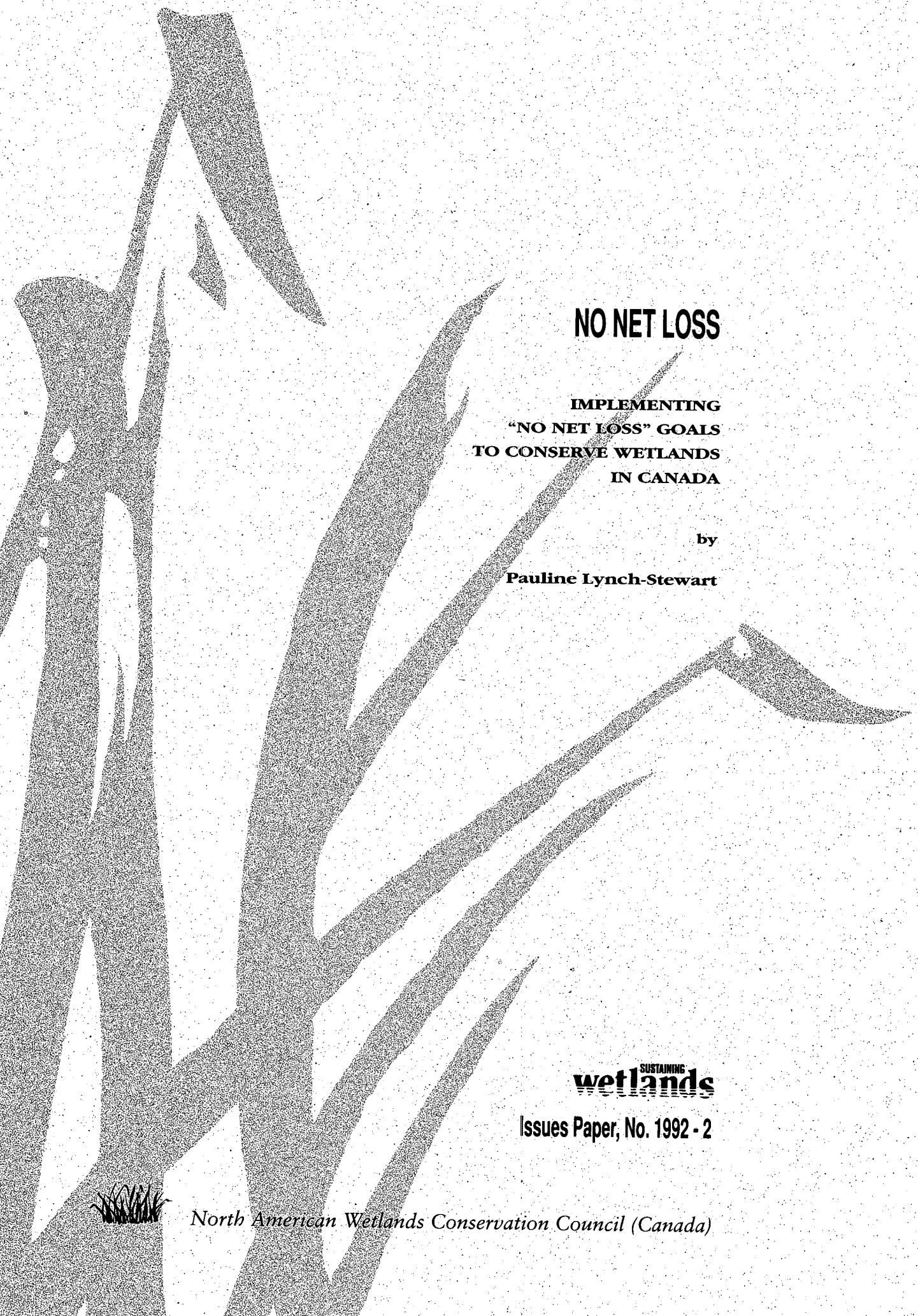

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IMPLEMENTING "NO NET LOSS" GOALS TO CONSERVE WETLANDS IN CANADA

by

Pauline Lynch-Stewart

SUSTAINING wetlands

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North American Wetlands Conservation Council (Canada)

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Preface

The North American Wetlands Conservation Council (Canada) is committed to advancing wetland conservation efforts in Canada, through the coordination and support of management, science and policy initiatives. In recognition of the value of a "no net loss" (NNL) policy goal for wetland conservation, and in response to the growing interest in such a goal to guide Canadian conservation efforts, the Secretariat to the Council, together with the Canadian Wildlife Service of Environment Canada, commissioned a study of how the goal might be practically implemented in Canada. The study reviewed the actual experience to date in implementing NNL in North America, and the needs and concerns of Canadians surrounding potential implementation of NNL in this country. Major sources of information included a literature review and interviews with representatives of government agencies, parties affected by regulations, interest groups and other stakeholders.

Based on the findings of that study, this paper offers jurisdictions across Canada, at the federal, provincial and local levels, perspectives on "no net loss" as a policy goal for wetland conservation. The paper describes an approach to implementing "no net loss" which is designed to address the issues surrounding the goal and to result in a positive change on the ground. Six recommendations are presented for "no net loss" implementation in Canada.

Introduction

No net loss (NNL) is increasingly being adopted by governments and their agencies throughout North America to focus and advance their wetland conservation efforts. Since 1986, operations at Fisheries and Oceans Canada have been guided by the *Policy for the Management of Fish Habitat* which contains "no net loss of productive capacity of fish habitat" (including wetlands) as a guiding principle. The Canadian federal government has recently released *The Federal Policy on Wetland Conservation* (Government of Canada 1991), which commits all federal departments to the goal of "no net loss of wetland functions" on federal lands and as a result of federal programs, in certain other areas of Canada. In the United States, President Bush has followed up on his national goal of "no net loss of wetlands" with the release in 1991 of an implementation plan "to slow and eventually stop the net loss of wetlands" (The White House 1991b). Key federal agencies in the U.S. have formulated specific plans for the implementation of NNL. Legislative or policy initiatives based on the NNL concept are under way in over 30 states. Maryland, Oregon, New Jersey and Illinois have enacted state legislation aimed at NNL of wetlands, while Washington has set NNL goals at the state level through an Executive Order.

With the considerable (albeit short-term) experience in implementing NNL policies, and the growing interest in this direction for wetland management, let's pause and reevaluate: Is NNL making a difference to the way decisions are made, and ultimately to the wetland resource? How are wetland managers translating this "ideal" to action on the ground? What are the issues or obstacles surrounding implementation of NNL? What can we learn from North American experience to date, that can help us in implementing NNL goals in Canada?

To answer these questions, this paper is organized into four major sections: a review of comments regarding the effect of implementing the NNL goal; a characterization of NNL as it is currently being implemented; a summary of the major issues and questions which need to be resolved in any NNL program; and a recommended approach to the implementation of NNL in Canada. As background to this discussion of NNL implementation, the origin and meaning of the NNL concept is explored in the next section entitled "What is No Net Loss?".

What is "No Net Loss"?

Where did the idea come from, and basically, what does it mean?

Fisheries and Oceans Canada presented their *Policy for the Management of Fish Habitat* to Parliament in October, 1986. It contained an innovative "guiding principle" which is fundamental to their habitat conservation goal: "no net loss of productive capacity of habitats." To Fisheries and Oceans Canada, the "no net loss" principle means that, "the Department will strive to balance unavoidable habitat losses with habitat replacement on a project-by-project basis so that further reductions to Canada's fisheries resources due to habitat loss or damage may be prevented" (Fisheries and Oceans Canada 1986).

Also in 1986, the Association of State Wetland Managers recommended "an explicit 'no net overall loss' policy" as an important step forward in protecting wetlands in the U.S. The Association concluded that such a policy would provide relatively clear guidance to landowners and provide agencies with a relatively simple but flexible yardstick (Kusler 1988).

The National Wetlands Policy Forum was convened in 1987 by The Conservation Foundation, at the request of the U.S. Environmental Protection Agency, "to address major policy concerns about how the nation should protect and manage its valuable wetlands resources" (The Conservation Foundation 1988). The Forum members included three governors, a state legislator, and heads of state agencies; a town supervisor; chief executive officers of environmental groups and businesses; farmers and ranchers; and academic experts. Three public workshops were held across the U.S. to obtain the perspectives of other local officials, landowners, public interest groups, commercial interests, private citizens, and wetland experts. The Forum released its final report, entitled "*Protecting America's Wetlands: An Action Agenda*" in 1988. This report recommends that "the nation establish a national wetlands protection policy to achieve no overall net loss of the nation's remaining wetlands base, as defined by acreage and function, and to restore and create wetlands, where feasible, to increase the quality and quantity of the nation's wetlands resource base." It is important to note that the Forum's final report "represents a consensus, reflecting a wide diversity of perspectives and based on an extensive process of consultation" (The Conservation Foundation 1988).

Joseph Larson, of the University of Massachusetts, was a member of the Forum. Larson provided insight into the Forum's deliberations which resulted in recommending the NNL goal: "The goal arose out of the recognition that the U.S.

has lost half of its wetlands, and enough is enough! But if, realistically, there is going to be some loss then what do you do? The no net loss goal is based on the principle that losses should be balanced. If loss is not acceptable, then we have to do something to make up for it... as a last resort, to create a wetland where there was none before. Thus, the goal represents a realistic perspective on wetland conservation."

