Ministry of Natural Resources

Fish and Wildlife Program

Background

The Ministry of Natural Resources (Ministry) seeks to bring about a healthy environment—one that is naturally diverse and supports a high quality of life—through the sustainable development of Ontario's natural resources. The Ministry aims to accomplish this with commitments to biodiversity and to the protection and sustainable use of natural resources such that nature can renew itself and be available for the use and enjoyment of future generations.

The Ministry estimates that 5.5 million Ontarians take part each year in recreational fishing, hunting, and wildlife viewing and that these activities are worth nearly $11 billion a year to the provincial economy and account for more than 77,000 jobs. Ontario's commercial fishery, the largest freshwater fishery in the world, has a processed annual value of more than $200 million.

The Fish and Wildlife Branch (Branch), through its head office in Peterborough, provides leadership and direction to three regional offices and 25 district offices that deliver Fish and Wildlife Program (Program) services in the field. The district offices are responsible for species management, maintenance of fishing and hunting opportunities, public information, and customer service. The Branch also oversees specialized functions, such as scientific research, the operation of fish hatcheries, and legislative enforcement, which are delivered by other divisions and branches within the Ministry.

Since April 1, 1996, all licence fees, royalties, fines, and other revenues collected under the *Fish and Wildlife Conservation Act* have been retained in a Fish and Wildlife Special Purpose Account and dedicated to Program expenditures. Total funding for the Program in the 2006/07 fiscal year was $74.2 million, comprising $59.5 million from the Special Purpose Account and $14.7 million from the Ontario government.

Audit Objective and Scope

The objective of our audit of the Fish and Wildlife Program (Program) was to assess whether the Ministry of Natural Resources (Ministry) had adequate procedures in place to:

- measure and report on the effectiveness of the Program in fulfilling its mandate to manage fish and wildlife resources for sustainability; and
- ensure compliance with related legislation and ministry policy.

The scope of our audit included discussions with relevant staff as well as a review and analysis

of documentation provided to us by the Ministry's head office and a sample of regional and district offices. We also reviewed practices and experiences in other jurisdictions with respect to the sustainability of fish and wildlife resources and the management of biodiversity. The Ministry's internal audit branch had not performed any audits on fish and wildlife activities in the last five years. Accordingly, its work did not have an impact on the scope of our audit.

Our audit was performed in accordance with the standards for assurance engagements, encompassing value for money and compliance, established by the Canadian Institute of Chartered Accountants, and accordingly included such tests and other procedures as we considered necessary in the circumstances. The criteria used to conclude on our audit objectives were discussed with and agreed to by ministry management and related to systems, policies, and procedures that the Ministry should have in place.

Summary

Although the Ministry had gathered data and carried out assessments on fish and wildlife resources, this information was not sufficient or current enough to be utilized to ensure that the Ministry was effectively conserving biodiversity and managing resources for sustainability. In addition, while the Ministry had taken steps to address some of the issues surrounding biodiversity and sustainability with the issuance of Ontario's Biodiversity Strategy in 2005 and the enactment of the *Endangered Species Act, 2007*, we noted a number of examples involving plant, fish, or wildlife species where sustainability is of increasing concern.

A number of our observations suggest that the reason, at least in part, for the Ministry's difficulty in meeting its goal of managing resources for sustainability is reductions in available financial resources. Although program funding has been relatively stable for the past 20 years, the $67.4 million spent on fish and wildlife in the 1987/88 fiscal year is equivalent to more than $100 million in today's dollars, as compared to the $74.2 million actually spent in 2006/07. Additional investments may well be needed to address several of our concerns.

With respect to *biodiversity*, we found the following:

- One of the major threats to biodiversity is habitat loss and fragmentation. Although the Ministry has issued guidelines and frameworks to protect fish and wildlife habitats, it has no comprehensive inventory of all critical habitats key to the recovery or sustainability of fish and wildlife resources. Identifying these critical habitats would help the Ministry develop strategies to protect them from further degradation.
- We recommended in our 2002 audit of the Ontario Parks Program (then responsible for species at risk) that the Ministry develop an overall strategy to provide for the conservation, protection, restoration, and propagation of species at risk. We noted in the current audit that such a strategy has been drafted but has not yet been approved or implemented. The Ministry also has 120 recovery strategies in various stages of development for endangered and threatened species. However, just 22 of these have been released by the Ministry for public comment. In addition, only two of the approved recovery strategies related to the 42 regulated endangered species—those deemed most at risk. For example, the golden eagle has declined to an estimated six nesting pairs in Ontario, yet no recovery strategy is in place. We also noted that the status of six species designated as "threatened" or "vulnerable" during our 2002 audit has since declined further, to "endangered."

- While the Ministry took some action to monitor and control the further spread of identified invasive species, it generally had not conducted or obtained the scientific research needed to determine the long-term impacts and the long-term action necessary to contain or eradicate these species. In addition, more proactive upfront research is needed to identify potential invasive species before they severely affect native species or cause restoration costs to escalate.

With respect to *wildlife management*, we found the following:

- The Ministry did not have complete and current data on moose populations. Of the 68 geographic areas being managed that calculate moose harvest quotas and allocate hunting tags, 41 (representing 60%) reported a huntable population greater than the total estimated population for the area. Consequently, more hunting tags were issued than the harvest guidelines recommended.
- The Ministry had no management plan for dealing with the overabundant deer population. While an abundant deer herd provides increased hunting opportunities, an overabundant deer population can adversely affect biodiversity, species at risk, forest regeneration, sensitive ecological areas, and the habitats of other wildlife species, and can increase the risk of exposure to transmittable diseases and parasites.
- Harvests of black bears in some areas may be occurring at unsustainable levels. Of the 76 bear management areas for which data were available, at least 10 reported harvest levels in excess of guidelines for 15 of the 18 years between 1987 and 2004.
- The forest-dwelling woodland caribou is a threatened species in Ontario. While the Ministry has developed a draft recovery strategy for this species, it has been slow to finalize and implement it. Biologists have warned that the recovery strategy needs to be implemented on a more timely basis to maintain the woodland caribou population and its habitat.

With respect to *fisheries management*, we found the following:

- While the Ministry's management of commercial fisheries has been largely successful in promoting the sustainability of commercial fish stocks, there was a need for better monitoring and enforcement. There were a number of examples occurring in some fish-management zones on Lake Superior and Lake Huron, where commercial and aboriginal operators consistently exceeded their catch quotas. In addition, the Ministry had no policy for managing "bycatch," the unintended catch of fish other than the target species; nor did it have procedures to estimate the quantity or species of the bycatch. Without this information, it is difficult to determine the harvest limit needed by species to sustain the commercial and recreational fishing for each species.
- The Ministry did not carry out enough evaluations to assess the success of its fish-stocking program, intended to rehabilitate fish stocks and provide enhanced recreational angling opportunities. In addition to the 8.5 million fish the Ministry stocks in lakes and rivers each year, community groups stock 6 million fish annually. The Ministry tests the fish that it stocks for disease, but there was no program for testing fish stocked by community groups. Without any such testing, there is a risk of introducing infectious diseases that could threaten the health and sustainability of the indigenous fish population.

With respect to *enforcement*, we found the following:

- For the 2006/07 fiscal year, the enforcement units we reviewed prepared a risk-based plan

outlining enforcement activities necessary to effectively protect natural resources. However, these units reported a reduction from planned levels of between 15% and 60% in the number of patrol hours by conservation officers. These reductions affected such enforcement activities as patrols to stem the illegal harvest of big-game animals, monitoring of sport fishing in sensitive fisheries, and aerial patrols of remote tourist areas.

The reduction of deterrent patrols by conservation officers may have put added pressure on the province's fish and wildlife resources. For example, we noted that when one enforcement unit carried out a two-week enforcement blitz in 2006, it seized 57 illegally hunted moose, almost double the 29 moose seized during a similar blitz in 2005.

- Effective deployment of conservation officers helps deter illegal activity and protect resource sustainability. However, the current deployment strategy has left gaps in enforcement coverage that could have a detrimental effect on resources. In one area visited, we noted that there was no full-time lake conservation officer to patrol a lake that was home to 30 licensed commercial fishing operators.

We sent this report to the Ministry and invited it to provide responses. We reproduce its overall response below. As for its responses to individual recommendations, the Ministry provided either a separate response per recommendation or a combined response to two or more recommendations. Those responses follow the appropriate recommendations in Detailed Audit Observations.

OVERALL MINISTRY RESPONSE

The Ministry appreciates the audit of the Fish and Wildlife Program undertaken by the Office of the Auditor General and the series of recommendations made to enhance program delivery. The Ministry will give full consideration to the recommendations when setting business priorities and developing future strategic directions.

The objectives of the Ministry's Fish and Wildlife Program are to manage fish and wildlife resources and associated habitats on a sustainable basis. The Program has been realigned and broadened to be consistent with the Ministry's overall strategic directions, which place greater priority on protecting biodiversity and habitat. Funding will be focused on high-priority areas. In setting priorities, risk-based analysis and a landscape or ecosystem approach to managing resources will be used. A key milestone in this approach has been the development of Ontario's Biodiversity Strategy, which will function as an overarching plan to protect Ontario's natural heritage.

