Section 6

FISHERIES

FISHERIES

6.1 Overview and Recommendations

Source: Bruce Litteljohn

6.1.1 The Great Lakes and the St. Lawrence River supplied fish to Aboriginal groups long before the arrival of European settlers. They supported flourishing commercial and recreational fisheries throughout the 19th century and well into the 1920s. From the 1920s to the 1950s, the fisheries declined as a result of intensive commercial fishing and the appearance of the parasitic sea lamprey. The decline continued as pollution levels and loss of fish habitat increased. Some fish stocks such as lake trout have shown signs of recovery, but not to their historic levels.

6.1.2 There are many threats to the sustainability of the basin's freshwater fisheries resource. One of the biggest threats is invasive aquatic species. Once a species becomes established, it changes the aquatic ecosystem forever. Invasive aquatic species can be put in the water purposely or inadvertently, arrive by natural migration or, more often, hitchhike on a ship. The sea lamprey and the zebra mussel are just two of close to 160 invasive aquatic species that have found their way into the basin since the 1800s, with devastating effects on fish and the ecosystem.

6.1.3 Another major threat is damage to fish habitat—the places where fish spawn, feed, grow, and live—caused by physical damage along shorelines or by effluents such as municipal sewage and industrial waste that enter the water. Damage to fish habitat is one of the biggest reasons for declines in fish populations.

6.1.4 Fisheries and Oceans devotes most of its attention to the fisheries entirely under its jurisdiction—the fisheries on the east and west coasts. During the 1990s, the federal government increased this emphasis with the passage of the *Oceans Act*.

6.1.5 A number of events have influenced the level of federal involvement in freshwater fisheries. In the mid-1990s, the federal government made significant cuts in its programs and funding. At the same time, it began discussions with provinces to formally transfer to them its responsibilities for freshwater fisheries, primarily fish habitat management. However, the provinces had their own financial problems and were not willing to take on more federal responsibilities permanently without a corresponding increase in federal funds to carry them out. These developments, along with public opposition, led the federal government to abandon the proposed transfer.

The federal role and mandate

6.1.6 The Constitution gives Parliament legislative authority over Canada's seacoast and inland fisheries. Conserving and protecting fish for their sustainable use is the federal government's objective under the *Fisheries Act*, which applies to all fisheries—whether on public or private property. The

legislation allows the federal government to control fishing seasons, set the annual total allowable harvest, and limit the size of fish that may be taken. It also has authority under the *Fisheries Act* to protect fish habitat.

6.1.7 Other federal legislation affects the basin's fisheries and has added to the government's responsibilities in the basin. The *Canada Shipping Act* allows Transport Canada to make regulations that will protect the basin from invasive aquatic species carried by foreign ships. The *Canadian Environmental Assessment Act* requires Fisheries and Oceans to assess the environmental effects of proposed development projects before giving an authorization to alter fish habitat. The Department's role will continue to expand as the proposed species-at-risk legislation calls on it to develop and carry out recovery plans for aquatic species at risk.

6.1.8 Provinces share in the management of inland (freshwater) fisheries. Provinces license who may fish and how many fish they may take from lakes and rivers within their borders. They also carry out some of the federal government's responsibilities on its behalf, including controlling fishing seasons and limiting the number and size of fish that can be caught. The provinces propose regulations under the federal *Fisheries Act* that are reviewed and approved by the federal government.

6.1.9 The fisheries resource is also shared internationally. Faced with the destructive threat of the predatory sea lamprey, Canada and the United States signed the Convention on Great Lakes Fisheries in 1954, creating the Great Lakes Fishery Commission. The Commission brings together fisheries agencies from both countries to manage a sustainable fishery in the Great Lakes. Fisheries and Oceans delivers the Sea Lamprey Control Program in Canada as an agent of the Commission.

What we audited

6.1.10 We examined four different aspects of the federal government's responsibilities for fisheries in the basin. We looked at what the federal government is doing to prevent and control invasive aquatic species (Subsection 6.2). We asked whether the federal government is doing enough to protect, restore, and enhance fish habitat (Subsection 6.3).

6.1.11 We looked at whether Fisheries and Oceans gets and uses the scientific information it needs in making its decisions (Subsection 6.4). Finally, we looked at the bigger picture—whether the federal government is fulfilling its responsibilities to conserve and protect the fish of the basin for their sustainable use by present and future generations (Subsection 6.5).

What we found

6.1.12 **Overall.** Fisheries and Oceans is the lead federal department for aquatic ecosystems. Cuts in departmental funding and the federal decision to retain its freshwater fish habitat management responsibilities have had a pervasive effect on the Department's ability to carry out its mandate in the Great Lakes and St. Lawrence River basin.

6.1.13 **Defining the federal role.** While Fisheries and Oceans has the overall responsibility for protecting and conserving the fisheries resource, it relies on related programs carried out by provinces and other federal agencies. But it

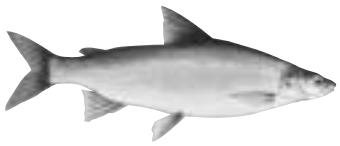
Some of the freshwater species in the basin


Yellow perch


Walleye


Rainbow smelt


Bass


Whitefish


Lake trout


Pacific salmon

Source: Fisheries and Oceans

does not look regularly at the effects of those programs on the aquatic ecosystem. Furthermore, it has not clearly defined its role in freshwater fisheries or clearly stated what it expects to achieve in its activities to protect the aquatic ecosystem and thereby the fish of the basin. Fisheries and Oceans has not evaluated whether it is contributing in the most effective way to the activities of the Great Lakes Fishery Commission.

6.1.14 The Department's role in the basin continues to evolve, and funding needs to keep pace. Both current and proposed legislation require an increased federal presence in the basin's fisheries.

6.1.15 The Department has no formal vision of the aquatic ecosystem it wants to promote in the basin. It has no criteria for determining when it should intervene to protect fish. And it has not kept Parliament informed of its plans in the basin or the results of its programs to date. Work with the provinces is under way to develop a national freshwater fisheries strategy, which is needed to establish clear accountability relationships. It remains to be seen whether the government will make this strategy a priority and provide the funds needed to carry it out and produce lasting results.

6.1.16 **Invasive aquatic species.** Invasive species are a serious and growing threat to the ecosystem of the Great Lakes and St. Lawrence River basin—a threat the federal government is ill prepared to counter, despite its commitments. There is no federal policy, no recognized lead department, and no plan to co-ordinate federal action to counteract the environmental, economic, and social impacts of these species.

6.1.17 Once here, species can quickly spread throughout the basin. However, the Department's position is that very little can be done to control non-native species once they become established. Furthermore, the government is doing little to prevent the arrival of additional invasive species. Keeping non-native species from entering the basin can save millions of dollars in control costs beyond the cost of damage they would do to the ecosystem.

6.1.18 A major pathway for invasive species to enter the basin is the ballast water carried by commercial ships. But Canada relies on ships' compliance with U.S. regulations and has only voluntary guidelines for ballast water exchange, through the *Canada Shipping Act* administered by Transport Canada. The guidelines do not provide enough protection.

6.1.19 Sludge at the bottom of empty ballast tanks can contain not only invasive species but also diseases such as cholera. Foreign ships with no ballast water on board pose a more significant threat than ballast water exchange, as neither the U.S. regulations nor the Canadian guidelines apply to them. Overall, the voluntary guidelines together with the ballast water regulations are only 3 to 17 percent effective.

6.1.20 The Sea Lamprey Control Program of the Great Lakes Fishery Commission has proved to be effective. Through this program, Fisheries and Oceans has helped the Commission control sea lamprey populations for more than 40 years. However, since the government cutbacks of the mid-1990s, Canadian funding for the program has been unstable.

6.1.21 **Protecting fish habitat.** One of the biggest reasons for declines in fish populations is damage to their habitat—the places where they spawn, feed, grow, and live. Individuals, municipalities, and companies have built retaining walls, docks, and dams; filled in wetlands; and polluted the water. It is difficult to put a figure on lost fish habitat; there is currently little information on the amount and quality of habitat across the basin.

6.1.22 The federal government's 1986 Policy for the Management of Fish Habitat addresses the government's obligations under the *Fisheries Act*—the protection and enhancement of fish habitat by Fisheries and Oceans and the Act's provisions for pollution prevention, administered by Environment Canada. Fifteen years have passed since the policy was adopted and it has not yet been applied fully. The Department does not know whether it is progressing toward its ultimate objective of a net gain in fish habitat.

6.1.23 Fisheries and Oceans has struggled to strengthen its habitat management program in Ontario since 1997, when the Province withdrew from administering fish habitat management activities on the federal government's behalf. Staff of Fisheries and Oceans have tried to keep up with the increased workload, but the delays have brought complaints from those seeking advice, guidance, or authorizations.

6.1.24 As part of re-establishing its program in Ontario, the Department recently developed agreements with 37 conservation authorities to help deliver the habitat program. But it is too early to measure their results. We are especially concerned about protection of fish habitat in areas that are not covered by conservation authorities.

6.1.25 Fisheries and Oceans has no fisheries officers in Quebec and no formal agreement with the Province to monitor habitat protection or enforce the *Fisheries Act* in fresh water. The Province has its own program to protect fish habitat, but unlike the federal program, it does not apply to private land. Fisheries and Oceans believes that freshwater fish habitat in Quebec is being lost.

6.1.26 The Department recognizes the problems in its habitat management program. In 1999 it received an annual increase of $28 million to strengthen the program and promote consistency across the country. However, only some of the improvements will be made in Quebec.

6.1.27 Environment Canada administers the provisions of the *Fisheries Act* that prohibit pollution of water used by fish. However, Fisheries and Oceans is still ultimately responsible for those and all other provisions of the Act. It has not determined whether its actions, combined with those of Environment Canada, meet the requirements of the *Fisheries Act*. Specifically, it has not stated clearly how Environment Canada is to apply the Act's provisions for pollution prevention.

6.1.28 **Scientific information for decision making.** Scientific information is the basis of informed decisions. Fisheries and Oceans needs credible scientific information to do the following:

- set priorities and make management decisions;

- identify emerging threats, assess their significance, and develop and carry out strategies to counter them;
- ensure that where others deliver its programs, they meet the requirements of its mandate; and
- contribute to collaborative decision making in the basin.

6.1.29 The Department lacks scientific information that it needs to carry out its mandate effectively. It lacks information on fish stocks, quantity and quality of fish habitat, contaminants in fish, and the presence of invasive aquatic species. At the same time, new legislation such as the *Oceans Act* is placing more demands on the Department for science.

6.1.30 In the early 1990s, federal funding levels for the Department's scientific research in Ontario were unstable. Since then, the situation has deteriorated. Federal cuts coincided with provincial cutbacks, widening the existing gaps in knowledge and research and creating new ones. In Quebec, the Department has conducted almost no freshwater science.

6.1.31 The Department has identified the gaps in its science program and is working to determine the costs of filling them. It has also recognized that it does not have the staff it needs to conduct freshwater science, but it has no clear plan to resolve the problem. Projects that provide key information currently lack a long-term commitment by the federal government to their funding.

6.1.32 Fisheries and Oceans has not yet developed a strategy that would guide it in determining what science it needs to do itself, what it should do in partnership with others, and what it can obtain from other organizations.

What we recommend

6.1.33 Our audit found that Fisheries and Oceans needs to develop a vision of the aquatic ecosystem it wants to promote in the basin. It needs to define its role and responsibilities for conservation and protection of the fisheries, provide better protection against harmful invasive species, protect and manage fish habitat more effectively, and ensure that it has the scientific information it needs.

6.1.34 Fisheries and Oceans should take the following actions to ensure that the objectives of the *Fisheries Act* are achieved:

- Develop its own vision of the freshwater fisheries it wants to promote in the basin.
- Clarify its role in conserving and protecting freshwater fisheries in the basin.
- Establish clear commitments and adequate funding for its activities.
- Develop suitable accountability arrangements with its partners—the federal departments, provinces, and others it relies on to achieve the objectives of the *Fisheries Act*.
- Monitor the results of its activities and those of its partners and report them to Parliament.