An Action Agenda articulates four key points which serve to clarify the meaning and intention of the goal:

- Wetland "alterations cannot be stopped entirely — some alterations occur naturally, many are the continuing legacy of past activities, and some unavoidable alterations may result from beneficial human activities." The goal seeks to offset unavoidable losses through "restoration of former degraded wetlands and, where feasible, creation of new wetlands."
- "...the goal does not imply that individual wetlands will in every instance be untouchable or that the no net loss standard should be applied on an individual permit basis — only that the nation's overall wetlands base reach equilibrium between losses and gains in the short run and increase in the long term."
- "The public must share with the private sector the cost of restoring and creating wetlands to achieve this goal."
- "...the goal may have to be implemented at different rates in various regions of the country to reflect regional wetlands needs, conditions and types."

The "Sustaining Wetlands Forum", held in 1990, brought together Canadian agricultural, municipal, business and environmental conservation interests to develop Canadian wetland conservation recommendations for the consideration of the National and Provincial Round Tables on the Environment and the Economy and other appropriate groups. One of the key recommendations forwarded by the Forum was that "no net loss of wetland functions" should be established as a national goal in Canada (Sustaining Wetlands Forum 1990).

The Government of Canada recently released *The Federal Policy on Wetland Conservation* (Government of Canada 1991), outlining seven strategies to provide for the wise use and management of wetlands. One of seven strategies deals with the management of wetlands on federal lands and in relation to federal programs. This strategy commits all federal departments to the goal of no net loss of wetland functions (i) on federal lands and waters, (ii) in areas affected by the implementation of federal programs where the continuing loss or degradation of wetlands has reached critical levels, and (iii) where federal activities affect wetlands designated as ecologically or socio-economically important to a region. The *Policy* also encourages specific actions to enhance wetland functions on federal lands and waters through the ongoing implementation of all federal programs. Implementation guidelines for the *Policy* are forthcoming.

Is NNL Making a Difference?

Is the NNL goal making a difference to the way decisions are being made, and ultimately to the wetland resource? Wetland managers, non-government interest groups and regulated parties were asked to comment on the actual "track record" of the NNL goal, including its value on a conceptual level, and its practical effect.

The wetland managers and interest groups responded soundly in favour of the NNL goal. The main message was that, conceptually, the goal contributes significantly to wetland conservation, even though there is much work to be done to refine its practical implementation. Many emphasized that the goal is a vast improvement over previous approaches, and that in aspiring to achieve NNL, wetland functions and values are being protected. Numerous examples of the positive value of the NNL goal to wetland management, and its effectiveness in conserving the wetland resource, were provided:

- "As an underlying principle and basis for negotiations with development interests, it sends the message that the Department is serious about habitat being protected... (operating under the guiding principle is) no different than the way we've been responding to development for 10-15 years, but it offers a more structured approach and tangible results" (Peter Delaney, Fisheries and Oceans Canada, Pacific and Yukon Region);
- "The NNL goal has added a very valuable component to our wetland program. The goal keeps you focused on a day-to-day basis... even the presence of that pressure keeps you honest in terms of doing the most that you can. The effect of the goal is to act like a fine-tooth comb — making sure we take great care in scrutinizing (wetland development) permits. The goal cuts down on senseless, needless loss of wetlands... and has resulted in a lot fewer losses than there would have been without it" (David Burke, Maryland Department of Natural Resources);
- "The NNL goal has articulated the idea that we are serious about wetlands... we need to have an objective, and NNL provides that objective. It represents an improvement over the general statement of 'to protect' or 'to reduce'. The goal also provides a focal point for developing wetland programs, and for establishing public support for wetland conservation" (Marvin Hubbell, Illinois Department of Conservation);

"The NNL goal... is immensely useful as a beacon to target all our disparate interests."

Scott Feierabend, U.S. National Wildlife Federation

- "That there is a goal for wetlands built into Maryland state law is more important than anything else. Wetland conservation under Section 404 of the *Clean Water Act* promoted the 'let's make a deal' approach... there was no 'duty' to protect wetlands. Having rules on the books has tightened up the way things are done" (Curtis Bohlen, Chesapeake Bay Foundation);
- "(The NNL goal in the U.S.) is immensely useful as a beacon to target all our disparate interests, and to provide a focus for our smorgasbord of wetland policies and regulations... NNL has also served in bringing the wetland issue to the household level" (Scott Feierabend, U.S. National Wildlife Federation).

But what do the "regulated parties", or industry, business, and development interests think about the value of the goal and its practical effects? In general, representatives of these interests were more critical in their response, but their criticism and recommendations focused on the specifics of how the goal should be implemented, rather than undermining the value of the goal as a standard for wetland conservation. Representatives of national organizations in the U.S., such as the U.S. Farm Bureau and the National Wetlands Coalition (NWC) (representing 65 clients from the U.S. regulated community, including port authorities, municipalities, land developers and oil companies), reserved judgement on the "track record" of NNL implementation, indicating that the effects to date of the federal NNL policy goal in the U.S. are unclear.

Representatives from more localized areas suggested that development interests are beginning to understand and work with agencies responsible for NNL implementation. George Colquhoun, Port Manager of the North Fraser Harbour Commission observed, "In view of the alternatives, (industries operating in the harbour) are learning to respect the NNL principle, and for the most part, coming on side." Similarly in Maryland, David Burke of the Department of Natural Resources reported that the response of regulated parties was "initially mixed, but now a little more in favour." Developers in that state appreciate the value of the "carrots" that have been built into the process, such as the mandatory time frames for permitting process, clear-cut rules for mitigation, and greater predictability in terms of permitting decisions. Burke also noted that the goal is having an impact on the way developers view the issue, since it has had the effect of cutting down the number of permit applications.

Marvin Hubbell of the Illinois Department of Conservation reiterated the importance of demonstrating to developers "what's in it for them": "Our commonsense standpoint has helped the transportation department to ultimately come around, since we have shown that we are willing to look at things which make their lives easier, while still complying with the (NNL) Act." Hubbell concluded, "The goal has raised the awareness of all (Illinois) state agencies about how they do business and how it affects wetlands. This has had an impact on overall planning and design of projects in the State."

Although no specific comments were made on the absolute economic effects of implementing NNL, a number of the individuals surveyed commented on the relative nature of economic effects: for small to medium enterprises such as farmers, the effects "could be significant," whereas for large enterprises, the economic effects "could be absorbed easily."

Photo: R. Sarrazin

Wetlands, such as those along Île-du-Milieu near Montreal, are threatened by rapidly expanding urban environments.

Appendix A entitled "NNL Implementation Procedures in Selected Jurisdictions" profiles NNL implementation in each of four jurisdictions: Fisheries and Oceans Canada, U.S. Federal Government (Environmental Protection Agency - EPA, and Army Corps of Engineers - Corps), and the states of Illinois and Maryland. The profiles describe the ways and means that jurisdictions have devised for integrating NNL into their decision-making processes. From these profiles, a number of observations may be of interest to jurisdictions considering their own implementation guidelines or procedures:

- All goals make reference to NNL of wetland functions as well as area, but explicitly recognize the need to use surrogate measures of functions, "in the short term" or "in the absence of more definitive measures."
- In all cases, the determination of mitigation is based on a priority sequence of avoidance, minimization, and compensatory mitigation.
- "Avoidance" usually requires consideration of project alternatives that would have less adverse impact on the wetland, and site alternatives for non-water dependent activities that do not involve wetlands.
- Maps are often provided to generally identify areas where development would be constrained by wetlands.
- All jurisdictions implement NNL goals through systematic review of activities in and around wetlands. (In the case of the U.S. Federal Government, application of Section 404 of the *Clean Water Act* is only one element of their plan to implement the President's NNL goal for the nation's wetlands. In August 1991, the President announced a three-part plan for advancing the NNL goal (The White House 1991a):

  1. Strengthening wetlands acquisition programs and other efforts to protect wetlands;

  2. Revising the interagency manual defining wetlands to ensure that it is workable; and

  3. Improving and streamlining the current regulatory system.

How is This Ideal Being Translated into Action?

- Fisheries and Oceans Canada adopted the NNL principle in its Fish Habitat Policy in 1986 and is currently developing options for implementing mitigation procedures.
- In the U.S. EPA/Corps Memorandum of Agreement, the mitigation sequence is considered satisfied if proposed mitigation is in accordance with an approved comprehensive plan.
- Compensation requirements (related to geographic location, wetland type, etc.) are also priorized, with on-site, in-kind compensation being identified as most preferable.
- All wetland-specific guidelines surveyed (this excludes Fisheries and Oceans Canada) use area as a surrogate measure for compensating wetland functions and values. A minimum 1:1 ratio is used (replacement area:lost area), becoming greater or less depending on the functional values of the impacted site, the values of the replacement wetlands, and the likelihood of success of mitigation.
- Maryland prescribes compensation ratios for each of the four types of wetlands within its wetland classification; (e.g. 1:1 for emergent wetlands; 2:1 for scrub/shrub wetlands) and also allows for non-wetland creation activities to replace wetland functions.