Detailed Audit Observations

BIODIVERSITY

Biodiversity refers to the interconnected variety of life at all levels, including the interactions between species and entire ecosystems. The loss of one species may disrupt the balance of life in the ecosystem, affecting other plants, animals, insects, and even humans. As human activity increases, so too does the number of species and ecosystems at risk. Biodiversity is beneficial to all species because it can help to clean the air, recycle and purify drinking water, provide food and shelter, and moderate the effects of climate. The diversity of natural life also provides economic benefits to Ontario through forestry, hunting, fishing, and other recreational activities. The major threats to biodiversity and its life-supporting ecosystems are habitat loss and fragmentation, invasive species, pollution, and unsustainable use.

Ontario's Biodiversity Strategy

Over the past 25 years, countries around the world have recognized the need to create a better balance between the effect of human activity on ecosystems and the capacity of the Earth to absorb these human impacts. In 1980, the *World Conservation Strategy* issued by the World Commission on Environment and Development laid the groundwork for biodiversity strategies. By 1992, the United Nations issued its Convention on Biological Diversity, which led to an international agreement that commits nations to achieve a significant reduction in the current rate of biodiversity loss by 2010. In 1995, the federal, provincial, and territorial governments agreed to the *Canadian Biodiversity Strategy*.

In 2005, the Ministry issued *Protecting What Sustains Us: Ontario's Biodiversity Strategy*, outlining the threats to biodiversity, and *Our Sustainable Future*, which outlines the Ministry's strategic directions to meet those threats. This strategy also had two goals: protect the genetic, species, and ecosystem diversity of Ontario, and reap benefits for Ontarians through the use and development of the province's biological assets in a sustainable manner.

We noted that the Ministry has undertaken a number of activities to help conserve biodiversity in the province, including:

- enactment of the *Endangered Species Act, 2007*;
- regulation of new protected areas, such as provincial parks and conservation reserves;
- working with local partners to focus their voluntary efforts on conserving and restoring natural areas;
- development of a new ecological framework for managing recreational fisheries; and
- stocking rivers and lakes to restore native fish species.

Sufficient time has passed since the province signed the biodiversity agreement in 1996 for the Ministry to move forward with comprehensive plans to conserve biodiversity. Although, as noted above, a number of activities have been initiated, further progress is required to meet the commitments for 2010 under the *Canadian Biodiversity Strategy*. Progress is required as follows:

- The Ministry had not incorporated its many initiatives into a detailed and comprehensive plan, nor had it laid out the time frames necessary to ensure that it will meet its commitments. While informal work plans are being used, the Ministry has not determined how well these plans are meeting the timelines to achieve the *Canadian Biodiversity Strategy*'s goals.
- The Ministry had not yet completed efforts to define biodiversity outcomes and indicators for measuring progress toward those outcomes. In this regard, we noted that other Canadian jurisdictions, such as Quebec and Saskatchewan, had developed performance measures and indicators to supplement their action plans, including monitoring and reporting systems to determine progress in meeting their commitments under the *Canadian Biodiversity Strategy*.
- During the 2006/07 fiscal year, $4.2 million was reallocated to biodiversity funding. While these are direct operating funds for biodiversity, other Ministry programs carry out work that complements biodiversity goals. We were advised that existing staff doing similar work in other program areas were simply transferred into the biodiversity section with little real increase in resources devoted to biodiversity initiatives. As a result, Ministry staff are struggling to meet the goals and commitments of the *Canadian Biodiversity Strategy*.
- The Ministry has state-of-the-resources reporting documents for some program areas and for some species in local areas. However, there were no comprehensive fish and wildlife state-of-the-resources reports on a province-wide basis. In addition, we

noted a need for increased co-ordination of biodiversity efforts within the Ministry and with external stakeholders to ensure that the appropriate information is collected. This lack of information limits the Ministry's ability to help conserve biodiversity and to track and report its progress in this regard.

RECOMMENDATION 1

To better ensure that Ontario can meet its commitments under the *Canadian Biodiversity Strategy,* which was adopted by the province in 1996, the Ministry of Natural Resources should:

- develop a comprehensive plan for implementing its biodiversity strategy, along with appropriate time frames;
- review the adequacy of resources devoted to biodiversity;
- clearly define biodiversity outcomes and performance indicators to measure progress; and
- prepare a comprehensive report on the overall state of biodiversity in the province.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 1, 2, 3, and 4. We reproduce it following Recommendation 4.

Habitat Protection

Habitat is the area where plants, animals, fish, and other organisms live and find food, water, shelter, and the space needed to sustain their populations. Specific habitats of concern may include areas where species concentrate at a vulnerable point in their life cycle, and those of temporary importance to migratory species. Healthy fish and wildlife habitats enhance ecological balance and preserve biodiversity.

The Ministry has identified loss or degradation of habitat as the single biggest cause of wildlife species extinction in the province. The Ministry determined that this is a particularly serious problem in southern Ontario, where urbanization, agriculture, and road density greatly affect some of the province's rarest species. In Northern Ontario, resource extraction, hydroelectric power development, and associated roads and bridges can affect biodiversity through habitat changes and degradation of local bodies of water.

The Ministry works with a number of community partners, including local stewardship councils it has established, to help protect and restore habitats by involving landowners, private companies, and volunteers to develop environmental priorities for their specific areas. In addition, the Ministry has expanded the Ontario Parks System and protected areas to help prevent habitat loss and fragmentation. While approximately 70% of southern Ontario's original wetlands have been lost, the Ministry and its community partners have managed to preserve some wetlands from further degradation, keeping them viable for the wildlife species that rely on them.

In 2000, the Ministry issued the *Significant Wildlife Habitat Technical Guide* to help identify, evaluate, and rank significant wildlife habitat. In addition, the Ministry's draft Ecological Framework for Recreational Fisheries Management provides direction to staff with respect to the Ministry's responsibility to ensure the health of fish populations and restore degraded habitats that support fish populations and fisheries. Fish are important indicators of environmental change; when the health of aquatic ecosystems declines, fish populations suffer immediately, providing an early warning about environmental degradation leading to biodiversity loss. We noted that while community partners have identified some habitats as critical, the Ministry does not have a comprehensive inventory of these habitats critical to the sustainability

or recovery of fish and wildlife resources. By identifying critical fish and wildlife habitats, the Ministry would be better able to categorize ecosystems, prioritize areas of concern, and develop management plans to protect them.

RECOMMENDATION 2

To help protect fish and wildlife habitats from further loss, alteration, and fragmentation and to preserve biodiversity, the Ministry of Natural Resources should identify the key habitats that are critical to the continued sustainability of native species and prepare timelines for the development of management plans to protect those habitats.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 1, 2, 3, and 4. We reproduce it following Recommendation 4.

Species at Risk of Extinction in Ontario

Ontario is home to hundreds of vertebrate species, including more than 80 different mammals, 470 species of birds, 60 reptile and amphibian species, 160 species of fish, and more than 20,000 species of invertebrates such as insects and spiders. There are more than 3,380 species of plants, 1,000 species of fungi and algae, and hundreds of lichens and mosses. Even with this wealth of diversity, however, more species become endangered each year, often as a result of increased human activity. The Ministry provides annual funding of about $2 million for species at risk to support protection programs and co-ordinate recovery and research projects with various stakeholders. At the time of our audit, there were 182 species at risk in the province. Figure 1 defines the Ministry's classifications for species at risk and indicates the number of species in each classification. Figure 2 identifies the classification and status of some of the species at risk.

At the time of our audit, the Ministry was still subject to the requirements of the *Endangered Species Act, 1971* for the conservation, protection, restoration, and propagation of species threatened with extinction in Ontario. In May 2007, the Ontario Legislature enacted the *Endangered Species Act, 2007* (Act) to replace the existing legislation. The new Act will come into force no later than June 30, 2008. Its objectives are to:

- identify species at risk on the basis of the best available scientific information, including information obtained from communities and traditional aboriginal knowledge;
- protect the at-risk species and their habitats; and
- promote activities to assist in the recovery of these species.

The new Act strengthens the Committee on the Status of Species at Risk in Ontario, which is to be made up of persons with relevant scientific

Figure 1: Ministry Classifications for Species at Risk

Source of data: Ministry of Natural Resources

Ministry Classification	Definition	# of Species
extinct	no longer exists anywhere	6
extirpated	no longer exists in Ontario	10
endangered – regulated (protected by legislation)	facing imminent extinction or extirpation	42
endangered – not regulated (no legislative protection)	facing imminent extinction or extirpation	33
threatened	at risk of becoming endangered	46
special concern	vulnerable to human activity or natural events	45
Total		**182**

Figure 2: Classification and Status of Selected Species at Risk

Source of data: Ministry of Natural Resources

Species at Risk	Ministry Classification	Status in Ontario
drooping trillium	endangered, regulated	found at 2 sites
golden eagle	endangered, regulated	only 6 nesting pairs left
Karner blue butterfly	endangered, regulated	zero, thought to be extirpated
northern cricket frog	endangered, regulated	zero, thought to be extirpated
red mulberry tree	endangered, regulated	found at 10 sites
badger	endangered, not regulated	only 200 left
barn owl	endangered, not regulated	zero, thought to be extirpated
butternut tree	endangered, not regulated	one-third killed by disease since 1991
northern bob white	endangered, not regulated	fewer than 1,000 left
Pritcher's thistle	endangered, not regulated	found at 4 sites
massasauga rattler	threatened	only 350 left
wolverine	threatened	population estimated to be only in the hundreds
monarch butterfly	special concern	population in decline
red-headed woodpecker	special concern	population decreased by two-thirds in last 10 years

expertise or aboriginal traditional knowledge. The committee's functions will include the identification, assessment, and classification of species at risk. Despite the new legislation, we continue to have concerns with respect to the Ministry's species-at-risk program.