6.1.35 Fisheries and Oceans should take the following actions to ensure that fish and fish habitat are protected as required by the *Fisheries Act* and the Policy for the Management of Fish Habitat:

- Measure progress toward its ultimate objective of a net gain in fish habitat. This should include, as a first step, monitoring the effectiveness of its advice and its decisions on individual projects.
- Ensure that it completes the renewal of its habitat management program and apply it consistently across the basin.
- Clearly define the actions it requires of Environment Canada to protect fish and fish habitat effectively and carry out the *Fisheries Act*'s provisions for pollution prevention.

6.1.36 Fisheries and Oceans should significantly expand its efforts in the following ways to control and prevent the introduction of invasive aquatic species and meet its stated commitments:

- Where feasible, develop programs to eradicate or prevent the further spread of invasive aquatic species already in the basin.
- Identify the threats posed by aquatic species that could invade the basin and assess the risks they pose to the aquatic ecosystem. Where there is significant risk, it should develop action plans to respond, with other parties, to an incursion.
- Conduct further research and propose alternative methods of preventing the release of invasive aquatic species in ballast water discharged by ships.
- Develop, with Transport Canada's participation, proposed changes to legislation to control or prevent the introduction of invasive aquatic species. (This should be done in consultation with the United States to ensure co-ordinated action.)

6.1.37 Fisheries and Oceans should do the following to ensure that it has the scientific information it needs to carry out its mandate in the basin:

- Clarify its responsibilities for research.
- Develop a strategy to guide its research activities and its acquisition of information from others.
- Ensure that it has adequate and stable funding for research commensurate with its needs for scientific information.

6.1.38 Fisheries and Oceans should establish stable funding to support the Great Lakes Fishery Commission. The Department should review its past performance and determine how it can participate most effectively in the Commission's activities.

(See Summary for departmental responses.)

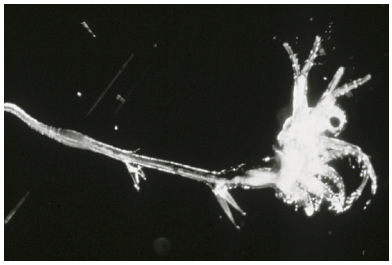
6.2 Invasive Aquatic Species

The issue

Invasive species threaten the basin

Zebra mussels cause extensive damage in the basin.

Source: U.S. Environmental Protection Agency



Spiny water flea, a small crustacean, competes with young fish for food.

Source: Great Lakes Fishery Commission

6.2.1 Exotic or alien species are those that are not natural to an ecosystem but have been introduced intentionally, or unintentionally. Some species, such as rainbow trout, are considered desirable as they have become important to the recreational fishery. Others are undesirable and considered invasive—zebra mussels, for example. While invasive species are a problem for both terrestrial and aquatic ecosystems, our audit focussed on invasive aquatic species.

6.2.2 Invasive aquatic species are second only to habitat destruction as a leading factor in the extinction of native aquatic species. Without intervention, invasive aquatic species can have severe, adverse impacts on the natural ecosystem and those who depend on it. They are recognized as a significant, unresolved problem around the world, but the problem is not new. The sea lamprey and the zebra mussel are just two of nearly 160 species that have invaded the Great Lakes and St. Lawrence River basin since the 1800s, with devastating effects on fish and the ecosystem.

6.2.3 The dense human population of the Great Lakes and St. Lawrence River basin has severely disturbed fish habitat and ecological communities. These invasions make the basin particularly susceptible to the introduction of additional species. Invasive aquatic species can enter the basin in many ways—aquaculture, the aquarium trade, baitfish, and recreational boating, among others. But the biggest known threat is commercial ships that can carry invasive species from foreign ports and release them into the basin unintentionally.

The federal role

6.2.4 Invasive aquatic species are a direct threat to fish or to their food. Fisheries and Oceans is responsible for conserving and protecting fish in the basin, including the habitat in which they live and the food on which they depend. The Department also carries out research on invasive species and gives scientific advice to Transport Canada's ballast water program.

6.2.5 Today, Transport Canada is responsible for regulating and controlling the management of ballast water on commercial ships and preventing or reducing the release of foreign aquatic organisms or pathogens from commercial ships into Canadian waters. In recent years this responsibility has moved back and forth between Fisheries and Oceans and Transport Canada. The *Canada Shipping Act* provides legislative authority to the federal government.

6.2.6 Canada signed the United Nations Convention on Biological Diversity in 1992. In its subsequent biodiversity strategy it made a commitment to "prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species." Environment Canada takes the

federal lead in the Canadian Biodiversity Strategy. It also does research on the environmental impacts of invasive aquatic species in inland waters.

Our audit question

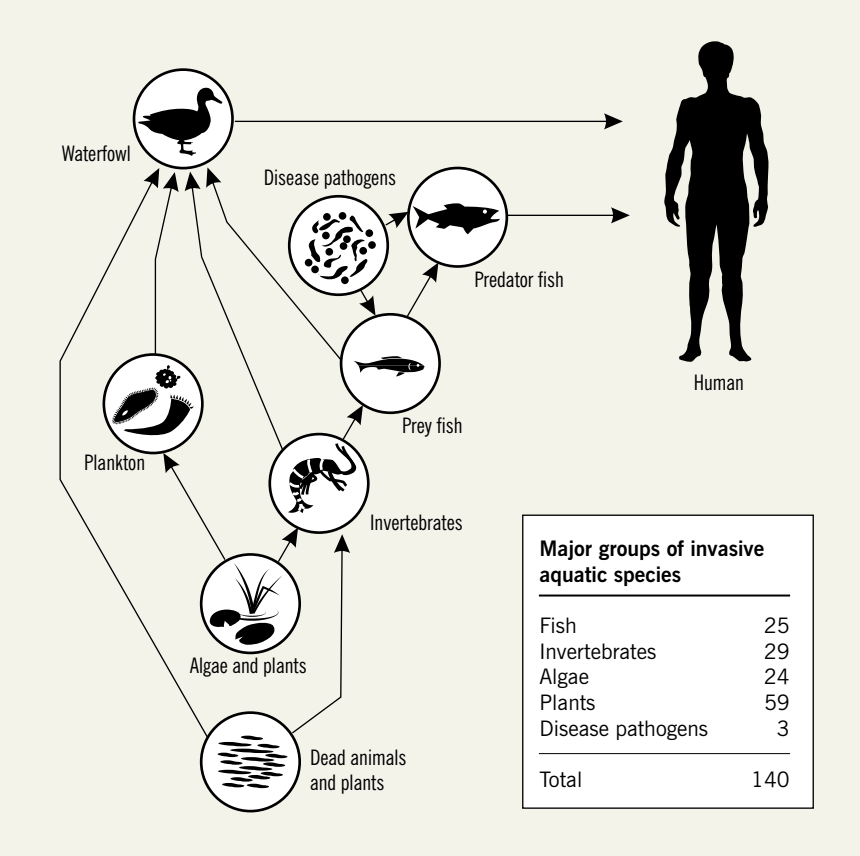
6.2.7 Is the federal government protecting the basin's ecosystem by preventing the entry of invasive aquatic species or monitoring and controlling their spread?

The story

Need for a co-ordinated approach

6.2.8 History has shown that once introduced into the basin, it is difficult or impossible to eradicate an invasive aquatic species or keep it from spreading. When an invasive species becomes established it can change the food web and further disrupt the ecosystem (see Exhibit 6.1). The methods used to control invasive species can themselves disrupt the ecosystem.

Exhibit 6.1 Invasive aquatic species affect different levels of the food web



Source: Adapted from The State of Canada's Environment, Government of Canada, Ottawa, 1991. Reproduced with the permission of the Minister of Public Works and Government Services, 2001.

6.2.9 Coupled with serious losses to the basin's recreational and commercial fisheries is the estimated $500 million spent each year on efforts to control invasive species in the Great Lakes. Correcting the damage they cause has its own high price—close to $44 million in the past 10 years, just to keep the water intake pipes of power-generating facilities free of zebra mussels. During the same period, Fisheries and Oceans spent about $52 million to control the sea lamprey population in the Great Lakes.

6.2.10 On paper, the Canadian Biodiversity Strategy contains a strong commitment to prevent and control invasive species. However, this commitment has not been translated into results. While Fisheries and Oceans is the lead federal department for aquatic ecosystems, it has not developed a plan to meet Canada's commitment.

6.2.11 **Co-operation is essential**. Invasive species are a basin-wide threat that requires the concerted efforts of the federal government, Ontario, Quebec, the U.S., and other partners—among them, resource management agencies, the research community, non-government organizations, industry, and the general public. Some are working on their own to combat invasive species, but to be effective, these separate efforts need to be co-ordinated under a lead agency.

The federal government is working to control sea lamprey

6.2.12 The Sea Lamprey Control Program of the Great Lakes Fishery Commission has proved effective. By participating in this program, Fisheries and Oceans has helped control sea lamprey populations in the basin for more than 40 years (Exhibit 6.2). Canada and the U.S. share in the program's funding, based on a formula that reflects the historic value of whitefish and lake trout caught and the estimated total area of the Lakes in each jurisdiction. The U.S. contributes 69 percent of the costs and Canada 31 percent.

Sea lamprey on a lake trout.

Source: Great Lakes Fishery Commission

6.2.13 Fisheries and Oceans delivers the Sea Lamprey Control Program from Sault Ste. Marie, Ontario, on behalf of the Commission. About 45 permanent and seasonal staff travel across the Great Lakes basin every summer. One team assesses the number of sea lamprey larvae in streams and rivers; a second team applies a chemical to kill them. Members of the team that apply the chemical are licensed by the provincial government to use pesticides. The Department has helped the Commission develop methods of treating streams that are more effective and thus require less of the chemical. They summarize their activities and results in annual reports.

6.2.14 In 1995, as part of significant government-wide cuts to programs and funding in the mid-1990s, Fisheries and Oceans eliminated its annual contribution to the Commission from its ongoing budget. Since then, the source of funds for Canada's entire contribution has been in question each year; it depends on whether the Deputy Minister of Fisheries and Oceans funds it from elsewhere in the budget. After six years, this funding uncertainty still has not been resolved. While there has been some movement toward resolution in recent months, there is no assurance of ongoing Canadian funding while the present arrangement continues.

6.2.15 Long-term, stable funding is needed to support the Commission's research, its Sea Lamprey Control Program, and its other committees. Stability will not be assured unless the federal government makes it a regular budget item.

Little action to control most other invasive species

6.2.16 **No identified options for controlling the biggest threats.** Once here, invasive species can quickly spread throughout the basin. However, Fisheries and Oceans does not have a policy or established procedures to respond to a new species or to its spread. The Department's position is that very little can be done to control invasive species once they become established in the Great Lakes. The federal government has therefore not attempted a comprehensive, well-managed response to invasive species already in the basin. They are having a dramatic impact on the basin's aquatic ecosystem, but there are no co-ordinated control programs except for the sea lamprey.

Exhibit 6.2 Controlling sea lamprey populations in the basin

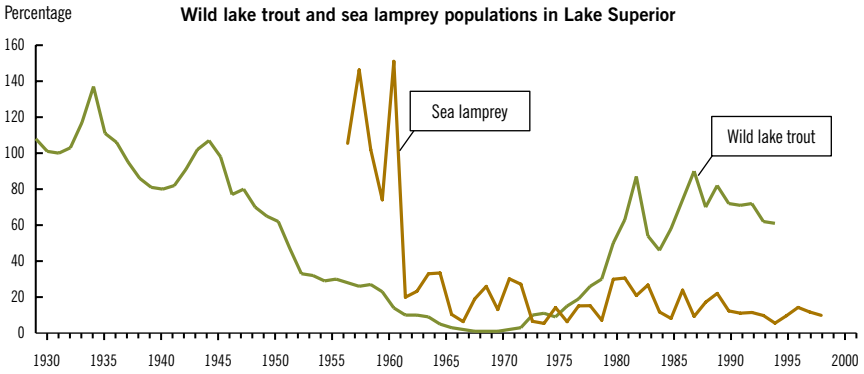
Damage inflicted on lake trout by the sucking disk of a sea lamprey.