- Illinois links the replacement ratios to the geographical and wetland type compensation options (such as "on-site", "in-kind"), requiring higher ratios of replacement area to lost area (possibly in excess of 5:1), the "further away from the preferred compensation options."
- Long-term monitoring and compensation bonds are a common feature to ensure compliance with permit conditions, and success of mitigation/compensation plans, especially in areas of scientific uncertainty.
- Mitigation banks/compensation funds are also used as an alternative for developers. For example, Illinois does not allow bank credits for a state agency's "normal ongoing activities."

The implementation strategies presented in the previous section represent innovative resource management techniques to address the many challenges presented by the NNL goal. However, the dragon is not yet slain. The implementation of NNL goals remains at the centre of much controversy. Jon Kusler of the Association of State Wetland Managers predicted, "Translating the no net overall loss goal for wetlands into workable federal, state, and local regulations and implementing these regulations will not be easy. But... the ultimate result will be worth the effort" (Kusler 1988).

It is important to keep in mind that those jurisdictions which have experience in NNL implementation insist that, although there are still problems to be ironed out, wetland conservation is benefitting from having the goal in place. Scott Feierabend of the National Wildlife Federation in Washington explained, "Debate doesn't lessen or invalidate the concept — we are in the process of better refining how it is implemented and someday we'll get closer (to realizing the goal)." Joseph Larson, of the University of Massachusetts, and Chairman of the United States National Ramsar Committee, pointed out that the process involved in aspiring to NNL is valuable in itself: "On the way to getting there you are going to reduce adverse impacts, and thereby reduce risks to public health, welfare and safety."

Implementation Challenges for NNL Policies

The following six "challenges" summarize not only the issues and obstacles raised by parties in jurisdictions currently implementing NNL, but also the concerns of Canadians involved in developing wetland policy and those potentially affected by such policy. The six challenges are:

1. Defining "no net loss" of wetlands.
2. Bringing the players on-board; building belief in, and commitment to, implementing NNL.
3. Working towards NNL despite information and knowledge deficits.
4. Incorporating regional realities into implementation procedures.
5. Balancing the needs of both economic development and environmental protection, in the context of wetland decisions.
6. Spreading the costs of achieving NNL among all those who benefit.

Challenge 1: Defining "No Net Loss" of wetlands.

Nancy Patterson of Toronto, Ontario lobbied for a wetland policy with the Federation of Ontario Naturalists (FON) for over 10 years. Patterson said that people in Ontario are concerned with the "net" word: does it imply that the entire resource is up for grabs? Prominent non-government organizations in that province such as FON and the Canadian Environmental Law Association (CELA), advocate "no loss" of area or function on specific "valued wetlands" (CELA and FON *et al.* 1991). The Ontario Government's *Draft Policy Statement on Wetlands* introduced the concept of "no loss" of "provincially significant wetlands", particularly for that area of the province in which wetland loss has been high (Ontario Ministries of Municipal Affairs and Natural Resources 1991).

And if NNL opens the door to replacing wetlands, we are faced with a flood of questions related to compensating losses: What is the basis for compensation (e.g. wetland function, acreage, or both)? Should replacement wetlands be the same wetland type? Is non-wetland compensation allowed? Where and when would wetland replacement be required (e.g. on-site, in the same watershed, or elsewhere; immediately or sometime in the future)? Further, what does "overall" mean? Is the wetland "balance sheet" drawn up for the country, a region, or a watershed? Or do we apply NNL to each individual wetland use decision?

How do we define "no net loss" and design implementation criteria which answer these questions, are widely acceptable, and, more to the point, are effective in maintaining the benefits of wetlands? And how do we ensure a widespread understanding of NNL, which is fundamental to implementation?

The challenge of defining the term "wetland", as experienced in the U.S., is described in Appendix B entitled "Definition and Delineation of Wetlands in the U.S."

Challenge 2: Bringing the players on-board; building belief in, and commitment to, implementing NNL.

There are many groups who have a considerable interest in wetlands: environmentalists, landowners, farmers, other industry and business sectors, consultants, government agencies, and the public in general. These are the groups that make a difference to the way wetlands are managed, because together they hold the keys to implementing NNL: the innovative ideas and practical know-how, the resources, the legislated mandates, and the property rights. Thus, the achievement of NNL depends on the cooperative participation of many parties. How do we get these parties to buy into NNL implementation?

"People in Ontario are concerned with the 'net' word: does it imply that the entire resource is up for grabs?"

Nancy Patterson, Canadian Wildlife Service

Challenge 3: Working towards NNL despite information and knowledge deficits.

Many of those interviewed, in particular wetland managers in Canada, felt that despite the conceptual appeal of NNL, scientific and technical limitations posed major obstacles to realizing the goal. The major limitations cited were those related to our understanding of wetland functions (and ways and means to assess such functions), as well as limitations related to our capacity to restore or create wetlands. However, it was also acknowledged that, in the meantime, economic development continues and wetland functions and values must be respected.

How can we make progress on the NNL goal using our best science? What are our research priorities for implementing NNL? And how do we design the implementation process so that wetland managers are always using the best science?

Challenge 4: Incorporating regional realities into implementation procedures.

Regions throughout North America vary widely in terms of their relative abundance and type of wetlands. Regions also vary according to the type and intensity of development pressures and the effects of development on the wetland resource (in terms of the rate of wetland loss or the resulting physical, chemical and biological changes to wetland systems). Regions are also distinct in their level of public understanding of the implications of loss, and the motivation of landowners to protect wetland functions. And because our understanding of wetland types and their inherent functions varies so widely, regions can be characterized by the varying levels of knowledge concerning wetland functions, and of wetland restoration or creation. How do we reflect these regional variations in NNL implementation?

Challenge 5: Balancing the needs of both economic development and environmental protection, in the context of wetland decisions.

NNL was designed as a conceptual compromise, with built-in flexibility for both economic and environmental interests. On the one hand, NNL communicates that the wetland resource is too important to allow any more loss. On the other hand, NNL provides alternatives to absolute protection of every wetland. But how do we design NNL procedures which practically realize this balance? Kusler (1988) summarized, "Some regulatory agencies, environmentalists, planners and others believe that loose application of the NNL concept will result in widespread proposals for destruction of wetlands with only promises of scientifically tenuous wetland restoration and creation projects offered in exchange for such destruction. Some developers fear too stringent an interpretation of NNL standards so that no future activities will be permitted in wetlands." The process must recognize the valuable social and economic contributions of competing uses, as well as the many social and economic benefits, which accrue from wetlands. How do we accommodate these diverse needs in NNL implementation?

Photo: C. Rubec

Over 65% of the coastal salt marshes in the Maritime provinces have been converted to other land uses.

Challenge 6: Spreading the costs of achieving NNL among all those who benefit.

The benefits of wetlands, such as flood control, water purification, and provision of wildlife habitat, accrue to many. Is it up to farmers, private landowners or large corporations to pay to ensure that we all continue to enjoy these benefits in the future? Is wetland conservation just part of the "cost of doing business?" Or, if wetland functions contribute to public health, safety and welfare, and warrant public policy, what is the role of all stakeholders, including governments, in supporting NNL?

Recommendations for Implementing NNL Policies in Canada

The adoption of NNL goals in Canada would signal a new direction in responding to this country's continuing loss and degradation of our wetland resource. NNL recognizes that wetland losses are no longer acceptable, but that losses which cannot be stopped must be compensated by wetland restoration and, where feasible, new wetlands must be created.

As such, the NNL goal in a Canadian context would provide a **beacon towards which we would strive.** The goal is one that may not be immediately achievable on a consistent basis. We may not have the scientific and technical capacity to "make up" for losses or, indeed, predict what those losses may be. But, if the concept of the goal itself is deemed to be valid, then our inability to immediately achieve it is not a legitimate reason to dismiss the goal. On the contrary, if the goal describes the ideal to which we should aspire, then it is indeed a goal which will contribute to our ability to manage the wetland resource to optimize benefits to all interests. Kusler (1988) argued, "It is much better from a policy and legal perspective to have definite standards than to operate in a constant grey area of unquantified impacts and unquantified compensation techniques." It may be useful to view the NNL goal as a long-term goal, and to articulate specific objectives, strategies and timetables aimed at removing the barriers (such as incomplete scientific understanding) to our achieving the goal.

The NNL goal would contribute to wetland conservation in Canada in a number of ways. It would force definition of what we do and do not know about protecting the resource, and thereby guide the design of our research programs. The NNL goal would provide an administrative tool for focusing and aligning current programs that influence wetlands and designing new ones to fill in the gaps in achieving NNL. The NNL goal would also provide a structured context with defined outcomes within which to negotiate the needs and concerns of environmental and economic interests.

In the flurry of discussion surrounding the NNL goal, it is sometimes forgotten that in some areas of the U.S. and Canada, the wetland resource is so seriously depleted that we need to work towards net gain of wetlands. The Conservation Foundation in Washington identifies this as their "long-term goal." In addition to its NNL commitment, Canada's *Federal Policy on Wetland Conservation* includes a strategy to "Encourage actions to enhance wetland functions on federal lands and waters

through the on-going implementation of all federal programs, especially in those areas of Canada where the continuing loss or degradation of wetlands has reached critical levels, or where wetlands are important ecologically or socio-economically to a region." In the process of learning to achieve NNL, we will have gained the tools necessary for achieving net gain of wetlands.