In our 2002 audit of the Ontario Parks Program, responsible at the time for species at risk, we recommended that the Ministry develop an overall strategy to provide for the conservation, protection, restoration, and propagation of species at risk. Sufficient time has passed for the Ministry to have developed such a strategy, and although a draft Species at Risk Strategy for Ontario has been prepared, it has not been approved or put in place. Ministry staff informed us that, with the passage of the new legislation and the ongoing development of the National Policy Framework for Species at Risk, the final strategy should be in place by the end of the 2007/08 fiscal year.

Ministry policy requires that recovery plans be developed to identify ways to manage and improve the status of a species designated as threatened or endangered by halting or reversing its decline, and by reducing the threats to its survival. As of February 2007, the Ministry had 120 recovery strategies in various stages of development and review for the endangered and threatened categories. Only 22 of these recovery strategies, covering 28 species, were finalized and approved by the Ministry, but even these were awaiting feedback, either in response to public posting on the Environmental Registry or from the national Species-at-Risk Registry. We also noted that recovery strategies had been completed for only two of the 42 regulated endangered species. There is a need to complete these recovery strategies on a more timely basis because some species are already in imminent danger of extirpation (meaning they no longer exist in Ontario) or extinction (meaning they no longer exist anywhere). For example, there are thought to be only six nesting pairs of golden eagles left in Ontario.

Without specific recovery plans in place, it is difficult for the Ministry to effectively manage species at risk to ensure both their continued existence within the province and their future sustainability. Six species that during our 2002 audit had

been designated as "threatened" or "vulnerable," equivalent today to "special concern," have further deteriorated and moved onto the endangered list. These include two types of fish, two species of turtle, a salamander, and a plant. Without effective management and monitoring by the Ministry, these species face further decline—and even the possibility of extinction in Ontario—clear indicators of the decline of biodiversity.

Some conservation efforts and recovery plans have had positive effects on species at risk. For example, the combined efforts of the Ministry, the federal government, and community partners have brought the peregrine falcon back from the brink of extinction in the province. The species has been upgraded from "endangered" to "threatened," offering a good example of what can be accomplished when a proper recovery plan is in place and implemented.

RECOMMENDATION 3

To more proactively manage species at risk and help sustain and increase endangered populations, the Ministry of Natural Resources should:

- finalize and put into place its Species at Risk Strategy for Ontario; and
- prepare and implement a recovery plan with related time frames for necessary actions for each of the species listed in Ontario as endangered or threatened.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 1, 2, 3, and 4. We reproduce it following Recommendation 4.

Invasive Species

There are over 1,000 invasive species in Ontario that have been accidentally or deliberately introduced into habitats outside their normal living range. Some notable examples of invasive species are the sea lamprey, zebra mussel, round goby, rusty crayfish, spiny and fishhook water fleas, purple loosestrife, Asian long-horned beetle, and emerald ash borer. Invasive species originate on other continents, in adjacent countries, or in other ecosystems within Canada, and they often have no natural predators in Ontario. As a result, many reproduce quickly and infest, damage, displace, or destroy native species, ecosystems, agricultural crops, wetlands, lakes, or rivers. Consequently, invasive species can significantly impair biodiversity. The Ministry has determined that, once established, invasive species cannot be easily eradicated. Control measures are usually expensive and may be harmful to the environment.

While experts say prevention is the best response to invasive species, we noted that the Ministry's approach is often reactive, with few specific plans to identify, prevent, control, or eradicate invasive species before they severely damage native species or force restoration costs to rise dramatically. The Ministry has taken action to monitor and control the further spread of identified invasive species. For example, it has worked with community partners and set up public-education campaigns, such as the Invading Species Awareness Program, to help prevent the further spread of invasive fish species to inland lakes. However, the Ministry generally has limited scientific knowledge of the long-term impacts and the action plans necessary to contain or eradicate these species.

Scientists have determined that ballast water from ocean-going ships accounts for 75% of the invasive aquatic species that have entered the Great Lakes since 1970. In this regard, the Ministry has worked with other jurisdictions and agencies, especially the federal government, on prevention initiatives. An attempt was made by the federal government, supported by Ontario, to require all ships entering the St. Lawrence River and ultimately

the Great Lakes to flush out their ballast tanks with salt water at least 200 miles off the shores of Canada. Draft regulations to this effect were prepared by Canada under the *Canada Shipping Act*. However, after public consultation, the final regulations enacted in June 2006 did not make this procedure mandatory. As a result, ocean-going ships that flush their ballast waters inland continue to pose a significant threat to the Great Lakes basin. For example, scientists reported in January 2007 that a new invasive species in Lake Ontario called the bloody red mysid was believed to have arrived in the ballast tanks of ocean-going ships. This species is in the shrimp family, and specialists say it has the potential to severely affect the lake's food chain. The introduction and spread of invasive species in this manner continue to affect the biodiversity of the Great Lakes basin.

RECOMMENDATION 4

To help protect Ontario's native fish and wildlife populations, habitats, and overall biodiversity, the Ministry of Natural Resources should:

- address knowledge gaps regarding the long-term effects of existing invasive species on biodiversity;
- develop action plans that set priorities for the prevention, monitoring, and eradication of invasive species based on assessments of the risks posed by invasive species;
- evaluate and report on the effectiveness of measures taken through these action plans; and
- continue to work with the federal government to enact more stringent regulations with respect to flushing ballast tanks of ocean-going vessels before they enter Canadian waters to prevent the introduction of destructive invasive species.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 1, 2, 3, and 4, as follows.

The Ministry acknowledges the significance of an integrated implementation plan for Ontario's Biodiversity Strategy that includes high-level outcomes and performance indicators and will ensure its timely completion. Along with an interim report in 2007, Ontario will prepare its first formal *State of Biodiversity Report* in 2010, which will be prepared every five years thereafter. This report will include biodiversity reporting standards and benchmarks, as well as an outline of biodiversity challenges, risks, threats, and opportunities.

Currently, the Ministry tracks the location, condition, and distribution of all species potentially at risk and seeks to assign conservation status rankings to those species. The Ministry will review processes to inventory and assess the natural-heritage features that support a wide range of species and the key ecological-community habitats that will be necessary to protect against habitat loss.

The Ministry's draft Species at Risk Strategy for Ontario has now been incorporated into Ontario's Biodiversity Strategy and the new *Endangered Species Act, 2007*. The new Act will require the development of recovery strategies for all future and currently listed endangered and threatened species within specific time frames.

The Ministry will endeavour to develop more effective measures to help prevent, monitor, and eradicate invasive species. In this regard, the Ministry will work co-operatively with its community partners to assess the risks posed by invasive species, monitor several pathways of introduction, and refine the techniques used in its risk assessments. In addition, the Ministry will encourage the federal government to work

with the United States to conduct joint compliance monitoring inspections of all incoming vessels and to harmonize U.S. ballast regulations with those of Canada.

WILDLIFE MANAGEMENT

One of the Ministry's goals for the management of wildlife species is to provide continuous social, cultural, and economic benefit for the people of Ontario. Moose, deer, and bear are the most commercially important big-game species—and the ones most vulnerable to overharvesting. In addition, while the forest-dwelling woodland caribou is not hunted in Ontario, it has become a species of concern and is classified as threatened in this province. Consequently, the Ministry devotes a significant part of its wildlife management efforts to these four species. Each requires specific management policies, population-management techniques, habitat protection, and harvest-data management. The Ministry has divided the province into areas called wildlife management units to monitor species populations, set hunting seasons, and allocate tags giving hunters the right to harvest game.

The Ministry's primary management method for the deer and moose populations is harvest control through the issue of a limited number of hunting tags; if fewer tags are available, fewer animals will be killed. The Ministry controls the total number of tags for hunting adult moose and antlerless deer (does and fawns). In addition, the Ministry limits the number of licences granted to hunt deer in specified areas of southern Ontario.

While the focus of the Ministry's wildlife management effort is related mainly to moose, deer, and bear, it also monitors fur-bearing animals, other game mammals, game birds, reptiles, amphibians, and waterfowl populations, along with vulnerable, threatened, and endangered species.

To help in the development of management plans and to assess the sustainability of each species, wildlife managers use information on species population size, birth and mortality rates, age and gender ratios, habitat quality, interactions between wildlife species, and encounters with human populations. According to the Ministry, there is a need to maintain a balance between the sustainability of wildlife populations and the economic benefits to local communities generated by hunting.