Source: Great Lakes Fishery Commission

Sea lamprey are parasites that attach themselves to a fish with their sucking disk and sharp teeth, rasping through scales and skin to feed on body fluids, often killing the fish.

They are native to the Atlantic Ocean, not the Great Lakes, and are believed to have entered Lake Ontario in the 1830s. By the late 1940s, the sea lamprey population had exploded from Lake Erie to Lake Superior, causing severe damage to lake trout and other critical species of fish.

It was the destructive power of the sea lamprey that propelled the U.S. and Canada to co-operate in a binational response: the Great Lakes Fishery Commission. It has succeeded in controlling the sea lamprey population and protecting the commercial and recreational fisheries. The role of the federal government, as a member of the Great Lakes Fishery Commission and an agent for the sea lamprey control program, has been clear for the last 40 years.



Source: Great Lakes Fishery Commission

Even less action to keep new invasive species out

6.2.17 Our audit found that the government does little to prevent the arrival of invasive species. Keeping them from entering the basin could save millions of dollars in control costs beyond the costs of damage they cause to the ecosystem.

6.2.18 The federal government has done research on the environmental effects of certain invasive species that have entered the basin but little on ways to keep more from entering. A first step toward prevention would be to identify potential sources (foreign ports in the case of ballast water, for instance) and species that could invade Canadian waters. Fisheries and Oceans has not determined which species are most likely to enter the basin and which of those would do the most harm—that is, which species are the biggest threats. While ballast water is generally recognized as the way most invasive species arrive in the basin, the Department has not assessed the relative significance of other entryways such as the aquaculture, aquarium, and baitfish industries.

Voluntary guidelines for ballast water exchange are ineffective

Cargo ships can carry invasive species and release them in the basin.

Source: Bruce Litteljohn

6.2.19 When ships carry less cargo, they carry ballast to steady themselves—usually water in special ballast tanks. Ships take on ballast water at ports all over the world. As they load cargo at ports on the St. Lawrence and the Great Lakes, these ships pump the water out of their ballast tanks and into the basin, along with any invasive species the water may contain.

6.2.20 About 100 ports in the basin on both sides of the Canada–U.S. border are engaged in active international and domestic shipping. More than 30 invasive species in the Great Lakes have hitchhiked there in ballast water—among them, the zebra mussel and the spiny water flea.

6.2.21 Since 1989 Canada has had voluntary guidelines, under the *Canada Shipping Act*, for ships to exchange their freshwater ballast with salt water as far from land as possible before entering the St. Lawrence Seaway. This exchange is intended to remove most freshwater organisms and kill the remaining organisms by subjecting them to salt water. Transport Canada receives copies of ballast water exchange reports from ships entering the basin, but it does not sample or test to verify that the information is correct. Rather, it relies on the U.S. regulation of ballast water exchange and on U.S. compliance rates. The Canadian Coast Guard (part of Transport Canada at the time) decided to rely on the U.S. regulations because they applied to all ships with ballast water that entered the Great Lakes. A Fisheries and Oceans study conducted 10 years ago found a high rate of compliance (95 percent) with the U.S. ballast water regulations. The same study, however, showed that the procedures used in exchanging ballast water were only 67 percent effective, because some species can survive exposure to salt water.

6.2.22 Given that all ships must comply with the U.S. regulations, Canada has been slow to establish its own—although the *Canada Shipping Act* gives it the authority to do so. Responsibility for ballast water exchange shifted from Transport Canada to Fisheries and Oceans in 1995 and back to Transport

Canada in 2000. The shift in responsibility underlines the lack of commitment to action. Although Fisheries and Oceans is the lead federal department for the aquatic ecosystem, it has not taken ownership of this issue.

6.2.23 At present, the U.S. Coast Guard does not check ships that enter the basin through the St. Lawrence River for compliance with U.S. regulations until they reach Massena, New York. So ships that take on cargo in Quebec City, for example, can discharge their ballast water there without being monitored for compliance.

Did you know?

- Number of invasive aquatic species introduced in the basin since the 1800s: **close to 160**
- Annual amount spent to control and repair damage from invasive species in the Great Lakes: **about $500 million**
- Cumulative cost of damage in the Great Lakes (Canada and U.S.) by zebra mussels: **over $3 billion**
- Annual cost of the Sea Lamprey Control Program: **$21 million**
  amount Canada contributes: **$6 million**
- Number of ports in the basin (Canada and U.S.) that could be the release point for the next invasive species: **over 100**
- Percentage of ships that comply with the U.S. ballast water regulations, according to a 1991 Canadian study: **95**
- Percentage of ships to which these regulations apply: **5 to 25**

6.2.24 Surprisingly, foreign ships with no ballast water on board pose a bigger threat than ballast water exchange, and they are not subject to regulations. These are ships that have pumped out their ballast tanks to minimum levels as they loaded cargo. However, most ballast tanks have a few hundred tonnes of unpumpable slop and sediment at the bottom; they are never completely empty. The sludge can contain not only invasive species but also diseases such as cholera. These ships may unload and reload cargo at different ports. As they do, they take on and release ballast water and could release invasive species and diseases into the waters of the basin.

6.2.25 Each year, foreign ships with no ballast water account for 75 to 95 percent of ships entering the basin. Neither the U.S. regulations nor the Canadian guidelines apply to them. In other words, the voluntary guidelines together with the ballast water regulations are only 3 to 17 percent effective. This is a significant gap in the protection of the basin.

6.2.26 In its most recent sustainable development strategy, Transport Canada made a commitment to Parliament to have regulations and standards for ballast water management in place by 2002. It remains to be seen whether they will apply only to ballast water exchange or will address other issues such as ships with no ballast water. Transport Canada may have the regulatory responsibility, but Fisheries and Oceans retains responsibility for conducting scientific research on ballast water to get the information needed for program activities, regulation, and policy development.

6.2.27 **Further research needed for ballast water management**. Exchanging ballast water on the open sea has certain benefits but is not an ideal solution: a mid-ocean exchange can be an unsafe manoeuvre. Some alternatives have been suggested, but Fisheries and Oceans has not evaluated them thoroughly. One possibility would be to have ships exchange their ballast water at a shore facility before they enter the basin; another could be to treat the ballast water before it is released into the basin. Treatment options include fitting the ship's water pipes with a filter; using ultra-violet radiation; and on ships with no ballast water, treating ballast sediment with chemicals. However, these alternatives have their own limitations and the shipping industry sees them as impractical or prohibitively expensive. It is argued, for example, that with current technology it would take too long to filter the ballast water; and building a shore-based treatment facility would be costly. Using chemicals could also have environmental costs.

6.2.28 In our view, the problem of invasive species in ballast water warrants concerted action now. A single ship can introduce a species, and every introduction is potentially irreversible. Given its responsibilities, Fisheries and Oceans needs to weigh the costs of damage by invasive species against the costs of alternative means of control, and take appropriate action.

6.2.29 **Being ready for the next invasive species**. A forward-looking, organized approach to prevent and control invasive aquatic species could include the following:

- identifying species that are a threat;
- assessing the risk of their entry;
- developing and assessing treatment technologies;
- monitoring the environment to detect new species or occurrences;
- understanding ecosystem impacts; and
- developing control strategies and plans.

Conclusion

6.2.30 Invasive aquatic species are a serious and growing threat to the ecosystem of the Great Lakes and St. Lawrence River basin—a threat the federal government is ill prepared to counter, despite its commitments. There is no federal policy, no recognized lead department, and no plan to co-ordinate federal action to counteract the environmental, economic, and social impacts of these species.

Our audit objectives and main findings

Holding the federal government to account		
1 **Has the government fulfilled its commitments?**	**Commitments**	**Results**
	Conserve and protect fish and fish habitat in the basin.	The federal government has been slow to protect fish and fish habitat from the threat of invasive species. It has developed an organized, co-ordinated response only to sea lamprey. There is no national policy that would allow departments to address this issue in a co-ordinated way.
	Prevent the introduction of, control, or eradicate alien species that threaten ecosystems, habitats or species. (Biodiversity Strategy)	The federal government's efforts are not focussed on prevention. Its efforts to control or eradicate invasive species that are already in the basin are ad hoc and lack co-ordination.
	Improve and perpetuate fishery resources and specifically to control sea lamprey. (Great Lakes Fishery Commission)	Fisheries and Oceans, under the direction of the Great Lakes Fishery Commission, has controlled sea lamprey populations in the Canadian portion of the Great Lakes.

Our audit objectives and main findings

Assessing the government's performance		
❷ **Has the government applied good management practices?**	**Strengths**	**Weaknesses**
	The federal government, with the Great Lakes Fishery Commission, has defined the sea lamprey problem (economic impact, effects on fisheries) and taken steps to address it. The program for the control of sea lamprey populations in the Great Lakes is largely effective.	The federal government does not have a forward-looking, organized approach, which could include identifying species that are a threat, assessing their risk of entry, preventing their entry, and controlling their spread.
❸ **Has the government established good governance structures?**	The Great Lakes Fishery Commission has been an effective structure through which Canada and the U.S. have co-operated to address the problem of sea lamprey in the Great Lakes.	The government does not have a policy, a lead department, or a plan to counteract the impacts of invasive species. It is difficult to piece together the extent of the problem and the action being taken to resolve it. The government has passed the responsibility for ballast water management from Transport Canada to Fisheries and Oceans and back to Transport Canada. It is too soon to tell what impact the most recent transfer will have. The federal government is not actively managing the issue of invasive species. Therefore, we cannot say that it is protecting the public interest.

6.3 Protecting Fish Habitat

The issue

6.3.1 **Fish habitat needs protection.** Damage to fish habitat can threaten fish populations more than overfishing. Urbanization and land development in the Great Lakes and St. Lawrence River basin have caused the loss of shorelines and wetlands—important areas where fish spawn, feed, grow, and live.

Fish habitat refers to places that fish need to spawn, feed, grow, and live. Water temperature, oxygen levels, food sources, and shelter are important factors in habitat quality.

Source: *Cold Comfort*, Ontario Ministry of Natural Resources (Posters 1-800-667-1940)

6.3.2 Many activities can result in the destruction of fish habitat. Removing vegetation along the edges of streams and lakes results in increased water temperature and a loss of habitat, where fish find food. It allows running water to erode the soil and transport sediments into streams, where they can smother gravel used by spawning fish. Effluents discharged into water can damage water quality and thus fish habitat, potentially harming fish. Examples include effluents from pulp and paper companies and mining companies, sewage and other municipal waste, and pesticides and nutrients in runoff. Dredging in harbours, channels, and marinas can destroy habitat by removing it and depositing silt. Individual property owners—by building a retaining wall, installing a dock, or damming a creek—can also destroy fish habitat.

6.3.3 It is difficult to put a figure on the loss of fish habitat—there is currently little information on the quantity and quality of habitat across the basin. But we can protect it, with proper care, and thereby protect wetlands and shorelines, improve water quality, and protect certain species at risk.

The federal role

Clear responsibility to protect fish habitat

6.3.4 Fisheries and Oceans is responsible for protecting fish habitat. It has a powerful tool in the *Fisheries Act*, which controls actions that would damage habitat and pollute the water used by fish. While Environment Canada administers the *Fisheries Act* provisions that prohibit pollution of water used by fish, Fisheries and Oceans is responsible for those and all other provisions of the Act. In addition, the *Canadian Environmental Assessment Act* stipulates that before Fisheries and Oceans can issue an authorization under the

Fisheries Act for any activity that would alter, disrupt, or destroy fish habitat, it must complete an environmental assessment.

6.3.5 The federal government's Policy for the Management of Fish Habitat is the cornerstone of its efforts to protect fish habitat. The policy's objective is to achieve a net gain in the natural productive capacity of fish habitat through the goals of conservation, restoration, and development. The policy applies to all projects and activities—large and small, on public or private land, in or near the water—that could alter, disrupt, or destroy fish habitat. If a loss of habitat is unavoidable, it must be compensated for by restoring, enhancing, or constructing habitat elsewhere.