The following recommendations are based on a review of the ways and means of implementing NNL and other wetland programs in jurisdictions throughout North America. The recommendations reflect the advice of these jurisdictions and their "lessons learned." The recommendations also respond to the issues or challenges raised in the course of research. The six recommendations do not answer all the questions posed by the preceding "Challenges" section, but instead describe the context within which the questions should be answered:

1. Focus on the "region" as the operational unit for customizing the design and implementation of NNL goals.
2. Involve all stakeholders in deciding how to attain NNL implementation, and in working together to attain it.
3. Adopt a comprehensive program of mechanisms selected to target the major causes of wetland loss, emphasizing positive mechanisms which encourage wetland conservation.
4. Base NNL implementation on an ecological functions perspective, ideally in the context of advance planning.
5. Promote advance planning as an effective vehicle for NNL implementation.
6. Provide mitigation directives to help managers and development proponents through the maze of mitigation options. The directives should recognize the scientific limitations related to functional assessment and creation/restoration of wetlands.

Recommendation 1: Focus on the "region" as the operational unit for customizing the design and implementation of NNL goals.

Allyn Sapa of the U.S. Fish and Wildlife Service in North Dakota echoed the advice of many when he pointed out: "You need to sculpt NNL implementation to specific regions," to reflect their wide variations, "since in some areas there is resistance to implementing NNL, while in others it's a simple thing to do... there also seems to be a better opportunity for compensation in North Dakota; restoration of old wetland basins that have been drained has been very successful."

"You need to sculpt NNL implementation to specific regions."

Allyn Sapa, North Dakota Fish and Wildlife Service

The proposed Alberta Wetlands Policy recognizes that there are significant differences between "regions" in that province. Len Fullen, of Alberta Agriculture and a member of the Alberta Wetlands Policy Steering Committee, exemplified this: "Parts of southern Alberta have hardly any wetlands left, and even some of the landowners are looking for ways to restore the resource in those areas. In other regions further north, landowners are looking at the consolidation of wetlands to promote more efficient grain production. The proposed policy advocates regional watershed level planning, to develop action plans tailored to particular geographic areas."

Many other wetland conservation programs in North America recognize the need to customize implementation measures to specific geographical areas such as ecosystems, watersheds, physio-

graphic features, or jurisdictional areas Regions are commonly delineated based on uniform characteristics such as wetland types, sources and rates of wetland loss, and on public awareness of the wetland issue and level of motivation to act on conservation measures. Examples of regional approaches include: the Great Lakes Wetlands Policy Consortium's "environmental agenda", wetland policy recommendations developed specifically for the Great Lakes Basin by a group of Canadian and U.S. environmental and conservation groups (Brown 1990); the "Great Lakes Wetlands Conservation Action Plan", a cooperative effort currently being developed between the Province of Ontario, the Government of Canada and other stakeholders (Patterson 1991); Manitoba's conservation district approach to the management of wetland resources; and wetland conservation programs in British Columbia which have focused on single estuaries or watersheds. *The Federal Policy on Wetland Conservation* has recognized the 20 wetland regions of Canada as defined by the National Wetlands Working Group (1988) as a fundamental framework for the Policy's implementation.

This regional approach to implementing NNL is pivotal to all of the other recommendations made in this paper for achieving NNL. The regional approach provides a practical framework for bringing together interested parties and establishing consensus. As recommended by Robert Szabo of the National Wetland Coalition, the regional approach: "Allows you to shift down to the local level to be more flexible in terms of incentives to encourage and enforce positive things." Regions can also provide an ecological context for viewing wetlands as functioning units in the landscape.

Recommendation 2: Involve all stakeholders in deciding how to attain NNL implementation, and in working together to attain it.

Implementation of NNL in any region will require the participation and cooperation of many parties. For example, Len Fullen in Alberta noted, "There's so much of the wetland resource in private hands that landowner input to developing a wetland management strategy is critical if you hope to achieve regional and provincial wetland goals." Gary Williams, an environmental consultant in British Columbia, urged the involvement of the many Canadians in government and non-government agencies "who have already been through the painful process of trying to make the (Fisheries and Oceans Canada) NNL guiding principle work." It is recommended that all stakeholders be afforded the opportunity to participate in decisions on how to implement NNL goals. At a minimum, the following stakeholders should be involved:

- Government agencies responsible for administering the NNL program;
- Government agencies, business and industry, farmers and landowners, and native groups who will be affected by its implementation;

Photo: K. Cox

Wetland stewardship involves government and non-government groups across Canada.

- Non-government organizations representing citizens' interests in wetlands;
- Government and non-government scientific and technical experts.

Involvement of these parties in the design of NNL programs will ensure that such programs reflect a balance of the many and diverse interests in wetlands. Their participation in consensus decisions regarding NNL implementation will go a long way in fostering support for the decisions and a long-term commitment to the implementation process. Participation of those who will actually be carrying out and designing the implementation procedures will help to make them practical and workable.

The implications of not involving stakeholders in the design of implementation procedures can be painful. Staff at the U.S. Environmental Protection Agency (EPA) indicated that the root cause of the current controversy on the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (see Appendix B entitled "Definition and Delineation of Wetlands in the U.S.") is that they didn't bring enough people to the table. "We should have had a broader, more open public process for development of the manual," remarked Cory Giacobbe of the EPA. Joseph Larson commented that the EPA's "failure to have public comment has resulted in more criticism than they deserve." Although wetland definition and delineation in Canada has not been raised as the subject of serious controversy like it has been in the U.S., (due perhaps to Canada's focus on non-regulatory approaches to wetland conservation), it is particularly important to resolve the Canadian definition and delineation question in a cooperative setting.

The following sections provide suggestions and options related to the decisions that are required for implementation of a NNL program.

Recommendation 3: Adopt a comprehensive program of mechanisms selected to target the major causes of wetland loss, emphasizing positive mechanisms which encourage wetland conservation.

The term "mechanisms" refers to the ways and means of influencing wetland decisions and affecting change on the ground. Potential mechanisms for realizing NNL include policy and legislation and associated regulatory or permitting processes, incentives and disincentives, education and research programs, resource management planning processes, project management and approval processes, joint initiatives between the public and private sector, and codes of practice. Excellent descriptions of these mechanisms, and examples of how they

Photo: NAWCC (Canada)

Wetland awareness facilities such as in the Waterfowl Park at Sackville, New Brunswick are invaluable to education.

might be used, can be found in Brown (1990), Sustaining Wetlands Forum (1990), CELA (1991), and Alberta Water Resources Commission (1990b).

Each of these mechanisms has inherent strengths and weaknesses in the achievement of NNL. Regulatory programs are seen as a useful mechanism for quickly and effectively stemming wetland losses in the near term. However, Max Peterson of the International Association of Fish and Wildlife Agencies in Washington stressed, "In the long term, regulations have not proven to be a good permanent approach to protecting the land... incentives such as government or private conservation easement programs cost less in the long run than enforcing regulations." Peterson and many others emphasize education as an important component of NNL programs: "Convince people of their value and then help them do what makes good sense."

Overall, respondents encouraged Canadian jurisdictions to adopt a comprehensive NNL program which emphasizes positive mechanisms to encourage wetland conservation. Clayton Rubec of the North American Wetlands Conservation Council (Canada) urged a positive approach to NNL implementation in Canada, rather than a litigative approach: "We need to change the way landowners manage their property, by, in part, convincing them of what's in it for them." A 1989 workshop of wetland managers concluded, "The greatest opportunities for wetland restoration or creation lie not in the regulatory context but rather in public or cooperative public and private projects where existing wetlands have been damaged or degraded" (Association of State Wetland Managers 1989).

The mix of mechanisms that will be effective in achieving NNL is as varied as wetlands and wetland issues across Canada. This variability is demonstrated by the range of wetland initiatives currently under way across Canada:

- In Ontario, an estimated 68% of the original wetlands in the southern part of that province have been lost and development pressures continue on the remaining wetlands. The Ontario Government has released a *Draft Policy Statement on Wetlands* under the provincial Planning Act, which proposes to control development in "provincially significant wetlands" and adjacent lands, by means of official plans, plans of subdivision, zoning bylaws, and other planning tools (Ontario Ministries of Municipal Affairs and Natural Resources 1991). The Canadian Environmental Law Association (CELA) and the Federation of Ontario Naturalists (FON) recommended a Wetlands Protection Act to serve as a regulatory underpinning to a NNL goal in Ontario. It would be part of a comprehensive program including permitting, planning, and land use zoning (CELA and FON 1991). The Ontario government is "monitoring the need for stronger measures to protect wetlands as the planning policy is brought into operation, as the U.S. reviews its legislative approach, and as other aspects of the wetlands management program of the Ontario government are implemented" (Glooschenko, Ontario Ministry of Natural Resources).

"In the long term, regulations have not proven to be a good permanent approach to protecting the land ... incentives such as government or private conservation easement programs cost less in the long run."