Moose Management

Management practices for moose focus on the creation and maintenance of hunting opportunities through habitat and population management. In this regard, the provincial moose policy has been in place since 1980, when specific provincial moose population and harvest targets were established for what came to be known as the huntable moose population—those animals outside parks and other protected areas. The program targets established in 1980 called for a huntable moose population of 160,000 animals by 2000. When this policy expired in 2000, the Ministry did not develop an updated plan. Instead, the Ministry revised its moose population objective for each wildlife management unit to reflect the carrying capacity of the habitat to support moose, historical population densities, and socio-economic considerations, such as the economic spin-offs from hunting. Within these objectives, the Ministry has determined that the desired province-wide moose population would be 123,000.

The Ministry's Standards and Guidelines for Moose Population Inventory in Ontario requires annual aerial surveys of management units in the core moose range, with a goal of surveying the entire territory every three years. These surveys estimate moose population size and trends, and help determine the age and gender composition of herds. Information from aerial inventories is used

to determine the optimal number of hunting tags each management unit should issue to ensure a sustainable moose population. Thus, it is important that information be as current as possible.

We reviewed the Ministry's moose aerial inventory records from 1975 to 2006 and noted that, of the 80 management units that conducted aerial inventories during this period, 21, including eight in the core moose range, had done no aerial inventory for at least five years. Eight had done no aerial inventories for at least 10 to 20 years.

The huntable moose population is used by the local district offices to determine how many hunting tags will be issued. Of the 68 management units that calculate harvest quotas and tag allocation using the Ministry's moose harvest system, we noted that 41, or about 60%, have a huntable population greater than their total estimated population. For example, in one management unit, the estimated population was 3,904 while the huntable population was 4,672. In another, the estimated population was 1,827 while the huntable population was 2,392. Consequently, more tags were issued than recommended in the harvest guidelines, which could threaten the sustainability of the population in these management units. We made a similar observation in our 1998 audit, but the number of units where the huntable population was higher than the estimated population has actually increased since then.

We had concerns that the harvest quota, the number of hunting tags issued, and moose population trends for some management units are not being managed for sustainability. We reviewed 12 management units within the core moose range and found that eight of them had estimated moose populations below the target population. In one management unit, for example, the target population was 4,050 while the estimated population was 643. In another, the target population was 4,035 while the estimated population was 1,927. In these cases, as well as others where actual numbers were below population targets, hunting tags generally reflected the fluctuations in the moose populations, but were not further adjusted to allow the moose herds to regenerate and achieve the target populations in those units. Head office oversight and approval may be required to ensure maintenance of a proper balance between sustainability of the moose population and economic spin-offs generated by hunting.

The number of moose tags available in a wildlife management unit should be related to the number of moose that Ministry biologists calculate can be sustainably harvested. Because the number of Ontarians wishing to hunt moose is greater than the number of tags available, tags are allocated through a computerized draw, giving preference to those who choose to hunt in groups. In addition to this draw, 5% of the adult moose tags in wildlife management units north of the French and Mattawa Rivers are held back from the regular draw and allocated to a second draw open only to residents of Northern Ontario. Our review of the tag draw system indicated that it was operating fairly, with each hunter having the same opportunity to obtain a tag. However, as noted above, there needs to be more current information from aerial inventories to determine the proper number of hunting tags to issue each year to maintain a sustainable moose population and achieve the Ministry's current target population.

Since 2000, an estimated 9,600 moose have been harvested annually. According to the Ministry's moose harvest plans, the current huntable moose population is estimated at 93,000, significantly less than the current target of 123,000 moose established in 2000 and less than the population of 100,000 moose at the time of our last audit in 1998.

The current selective harvest system controls the hunting of adult moose and allows for the harvest of calf moose. This system generally works well in managing moose populations at times of low to

moderate hunting effort. At times of high hunting effort, however, unrestricted calf harvests can create a need to reduce the overall harvest to ensure that an adequate number of calves survive into adulthood. Wildlife biologists use the number of calves per 100 cows (female moose) as a measure of the health of the moose population. For the same 12 management units within the core moose range noted above, we found that the number of calves per 100 cows has been declining in all the units since the mid-1970s. In 2004, the Ministry addressed this decline by ending the policy of providing calf tags on demand in four management units, none of which is in the core moose range. Instead, hunters in these units must now enter draws to win calf tags. The unrestricted issuing of calf tags may have contributed to the inability to meet the population targets in the 12 management units noted above. Consequently, the Ministry needs to review its management practices to ensure that they are adequate to manage the sustainability of Ontario's moose population.

RECOMMENDATION 5

To assist in maintaining the proper balance between keeping moose population levels sustainable and providing a reasonable level of hunting opportunities, the Ministry of Natural Resources should:

- develop and implement a moose management policy designed to achieve the overall target moose population;
- carry out population inventory assessments more frequently to more accurately determine the current moose population;
- ensure that the huntable moose population used to determine the number of hunting tags issued does not exceed the estimated actual population;
- more severely restrict hunting in management units where the actual number of moose is significantly below target population levels; and
- implement tighter requirements for calf tags in all management units with low calf populations.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 5, 6, 7, and 8. We reproduce it following Recommendation 8.

Deer Management

Management practices for deer include balancing increasing demands from hunters with the rising incidence of human/deer conflicts and concerns over the spread of disease. One hundred of the 150 wildlife management units in Ontario manage deer; across the province, the average deer harvest between 2000 and 2005 was 82,000 a year. The Ministry estimates the current size of the provincial herd at 400,000.

The Ministry does not have an approved deer management policy; staff informed us that a 1991 draft policy is generally still being used. The Ministry also has a number of guidance documents with respect to deer such as the *Forest Management Guidelines for the Provision of White-Tailed Deer Habitat* and a draft Decision Support Tool for the Ecological Management of Cervids in Ontario. (Cervids are antlered grazing animals such as deer, elk, moose, and caribou.) In our 1998 audit of the program, we also reported that there was no approved deer management policy in place. During our follow-up of that audit in 2000, the Ministry indicated that it was in the process of completing a deer hunt review to identify areas where the animal population can support an increased harvest. This review was intended to facilitate development of a formal deer-management policy, but neither the review nor the formal policy has been completed.

The Ministry does not carry out aerial surveys of the deer population because the animals inhabit heavily wooded areas not easily visible from the air. Instead, it calculates allowable harvest levels by considering past harvest levels, hunter surveys, and indirect deer population indicators such as deer/vehicle collisions, nuisance deer complaints, the capacity of the habitat to produce and sustain deer, and the effects of severe winters on deer survival. These trend indicators are among the data used in the deer-harvest decision support system to assess the effectiveness of the previous year's harvest, and to set quotas for the current year. District biologists told us that, while the system is generally useful in planning the tag allocation for each management unit, it is difficult to use and its output is often difficult to understand. In addition, many biologists in Northern Ontario use the system as a guide only, relying instead on information such as deer sightings by hunters and harvest success rates to determine population levels and the allocation of hunting tags.

The Ministry mails a survey to deer hunters to collect information, such as harvest success, but, owing to low response rates and the variability of the indirect deer population indicators noted above, the Ministry has limited and incomplete information at the management unit level to properly manage deer.

There has been a general increase in the overall deer population to a point where an overabundance in some management units has exceeded the carrying capacity of the habitat. If the population grows faster than the food resources, the habitat can no longer sustain the animals. Generally, densities of 25 or more deer per square kilometre exceed the carrying capacity of the average habitat. However, we noted that some provincial parks have densities of 25 to 30 deer per square kilometre, and one area of Middlesex County has a density exceeding 100 deer per square kilometre.

An overabundant deer population can have a detrimental effect on biodiversity, species at risk, forest regeneration, sensitive ecological areas, and habitats of other wildlife species. It can also increase the risk of human injury or death in vehicle collisions. According to Ontario Road Safety Annual Reports, in recent years there has been a 95% increase in the number of motor vehicle collisions with wildlife (frequently deer)—from 7,000 in 1993 to 13,700 in 2004. Over the past few years, the Ministry has implemented a number of initiatives to deal with the increasing deer population, including a draft Strategy for Preventing and Managing Human/Deer Conflicts in Southern Ontario. However, the Ministry needs to develop a plan to manage the abundant deer population.

According to the Ministry, areas with high deer densities have an increased risk of exposure to transmittable diseases and parasites such as chronic wasting disease (CWD) and brainworm. Deer and elk are susceptible to CWD, a fatal neurological disease. Even though the Canadian Food Inspection Agency (CFIA) has indicated that there is currently no scientific evidence that CWD affects humans, and there is no evidence that Ontario deer are infected, the Ministry nevertheless developed and released the Ontario Chronic Wasting Disease Emergency Response and Surveillance Plan in 2005.