6.3.6 **Other jurisdictions.** In Canada, fish habitat protection is a federal and provincial partnership. Ontario and Quebec have their own environmental, wildlife and land-use-planning legislation that gives them a role in protecting water and fish habitat in the Great Lakes and St. Lawrence River basin. However, some provincial laws and regulations apply only to public land. From 1989 to 1997, Ontario carried out most habitat management activities on the federal government's behalf. There has been no equivalent arrangement with Quebec. Currently, most conservation authorities in Ontario have agreements with Fisheries and Oceans to advise the public on measures to protect fish habitat.

Our audit questions

6.3.7 How well does the federal government apply its habitat management policy to protect fish habitat in the Great Lakes and St. Lawrence River basin? Does the Minister of Fisheries and Oceans have assurance that Environment Canada prevents pollution of fish habitat in accordance with the objectives of the *Fisheries Act*?

The story

Federal policy is clear but implementation is incomplete

6.3.8 The 1986 Policy for the Management of Fish Habitat presents a clear objective: a net gain in fish habitat. The policy covers both fish habitat protection by Fisheries and Oceans and pollution prevention by Environment Canada. However, 15 years after the policy's adoption, it has never been fully implemented. Of the policy's eight separate but related strategies, Fisheries and Oceans has emphasized one: protection and compliance. And it has not applied that strategy consistently in the two provinces of the basin. The 1986 policy recognizes that protection and compliance alone are not enough to achieve a net gain in fish habitat. The seven remaining strategies in the policy must be carried out as well to fulfil the three policy goals (Exhibit 6.3).

Steps to protect existing fish habitat

6.3.9 Fisheries and Oceans' fish habitat management program consists primarily of reviewing development proposals to identify potential threats to fish habitat and outlining measures to avoid or mitigate their impacts (Exhibit 6.4). Anyone who causes unauthorized damage to fish habitat can be charged under the *Fisheries Act*. Any person who proposes a project that will likely affect habitat should consult Fisheries and Oceans to see whether an authorization is needed. Available options to protect fish habitat are, in order of preference, to relocate the project, redesign it, find ways to reduce damage, and/or provide for replacement habitat (normally called compensation).

6.3.10 Before Fisheries and Oceans can issue an authorization, its officers must complete the environmental assessment required by the *Canadian Environmental Assessment Act*. The assessment increases the time it takes to process an authorization, but it also provides protection by examining additional environmental factors.

Unsuccessful attempts to delegate to the provinces

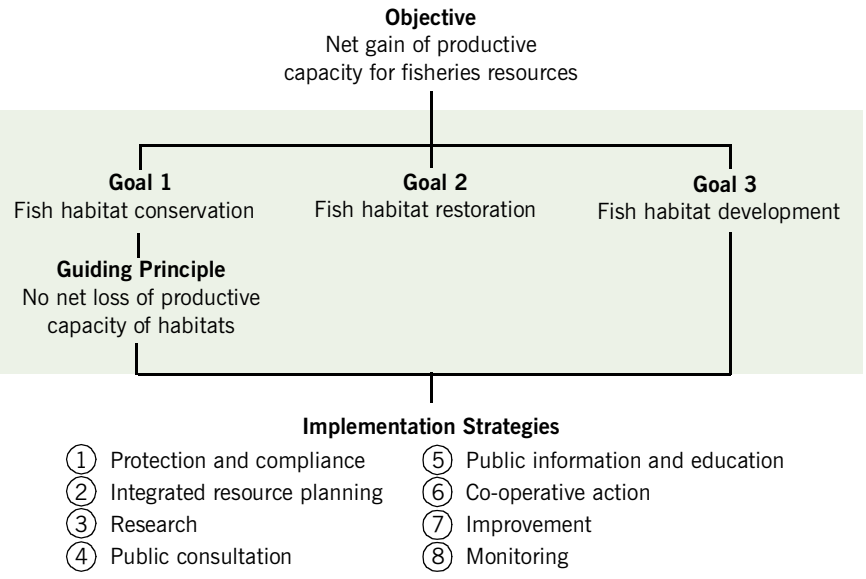
Did you know?

- Amount of fish habitat lost or gained in the basin: **unknown**
- Number of years that the Policy for the Management of Fish Habitat has been adopted but not fully implemented: **15**
- Number of agreements that Fisheries and Oceans has with conservation authorities in Ontario to help deliver the Fish Habitat Management Program: **37**
- Number of people in 1998–99 who received advice and authorizations from Fisheries and Oceans for projects that could affect fish habitat in Ontario: **1,542** number in Quebec: **108**
- Number of additional staff Fisheries and Oceans planned to hire to renew its Fish Habitat Management Program in Ontario: **103** number in Quebec: **12**

6.3.11 In its 1995 Budget, the federal government announced that it would formally delegate the management of freshwater fish habitat to the Prairie provinces, Ontario, and Quebec. It made this decision so it could increase its presence in managing Canada's oceans and, at the time, Ontario and Quebec were already managing their commercial and recreational freshwater fisheries by arrangement with the federal government. Furthermore, since 1989 Ontario had enforced most *Fisheries Act* provisions for fish habitat protection under an agreement with Fisheries and Oceans.

6.3.12 Skeptical about the protection the provinces would provide, environmental groups strongly opposed the transfer of responsibilities. Moreover, the proposed delegation meant that without federal involvement, many projects that would otherwise warrant an environmental assessment under the *Canadian Environmental Assessment Act* would not be assessed. Recognizing their concerns, the Department proposed to only partially delegate freshwater habitat management to the provinces—which would still require changes to the federal legislation. The provinces would not agree. They wanted the existing arrangement formalized and additional funding to manage fish habitat on the federal government's behalf. Ontario withdrew

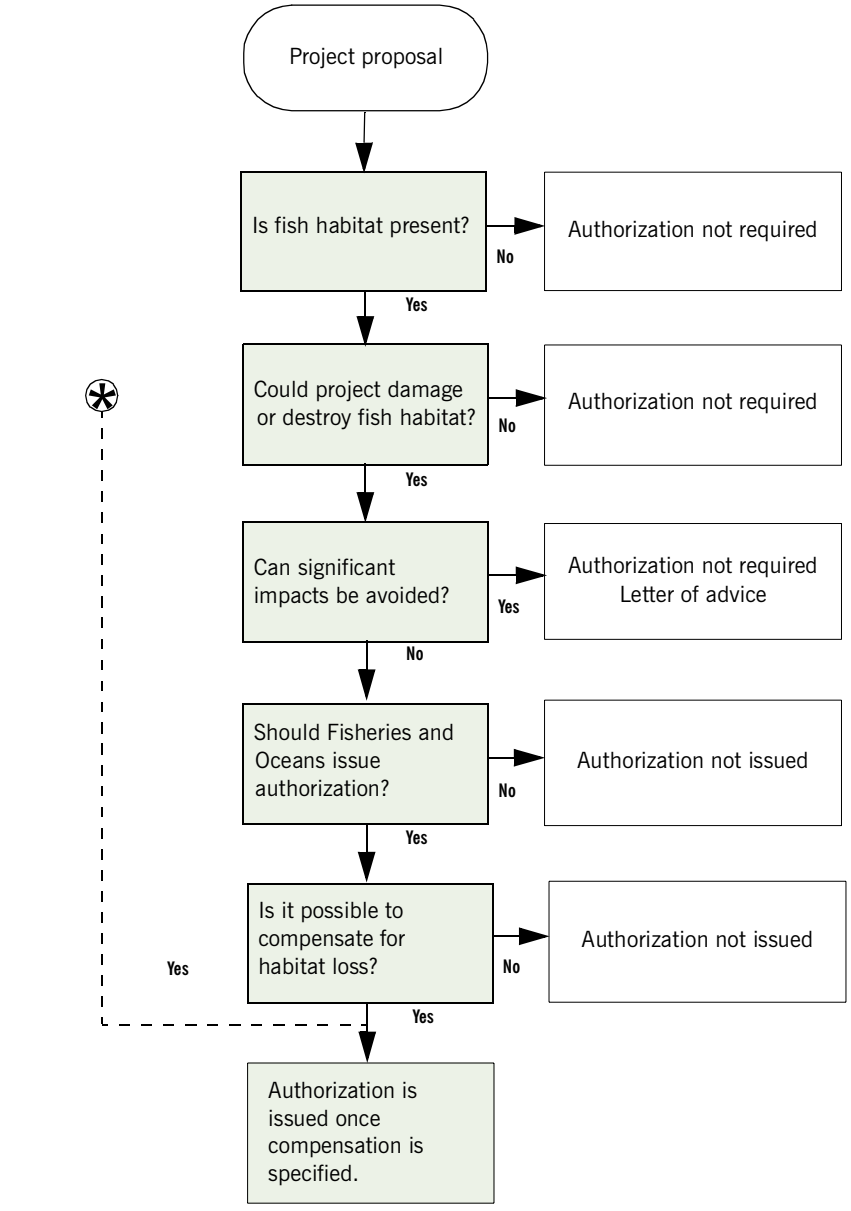
Exhibit 6.3 Policy framework for fish habitat management



Source: Adapted from Policy for the Management of Fish Habitat, Fisheries and Oceans, 1986

from its agreement to manage fish habitat in September 1997. Quebec argued that its own legislation and programs already protected fish habitat. As no agreement was reached, Fisheries and Oceans reassumed its full responsibilities for national management of freshwater fish habitat.

Exhibit 6.4 Decision framework for determining and authorizing harmful alteration, disruption, or destruction of fish habitat



* If a project is likely to result in damage or destruction to fish habitat, an environmental assessment should be conducted concurrently and must be completed before an authorization is issued.

Source: Adapted from Decision Framework for the Determination and Authorization of Harmful Alteration, Disruption or Destruction of Fish Habitat, Fisheries and Oceans, 1998

Struggling to strengthen its program in Ontario

6.3.13 The Department had no back-up plan ready when Ontario decided to withdraw from its administration of fish habitat management. It told us that it had made some arrangements for effective transition. The Department temporarily reassigned fewer than five fisheries enforcement officers from other regions to Ontario to complement the seven habitat biologists already working there. It also relied on informal local arrangements between provincial and federal officials. We noted a decline in the number of charges laid during this period—none during 1997–98 and only one in 1998–99, compared with six in 1996–97.

6.3.14 Following the province's withdrawal from its agreement, the federal workload in the habitat management program increased dramatically—from reviewing a total of 250 development proposals per year in September 1997 to reviewing more than 3,000 a year later. Staff struggled to keep up with the workload, but the delays brought complaints from those seeking guidance, advice, and authorizations. Finally, in 1999, the federal government ended its attempts to delegate and instead expanded its program. At the time of our audit, the Department was completing the hiring of 78 fisheries biologists and opening new district offices across Ontario. We believe that Fisheries and Oceans has taken too long since 1997 to establish a replacement program in Ontario and has been less able to protect fish habitat in the meantime.

6.3.15 The Department is still struggling to deploy up to 25 more fisheries enforcement officers in Ontario. It takes two years to train fisheries officers so they can enforce fisheries legislation for all species across Canada. The Department provides comprehensive training so that it can assign any officer to any location. However, it finds it difficult to attract and retain officers in Ontario because the habitat work relies on only a small portion of their overall training.

6.3.16 As part of re-establishing its program, the Department recently developed three levels of agreement with 37 conservation authorities in Ontario to help deliver the habitat program (Exhibit 6.5). Conservation authorities are local environmental agencies that conserve, restore, develop, and manage natural resources in areas defined by watersheds. The Department's agreements with them build on their former responsibilities with the Province and make good use of their local knowledge. Conceptually these agreements have promise, but it is too early to measure their results.