Max Peterson, International Association of Fish and Wildlife Agencies

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- It is estimated that nearly 65% of the original salt marsh area of Nova Scotia has been transformed into dykeland, and pressure continues to "reclaim" freshwater wetlands. In response, the Government of Nova Scotia has released a draft discussion paper on provincial land use policy concerning freshwater wetlands and salt marshes (Nova Scotia Departments of Lands and Forests and Municipal Affairs 1989). The discussion paper proposes protection of wetlands which are of value to wildlife through municipal planning strategies and land use bylaws.
- Although wetland losses in the Prairies are estimated at over a million hectares, conservation programs there must recognize that the vast majority of prairie wetlands are located on privately-owned farmland. The wetland management strategy in Alberta will be characterized by "public consultation, clear communication and education programs," said Len Fullen of Alberta Agriculture. The provincial Wetlands Management Policy Committee recommended consideration of legislative amendments to enable use of private conservancy measures, such as conservation easements, to protect wetlands on private lands. Fullen remarked on wetland management priorization in Alberta: "Knowledge first, we're most of the way, then enable landowners to do what they know they should be doing... we need to come up with adequate funding for landowner incentives, not just education and communication if we're going to get farmers to set aside wetlands and some adjacent uplands."
- In Saskatchewan, proposed wetland strategies also emphasize education on the values of wetlands, and conservation demonstration projects. "We're not interested in regulating (wetland protection) until there's a better acceptance of wetland values," said David Phillips of the Saskatchewan Wetland Conservation Corporation.

During the course of research, a number of vehicles were suggested as having potential for implementing NNL goals in Canada:

- The North American Waterfowl Management Plan was identified as having enormous potential for NNL implementation. The Plan builds partnerships between the private and public sectors that have resulted in the protection or enhancement of over 120 000 ha (300 000 acres) of wetland habitat in Canada, under the auspices of the Canada-U.S. Prairie Habitat and Eastern Habitat Joint Ventures. The Plan is targeted to conserve over 2.4 million ha (5.9 million acres) of upland and wetland habitat across Canada during the 1988 - 2003 period. In the U.S., this "federal-state-private sector partnership blueprint has become a major force in the

Photo: Ducks Unlimited Canada

Prairie pothole wetland conservation is one focus of the North American Waterfowl Management Plan in western Canada.

(Department of Interior's) actions to help meet President Bush's goal of "no net loss" of the nation's wetlands" (United States Department of the Interior 1991b).

- The *Environmental Assessment and Review Process (EARP) Guidelines Order* requires an assessment of the effects of all federal decisions, activities and projects on the environment in Canada. This process, which has recently been interpreted as a legal obligation by the Federal Court, represents a potentially powerful tool for implementing the federal NNL strategy as it relates to federal lands and federal initiatives. Integration of NNL procedures with the EARP would serve to improve assessments of project effects on wetlands, as well as minimizing the number of "hoops" that federal agencies must jump through for project approvals.
- Many individuals commented that federal and provincial agencies should "put their own house in order" before requiring non-government agencies to participate in NNL strategies. Federal lands could be used as development and testing grounds for NNL procedures, and to demonstrate the practical application of mitigation and compensation procedures. Many individuals also commented that governments, in the public interest, should maintain public relations programs that support NNL implementation by communicating and demonstrating the economic and other benefits of wetland conservation in general and NNL specifically. Such programs should "justify the effort and expense of wetland conservation as much as possible in economic terms" and "show how NNL protects economic interests and creates economic opportunities."
- Land use planning and zoning were widely supported as tools for working towards NNL goals at the provincial and local levels in Canada. In the U.S., Joseph Larson points out that this would require a fundamentally different approach to controlling land use: from the usual approach based on the appropriateness of adjacent uses, to one that recognizes the interconnectedness of functional units on the landscape (and, in the case of wetlands, their role in such functions as water retention, flood control, and water quality). Land use restrictions on wetlands would recognize the importance of these systems to public health, welfare, and safety.
- Positive incentives ranging from conservation easements to tax relief for agricultural programs were continually raised as preferable alternatives in the Canadian context for working towards NNL. Incentives are much more palatable to the public, and they ensure that the costs of the NNL program are shared by the public who are the beneficiaries of wetland conservation.

Recommendation 4: Base NNL implementation on an ecological functions perspective, ideally in the context of advance planning.

"Wetlands are integral elements of ecological and economic landscapes, but are rarely managed as such. They are inseparable from local and regional hydrology and may perform a range of functions or provide benefits regionally, nationally, or internationally. These can include natural and economic benefits such as flood storage, habitat for migratory waterfowl, oil exploration, and timber harvest, all of which may extend beyond the immediate area" (Haygood and Reed 1988).

A number of wetland managers complained that, in the political battles over wetlands, "what we are trying to accomplish is getting lost." And "what we are

trying to accomplish" is the maintenance of wetland functions and values. Descriptions of wetland values may be found in Government of Canada (1991) and The Conservation Foundation (1989). To be consistent, the reasons for adopting and implementing NNL goals should also be articulated in terms of wetland functions and values. As Joseph Larson observed, "The functional foundation will survive and be best defended. It provides people with good reasons for why a public policy is important and why it is being applied... because wetland functions are tied to public health, welfare, and safety."

In addition to being the "best defended", the functional approach was also advocated as the most pragmatic. Robert Szabo of the U.S. National Wetland Coalition suggested, "No net loss is not achievable in terms of acreage — but what might work is no net loss of functions and values." Szabo urged that implementation of NNL be realistic: "Some wetlands are going to be used — require that wetland functions and values be replaced."

Implementation of a NNL goal based on functions and values retains the validity of the goal in the face of regional variations in the magnitude of the wetland resource. Janet Planck of the Ontario Region of Environment Canada commented, "Applying the 'no net loss' goal to areas of high concentrations of wetlands still makes sense if the focus is on loss of functions and values important to the public." Dave Cline of the National Audubon Society defended the relevance and value of the NNL goal to "wetland-rich" Alaska: "The goal of no net loss does not require that the exact conditions that existed before a wetland project be recreated. Instead it requires that reasonable efforts be made to replace important wetland functions and public values... (the goal and the EPA/Corps Memorandum of Agreement) call for replacing functions and values commensurate with those lost to development" (Cline 1990). Joseph Larson suggested that in Canada the functional basis for NNL implementation would effectively "stratify" wetland policy, reflecting the variable nature of the "wetland regions" as developed by the National Wetlands Working Group (1988).

Implementation of NNL based on functions also guides time frame and geographic context decisions related to wetland mitigation. As Joseph Larson recommended, "Retain or replace functions, where, when, and to whom or what they are important." To exemplify this, he added, "It may be important to replace waterfowl staging area on the same flyway, wetlands important to flood control in the same hydrological reach, or wildlife habitat within a native hunting area."

"No net loss is not achievable in terms of acreage — but what might work is no net loss of functions and values."

Robert Szabo, U.S. National Wetland Coalition

Implementation of NNL based on functions provides guidance in determining acceptable mitigation options for particular wetland sites, such as "avoidance", "minimization" of unavoidable impacts or "compensation" for unavoidable impacts, and provides the criteria and conditions for compensatory activities. Curtis Bohlen of the Chesapeake Bay Foundation in Maryland concluded, "What we need embedded into the (NNL implementation) process is a systematic ecological perspective — we need to focus on ecosystems and watersheds. We need to ask: 'What is the wetland's role in the watershed?' It's not the fact that there's a wetland present that determines what can and cannot be done on a particular

site. It's the health of the watershed, and the role of the wetland in that health, that should determine the fate of that site."

Gary Williams has been working on various wetland restoration/creation programs on Canada's Pacific Coast for over five years. He is a strong advocate of the ecological functioning perspective: "When we look at a wetland, we should not be asking 'what resource is there' but 'what is happening', since ecological functioning drives the biological community." Williams believes wetland conservation decisions should be based on functional mapping.

On Canada's east coast, Fisheries and Oceans Canada staff also consider "functional mapping" to be an important component of their program aimed at achieving NNL of productive capacity of fish habitat. Jerry Pratt reported that the Habitat Management Division is working on generic models of the productive capacity of habitat for various types of fish. These models, with the aid of ground truthing, will enable the characterization of fish habitats related to productive capacity.

While many remarked on the difficulty of this functional approach, Scott Feierabend stressed that since it is clear that the ultimate endpoint of NNL programs should be to ensure that wetland functions should be maintained or replaced, it is important that we recognize that we are using acreage as a surrogate and work towards quantifying, protecting, and restoring wetland functions.

Although recognizing that the ecological functions perspective can be applied in a reactive approach to wetland conservation, many individuals stressed the importance of a proactive planning approach for incorporating the ecological perspective. Joseph Larson counselled, "If we are going to make decisions, we must do whatever is possible to reduce the risks to public health, welfare, and safety. We must do advance planning using the best information available, to predict the likelihood of an important function... to start putting red flags on wetlands as early as possible."

> *"We must do advance planning using the best information available... to start putting red flags on wetlands as early as possible."*
>
> *Joseph Larson, University of Massachusetts*

Recommendation 5: Promote advance planning as an effective vehicle for NNL implementation.

Many wetland managers emphasized the advantages of advance planning approaches to wetland management, over the traditional case-by-case approach. As defined by Haygood and Reed (1988), these advance planning approaches, also referred to as "area wide" or "multi-project" plans, are generally "processes which engage more than one agency or organization (and often many, including environmental, development, and citizen interests) in an exercise of jointly setting goals or priorities for a particular location and its land and water resources... Wetlands may be the focus of the planning process or just one of several focuses in a 'multi-objective' effort."