Brainworm is a parasite that lives harmlessly in deer. However, when deer share a habitat with moose, elk, or caribou, the parasite can be transmitted to the other animals and cause severe neurological damage and death. Current scientific evidence indicates that there is no public health concern for the human consumption of animals infected by brainworm. Ministry biologists told us that the growing deer populations are moving into traditional moose ranges. In studies of deer within the moose range in 2000 and 2005, the Ministry determined that 30% to 60% of the deer tested were infected with brainworm. Because moose

populations are already below target in a number of management units, the increased risk of brainworm could lead to further reductions in the moose population. The Ministry has no surveillance program for brainworm similar to the CWD program and it collects very little information about the rate of moose mortality due to brainworm infection. In this regard, we noted that another jurisdiction is trying to develop a suitable test of blood-serum samples taken from moose to determine if they have been exposed to brainworm.

RECOMMENDATION 6

To assist in maintaining a healthy deer population and controlling the spread of disease to more vulnerable animals, such as moose, the Ministry of Natural Resources should:

- complete a deer management policy to provide strategic direction for managing the increasing deer populations;
- review its Ontario Deer Harvest Decision Support System to ensure that it provides biologists with appropriate, complete, and current information to set hunting quotas; and
- work with other jurisdictions to develop better detection and monitoring strategies for infectious diseases.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 5, 6, 7, and 8. We reproduce it following Recommendation 8.

Black Bear Management

Management practices for black bear focus on protecting the habitat and maintaining the population at a sustainable level to provide for continued hunting opportunities and the related economic benefits for the province. The current population of black bears is estimated at 75,000 to 100,000, with an estimated annual harvest of 5,400 animals. While some areas of the province have an abundance of black bears—to the point of being a nuisance—we noted that the Ministry had incomplete information regarding black bear harvests, which could lead to decisions that do not support sustainability in all areas of the province.

The Ministry has a provincial bear policy, dated September 1990, but does not set quotas or restrict licences for bear hunting. Instead, it uses sustainability guidelines based on indicators of estimated bear population density, total annual harvest, and the percentage of total females and adult females in previous harvests to determine the maximum harvest. Using these guidelines, the average harvest should not exceed one bear for every 50 square kilometres in the north and one bear for every 25 kilometres in central Ontario. In addition, the Ministry indicated that black bear populations are sensitive to overharvesting because of such life-cycle characteristics as late maturity and alternate-year reproduction. Because bear population sustainability is most affected by mortality and survival rates of adult females, the guidelines limit the killing of adult females to 20% of the total harvest.

To help reduce female bear and cub mortality, in 1999 the Ministry permanently cancelled bear hunting in the spring season. However, despite the cancellation of the spring bear hunt, according to bear harvest data available between 1987 and 2004 we found that there is a risk that bear populations in some areas may not be maintained at sustainable levels. Of the 76 wildlife management units where bear harvest data were available, we noted instances every year where some management units exceeded the allowable harvest of adult female bears. For instance, in 15 of the 18 years, at least 10 management units exceeded the harvest guidelines. In addition, the main source of the harvest information collected by the Ministry is a

provincial mail-in survey that is to be completed by all bear hunters. We noted that from 2000 to 2004, the response rate to the survey averaged less than 50%. In 2005, the Ministry made the survey mandatory and sent reminder notices to Ontario-resident bear hunters. Although the response rate increased to 60%, the count of harvest years that exceeded the sustainability guidelines noted above was still based on incomplete information. If all mail-in surveys had been returned, they might have indicated a harvest higher than previously noted. Exceeding the harvest guidelines for adult female bears is likely to have a detrimental effect on the overall sustainability of the bear population.

Although tourist outfitters operating bear management areas are assigned a bear harvest level based on the sustainability guidelines, the Ministry did not take proper corrective action when the guidelines were exceeded. At the districts we visited, numerous operators harvested bears from 2001 to 2006 in excess of the established sustainability guidelines. We noted that the Ministry had informal discussions with these operators, but there was little improvement; the same operators continue to harvest more bears each year than allowed. For example, one operator with a maximum quota of 14 bears a year consistently harvested more—up to 28 animals in one year.

RECOMMENDATION 7

To ensure that black bear populations are maintained at sustainable levels in all areas of the province, the Ministry of Natural Resources should:

- consider sanctions against bear hunters who fail to respond to the mandatory provincial mail-in surveys, which are needed to obtain accurate data to use in setting sustainability guidelines; and
- take corrective action against tourist outfitters who continually exceed the sustainability guidelines for the maximum bear harvest.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 5, 6, 7, and 8. We reproduce it following Recommendation 8.

Forest-dwelling Woodland Caribou

Management practices for the forest-dwelling woodland caribou focus on the recovery of this threatened species. Approximately 5,000 woodland caribou roam Ontario's northern boreal forest region. Over the last century, the range of the woodland caribou has been receding northward, shrinking at a rate of approximately 35,000 square kilometres per decade and resulting in a declining population. The retreating range for woodland caribou is largely due to habitat change.

In February 2005, the Ministry addressed these concerns with a draft Recovery Strategy for Forest Dwelling Woodland Caribou in Ontario. The goal of the recovery strategy is to maintain self-sustaining populations where they currently exist, ensure security for isolated populations, and re-establish the herd in strategically selected habitat areas. To meet this goal, the Ministry developed 11 recovery objectives, including:

- establishment of benchmarks for caribou range occupancy and population health;
- development of a caribou range occupancy database;
- reduction of known threats; and
- identification, protection, and management of essential habitat.

At the completion of our audit, the recovery strategy was still at the draft stage and the Ministry still needed to obtain information about caribou habitat requirements, predation (natural predators), response to development activities, encroachment by other species into caribou habitat, and the effects of disease. Biologists say that if the recovery

strategy is not implemented on a timely basis, there is a risk that the woodland caribou population and its critical habitat could further deteriorate, resulting in a more serious classification on the list of species at risk in Ontario, such as endangered or extirpated.

RECOMMENDATION 8

To help protect the threatened forest-dwelling woodland caribou from further deterioration, the Ministry of Natural Resources should gather the necessary information to finalize and implement its recovery strategy on a timely basis.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 5, 6, 7, and 8, as follows.

Ministry policies relating to the management of moose, deer, and black bear will continue to be responsive to environmental and societal changes as the Ministry implements landscape ecological management approaches for these species. The Ministry will provide enhanced policy direction for the sustainability of wildlife populations and habitat management. In addition, the Ministry will further review provincial and local wildlife population and habitat objectives, decision support tools, and monitoring and assessment programs.

The Ministry will continue to work with the Canadian Cooperative Wildlife Health Centre and others to identify wildlife-disease monitoring and surveillance priorities, and the Ministry will continue to contribute to or lead in the surveillance, monitoring, and management of the current wildlife-disease priorities, which are chronic wasting disease, avian influenza, West Nile virus, and tuberculosis.

The government intends to regulate the protection of caribou habitat, and the Ministry will continue to contribute to the development and finalization of national and provincial recovery strategies for woodland caribou. The Ministry has also begun to develop a conservation framework in response to the recommendations emanating from the development of the recovery strategies.

FISHERIES MANAGEMENT

The Ministry is responsible for developing fisheries legislation, policies, programs, and guidelines for population assessments. It also manages fish habitats and monitors fish stocks across the province for both recreational and commercial fishing. Recreational fishing is estimated to contribute more than $2.3 billion annually to the provincial economy, while the processed value of the commercial fishery is more than $200 million a year.

Ontario manages 148 fish species in the four Great Lakes that border the province and in more than 250,000 inland lakes. In 1992, the Ministry issued a *Strategic Plan for Ontario Fisheries*, a blueprint for provincial fisheries management. The plan aims to help protect healthy aquatic ecosystems and rehabilitate those that have deteriorated.

Commercial Fisheries Management

Most commercial fishing activity takes place in the Great Lakes, with Lake Erie being the largest fishery. There is a limit to the natural productive capacity of aquatic ecosystems and thus a limit to the amount of fish that can be sustainably harvested. Therefore, to manage the commercial fisheries, the Ministry works with American federal and state agencies in sharing the fish resource pursuant to the Joint Strategic Plan for Management of Great Lakes Fisheries. On the basis of the total allowable catch (the amount of fish that can be harvested without affecting the sustainability of the fish

stock), the Ministry then sets the commercial fishing quotas by species for each commercial licence.

Each year, both Ontario and the United States carry out lake assessments to determine the fish population and the ability of species to reproduce. These assessments are then used to adjust fishing quotas to achieve a sustainable fishery. We noted that the Ministry has adjusted its quotas from year to year as a result of these assessments to allow for an annual fish harvest that would help ensure the sustainability of future fish stocks.

Harvests in excess of the total allowable catch pose an increased risk to the sustainability of fish stocks. The Ministry's management of commercial fisheries generally promoted the sustainability of commercial fish stocks. However, we noted a number of significant exceptions where there is a need for better monitoring and enforcement. For example:

- In two fish-management zones on Lake Superior, unlicensed fishing by a native band resulted in a total harvest that greatly exceeded the quotas set for these zones. For example, the quota set for whitefish, which is the most commercially harvested fish, was exceeded by 275%.