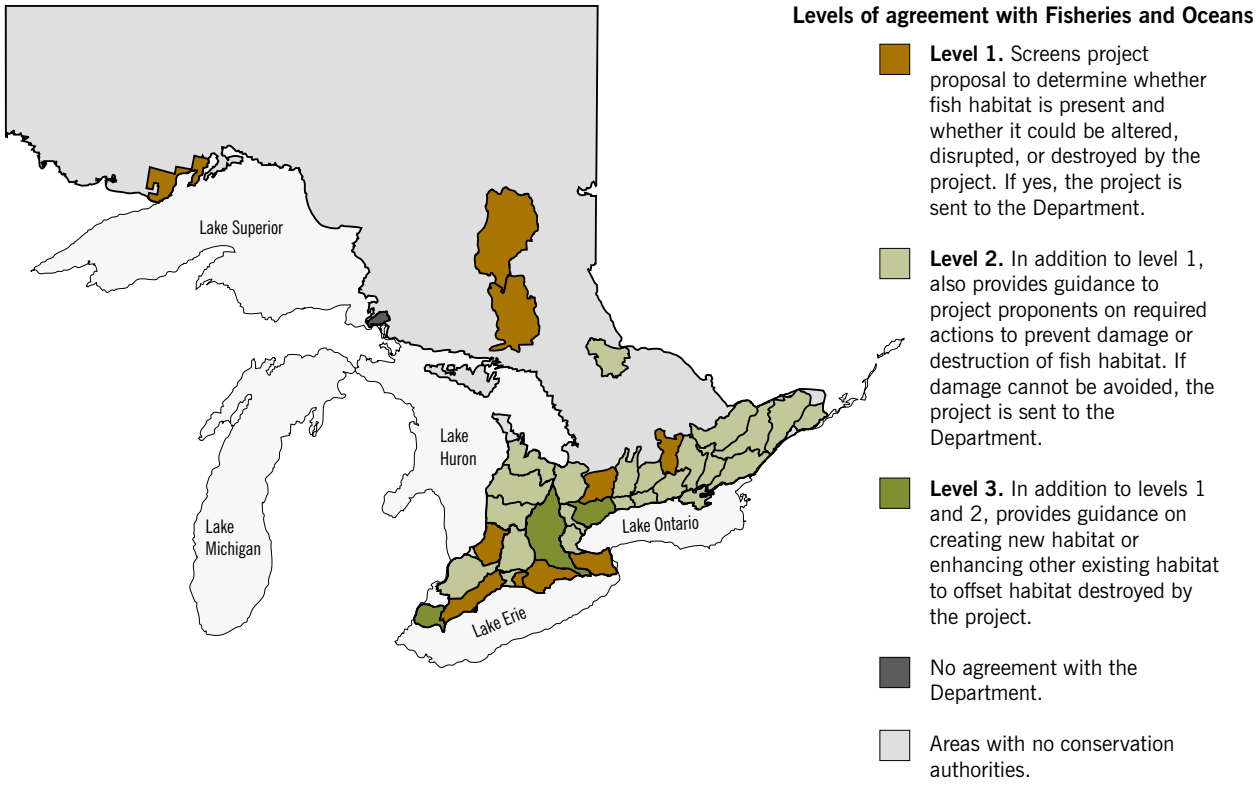
6.3.17 We are especially concerned about the protection of fish habitat in areas not covered by conservation authorities—most of the territory north of Lake Superior and Lake Huron. There is no federal–provincial accord on fish habitat management that applies to this region, apart from recent guidelines developed by the Department, the Province, conservation authorities, and Parks Canada Agency. Parks Canada informed us that four of its field units have signed a memorandum of agreement with Fisheries and Oceans on the fish habitat referral process. Fisheries and Oceans relies on these groups to help protect habitat as part of carrying out their own responsibilities—for example, the province's approval of forestry management plans.

6.3.18 This arrangement may avoid duplication, but Fisheries and Oceans does not monitor whether fish habitat in this region is protected in accordance with its policy. We found that it had not assessed the implications of the 1998 Report of the Provincial Auditor of Ontario, which questioned the Province's capacity for fish and wildlife enforcement. We question the federal government's current capacity to protect fish habitat in areas not covered by conservation authorities.

Freshwater fish habitat may not be protected adequately in Quebec

6.3.19 Unlike Ontario, Quebec has never had a formal habitat agreement with Fisheries and Oceans. The Province does not recognize the federal jurisdiction over freshwater fisheries and related sections of the *Fisheries Act* and the *Canadian Environmental Assessment Act*. At a working level, though,

Exhibit 6.5 Conservation authorities in Ontario share in the management of fish habitat



Fisheries and Oceans assigns three levels of responsibility to conservation authorities, based on their level of experience and capacity. Conservation authorities review project proposals on behalf of the Department, free of charge. Fisheries and Oceans provides training, as well as hardware and software, to fulfil the requirement for annual reporting to Parliament. The Department retains responsibilities for *Fisheries Act* authorizations and conducting environmental assessments under the *Canadian Environmental Assessment Act.*

Source: Adapted from A Protocol Detailing the Fish Habitat Referral Process in Ontario, August 2000. Fisheries and Oceans, Parks Canada, Conservation Ontario, Ontario Ministry of Natural Resources.

federal and provincial officials do share the objective of protecting fish habitat. Federal staff rely on detailed provincial knowledge in carrying out their fish habitat work.

6.3.20 Fisheries and Oceans has no fisheries officers in Quebec to monitor habitat protection or enforce the *Fisheries Act* in fresh water. While the Department believes that habitat is being lost, it has no agreement with Quebec for the Province to enforce the habitat provisions of the Act and has no established process to know whether charges have been laid. Though Quebec has its own program to protect fish habitat, unlike the federal program it does not apply at present to private land. However, provincial wildlife officers are empowered to apply the *Fisheries Act* to protect fish habitat. Finally, although the Province analyzes and approves projects, there is no formal mechanism to refer them to the federal government. Habitat may be lost and no new habitat created or enhanced to compensate.

Proper care must be taken to protect fish habitat when working near water.

Source: Fisheries and Oceans

6.3.21 Until 1997, the Department did not issue any authorizations in Quebec for projects that would affect fish habitat. As a result, any environmental assessments under the *Canadian Environmental Assessment Act* that might have been triggered as part of the federal authorization process were never done. The Department's involvement in protecting freshwater fish habitat was restricted to large projects and federal projects. On those projects, it advised on measures to minimize changes to fish habitat, but lost habitat was not replaced.

6.3.22 Since 1997–98, Fisheries and Oceans has marginally increased its efforts in Quebec to administer *Fisheries Act* provisions for fish habitat protection. It issued its first authorizations, along with compensation plans to replace lost habitat. However, the Department does not have the staff to do this systematically and comprehensively. The recent increase in federal activity happened without formal consultation or co-ordination with the Province. It was poorly received by the Province, by project proponents, and by other federal departments. The lack of clarity about the roles of the Department and the Province and the lack of public information have left applicants confused about when they should involve the federal government.

6.3.23 Before issuing an authorization, program staff often need scientific advice. However, the Department has no freshwater science expertise for habitat decisions in Quebec, even though 80 percent of the applications it receives for analysis involve freshwater habitat. We were told that given budget constraints, all scientific efforts are directed to the marine environment.

Is habitat being gained or lost?

6.3.24 Fisheries and Oceans does not know whether there has been a net gain or a net loss in the basin's fish habitat. It does not gather enough information to assess the productive capacity of fish habitat. The Department has not measured changes to the amount of habitat over the years. It has not done enough monitoring to conclude whether applicants have complied with the advice or authorizations it has given. Nor does it monitor whether its

decisions have resulted in a gain or loss of the productive capacity of fish habitat. However, the Department recognizes that it needs better information on the state of habitat, and it is planning to initiate measurement techniques.

Problems with Habitat Management Program are recognized

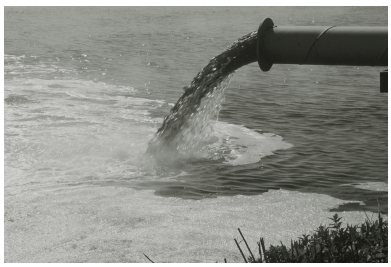
6.3.25 In 1999, the Department commissioned a study of the national Fish Habitat Management Program. The study examined how well the program had analyzed and responded to projects referred to the Department. In response to the study's criticisms and recommendations, the Department initiated a renewal of the program to promote consistency across the country and provide for more early intervention and monitoring. In 1999, it received an annual increase of $28 million to strengthen its national program for the management of freshwater fish habitat, emphasizing the Prairie provinces and Ontario.

6.3.26 The changes recommended by the study were not new. Some had begun under the former Habitat Action Plan but were never completed. Indeed, in 1993 the Department had launched a four-year, $29.4 million plan to develop co-operative arrangements with inland provinces and national tools to manage and protect fish habitat. But the Habitat Action Plan did not meet its objectives. Furthermore, the 1999 study found employees skeptical about whether a new initiative would succeed.

6.3.27 At present, as the Department implements the initiative, it has considerable work remaining. For example, it has added staff in Ontario but has problems attracting senior biologists. In Quebec, the renewal initiative includes activities to encourage acceptance of the federal program, such as public information campaigns. Although the renewal program is national in scope, it is not designed to provide the same level of monitoring and enforcement in Quebec as in Ontario.

Problems in applying pollution prevention provisions of the *Fisheries Act*

6.3.28 Beyond protecting fish habitat, the *Fisheries Act* includes provisions to prevent pollution of waters used by fish. Although Environment Canada administers that section of the Act on behalf of the Minister of Fisheries and Oceans, the Minister remains accountable for the entire Act. The two departments signed a memorandum of understanding (MOU) in 1985 to clarify their responsibilities for the administration of that section.



Effluents must be properly treated to avoid polluting fish habitat.

Source: Bruce Litteljohn

6.3.29 We noted several deficiencies in the MOU. For example, Fisheries and Oceans is concerned about Environment Canada's interpretation and consequent lack of enforcement of the provision that prohibits the deposit of any "deleterious substance" in waters used by fish. Fisheries and Oceans found that in some cases, Environment Canada has interpreted this to mean a substance that kills fish. But to Fisheries and Oceans, a substance is deleterious even if it could cause indirect harm such as a build-up of contaminated sediments over time.

6.3.30 The Commissioner's 1999 Report cited a separate problem in the application of pollution prevention provisions. In the chapter, Streamlining

Environmental Protection Through Federal–Provincial Agreements, we noted that Environment Canada had not ensured that the pulp and paper regulations of the *Fisheries Act* were properly enforced in Quebec.

6.3.31 Although since 1992 the two federal departments have repeatedly noted the need to revise the MOU, it has not been revised. Fisheries and Oceans has the legal responsibility for the *Fisheries Act* provisions, but it has not stated precisely the responsibilities of each department. Nor has it clearly defined how Environment Canada should apply the term "deleterious substance" to achieve the objectives of the *Fisheries Act*.

A need for a compliance and enforcement policy

6.3.32 The federal government needs a policy that establishes principles for the fair and consistent enforcement of the *Fisheries Act*'s provisions for habitat protection and pollution prevention. In 1998, Fisheries and Oceans and Environment Canada made a commitment to the Standing Committee on the Environment and Sustainable Development to have such a policy in place by the end of 1998. Efforts to develop the policy have been under way for more than 10 years and today, two and a half years beyond their target, the departments are finalizing a draft for public consultation. In our view, this delay is unacceptable.

Reports to Parliament have been delayed

6.3.33 Reporting is an essential feature of good accountability and a requirement of the *Fisheries Act*. While we found some improvements in the latest report to Parliament by Fisheries and Oceans, reports are still not on time. Nor do they provide a good summary of the results of the Act's provisions for habitat protection and pollution prevention.

6.3.34 The reports for 1995, 1996, and 1997 on activities of both Fisheries and Oceans and Environment Canada were not produced until the Federal Court of Canada ordered the Minister of Fisheries and Oceans to comply with the requirements of the *Fisheries Act*. In 1998, Fisheries and Oceans published the 1996–97 report (with data on convictions in 1994–95 and 1995–96). The 1998–99 report was published in February 2001, one year later than the departmental target date. The Department has begun to report its activities under the eight strategies of the Policy for the Management of Fish Habitat. It has yet to report on the effectiveness of its efforts and on whether fish habitat has been gained or lost, but providing that information is its long-term reporting objective.