Peter Delaney, of Fisheries and Oceans Canada's Pacific and Yukon Regional Office, described the environmental management plans that have been, or are being developed in the Fraser Estuary, as a "first good step" in implementing that department's NNL principle. Delaney noted, "The plans provide guidance to developers and encourage partnerships with other people in achieving NNL. We want to go that way - have to, in fact - if we want to reduce conflict with development interests, which costs too much time and money."

Fisheries and Oceans Canada is in the process of developing habitat management plans for 10 to 15 watersheds of the Fraser River. The planning process will involve documenting fisheries distribution, productive capacity and land uses, and collaborating with other stakeholders to set goals and strategies for the watersheds.

Planners usually base these "goals and strategies" on an inventory of the biophysical and socioeconomic resources at hand, and often an analysis of these resources. Haygood and Reed (1988) describe a range of analyses, which could all contribute to NNL implementation: predicting the functions of wetlands, such as the Habitat Evaluation Procedure (HEP) and the Wetland Evaluation Technique (WET); characterization or categorization of wetlands according to type, degree of stress on the wetland, or relative condition; and categorization of wetlands based on their relative value or importance, referred to as "ranking." Ranking involves placing inventoried wetlands into at least three categories defined by such factors as the importance of their ecological functions and inherent values. Advance planning of the wetland resource could also involve the determination of "threshold levels" of wetlands required to deliver certain functions.

Advance analyses could assist NNL implementation by: identifying priorities for acquisition programs; prescribing specific mitigation and compensation options suitable for various "categories" of wetlands; priorizing research programs in support of NNL; directing development to the most appropriate geographic areas; identifying those geographic areas requiring land use controls; or identifying threshold levels of wetlands which trigger NNL implementation. The text in Appendix C entitled "The Role of Advance Analyses in Selected Wetland Conservation Programs," exemplifies how three different jurisdictions have analyzed their wetland resource as a basis for designing and achieving wetland conservation programs.

Photo: Ducks Unlimited Canada

Habitat for waterfowl as well as soil and water benefits accrue from wetland conservation.

Advance planning can provide environmental benefits such as protection for high value wetlands and a context for assessing the cumulative effects of loss or degradation of individual wetlands. It provides economic benefits by guiding developers through the project planning stages and, as a result, reducing conflicts later on; by facilitating a more efficient, streamlined process of development approvals; and by increasing predictability and consistency in development decision making. Advance planning promotes consistency, complementarity and cooperation among a variety of programs aimed at common goals.

Recommendation 6: Provide mitigation directives to help wetland managers and development proponents through the maze of mitigation options. The directives should recognize the scientific limitations related to functional assessment and creation/restoration of wetlands.

Kusler (1988) assures, "Fears of NNL resulting in wholesale destruction of wetlands based on promises of future compensation on the one hand, or banishment of any activity from wetlands on the other, need not materialize with careful, thoughtful mitigation directives."

Mitigation directives assist development proponents and wetland managers in planning and assessing project proposals. Directives provide options and criteria for guiding decisions which support the NNL goal. As demonstrated in the previous section, advance planning can help developers prepare proposals which incorporate NNL principles, and help wetland managers to more efficiently determine consistent, justifiable responses to development applications. As the development of mitigation directives should involve stakeholders, particularly representatives of those groups who will be planning and assessing development related to wetlands, this section contains a list of the major elements that should be contained in those directives, along with options or comments to be considered.

A. Wetland definition and delineation criteria

(Although a wetland definition and delineation criteria are more widely applicable to implementing NNL, the subject is considered here because mitigation directives are often written in response to regulations, and require more technically rigorous definitions and criteria than other NNL mechanisms.)

- Wetland definition and delineation based on simple, easy to understand terms are needed. Respondents advised, "Use a definition that a lay person can relate to — a landowner should be able to tell if he has one on his land"; "Operationally, people want to know if the land they're buying is wetland"; "The public has to be able to recognize that they're operating in a wetland." Other respondents urged Canadians to "be fairly liberal in your definition", and to "define on a scientific rather than a political basis."
- The only nationally consistent definition of wetlands in Canada is that of the National Wetlands Working Group (1988)(see below).

"Wetland is defined as land that has the water table at, near, or above the land's surface or which is saturated for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic vegetation, and various kinds of biological activity that are adapted to the wet environment."

National Wetlands Working Group (1988)

B. A sequence of mitigation options

(For example, "avoidance", "minimization" of unavoidable impacts, and "compensation" for unavoidable impacts, with criteria associated with each option. At what point/in what situation do you accept that the option cannot be met, and allow consideration of the next option in sequence?)

- Joseph Larson urged that an emphasis be placed on avoidance, "Limit alteration of wetlands to activities for which there are no alternatives." He also stressed that restoration/creation alternatives should only be considered as a last resort.
- David Nomsen of the National Wildlife Federation in North Dakota encouraged the preservation of wetlands on the basis that scientific understanding doesn't yet enable replacement of these systems. "The first step in sequential mitigation is to 'avoid'... in some cases, this means saying 'no' (to development applications)."
- Decisions to allow compensation should recognize our ability to replace functions and values of those particular wetland systems. David Burke observed: "If replacement is difficult, you want to minimize the need for this (in your permitting decisions). Some systems are easier to replace or restore than others."
- Consider linking mitigation options to classes of wetlands (e.g. limiting some wetlands to avoidance only, and resulting in "no loss" of valued wetlands; or requiring minimization or compensation for others). Robert Szabo recommended NNL mitigation directives which "compromise strict sequencing: categorize wetlands according to those for which you compensate owner (no sequence); those wetlands for which you need to obtain a permit under a balancing test, providing mitigation that will return equal or greater functions and values; and those that are not regulated."
- Consider linking the criteria for each option to impact "significance" as defined by the Canadian Federal Environmental Assessment and Review Process (e.g. by requiring "avoidance" of "significant" impacts).

C. Compensation requirements

(As related to function or area basis, type of wetland, geographic context, time frame, including definition of priorities and criteria.)

- Consider how these compensation requirements can be determined by functional assessments, and how advance wetland characterizations or "rankings" might be linked to specific compensation requirements (e.g. activities on "important" wetlands be restricted to "avoidance" only).
- Consider linking incentives/disincentives to achievement/non-achievement of compensation priorities (e.g. on-site, in-kind, etc.), such as those applied by the Illinois Department of Conservation and described in Appendix A entitled "NNL Implementation Procedures in Selected Jurisdictions."
- Consider how functional replacement/compensation might best be achieved based on functions or surrogate measures for functions such as area ratios.

D. Acceptable compensation alternatives to restoration or creation of wetlands

- Consider the acceptability of mitigation banking or non-wetland creation activities in working towards NNL goals. Mitigation banking issues focus on the potential for using banked credits to "subsidize" wetland drainage using private sector habitat creation credits. Banking should be done on an agency basis or by resource sector, so that all parties balance their own losses and gains.

E. Monitoring and maintenance requirements

- Robert Szabo recommended that mitigation directives require legal and financial responsibility and governmental monitoring, "for long enough periods of time to ensure (the mitigation) works."
- Consider the benefits of requiring legally binding "compensation agreements" such as those described in Appendix A.

Further to the design of mitigation directives, a 1989 workshop sponsored by the Association of State Wetland Managers concluded that "there is a strong need for technical training and education for a broad range of groups to underpin implementation of the no net loss goal." Workshop participants broadly appealed for more training for federal and state agency personnel, local governments, consultants, and landowners with regard to: standards and techniques for implementing the NNL goal; evaluating the functions of wetlands; wetland delineation; and wetland restoration and creation (including the evaluation of projects) (Association of State Wetland Managers 1989).

In Conclusion

This paper recommends a careful, open and informed approach for reaching useful, workable and effective solutions to the NNL challenge. It raises a number of questions related to implementing NNL and provides options and suggestions to guide the answers to those questions. For jurisdictions considering the implementation of NNL goals: the next step is yours.