  In 1984, the band challenged the Ministry's right to impose licensing requirements for commercial fishing. The courts ruled that Ontario's commercial fishing licence requirement serves a valid conservation purpose and constitutes a reasonable limitation on the band's right to fish. However, the Ministry has not enforced the Act and overharvesting in these fish-management zones continues.
- Licensed commercial fishing operations consistently harvested more than the quota in two fish-management zones on Lake Huron. The harvest between 2003 and 2006 totalled 211,501 kilograms—260% more than the quota. In this case, the Ministry stated that although quotas were out of date, it did not have enough science-based information regarding stocks of lake trout to make formal adjustments to the quota. However, without sufficient information, such extensive overharvesting may lead to an unsustainable fishery.

In most forms of commercial fishing, the harvest will include unintended catches of fish and other aquatic life, called the bycatch. Often, this bycatch is discarded into the water, a practice generally regarded as wasteful and potentially hazardous for aquatic ecosystems over time. The Ministry does not have a bycatch policy or procedures for estimating the bycatch. Consequently, it is difficult to determine the total catch for each species to ensure that species are properly managed. We noted that another jurisdiction, Australia, had a bycatch policy to help enhance fisheries productivity and maintain the integrity of the aquatic ecosystems. This policy included strategies and procedures to reduce the bycatch, improve the protection of vulnerable species, and gather scientific information to determine the ecological impacts of the bycatch.

RECOMMENDATION 9

To further protect commercial fisheries and fish stocks, the Ministry of Natural Resources should:

- take appropriate enforcement action when the number of fish harvested is above the quotas set for sustainability; and
- consider developing a bycatch policy to help reduce the ecological impact on acquatic ecosystems and sustainability of the bycatch species.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 9, 10, and 11. We reproduce it following Recommendation 11.

Recreational Fisheries Management

District offices are responsible for managing fish resources in their areas. In the late 1980s, district offices prepared Fisheries Management Plans, which expired in 2000. These plans included the long-term strategic direction of the fishery resource, potential fish harvest yields, limits by species, resource use over time, management strategies, and an implementation plan. After the plans expired, the Ministry determined that management objectives and associated management actions for these plans may no longer reflect current science, governmental direction, or issues facing the fish resources. However, the Ministry did not update or develop new fisheries-management plans using current scientific and fisheries information. In addition, the expired plans were not reviewed or evaluated to determine if the objectives and targets were achieved, or whether the management actions and strategies were effective.

We noted that, since 2000, district offices have generally managed fisheries based on their own local issues and priorities. Consequently, we noted at the districts we visited that fisheries-management strategies were developed as an interim measure to provide an approach to fisheries-management activities in the districts. These strategies generally outlined the fisheries' management needs, the desired outcomes, and the management actions necessary to achieve the outcomes. However, putting formal plans in place is a critical first step to ensure that fragile fish resources are protected and sustained. Such plans would also enable the Ministry to measure the success of actions taken to protect the province's fish resources and ecosystems. The absence of formal fisheries-management plans can result in inconsistent or detrimental decision-making.

When the district fisheries-management plans expired in 2000, a working group identified the need to develop a monitoring program to specifically measure the health of aquatic resources. Such monitoring would determine whether the Ministry was managing the resources for ecological sustainability across the province. In 2004, the Ministry announced a draft Ecological Framework for Recreational Fisheries Management (for inland fisheries) that would help the Ministry monitor fisheries resources. The framework provides the building blocks for implementing the *Strategic Plan for Ontario Fisheries*. Under the framework, the Ministry intends to manage fish resources using a landscape rather than a lake-by-lake approach, and to develop new fisheries-management zones based on biological, climatic, and social factors. The Ministry also intends to develop regulatory tools for different sport-fishing species, establish broad zone standards to help ensure that regulations are based on sound science, monitor fisheries in a standardized manner to aid in state-of-the-resources reporting, and enhance the public's involvement through stewardship councils. The Ministry indicated that this framework would provide a monitoring tool to help it determine the necessary conservation measures, provide information about the health of aquatic ecosystems, and report on ecological sustainability and biodiversity.

At the completion of our audit, however, many of the framework fundamentals still had to be finalized and public consultation was still continuing. In addition, the Ministry did not have a time frame for implementing the framework, but informed us that implementation of the fisheries-management zones will be phased in. Meanwhile, the Ministry was carrying out a pilot project at three districts to implement the new fisheries-management zones and other aspects of the framework. The other districts were still managing fisheries on the basis of local priorities.

RECOMMENDATION 10

To help ensure that recreational fisheries continue to be managed in a sustainable manner, the Ministry of Natural Resources

should develop formal fisheries-management plans, along with appropriate time frames for implementation.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 9, 10, and 11. We reproduce it following Recommendation 11.

Fish Stocking Program

The stocking of hatchery-reared fish is a major component of the Ministry's Fisheries Management Program. As such, one of the Ministry's objectives for fisheries is to provide ecological, social, and economic benefits to the province, and to help achieve the Ministry's priorities, including biodiversity, by rehabilitating and protecting the province's fisheries and genetic stock while maintaining and enhancing angling opportunities.

To help achieve its objective, the Ministry operates 10 fish hatcheries that produce 11 species of fish and maintain 17 hatchery-resident broodstocks (fish kept for breeding). The average number of fish stocked by the Ministry across the province each year has been approximately 8.5 million. The fish produced at the hatcheries are stocked in four of the Great Lakes and in more than 1,000 inland lakes and streams.

Each year, ministry staff determine the number and species of fish to be stocked, and which lakes will receive them. Approximately half the stocking is designed to rehabilitate existing fish populations in order to help species reproduce naturally. The other half supports hatchery-dependent fisheries to provide enhanced recreational angling opportunities where naturally reproducing populations are too limited or non-existent.

To protect biological diversity and maintain a healthy ecosystem, the Ministry's *Guidelines for Stocking Fish in Inland Waters of Ontario* requires that no stocking be done without completing an aquatic habitat inventory, or lake survey, to ensure that the physical, chemical, and biological parameters of a body of water are suitable for the species being stocked. The guidelines also stipulate that the fish-stocking program be evaluated to ensure that its objectives are being achieved. We noted that the Ministry did not have current lake surveys, nor had it carried out enough recent post-stocking evaluations to assess the success of the program and its impact on fish stocks. For example:

- At the districts we visited, we noted that the required lake surveys had never been carried out for 88 of the 368 lakes stocked since 2001. Staff at one district informed us that some of the lakes in their area had been stocked each year for the past two decades even though they have never had a lake survey to determine the success of the annual stocking.
- Provincially, there have been 9,884 lake surveys—but more than 70% of these surveys were done prior to 1980. Ministry staff informed us that some districts may have completed more recent lake surveys, but these would be for new lakes and not for existing lakes that are stocked. Without current lake surveys, the Ministry may be stocking lakes that already have a naturally reproducing population, potentially harming these populations. We made similar comments in our 1998 audit of the program. In addition, given that the last lake surveys were done more than 20 years ago, current information is needed because many factors, such as degraded fish habitats, pollution, and the spread of invasive aquatic species, are relevant to the Ministry's stocking decisions.
- At the districts we visited, the Ministry generally lacked current information on the success of the stocking program because just 110 post-stocking evaluations were completed on the

368 lakes that were stocked. Of the completed evaluations, 54 were done prior to 2000, with 42 of these done before 1990.

In addition to the Ministry's stocking of hatchery-reared fish, a number of community partners also rear and stock fish in Ontario waters. Between 2002 and 2006, these partners stocked more than 30 million fish, or an average of 6 million a year. According to the Ministry's *Guidelines for Stocking Fish in Inland Waters of Ontario*, all fish stocked, regardless of source, must meet or exceed minimum federal fish health-and-quality standards and provincial guidelines requiring that the fish be free of any disease-causing pathogen or parasites. Although the Ministry tests the fish it stocks for disease, there is no program to test fish stocked by its community partners. Without a routine monitoring program in place to test the significant number of fish stocked by community partners, there is a risk that infectious disease could be introduced into the province's waters, adversely affecting the health and sustainability of Ontario fisheries.

RECOMMENDATION 11

To ensure that the fish-stocking program is effective in rehabilitating fish populations and providing enhanced recreational angling opportunities, the Ministry of Natural Resources should:

- perform regular lake surveys and post-stocking evaluations to determine whether the stocking objectives are being met; and
- establish a monitoring program for testing the health and quality of fish stocked by its community partners.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 9, 10, and 11, as follows.

The Ministry endeavours to manage Ontario's recreational and commercial fisheries using sound science to support the allocation of quotas, evaluate fish stocks, develop fisheries plans, and restore and protect fish habitats. Partners are major contributors to fisheries management. Current monitoring and assessment programs focus on high-priority areas, such as commercial harvest, rehabilitation of native stocks, and high-use recreational fisheries. Representative lakes will be monitored with more rigour, with the results used to develop the science needed to improve the Ministry's knowledge base.

Fisheries-management planning is in place for the Great Lakes and for certain high-value fisheries. Under the new Ecological Framework for Recreational Fisheries Management, the Ministry is moving toward a landscape scale of management at the level of fisheries-management zones. Objectives will be developed for each zone, and a new fisheries monitoring program will determine the health of fish stocks.