Conclusion

6.3.35 In the 15 years since Fisheries and Oceans introduced its Policy for the Management of Fish Habitat, it has not applied the policy effectively or completely. The Department is aware of problems in the part of the policy it has applied. It does not know whether the advice it gives and the decisions it makes result in a loss or gain of fish habitat. Nor has it provided on time its required reports to Parliament on the status of fish habitat.

6.3.36 Mechanisms that provide for accountability are needed to ensure that the provinces, conservation authorities, and the public comply with the *Fisheries Act* and the Policy for the Management of Fish Habitat. Agreements with provincial conservation authorities are too recent to conclude whether they are effective.

6.3.37 In both Ontario and Quebec, Fisheries and Oceans has left serious gaps in applying and enforcing the habitat protection provisions of the *Fisheries Act*. Its attempted withdrawal from habitat management in Ontario seriously eroded its capacity, which it is still rebuilding. While renewal of the Fish Habitat Management Program is essential to apply the habitat policy consistently across the basin, only portions of the program will be carried out in Quebec.

6.3.38 Fisheries and Oceans has not determined whether its actions, combined with those of Environment Canada, meet the objectives of the *Fisheries Act*. Specifically, it has not clearly stated how Environment Canada should apply the pollution prevention provisions of the Act.

Our audit objectives and main findings

Holding the federal government to account		
1 **Has the government fulfilled its commitments?**	**Commitments**	**Results**
	Protect fish habitat according to the *Fisheries Act* and the 1986 Policy for the Management of Fish Habitat.	Fisheries and Oceans has not fully implemented its 1986 policy. It has concentrated on only one of the eight strategies—protection and compliance—and done it inconsistently. The Department has begun to increase its presence in the basin but still lacks knowledge of how well fish habitat is protected. The Department has not consistently assessed whether its guidance, advice, and authorizations have been followed by project proponents and whether this has resulted in a gain or loss of fish habitat. The Department has not assessed the overall status of fish habitat and whether it has achieved a net gain in the productive capacity of fisheries resources.

Our audit objectives and main findings

Assessing the government's performance		
❷ **Has the government applied good management practices?**	**Strengths**	**Weaknesses**
	Fisheries and Oceans has initiated a renewal of its Fish Habitat Management Program with priorities to correct gaps in the implementation of its habitat policy.	The Department has not measured whether habitat is gained or lost, and it cannot measure its progress.
❸ **Has the government established good governance structures?**	Fisheries and Oceans has established arrangements with provinces, conservation authorities, and Environment Canada designed to protect fish habitat.	Fisheries and Oceans does not know if fish habitat is being protected under its various arrangements. The Department has not clearly stated to Environment Canada its requirements for pollution prevention. The Department has not reported to Parliament on time.

6.4 Scientific Support for Fisheries Decisions

The issue

Fisheries and Oceans relies on scientific research, such as this fish habitat study, when it evaluates development proposals or rehabilitates damaged areas.

Source: Fisheries and Oceans

6.4.1 Scientific information is the foundation of all the federal government's fisheries work in the Great Lakes and St. Lawrence River basin. As a science-based department, Fisheries and Oceans needs credible scientific information to do the following:

- set priorities and make management decisions;
- identify emerging threats, assess their significance, and develop and carry out strategies to counter them;
- ensure that where others deliver its programs they meet the requirements of its mandate; and
- contribute to collaborative decision making in the basin.

The absence of good science allows serious problems to develop undetected (such as declines in fish populations). The Department then has to confront them with crisis management, an expensive and risky option.

The federal role

6.4.2 Fisheries and Oceans is the lead federal department for aquatic ecosystems. Under the *Fisheries Act*, it is responsible for the conservation and protection of fish and fish habitat in the basin. Scientific information is the basis for this role, allowing the Department to determine whether it and its partners are meeting the requirements of its mandate. Federal departments fund, produce, and share scientific information about fish and fish habitat. While Fisheries and Oceans has the overall lead, Environment Canada conducts some of the science needed for its pollution prevention work under the *Fisheries Act*. Environment Canada and Health Canada lead the Toxic Substances Research Initiative to improve their knowledge of toxic substances in the ecosystem and the damage they cause. Fisheries and Oceans also participates in the initiative.

Our audit questions

6.4.3 Does Fisheries and Oceans determine what scientific information it needs for decisions and the best way to obtain it? Does it get the information and use it in making decisions?

The story

Significant gaps in science information

6.4.4 In its vision statement, Fisheries and Oceans makes a commitment to scientific excellence—a commitment that filters down through the Department's strategies, policies, and programs. We found that it sets priorities for its research activities, applies established criteria to select new projects, and reviews the progress of these projects annually. However, there are gaps in its science coverage. The Department lacks scientific information it needs to understand the state of the basin's ecosystem, including fish stocks, amount and quality of fish habitat, contaminants in fish, and the presence of invasive aquatic species. At the same time, new legislation such as the *Oceans Act* is placing more demands on the Department for science.

Cutbacks in the 1990s widened gaps in freshwater science

6.4.5 In the early 1990s, federal funding levels for scientific research in Ontario were unstable. Since then, the situation has deteriorated. The government-wide cuts of the mid-1990s in programs and funding reduced the Department's scientific presence in the Great Lakes. It scaled back its science activities under the Great Lakes Water Quality Agreement, for example, and eliminated open water research. It had two large research vessels in the Great Lakes to conduct open water research. One has left the basin and the other is used by Environment Canada, leaving Fisheries and Oceans without such a vessel on the lakes. Federal cuts coincided with provincial cutbacks, widening existing gaps in knowledge and research and creating new ones. In Quebec, the Department has conducted almost no freshwater science.

The *Louis M. Lauzier* is no longer available for research in the basin.

Source: Fisheries and Oceans

6.4.6 **Fisheries and Oceans is still recovering.** The Department has identified the gaps in its science program and is working to determine the costs of filling them. Based on departmental estimates, those costs will range from $3.5 million to $13.3 million annually in its Central and Arctic Region (which includes the Great Lakes). In the Laurentian Region (which includes a large part of the St. Lawrence River), the estimated costs are $1.5 million to $1.9 million annually to fill gaps in the freshwater habitat and fish contamination sections of its science program. The wide range in these estimates indicates that planning is still in the early stages.

6.4.7 The costs for the Central and Arctic Region include an estimated $2.76 million for science to support the expanded Fish Habitat Management Program. The Department failed to include scientific support in 1999 when it calculated the funding it needed to expand the program. It has not yet sought these funds. To fund some of the needed science, it has cut back on other important research.

6.4.8 The Department has recognized that it lacks the staff to conduct freshwater science, but it has no clear plan to resolve the problem. This is a particular concern in Quebec; the Department estimates that it needs another 14 people to conduct research on freshwater fish habitat and fish contamination. However, at the end of our audit it still had no staff with the expertise to do this research—expertise that can take 10 years to develop.

6.4.9 There are significant problems looming as the Department's work force ages. While the Central and Arctic Region is hiring five new scientists in the Great Lakes area, 54 percent of the environmental science researchers are expected to retire from the public service in the next four years. Funding and organizational restrictions have prevented managers from hiring new researchers beforehand to allow for the transfer of knowledge. The Region is taking some action, however, encouraging its researchers to work as adjunct professors in universities. They can thus help to train graduate students to become freshwater scientists. The Great Lakes Fishery Commission has just entered a formal agreement with the University of Guelph to develop a centre of expertise in fish habitat and sea lamprey control research. The Commission and Fisheries and Oceans both provide funding to support the research.

While this initiative should help provide a longer-term solution, it does not resolve the problems the Region faces in the next four years.

Need for a long-term, stable commitment to science

6.4.10 Its understanding of the ecosystem is the basis for Fisheries and Oceans' applied research and the advice it provides for decisions to support environmental assessments, for example. The Department has identified gaps in both of these areas. We are especially concerned that the Department has found it difficult to re-establish ecosystem monitoring, which is needed to track trends as the basin changes.

6.4.11 There is also a significant gap in basic scientific information on the amount and quality of fish habitat. Fisheries and Oceans has only isolated pockets of data on the basin. Knowing the location and state of habitat that is critical to healthy fish populations is essential to set the program's direction and measure progress toward goals and objectives.

Did you know?

- Percentage of Great Lakes science funding in Fisheries and Oceans cut since 1993: **30**
- Estimated annual costs to fill identified gaps in scientific information on the Great Lakes: **$3.5 million to $13.3 million**
  estimated annual costs for St. Lawrence River: **$1.5 million to $1.9 million**
- Number of Fisheries and Oceans research staff in Quebec with expertise in fresh water: **0**
  number needed to do the required work: **14**
- Of environmental scientists doing research in Central and Arctic Region (including Great Lakes), percentage expected to retire in the next four years: **54**

6.4.12 In some cases the Department is not conducting research or gathering basic scientific information for ongoing support to its programs—for example, baseline data on nutrient levels and productivity in the open water. (See the case study, The importance of maintaining up-to-date information on the environmental impacts of pesticide use for sea lamprey control.)

6.4.13 The Department's research programs require a sustained investment to maintain scientific expertise, specialized equipment, and program funding. Over the past 20 years, for example, its Great Lakes Contaminants Surveillance Program has helped to track trends and identify emerging problems of toxic chemicals (Exhibit 6.6). The information it provides is the basis for further studies by federal departments, such as Health Canada. However, the program is without long-term funding.

A shared basin needs shared information

6.4.14 Scientific information for environmental protection is a commodity for common use. Research by one organization can be useful to others. Fisheries and Oceans and the provincial ministries need access to each other's research results to help determine their own course of action. Fisheries and Oceans routinely conducts scientific research in partnership with other organizations—including the Great Lakes Fishery Commission, the provinces, Environment Canada, and universities. Sharing research enhances the Department's understanding of the ecosystem, stretches its limited resources, and develops environmental and fisheries science expertise in the basin.

6.4.15 However, Fisheries and Oceans has not yet developed a strategy that would guide it in determining what research it needs to do itself, what it should do in partnership with others, and what it can obtain from other organizations. It has committed to developing a science partnering strategy and guidelines by 2002.

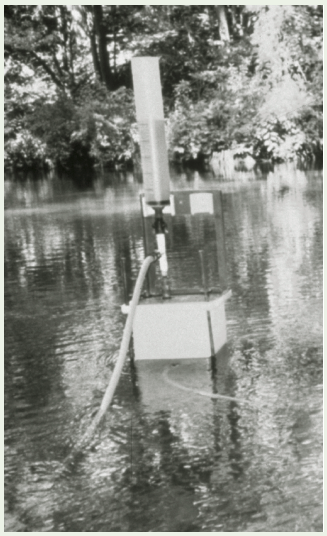
Fisheries and Oceans' role for science

6.4.16 In determining the research it will undertake, Fisheries and Oceans has not considered what information is needed for the management of the basin as a whole and how it can contribute to that information most effectively. It is presently developing an agreement to clarify its own responsibilities and those of Ontario for science and sharing of information under the Canada–Ontario Fisheries Agreement. The two governments recently signed a sub-agreement on information sharing and are developing another on science co-ordination. However, the Department has not clarified respective roles and responsibilities for science with Quebec, nor is it actively working to do so.

The importance of maintaining up-to-date information on the environmental impacts of pesticide use for sea lamprey control

Controlling sea lamprey in the Great Lakes with 3-trifluoromethyl-4-nitrophenol (TFM) has the clear economic benefit of providing increased numbers of healthy fish. But the environmental cost needs to be re-evaluated regularly.

Since 1958, TFM has been used in the tributaries of the Great Lakes on a rotational basis. The Sea Lamprey Control Program is the responsibility of the Great Lakes Fishery Commission, but it is delivered by Fisheries and Oceans in Canada and the Fish and Wildlife Service in the United States.



Applying the TFM pesticide.

Applying the chemical

Fisheries and Oceans, acting as an agent for the Commission, selects and ranks streams for treatment from a basin-wide list. The decision to apply TFM is based on a balance between the potential number of lamprey and the funds available for control. The Department develops a control plan for each stream, which is then treated by staff who are licensed to use pesticides. When applied in the right concentration, TFM is lethal to lamprey larvae but not to most other species. Some invertebrates are particularly sensitive to TFM and their populations could be reduced in the area of treatment, but research indicates that these populations recover.