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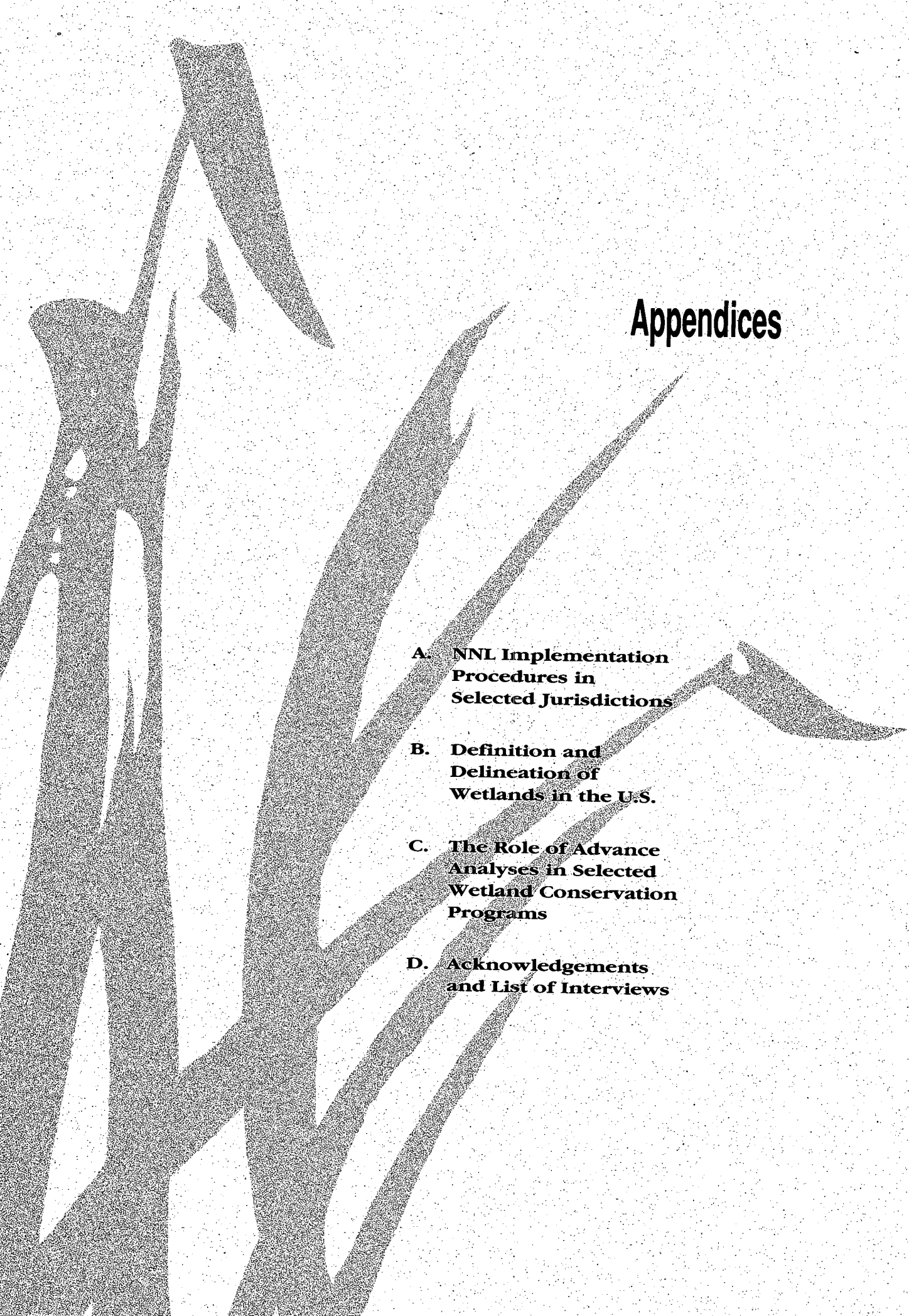

Appendices

A. NNL Implementation Procedures in Selected Jurisdictions

B. Definition and Delineation of Wetlands in the U.S.

C. The Role of Advance Analyses in Selected Wetland Conservation Programs

D. Acknowledgements and List of Interviews

GOALS

Appendix A

Fisheries and Oceans Canada (DFO)

- DFO released the Policy for the Management of Fish Habitat in 1986, to guide its habitat management activities under the *Fisheries Act.*
- The overall objective is to ensure a "net gain of productive capacity for fisheries resources." One of three habitat goals ("fish habitat conservation") will be implemented using "no net loss of the productive capacity of habitats" as a guiding principle.
- Under the NNL guiding principle, DFO strives to work with developers to ensure that projects are designed to maintain productive capacity of fish habitat. Where this is not possible, DFO strives to ensure that unavoidable habitat losses are balanced by habitat replacement or gains on a case-by-case basis.

U.S. Federal Environmental Protection Agency (EPA) and the Army Corps of Engineers (Corps)

- To date, "no net loss of wetlands" has been implemented primarily through Section 404 of the *Clean Water Act*. The EPA and the Corps jointly administer Section 404.
- "The Corps will strive to achieve a goal of no overall net loss of values and functions... it is recognized that no net loss of wetlands functions and values may not be achieved in each and every permit action."

Illinois

- Illinois passed the *Interagency Wetland Policy Act* in October 1989, with a goal of "no net loss of wetlands" resulting from state and state-supported activities.

Maryland

- *The Nontidal Wetlands Protection Act* was passed by the Maryland Legislature in April 1989. The *Act* establishes a goal of "no overall net loss in nontidal wetlands acreage and function."

REFERENCES FOR APPENDIX A:

Fisheries and Oceans Canada (DFO) - Fisheries and Oceans Canada, 1986.

U.S. Environmental Protection Agency (EPA) and the Army Corps of Engineers (Corps) - U.S. EPA and Corps, 1990; Cory Giacobbe *et al.*, Personal Communication.

Ilinois - Marvin Hubbell, Personal Communication.

Maryland - Maryland Department of Natural Resources, 1991; David Burke, Personal Communication.

Fisheries and Oceans Canada (DFO)

- Applies to habitat supporting Canada's freshwater and marine fisheries, including wetland habitat.
- Habitat is: "freshwater, estuarine and marine habitats that directly or indirectly support (or have the potential to support) fish stocks or fish populations that sustain commercial, recreational or subsistence fishing activities."
- DFO reviews all development proposals with the potential to affect fish and fish habitat falling under the authority of the *Fisheries Act*.
- Habitat management decisions must first comply with the federal Environmental Assessment and Review Process (EARP).
- Habitat management plans or habitat classification maps identify habitat-related constraints.

U.S. Federal Environmental Protection Agency (EPA) and the Army Corps of Engineers (Corps)

- A permit is required under Section 404 of the *Clean Water Act* to discharge dredged or fill material in "waters of the United States", including wetlands.
- For definition of "wetlands", see Appendix B.
- Advance Identification Maps are produced for areas where permit applications are likely. The maps identify areas which are suitable or unsuitable for development. They are available to the public.

Illinois

- The *Interagency Wetland Policy Act* applies only to state-owned lands and state-supported activities.
- The Department of Conservation implements the *Act* by reviewing the activities of state agencies. Actions are divided into three categories which are defined according to the degree of impact on the resource, and which identify the level of coordination or involvement of the Department in mitigation decisions.
- The *Act* requires each state agency to develop an "agency action plan" defining how, operationally, they will implement the goal.

Maryland

- Nontidal wetlands are inland, freshwater areas not subject to tidal influence and are usually covered or saturated with water for long periods during the growing season (e.g. marshes, swamps, bogs, wet meadows and bottomland forests). In practice, the Maryland Department of Natural Resources uses the 1987 Corps of Engineers Wetland Delineation Manual, which requires more water for a longer duration than the 1989 version of the Federal Manual (see Appendix B).

- Nontidal Wetlands Guidance Maps (based on U.S. Fish and Wildlife Service National Wetland Inventory Maps, with additional information including "wetlands of special state concern") have been produced as one information source to assist landowners in determining whether wetlands exist on their property.
- Since January 1, 1991, all activities in nontidal wetlands require a nontidal wetlands permit or a letter of exemption, unless specifically exempted by regulation.

MITIGATION OPTIONS

Fisheries and Oceans Canada (DFO)

- The Department has outlined a hierarchy of preferred mitigation options to achieve no net loss:

a) Maintain natural productive capacity without disruption
b) Avoid impacts through project relocation
c) Avoid impacts through project redesign
d) Minimize impacts through mitigation techniques
e) Compensate for habitat losses

U.S. Federal Environmental Protection Agency (EPA) and the Army Corps of Engineers (Corps)

- A Memorandum of Agreement (MOA) between the EPA and the Corps articulates the procedures to be used to determine the type and level of mitigation necessary.
- Permitting action is based on a sequence of mitigation procedures. These are:

1) Avoidance of potential impacts (are there practicable alternatives?);
2) Minimization of unavoidable impacts (through project modifications, permit conditions); and
3) Compensation for unavoidable adverse impacts.

- The level of mitigation required (e.g. avoidance, minimization or compensation) is based solely on the values and functions of the aquatic resource that will be impacted.
- Mitigation measures to offset unavoidable impacts "should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes".
- The sequence is considered satisfied if proposed mitigation follows an approved comprehensive plan.

Illinois

- Similar sequence to EPA/Corps MOA
- The program is structured on the premise that if there is an adverse impact, there will be compensation (in contrast to the 404 program, for which general and nation wide permits do not require compensation for all adverse impacts).

Maryland

- Mitigation sequence similar to EPA/Corps MOA.

COMPENSATION REQUIREMENTS

Fisheries and Oceans Canada (DFO)

- Only after it proves impossible or impractical to maintain the same level of habitat productive capacity would DFO accede to the exploration of a hierarchy of preferred compensatory options:
  a) The possibilities for like-for-like compensation should be assessed; that is replacing natural habitat at or near the site.
  b) Consider either moving off-site with the replacement habitat, or increasing the productivity of existing habitat for the affected stock.
  c) In rare cases where it is not technically feasible to avoid potential damage to habitats, or to compensate for the habitat itself, consider proposals to compensate in the form of artificial production to supplement the fishery resource.

U.S. Federal Environmental Protection Agency (EPA) and the Army Corps of Engineers (Corps)

- Compensation should be undertaken in areas adjacent or contiguous to the discharge site (on-site compensatory mitigation). Where necessary, off-site compensation should be undertaken in the same geographic area if practicable (in close physical proximity and, to the extent possible, in the same watershed).
- Functional values lost must be considered in determining compensation. In-kind compensation is preferable to out-of-kind. "Careful consideration" should be given to the likelihood of success of wetland creation/other habitat development. Restoration is the preferred option.
- Mitigation should provide, at a minimum, one for one functional replacement, with an adequate margin of safety.
- In the absence of definitive information on the functions and values of specific wetlands sites, a minimum of one to one acreage replacement may be used as a reasonable surrogate for no net loss of functions and values. Where functional values are known, this ratio may vary accordingly.
- "Mitigation banking may be an acceptable form of compensatory mitigation."
- "Simple purchase or preservation of existing wetlands resources may, in only exceptional circumstances, be accepted as compensatory mitigation."