Management of fish health is a shared responsibility with the federal government, and a number of regulations are applicable to fish stocked by the Ministry's partners. The Canadian Food Inspection Agency is making regulatory amendments to the *Health of Animals Act* to improve the management of fish health.

ENFORCING COMPLIANCE WITH LEGISLATION

The mandate of the Ministry's Enforcement Branch is to safeguard the public interest by delivering regulatory protection for Ontario's natural resources. To accomplish this, the Ministry employs approximately 250 conservation officers, who have powers of inspection, arrest, and search and seizure under various statues, including the *Fish and Wildlife Conservation Act*, the *Migratory Birds Convention*

Act, and the *Fisheries Act*. Regulations under these acts control hunting and fishing by restricting harvests and designating harvest seasons. In addition, conservation officers may operate random game-check stations throughout the year, where they collect information on game taken by hunters and ensure that regulations are being followed.

During the 2006/07 fiscal year, approximately 60 conservation officers performed management functions or other office duties while about 190 of the Ministry's conservation officers worked in the field, where they generally spent about 75% of their time on fish- and wildlife-enforcement activities. These field officers are responsible for patrolling approximately one million square kilometres, or an average of more than 5,000 square kilometres per officer.

Enforcement Activity

In April 2006, the Ministry centralized the enforcement function of the regional and district offices in the Enforcement Branch. Along with this reorganization, the Ministry adopted a risk-based compliance and enforcement framework. The new approach focuses the Ministry's work and response to incidents on the risk posed to human health and safety, natural resources, and the economy. Conservation officers are assigned to specific geographical areas. As part of their enforcement efforts, the officers conduct general deterrent patrols and target the areas of greatest risk identified in the risk-based plans to monitor resource users and maintain a visible presence in the communities.

The Ministry allocates operational support funding to the Enforcement Branch that averages approximately $9,000 per conservation officer to carry out field-enforcement activities.

From our review of the enforcement activities in the districts that we visited, and discussions with enforcement supervisors and officers, we noted the following:

- For the 2006/07 fiscal year, each enforcement unit prepared a risk-based plan outlining enforcement activities necessary to effectively protect natural resources. For the four units reviewed, the funds budgeted were insufficient to carry out the planned enforcement activities according to the risk-based plans. As a result, conservation officer patrol hours had been reduced from planned levels by between 15% and 60%. For enforcement activities on the Great Lakes, marine patrol hours were reduced by 50% from planned levels. Planned enforcement activities that were reduced included patrols to help prevent the illegal harvest of moose, deer, caribou, and black bear; sport fishing enforcement with sensitive fisheries and fish species; activities aimed at curbing unsafe hunting practices; and aerial patrols of remote tourist areas. If there was a shortfall in funding, district offices were not allowed to reallocate funds from other activities to the enforcement units, as was the case in prior years.
- For the enforcement units reviewed, conservation officers were unable to carry out additional harvest monitoring because of resource constraints. In this regard, they were restricted to spending between $75 and $125 a week for operating costs such as meals, gas, vehicle repairs and maintenance, and travel. At this level of funding, we noted that conservation officers carried out regular patrols an average of one or two days a week during the 2006/07 fiscal year, compared to an average three or four days a week the previous fiscal year. In the case of one unit, we noted that regular patrols were suspended by mid-November 2006 for lack of funds, even though the deer hunting season still had another 10 days to run. In the case of another unit, conservation officers were able to patrol only one-third of a major sport and commercial fishing

lake. Lack of enforcement and high fishing activity on this lake resulted in the walleye fish population collapsing to an unhealthy level. In such cases, it is questionable whether these reduced enforcement activities are effective in adequately safeguarding the fish and wildlife resources.

- Conservation officers and supervisors indicated that, because of reduced funding, there has been a decrease in the time spent on deterrent patrols. We noted that, in the last five years, the number of contacts was down 20% while charges had declined 16%. In addition, the number of conservation officers and time spent in the field have decreased over the same period. Studies from enforcement agencies in other jurisdictions have found that when officers are engaged in a proactive and directed patrol strategy, such as deterrent patrols, the non-compliance rate falls. In many cases, the other jurisdictions achieved a higher level of compliance with laws by deploying more officers for deterrent patrols. The reduction of deterrent patrols by conservation officers may have put added pressure on the province's fish and wildlife resources. For example, we noted that when one unit carried out a two-week enforcement blitz in 2006, it seized 57 illegally hunted moose, almost double the 29 moose seized during a similar blitz in 2005. In the case of two other units that carried out controlled deer hunts during the fall of 2006, conservation officers found that 15% to 20% of the hunters they checked were in violation of regulations, including hunting without a licence, transfer of deer tags, and trespassing to hunt.

Overall, the reduction in funding and field-enforcement activity may have an adverse impact on enforcement effectiveness and ultimately on fish and wildlife resources. We had similar concerns during our 1998 audit.

RECOMMENDATION 12

To help sustain fish and wildlife resources and ensure compliance with legislation, the Ministry of Natural Resources should determine whether the enforcement resources allocated are sufficient to achieve the enforcement goals established in its risk-based plans.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 12, 13, and 14. We reproduce it following Recommendation 14.

Deployment of Conservation Officers

To determine staffing levels for enforcement units, the Ministry uses a staff deployment model for conservation officers that was developed in the 1980s. The model was based on the population of a geographic area and the ability of the public to access natural resources. It has not been updated to reflect current risks to the fish and wildlife resources. As a result, enforcement supervisors had mixed success achieving the staffing levels they believe are appropriate. Staffing requirements were generally based on the Enforcement Branch's knowledge of the enforcement area, including such factors as demand for service (as determined by complaints), illegal activity patterns, concerns expressed by the public, and the geography of the area. Since the 2002/03 fiscal year, the number of field conservation officers has decreased by 7%, to 194 officers from 208. This has put further pressure on enforcement staff's ability to protect fish and wildlife resources.

With the new risk-based approach to enforcement activities, the Ministry needs to develop a conservation-officer-deployment model based on workload. We noted that other jurisdictions deploy officers primarily on the basis of the need for service.

Developing workload statistics and scheduling the officers accordingly, the Ministry would be better able to determine whether it has the staffing levels necessary to achieve its enforcement goals.

Effective conservation-officer deployment helps deter illegal activity and protect resource sustainability. However, the current deployment strategy has left gaps in enforcement coverage that could have a detrimental effect on the resources. In the case of one enforcement area, we noted there was no full-time lake conservation officer to patrol a lake that was home to 30 licensed commercial fishing operators. In another area, enforcement staff informed us of two cases where the commercial licence holders had falsified daily catch reports to conceal a bigger-than-reported actual catch. In these cases, there is a risk of increased non-compliance with fishing quotas, which could lead to unsustainable fishing practices.

The majority of conservation officers work eight-hour shifts that normally conclude before six in the evening, and there are generally few overnight shifts. According to ministry staff, most public complaints during the night do not need immediate attention, even though almost 20% of the calls to the Ministry's TIPS reporting hotline occur during overnight hours. We were informed that enforcement staff cannot respond to complaints in off hours without supervisory approval because the costs of overtime must be balanced with the severity of the complaint and concerns about staff safety. We were also informed that extensive off-hours work could diminish the staff's ability to carry out regular day patrols. However, failure to respond to complaints on a timely basis may increase the risk of illegal activity going undetected.

RECOMMENDATION 13

To further strengthen its risk-based enforcement plan and ensure that fish and wildlife resources are adequately protected, the Ministry of Natural Resources should review its deployment strategy to determine whether conservation officer staffing is sufficient in each area to carry out effective deterrent patrols and meet local service requirements while recognizing current funding pressures.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 12, 13, and 14. We reproduce it following Recommendation 14.

Hunting and Fishing Licence Suspensions

Residents who hunt and fish in the province are required to purchase an Ontario Outdoors Card to which are attached all valid hunting and fishing licence stickers. Anyone suspended from hunting or fishing as a result of a conviction under the *Fish and Wildlife Conservation Act* is not required to surrender the Outdoors Card, unless explicitly required by court order.

Conservation officers are required to enter prosecution and conviction information about offenders into the Compliance Activity and Violation Reporting System (CAVRS), along with the Ontario Outdoors Card number and any warnings about violations. Once a suspension record or warning is entered into CAVRS, the information is available to conservation officers in the field through the Provincial Communication Unit.

In addition, the Ministry has an Outdoors Card Information System (OCIS) to issue and track Outdoors Cards as well as hunting and fishing licences. The Outdoors Card numbers in CAVRS and OCIS are to be matched to ensure that individuals suspended from hunting and fishing do not obtain a licence or qualify for a deer or moose tag. For the matching control to be effective, conservation officers must ensure that the Outdoors Card number for each convicted individual is entered into CAVRS on a timely basis.

We reviewed all 157 hunting and fishing suspensions for 128 individuals convicted of an offence in 2005 and noted that the matching control between CAVRS and OCIS needs improvement. We found that 29 individuals had no Outdoors Card number recorded in CAVRS even though OCIS indicated that two of them had an Outdoors Card at the time of their conviction. We also found that seven individuals had purchased hunting licences after they were suspended from all hunting activities. Four purchased the licences from outside issuing agents, who do not have access to active suspension records, while three bought them from the Ministry, which did have access to suspension records.