Effects on fish

TFM became a concern in 1992, when Fisheries and Oceans staff identified previously undetected metabolic effects in fish at sites that had been treated. The Commission responded quickly, helping to fund research by Fisheries and Oceans. The research found that the TFM batches contained trace amounts of dioxin. Though it was not the most toxic form, fish are known to be sensitive to dioxins, especially in their developmental stages. The source of the dioxin was traced to a by-product of the chemical's production, and concentrations varied widely from one batch to another. The research led to a change in the manufacturing process, and the Commission now requires manufacturers to produce TFM without dioxins.

The need for ongoing research

The Commission has undertaken considerable research in recent years to re-register sea lamprey control chemicals (including TFM) with the U.S. Environmental Protection Agency. The Agency concluded the chemicals do not cause adverse effects on the environment or human health and are safe for re-registration. Health Canada is beginning a similar re-evaluation process.

While effects of TFM are thought to disappear in three to five days, further research is needed to determine whether the brief exposure every three to four years is enough to cause endocrine disruption or reproductive impairment in resident fish species. The Commission shares this concern and is waiting for further guidance from the Canadian and U.S. governments (such as study protocols to investigate pesticides for endocrine disruption) before proceeding with the research.

Dead sea lamprey.
Source: Great Lakes Fishery Commission

6.4.17 Fisheries and Oceans is not acting effectively in its role as the lead federal department for aquatic ecosystems. It does not gather and assess information systematically to determine whether fish and fish habitat in the basin are being conserved and protected—a responsibility that it shares with other departments and governments. It has not clarified with Environment Canada their respective responsibilities for research to support the *Fisheries Act* provisions for pollution prevention.

6.4.18 **The right information is not always available to front-line staff.** Fisheries and Oceans does not always put its scientific research to effective use. A departmental study found that habitat management staff lack information and decision-making models to apply the results of scientific research. Fisheries and Oceans staff need science to support their program decisions, especially where their decisions could be questioned in court. The Department is currently working to improve the way it translates and communicates scientific information to front-line staff.

Conclusion

6.4.19 Fisheries and Oceans has focussed on its own policies, programs, and international agreements to identify the gaps in its science information and set its own priorities. It has begun to improve its research on freshwater habitat, focussing on the Great Lakes. However, its research activity in the St. Lawrence River basin is still insufficient. Throughout the Great Lakes and St. Lawrence River basin, there are still significant gaps in the information available to the Department to understand the state of the basin's ecosystem and guide its future course of action.

Exhibit 6.6 The Great Lakes Contaminants Surveillance Program

This Fisheries and Oceans program maintains an archive of over 15,000 samples of tissues from fish and invertebrates.

The program uses the vessel *Shark* to collect samples.

The work requires expertise in analytical chemistry, biology, and data management, provided by professionals with years of experience.

It uses specialized equipment, including a high resolution mass spectrometer, to analyze the samples.

Source: Fisheries and Oceans

6.4.20 While the Department has begun efforts to fill the more significant gaps in its research, it has done so without first clarifying its core science needs and responsibilities.The Department cannot set a course on its own for its future science activities. It recognizes that it must collaborate and plan with its partners to ensure that together they obtain the scientific information they need to manage the basin's ecosystem. Progress is slow, and is evident only in Ontario.

6.4.21 To fulfil its stated mandate to conserve and protect fish and to support its expanded Fish Habitat Management Program, the Department needs to know whether fish populations are being managed for sustainability and whether fish habitat is being protected or destroyed; in many cases, it does not have that information. Fisheries and Oceans does not have a structured approach to determine what scientific information will be most important in the future—from applied research to monitoring—and how it can best obtain it. To incorporate scientific information better in decision making, the Department needs to regularly evaluate the effectiveness of its scientific research in the Great Lakes.

Our audit objectives and main findings

Holding the federal government to account		
❶ Has the government fulfilled its commitments?	**Commitments**	**Results**
	Develop and use scientific knowledge. Share information and results with others through the Great Lakes Fishery Commission, International Joint Commission, and Canada–Ontario Fisheries Agreement.	Fisheries and Oceans lacks significant information to understand the state of the ecosystem and guide its research programs in the basin. It is working to fill some gaps, but a lack of clarity about its role in freshwater science is hindering progress. It is now in the process of determining its roles.
	Conduct scientific research to provide the information and technology necessary for the conservation, restoration and development of fish habitats.	The Department does ongoing habitat science work in the basin but not enough to support the 1986 Policy for the Management of Fish Habitat. While it recently stepped up its research activities in Ontario, the Department has not begun to resolve the limitations of its freshwater habitat science in Quebec.
	Build core capacity for science to support ecosystem management in 2000–01.	The Department is conducting a national science gap analysis to identify science needs and rebuild its core science capacity.

Our audit objectives and main findings

Assessing the government's performance		
❷ **Has the government applied good management practices?**	**Strengths**	**Weaknesses**
	Fisheries and Oceans is developing plans and priorities for freshwater environmental science to guide some of its current activities. Fisheries and Oceans is developing better decision-making models and improving the flow of information from habitat scientists to habitat managers. The Department has signed a formal data sharing agreement with Ontario.	Fisheries and Oceans does not yet have plans and priorities for its responsibilities in fresh water, especially where they overlap with those of other partners. It does not have a formal agreement with Quebec to share information.
❸ **Has the government established good governance structures?**	Fisheries and Oceans is developing an agreement on science co-operation with Ontario and a national freshwater fisheries strategy with all the provinces (except Quebec).	Fisheries and Oceans does not have up-to-date agreements that clarify who is responsible for which research area when jurisdictions overlap.

6.5 Defining the Federal Role in the Basin's Freshwater Fisheries

The issue

6.5.1 Residents and visitors in the Great Lakes and St. Lawrence River basin want to be able to catch fish and eat the fish they catch. To flourish, fish need clean water, suitable habitat, and a plentiful, uncontaminated source of food. Everything that affects them—the complete aquatic ecosystem—must be managed to sustain them.

6.5.2 Are there fish in the basin to catch? Most of the desirable species declined during the last century. The main causes include destruction of habitat; overfishing; pollution from sewage, farming, toxic chemicals, and other sources; acid rain; weather variations; and the impact of invasive aquatic species such as the parasitic sea lamprey.

6.5.3 Can people eat the fish? The International Joint Commission and the Province of Ontario have warned that for children and women of child-bearing age, eating certain Great Lakes sport fish can lead to serious health problems or birth anomalies. Quebec has also issued consumption advisories.

6.5.4 Over the past 100 years, Ontario and Quebec have gradually assumed the day-to-day management of freshwater fisheries in the basin. However, the federal government retains the overall legislative responsibility for the conservation of the fisheries resource throughout Canada. Recent events have underlined the confusion over the federal government's role in the basin's fisheries and whether it is achieving its objectives.

The federal role

6.5.5 Under Canada's Constitution, Parliament has exclusive lawmaking power over the seacoast fisheries and the conservation and protection of inland fisheries. In the basin, as in other freshwater ecosystems, the main objective of the *Fisheries Act* is to conserve and protect fish for sustainable use.

A commercial fishing boat on the Great Lakes.

Source: Bruce Litteljohn

6.5.6 The provinces have legislative jurisdiction over property within their borders, except property owned by the federal government. This means they can determine whom they will license to catch fish in their lakes and rivers, what they will charge for a licence, and how many fish each licence holder can catch. Their programs include raising and stocking desirable fish species (primarily for recreational fishing) and conducting scientific research. Over time, provincial programs expanded to include most fishing activities, for some of which the federal government has legislative responsibility.

6.5.7 Canada and the United States signed the Convention on Great Lakes Fisheries in 1954, creating the Great Lakes Fishery Commission. The Commission's main fisheries management activities include conducting and co-ordinating research and reporting the results. It also makes recommendations to sustain and enhance the productivity of any Great Lakes fish stock of common concern to its members. State, provincial, and certain tribal fisheries agencies are part of the Commission's lake committees and make decisions on fisheries management, including stocking and harvest

levels. Federal government representatives are not members of lake committees but have observer status. They participate on the Commission's boards and committees that apply to all lakes (Exhibit 6.7). Decisions of the Commission and its committees do not have the force of law. There is no penalty for non-compliance.

Our audit question

6.5.8 Is the federal government fulfilling its responsibilities to protect and conserve fish in the basin?

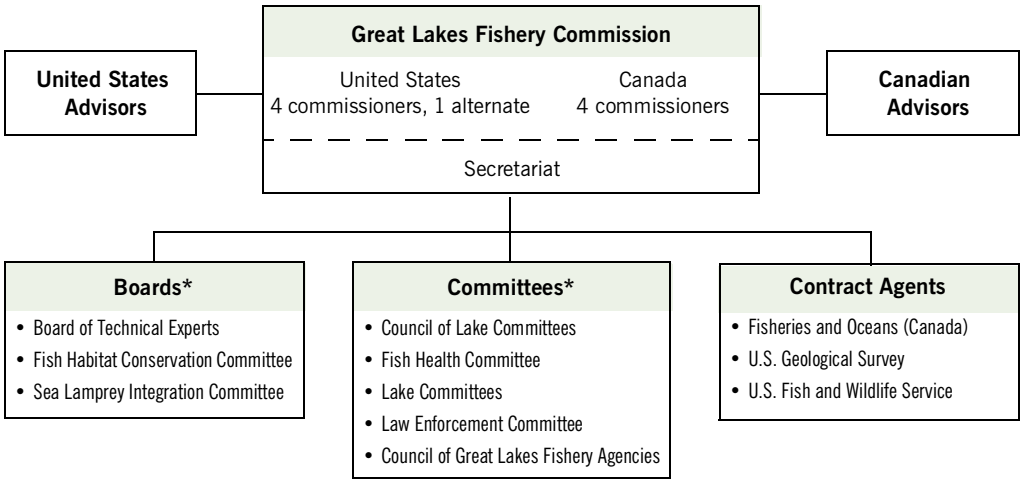
The story

Federal role is unclear

6.5.9 Decisions made by the provinces in managing the freshwater fisheries have a direct impact on the conservation and protection of fish—federal objectives under the *Fisheries Act*. It is not at all clear where the line is drawn between federal and provincial responsibilities.

6.5.10 In 1867 the federal government managed all aspects of fisheries in Canada. However, court decisions in the late 1800s recognized that provinces had jurisdiction over aspects of freshwater fisheries that principally involved property rights. As a result of these decisions, the federal government entrusted the management of freshwater fisheries to Quebec, Ontario, and other inland provinces, while retaining overall responsibility for the conservation of the resource. Where legislation conflicts, the federal legislation prevails.

Exhibit 6.7 Structure of the Great Lakes Fishery Commission



*Appointed by the Commission

Source: Great Lakes Fishery Commission

6.5.11 On paper, the federal conservation role includes controlling fishing seasons, establishing total allowable catches, and restricting the size of fish taken. However, Ontario and Quebec have been administering these responsibilities for some time, using the federal *Fisheries Act*. The provinces propose regulations that are reviewed and approved by the federal government.

6.5.12 Good management practices dictate that while the provinces deliver these activities, they have an accountability relationship with the federal government whose responsibility it is to see that the requirements of its mandate are met. This accountability relationship was understood and applied by the federal government in 1899, when it transferred fisheries management responsibilities to Ontario. Federal inspectors ensured that the Province's fisheries management activities achieved federal objectives. Sometime during the last century, however, this concept of accountability was lost.

The situation in recent years

6.5.13 In 1991 we audited the Central and Arctic Region of Fisheries and Oceans, which includes the Great Lakes portion of the basin. We found confusion over the respective roles of the federal and provincial governments in managing freshwater habitat and fisheries.

6.5.14 In addition to its traditional role of managing its freshwater fisheries, from 1989 to 1997 Ontario administered most of the federal habitat protection activities under an agreement with Fisheries and Oceans. Then the Department sought to formally transfer its responsibilities for the freshwater fishery (primarily fish habitat management) to the Province, but they could not reach an agreement. The federal government then resumed administering its fish habitat protection activities.