- "Monitoring is an important aspect of mitigation, especially in areas of scientific uncertainty. Monitoring should ensure that permit conditions are complied with... For projects... with higher levels of scientific uncertainty... long-term monitoring, reporting and potential remedial action should be required... through permit conditions."

Illinois

- *Compensation ratios* are determined using a matrix which defines incentives for achieving preferred compensation options. In the matrix, wetland replacement rations vary according to the degree of adverse impact, type of wetland, and relative location of mitigation site, (e.g. for minimal impact to an emergent wetland, with on-site mitigation, the ratio is 1:1*.) At the other end of the scale, for destruction of a forested wetland, with out-of basin mitigation, the ratio may exceed 5:1. Therefore, the further away from the preferred compensation options, the more difficult and costly compensation becomes.

- If there is not a reasonable expectation to replace wetland functions or values, no permit is granted (this applies to fens or bogs, essential habitat, and state natural areas.)

- Each state agency may establish a "wetland compensation account"; but (mitigation bank) credits cannot accrue from an agency's normal ongoing activities.

**Compensation ratios used in the matrix have yet to be approved through Administrative Rule.*

Maryland

- Compensation priorities are:

  1) on site, in kind;

  2) in watershed, in kind; and

  3) in watershed, out of kind.

- Compensation is currently based on acreage. Nontidal wetland losses shall be replaced by creating, restoring or enhancing nontidal wetlands at the following ratios (replaced area:original area):

  1:1 - Emergent nontidal wetlands
  - Farmed nontidal wetlands

  2:1 - Scrub-shrub and forested nontidal wetlands
  - Emergent nontidal wetlands of special state concern

  3:1 - Scrub-shrub and forested nontidal wetlands of special state concern

  or, 1:1 replacement plus non-wetland creation activities to replace functions.

- Payment into a compensation fund is allowed as one of three compensation options.

- Applicant is required to:
  - Monitor the project for five years;
  - Provide for the long-term protection of mitigation projects; and
  - File a mitigation performance bond of $20,000/acre.

Appendix B

Definition and Delineation of Wetlands in the U.S.

At the federal level in the U.S., there are four agencies that share important responsibilities for wetlands: The Environmental Protection Agency (EPA); the Army Corps of Engineers (Corps); the Department of Interior's Fish and Wildlife Service (FWS); and the Department of Agriculture's Soil Conservation Service (SCS). As these departments are responsible for implementing a wetland protection program which relies heavily on regulations (under Section 404 of the *Clean Water Act)*, and legislated incentives (under the "Swampbuster" provisions of the *Food Security Act)*, there is a need for a single, unified federal method for wetland delineations, to guide consistent and legally defensible determinations of wetlands and wetland boundaries.

In 1989, the four agencies adopted a single manual, referred to as the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*, which establishes a national standard for wetland determinations. While retaining the original definitions of the four agencies, the *Manual* presents technical criteria or parameters that conform to the federal definitions of wetlands used by the four agencies. These criteria (wetland hydrology, hydric soil characteristics, and hydrophytic vegetation) determine whether or not an area is a wetland. The *Manual* also provides guidance on how to collect and use field indicators (such as free water, water-stained leaves, silt marks, wetland-dependent plant species and organic soils) to determine whether or not the technical criteria were met (United States Environmental Protection Agency 1991). Most states are using, or plan to use, the *Manual* to guide implementation of their own wetland policies or statutes, once the *Manual* is finalized.

Revisions to the original 1989 *Manual* were proposed in 1991. These incorporate technical knowledge acquired from field testing of the manual, and address issues raised through public comment. At the time of writing, the debate continues. In general, the 1989 *Manual* is "much wetter", identifying many more wet areas of land as "wetlands" than the 1991 version of the *Manual*. Farmers complained that it included much of the land that they thought was cropland (Murray, personal communication). On the other side of the coin, the 1991 version of the *Manual* is "much drier", and wetlands such as bogs, forested bottomlands, and western riparian areas, would become non-jurisdictional wetlands (Peterson, personal communication). The environmental community claims that between 20 and 40 million ha (50 and 100 million acres) that were once thought to be "wetlands" would be excluded in the new manual (Murray, personal communication). The U.S. EPA has asked for comments on the 1991 version, and a revision is pending.

Appendix C

The Role of Advance Analyses in Selected Wetland Conservation Programs

Ontario

In Ontario, the Ministry of Natural Resources participated in the development of a Wetland Evaluation System (Ontario Ministry of Natural Resources and Environment Canada 1982) to identify and classify wetlands in southern Ontario on the basis of wetland functions and features. The Evaluation classifies wetlands into seven categories based on ratings given for four major sets of criteria: biological, hydrological, social and special features. Using this classification system, over 2 500 wetlands have been evaluated to date of which over 60% are Class I or II wetlands. Simkin (1988) concluded, "This inventory has given us the knowledge we need to determine what we have, its relative value and where it is. It allows us to determine implications of various management and policy options. Indeed, without it, it would not have been possible to develop the (Ontario) wetland policy statement."

The Province of Ontario's *Draft Policy Statement on Wetlands* (Ontario Ministries of Municipal Affairs and Natural Resources 1991) focuses on controlling development on "provincially significant wetlands" (Class I, II and III wetlands in southern Ontario) and adjacent lands by means of provincial and municipal planning tools. The *Draft Policy* introduces the concept of no loss of provincially significant wetlands, particularly for that area of the province in which wetland loss has been high.

A number of other wetland conservation initiatives are linked directly to the results of the wetland evaluation. The province has initiated a public acquisition program to enable the government, together with Wildlife Habitat Canada and Ducks Unlimited Canada, to purchase critical wetlands that are threatened by development. In addition, various habitat development and protection strategies are being implemented under the North American Waterfowl Management Plan, which has been jointly developed by federal, provincial, and state agencies and private organizations throughout North America. The province has also established the Conservation Land Tax Reduction Program to offer tax rebates to landowners of Class I, II, and III wetlands.

British Columbia

The North Fraser Harbour Commission (NFHC) in British Columbia initiated work in 1985 to establish an environmental management program for the North Fraser Harbour to be jointly administered by the NFHC and Fisheries and Oceans Canada. One of the main elements of the program is a shoreline classification with all habitats colour coded according to habitat value and suitability for development (Williams and Colquhoun 1987):

Red:

- highly productive habit
- prevention as a guide
- no development allowed unless suitable mitigation applied to proposal to ensure that existing habitat would not be alienated

Yellow:

- habitat of moderate value due to the type of habitat involved or due to past alienation by industry
- development allowed subject to mitigation/compensation (like for like and close proximity rules applied if compensation considered)

Green:

- habitat of lower values
- development allowed subject only to mitigation (i.e. environmentally sound design and timing restrictions)

The classification provides a guide for selecting appropriate (i.e. least sensitive) areas for industrial or commercial development, and indicates the level of mitigation/compensation required by proponents. Generally, high value (red) habitats are not to be developed, and important considerations for compensation in moderate (yellow) and low (green) value habitats include in-kind compensation (i.e. marsh for marsh) and close proximity compensation sites.

"The classification will provide improved harbour planning which is more proactive than the existing process. This will yield economic benefits in terms of a more streamlined and less costly harbour development process and improved environmental quality through maintenance of sensitive aquatic habitats" (Williams and Colquhoun 1987).

Alaska

The City and Borough of Juneau (CBJ), Alaska classified wetlands within the context of their Wetland Management Plan, with the goal of decreasing the time for obtaining decisions on dredge and fill permit applications. The Wetland Management Planning Process was designed to shorten permit processing times by increasing land use predictability and by allowing for federal delegation of permit issuance authority to established municipal land use management and zoning jurisdictions (Winograd 1988).

The wetland classification presents "a balance between property rights of landowners and public environmental concerns as embodied in the Clean Water Act. The classifications are based on the Wetland Evaluation Technique (WET), the preferences of community residents, and a land use inventory which determines the availability of practicable (upland development) alternatives. The balance is defined by distinct dredge and fill permit issuance requirements for each wetland management classification" (Winograd 1988).

Wetlands are classified according to six categories:

1. Restricted land use (lands not subject to development),
2. 'A' wetlands which cannot be developed unless there is no net loss of individual functional values in the drainage basin,
3. 'B' wetlands which cannot be developed unless there is no net loss of individual functional values in the community,
4. 'C' wetlands which cannot be developed unless there is no net loss of aggregate functional value in the community,
5. 'D' wetlands which can be developed using best management practices, and
6. Mitigation wetlands (wetlands which are available for enhancement projects).

'A' and 'B' wetlands are generally unsuitable for dredge and fill permitting. 'C' and 'D' wetlands are generally suitable for dredge and fill permitting. All restricted management designations exist independent of the wetland management plan. They include parks, preserves, national forest, etc. Category 'C' wetlands are generally suited to development and they can be developed if mitigation is obtained through mitigation banking or projects (Winograd 1988).

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