In addition, the Ministry's practice is to remove suspended individuals from the moose and deer tag draws by reviewing the CAVRS and OCIS databases for suspensions. Improved controls are also needed in this process, since we noted that two suspended individuals successfully entered the deer and moose draws and won tags.

RECOMMENDATION 14

To prevent suspended individuals from obtaining hunting and fishing licences or entering the deer and moose tag draws while under suspension, the Ministry of Natural Resources should improve procedures and controls to ensure that its information systems are more complete and that suspended hunters are not allowed to get moose and deer hunting tags.

MINISTRY RESPONSE

The Ministry provided a combined response to recommendations 12, 13, and 14, as follows.

The Ministry has implemented a risk-based compliance framework for planning enforcement operations and realigned the reporting relationship for many enforcement staff, including having conservation officers report to the Enforcement Branch. As part of this modernization, the Enforcement Branch recognizes the need to review officer deployment as part of a broader human-resources strategy.

In the meantime, the Enforcement Branch will continue to use a strategic approach, using risk-based planning and financial logic models to recognize the range of priorities, issues, and operating-cost differences across the province and to guide resource-allocation decisions. Enforcement activities will reflect ministry and broader government priorities and focus on activities that present the highest risk to resource sustainability and public safety.

Improvements will be made to the procedures and controls relating to licence suspensions. For example, a project is under way that will improve the Ministry's ability to prevent the sale of licences to clients under suspension.

FISH AND WILDLIFE FUNDING

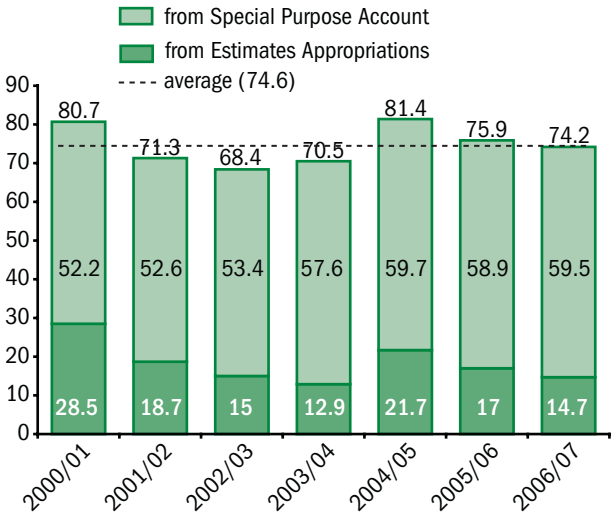
Effective April 1, 1996, the Ministry established a Fish and Wildlife Special Purpose Account (Account) in the province's Consolidated Revenue Fund. All revenues received under the *Fish and Wildlife Conservation Act* are deposited in the Account and used as directed by the Minister for making payments relating to fish and wildlife resource management and conservation. Specifically, the Act requires that funds from the Account can only be used for the management, perpetuation, or rehabilitation of fish or wildlife populations.

We noted that licence fees and other fish and wildlife revenue were deposited into the Account from the Consolidated Revenue Fund on a timely basis, allowing the Account to earn maximum interest revenue. In addition, money withdrawn from the Account was appropriately used for fish and wildlife resource management and conservation.

Since 2000, total funds provided by the Account, and other funding provided through ministry appropriations, have generally remained at the same level and averaged $74.6 million, as illustrated in Figure 3. In real-dollar terms, despite ever-increasing ecological concerns and related ministry responsibilities, funding for the Program has significantly declined over the last 20 years. In the 1987/88 fiscal year, fish and wildlife funding was $67.4 million, equivalent to more than $100 million in today's dollars. Given the investment required to address many of the other recommendations in this report, the Ministry may need to determine where to focus its efforts and whether certain aspects of its mandate are achievable given current financial resources.

Figure 3: Operating Funds for the Fish and Wildlife Program, 2000/01–2006/07 ($ million)

Source of data: Ministry of Natural Resources



RECOMMENDATION 15

Given the decline over the last 20 years in real dollar funding for Fish and Wildlife Program activities, the Ministry of Natural Resources should formally prioritize its responsibilities for maintaining biodiversity and safeguarding Ontario's fish and wildlife and allocate available funding accordingly.

MINISTRY RESPONSE

To enhance the delivery of the Fish and Wildlife Program, the government has allocated an additional $22 million over four years to implement the new *Endangered Species Act, 2007* and $18 million over four years in new funding for public stewardship activities. Enforcement funding has also been increased by approximately 7% for the 2007/08 fiscal year as compared to 2006/07. In addition, $5.85 million per year for three years under the Canada-Ontario Agreement have been allocated to the Ministry.

The Ministry will set priorities within funding allocations to strive to achieve a balance in delivering its responsibilities. Priority-setting will reflect government strategies and key ministry goals. These priorities will be reviewed and confirmed annually as part of the government's overall results-based planning process.

MEASURING AND REPORTING ON EFFECTIVENESS

In a 2005 policy document entitled *Our Sustainable Future*, the Ministry outlined its strategic directions to ensure the sustainable development of the province's natural resources and improve economic prosperity. The document included specific strategies and proposed actions to help achieve the Ministry's vision. For the Fish and Wildlife Program, key objectives are to:

- protect healthy fish and wildlife populations and the aquatic and terrestrial ecosystems on which they rely;
- rehabilitate degraded populations and habitats;

- provide and promote diverse fishing, hunting, and viewing opportunities as well as other social, economic, and cultural benefits based on Ontario's fish and wildlife resources;
- reduce threats to human health from fish and wildlife populations;
- increase the awareness, understanding, and involvement of stakeholders;
- promote organizational excellence and commitment to quality service; and
- meet the fish and wildlife Special Purpose Account revenue projections.

To demonstrate the effectiveness of the Program, the Ministry needs to measure and publicly report on its success and take corrective action where objectives are not met. However, we noted that the Ministry did not have specific performance measures for most of its objectives. Instead, the Ministry reported its achievement only in the following areas:

- percentage of game wildlife, migratory game birds, and commercial and sport fish with a conservation status of "secure";
- percentage of endangered species protected under the *Endangered Species Act*;
- percentage of municipalities participating in the Bear Wise Program regarding nuisance bears; and
- number of fish and wildlife volunteers and their hours participating in the Community Fisheries and Wildlife Involvement Program and the Ontario Stewardship Program.

These were last reported in the Ministry's 2006/07 results-based plans.

These measures are mainly directed at stakeholder participation and the percentage of fish and wildlife protected but do not reflect all aspects of the Ministry's goal of ecological sustainability and development of the province's natural resources. The Ministry needs to develop more comprehensive indicators for measuring and reporting on the Program's effectiveness. In addition, it would be useful to isolate and identify those factors attributable to the Ministry's own conservation efforts to help assess its effectiveness in achieving ecological sustainability.

We noted that other jurisdictions report performance measures such as:

- number of fish species present, and relative numbers of each of those species in a given ecosystem for biodiversity and population status;
- commercial fish harvest trends, to help determine the status of fish populations and the lake's capacity to produce a sustainable yield;
- quality and distribution of suitable habitat sufficient to maintain wildlife species across their range over time; and
- increases in the number of opportunities for fish- and wildlife-related recreation.

One jurisdiction also plans to report the changes in wetlands over time to help assess the threats to this type of ecosystem.

To better demonstrate whether the Program is effectively managing fish and wildlife resources, the Ministry should publicly report on performance measures such as those listed and track the extent over time of the human and biological stress imposed on the province's biodiversity and the impacts of efforts to mitigate risks to biodiversity. Although some reports have been issued on a local scale with respect to certain species, these reports do not include the big-game species, such as moose, deer, and bear, which are commercially important and are the most vulnerable to overharvesting.

We understand that the Ministry plans to prepare state-of-the-resources reports that, once fully implemented, will complement the reporting of its other public-performance measures and enable it to track the improvement or deterioration of resources and its overall effectiveness over time.

Although ministry staff agreed that an overall assessment was needed to evaluate program effectiveness, we were advised that insufficient

information and resources were available to measure achievement over such a broad range of expectations. However, publicly reporting trends in the health and diversity of fish and wildlife resources can highlight areas that require immediate attention and, if necessary, special funding.

RECOMMENDATION 16

The Ministry of Natural Resources should develop more comprehensive indicators for measuring and reporting on the Fish and Wildlife Program's effectiveness in ensuring that Ontario's fish and wildlife resources are healthy, diverse, and sustainable for the use and enjoyment of the people of Ontario.

MINISTRY RESPONSE

The Ministry is working toward the development of an outcome-based planning, monitoring, evaluation, and reporting system based upon the principles of continuous improvement, performance, and quality management, with measures to assess ministry performance. Performance measures will look at activities and inputs, as well as program effectiveness in achieving outputs and outcomes. As part of the ministry-wide initiative, the Fish and Wildlife Program is developing logic models that include high-level outcomes and performance measures with an initial focus on Ontario's Biodiversity Strategy.