6.5.15 Negotiations for a renewed Canada–Ontario Fisheries Agreement are proceeding slowly. The current agreement remains in force until a replacement takes effect. Both governments have tried to minimize enforcement duplication and co-ordinate their collection of scientific information by negotiating sub-agreements. However, the current agreement does not clearly define how the division of roles and responsibilities helps to meet the federal objective, conservation and protection for sustainable use.

6.5.16 In Quebec there has been almost no change in recent years. The federal government has no formal agreement with the Province for managing freshwater fisheries. Until recently, its presence in Quebec's freshwater fisheries was very limited; now it has a small program for fish habitat protection. The Province does not recognize federal jurisdiction over fisheries in fresh water, and the federal government has not pursued reopening discussions toward a formal agreement.

Federal information on basin fisheries is limited

6.5.17 Provinces make the management decisions for their freshwater fisheries in the basin using information gathered in their scientific research.

Although provincial programs were cut significantly in the mid-1990s—in some cases, as much as 40 percent—Fisheries and Oceans does not look regularly at the results of provincial and other programs in the basin or assess how those programs affect the aquatic ecosystem. However, the Department has access to information generated by the lake committees and by the State of the Lakes Ecosystem Conferences.

Did you know?

- Value of the basin's commercial freshwater fisheries in Ontario: **$40 million**
value in Quebec: **$6 million**
- Number of fish caught for recreation in Ontario waters of the Great Lakes: **33 million**
number kept: **14 million**
- Number of fish caught for recreation in Quebec province-wide: **60 million**
number kept: **43 million**
- Number of fish species in the basin: **179**
- Number of fish species no longer in the basin: **13**
- Level of Fisheries and Oceans' understanding of the basin's aquatic ecosystem and where it is heading: **very limited**

6.5.18 In certain locations, such as inland Quebec and lakes Superior and Huron, the Department's information on fish and fish habitat is so limited that its officials feel they cannot comment on ideas put forward by their provincial counterparts and other stakeholders. Furthermore, even if the provinces have information, there are no formal arrangements for transferring knowledge between the federal government and Quebec, and a data-sharing agreement has only recently been signed with Ontario.

Federal role in fresh water is increasing

6.5.19 The role of Fisheries and Oceans has evolved over the past decade. The Department is now expected to apply and enforce federal legislation in the basin in addition to the *Fisheries Act*. The public also expects more accountability and transparency from the government, and its expectations are likely to increase. Some of the changes that require an increased federal presence include the following:

- Resources are required to ensure under the *Canadian Environmental Assessment Act* that environmental effects of projects with a federal component or federal authorization are minimized.
- More than 100 new Fisheries and Oceans staff are beginning to deliver the expanded Fish Habitat Management Program in the basin.
- Invasive aquatic species are a significant threat to the ecosystem and require more research and monitoring. Measures to control the spread of certain species may also be needed.
- The proposed species at risk legislation, if enacted as currently drafted, will impose additional requirements on the Department. They include taking inventory of native aquatic species and identifying those at risk, preparing and implementing recovery strategies, and monitoring and reporting the results. Initial analysis by the Department indicates that the legislation would create a significant amount of new work.
- Recent court decisions have expanded Aboriginal participation in fisheries on the east and west coasts. These decisions could affect the federal role in the basin's fisheries, but it is not clear yet in what ways.

6.5.20 Each of these changes draws the Department further into freshwater fisheries. It is time for it to consider their cumulative impact on the federal role in the basin's fisheries and to plan for the future.

The Department is not managing for the future

6.5.21 Fisheries and Oceans does not have a clear vision of the aquatic ecosystem it wants to see eventually in the basin. While lake trout have recovered to a limited extent in some lakes, most species that were plentiful

in the past have not recovered to historic levels. Many fish still contain too many contaminants for people to eat them safely. The Department's programs—from protecting and enhancing fish habitat to controlling sea lamprey—have a positive effect on the basin. But is it putting its efforts in the right places? How does it know it is moving in the right direction? There is no vision for the basin that guides the Department in setting priorities, planning programs, and carrying them out.

6.5.22 Others do have a vision for the basin. The Great Lakes Fishery Commission developed its Strategic Vision of the Great Lakes Fishery Commission for the Decade of the 1990s, and A Joint Strategic Plan for the Management of the Great Lakes Fisheries. The Plan is a strategy for co-operation and consensus among federal, provincial, state, and tribal fisheries agencies. Together, the Vision and the Plan contain a number of broad goals for the fishery and ways for these fisheries agencies to work together toward common objectives. Lake committees have established fish population targets for each Great Lake. Ontario has a strategic plan for Ontario Fisheries, which also sets broad goals and objectives. Quebec produces a plan for each of its fisheries. All of these visions and plans provide a good reference point, but Fisheries and Oceans has no vision of its own to guide its sharing in the management of the basin and to set its own priorities.

The need for a freshwater fisheries strategy

6.5.23 At the root of the confusion over the federal role in the basin's fisheries is the fact that accountability relationships have not been stated clearly to reflect each party's role and responsibilities. Without clarity of roles, threats to the aquatic ecosystem such as climate change or invasive species could go undetected or unchecked. Provincial decisions on who may catch how many fish have a direct impact on the conservation of the resource. However, Canada and the provinces have not agreed on terms such as "conservation" and on how to apply them. The absence of a federal strategy makes it difficult to negotiate clear, comprehensive agreements between the federal and provincial governments.

6.5.24 In 1999, Fisheries and Oceans released a paper to encourage discussions with the provinces that would lead to a national strategy for freshwater fisheries. The Canadian Council of Fisheries and Aquaculture Ministers, which includes federal, provincial, and territorial ministers, has formed a task group to prepare a national strategy. (Quebec chose not to participate in the task group.) One of the group's objectives is to clarify federal, provincial, and territorial responsibilities for the management of freshwater fisheries. Another is to define the principles of freshwater fisheries management, including conservation. The current plan is to achieve a consensus among the ministers represented in the task group by September 2001.

6.5.25 Fisheries and Oceans has made clear its preference for delegation arrangements with provinces and territories, as outlined in its 1999 discussion paper. But its approach has two significant deficiencies. First, it does not

reflect the recent changes that are drawing it further into freshwater fisheries. Second, and more important, with no provision for accountability it repeats the flaw in previous delegation arrangements. Once again, though Fisheries and Oceans has the legislative responsibility to conserve freshwater fisheries for future generations, under the new arrangements it will have no means of determining whether it is doing so.

An example of the challenges ahead

6.5.26 Fisheries and Oceans faces challenges in ensuring that its future role makes the most effective contribution to the shared management of the basin while achieving its own objectives. One such challenge is to determine how it can best contribute to the Great Lakes Fishery Commission and its committees.

6.5.27 The Department currently participates as a full member of the Commission's committees that apply to all the Great Lakes. However, it participates only as an observer on the other committees. It has not examined whether it is contributing in the most effective way. Now, as it defines its future role, is an opportune time to consider and make appropriate changes.

6.5.28 Another challenge facing Fisheries and Oceans is to determine whether it should intervene in the management of a fishery to conserve and protect fish (see case study, Should Fisheries and Oceans intervene to protect the American eel in the basin?).

Should Fisheries and Oceans intervene to protect the American eel in the basin?

American eel populations in Lake Ontario have declined sharply in the last few years, from an estimated annual migration upstream of over 600,000 eel in the 1980s to fewer than 3,000 in 2000. American eel spawn in the Sargasso Sea of the Atlantic Ocean, and the immature elver migrates up the North American coast. Some travel up the St. Lawrence River to Lake Ontario, where they live for a number of years before returning to the Sargasso Sea to complete their life cycle. Many adult eels are killed by the turbines of a hydroelectric dam on the St. Lawrence as they return to the sea. Overfishing has been cited as a chief cause of their decline, but there are not enough scientific data to confirm this.

This eel is caught commercially at different stages of its life along the coasts of the U.S., the Atlantic provinces, Quebec, and the Canadian waters of the St. Lawrence River and Lake Ontario. Despite the dramatic decline in population, little action has been taken to safeguard the eel. Fisheries and Oceans has integrated fisheries management plans for this species in the Atlantic provinces and the Quebec coastal fishery (where the Department manages the fishery). But commercial fishers say that fishers in other jurisdictions harvest elvers or eels along the migratory path. No jurisdiction wants to lose its share to another, but the species could be suffering irreparable harm. The total quota set by Ontario in 2000 was 467,000 but only 64,000 eel were caught. Ontario and its commercial fishers agreed to reduce this year's quota 50 percent in Lake Ontario and in the Ontario portion of the St. Lawrence River, but it is not clear that this will ensure a sustainable population.

While the situation is difficult to resolve, Fisheries and Oceans has taken no action in the Great Lakes and has no plans to do so. This is in direct contradiction to its stated objective of conserving the fishery resource for its sustainable use. In developing a national strategy for freshwater fisheries, the Department needs to keep in mind the complex situations that can develop and ensure that the national strategy contains accountability measures and suitable criteria for determining when it should intervene.

Improving reporting to Parliament

6.5.29 Fisheries and Oceans does not report routinely to Parliament on its objectives for freshwater fisheries (including the basin) or the results it achieves. It does not collect data or report on the state of fisheries in the basin. Parliament is therefore unable to assess whether the Department is meeting its obligation to conserve and protect the fisheries. Without this information, Parliament cannot determine whether the resources it provides to the Department are appropriate.

6.5.30 The Department does not collect and report information gathered by other participants in the fisheries, and it is not gathering enough of its own to assess the health of the fisheries in the basin.

Conclusion

6.5.31 Fisheries and Oceans lacks sufficient information to know whether it is meeting its legislative objective of conserving and protecting fish in the basin for their sustainable use.

6.5.32 There are signs of progress in some areas. The Department is strengthening its role in the protection of fish habitat. Its presence in the basin is likely to increase in the coming years, if initiatives like the proposed species-at-risk legislation go forward.

6.5.33 Work is under way with the provinces to develop a national strategy for freshwater fisheries. But accountability relationships are still unclear, and so is the federal role. Further, the Department has no formal vision of the aquatic ecosystem it wants to promote in the basin and no criteria for deciding when it should intervene to protect fish. Nor has it kept Parliament informed of its plans and the results of its efforts.

Our audit objectives and main findings

Holding the federal government to account		
1 Has the government fulfilled its commitments?	**Commitments**	**Results**
	Conserve and protect fish for their sustainable use.	Fisheries and Oceans cannot be sure that its legislative mandate to conserve and protect fish in the basin is being met. It lacks sufficient information on the state of the basin.
	Co-operative management between Canada and the U.S. to achieve maximum sustainable use of common fisheries.	Fisheries and Oceans is in the process of implementing a freshwater habitat management program in the basin, but it does limited freshwater research and provides limited input to the Great Lakes Fishery Commission.

Our audit objectives and main findings

Assessing the government's performance		
❷ **Has the government applied good management practices?**	**Strengths**	**Weaknesses**
	Fisheries and Oceans helped create the Great Lakes Fishery Commission to foster consensus among the fisheries agencies in the basin. The Commission and agencies have developed a high-level strategic plan and vision to make consensus-based decisions for the Great Lakes fisheries. The federal government's representatives have input on committees that apply to all lakes.	Fisheries and Oceans lacks sufficient information for federal decision-making and does not always obtain it from other organizations. The Department does not yet have a federal freshwater fisheries strategy. It does not have a federal vision of the aquatic ecosystem it hopes to promote for the basin. It does not have criteria for determining when it would intervene to conserve or protect a species.
❸ **Has the government established good governance structures?**		Fisheries and Oceans does not have clear accountability relationships with provincial governments. The Canada–Ontario Fisheries Agreement of 1988 does not provide a clear accountability relationship. The Department does not have a formal agreement with Quebec. The Department has not clearly defined its roles and responsibilities. It does not report to Parliament on objectives, activities undertaken, and results achieved in fresh water or in the basin.