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Request for Environmental Assessment

Minister of the Environment
Environmental Assessment and Approvals Branch
135 St. Clair Avenue West, 10th Floor
Toronto, Ontario M4V 1P5

Dear Minister,

Please find below a detailed outline of the concerns regarding wild turkey introductions outside of their historical range in Ontario.

The Ministry of Natural Resources is moving forward with their wild turkey introduction program under Exemption Order MNR 42. I don't believe this Exemption Order is applicable in this case.

1. The Exemption Order makes permissible (b) protection of game and non-game species by relocation, controlled access and propagation;"

Wild turkeys were once part of Ontario's landscape. By the early 1900's they became extirpated from Ontario because of habitat loss and over hunting. In 1984, The Ontario Ministry of Natural Resources in partnership with field naturalists and sportsmen's clubs began re-introducing wild turkeys to Ontario. The objective of the wild turkey re-introduction program was to:

1. To re-establish wild turkeys as part of Ontario's natural heritage;
2. To provide for viewing and hunting opportunities as wild turkey populations become established;
3. To increase economic benefits through additional recreational opportunities provided by wild turkeys.

(Wild Turkey Management Plan For Ontario, September 1985, Wildlife Branch MNR)

The program has been very successful and from the original 137 wild turkeys released in 1984 and 1985, there is now an estimated 30,000 birds in Ontario. The area of range occupied is approximately 39,000 square kilometers (15234 sq. mi.). The size of this area is greater than the 27,000 square kilometers (10,500 sq. mi.) that made up the historical range. (MNR 2000 Ontario Wild Turkey Status Report)

In 1987, the Ministry began a recreational hunt of wild turkeys and hunter success rates have increased steadily. In 2000, the MNR issued 12,649 wild turkey hunting licenses (MNR 2000 Ontario Wild Turkey Status Report).

The success of the wild turkey program caused the Ontario Ministry of Natural Resources to redraft the wild turkey management plan for Ontario. In 1994, the objectives of the program changed. The partnerships narrowed to the Ministry of Natural Resources and the Ontario Federation of Anglers and Hunters, and the goals and objectives were re-written as follows:

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Goals:

To contribute to the diversity and health of ecosystems and associated wildlife populations and habitats by sustaining and increasing Ontario's wild turkey population for the benefit of the people.

Objectives:

1.0 Establish wild turkey populations in all suitable habitats
1.0 Preserve and manage a diversity of habitats to sustain optimum wild turkey populations
3.0 Provide optimum social, cultural and economic benefits from wild turkeys

Wild turkeys are well established in Ontario. They no longer are considered a species needing protection. They are not listed in any category with the Committee on the Status of Endangered Wildlife in Canada. In 1992, The Ontario Ministry of Natural Resources replaced controlled hunting of wild turkeys with regular hunts, the latter being defined as hunts in which hunter numbers are not controlled through application to a random draw. (Wild Turkey Management Plan for Ontario, 1994, Ministry of Natural Resources and Ontario Federation of Anglers and Hunters)

The Exemption Order makes permissible (b) protection of game and non-game species by relocation, controlled access and propagation. The first priority for the reintroduction wild turkey program in 1985 was to bring back a native extirpated species, for the sake of biodiversity. This mandate has been fulfilled and the current aim of the program is to promote a hunting agenda for a species that is well established in Ontario.

The Exemption Order also states:

2. The undertaking is carried out in accordance with accepted wildlife management principles and is designed to meet objectives which are established through projected wildlife population studies and user demand."

Objective 2.0 of The Wild Turkey Management Plan in Ontario 1994 states: Preserve and manage a diversity of habitats to sustain optimum wild turkey populations.

· Strategy 2.1: Incorporate an ecosystem approach in the management of wild turkey habitat.

Tactics

An ecosystem approach to habitat management should be adopted in principle and applied wherever feasible. For example, habitat management for wild turkeys should consider the effects on biodiversity (other species and vice versa). More specifically, attempts should be made to assess the relationship or compatibility between wild turkey habitat and the requirements of other species.

The Ontario Ministry of Natural Resources has embraced an ecosystem approach to wildlife management because it is now widely accepted that a single species approach to managing wildlife is no longer appropriate. Focusing primarily on single species conservation ignores potential negative impacts from those concentrated management efforts on other wildlife. Intensive management of a preferred species without considering the

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impacts to the ecosystem at large can create imbalance within that ecosystem. The Ministry as a whole has, in principle, adopted an ecosystem approach to natural resources throughout its management units, Fish and Wildlife, Forestry and Ontario Parks.

Now that the Ontario Ministry of Natural Resources has established wild turkey populations in Ontario and a successful hunting program, the current thrust of the wild turkey program is to expand wild turkey range well outside of its historical range for the purpose by optimizing hunting opportunities across the province.

Introducing wild turkeys into regions where they did not evolve with the local biota is in fact introducing a non-native species into a new ecosystem. The Ontario Ministry of Natural Resources acknowledges they are introducing wild turkeys outside of their historical range. (MNR 2000 Ontario Wild Turkey Status Report) (Internal Risk Analysis: Introduction of Wild Turkey to St. Joseph Island, Ontario, MNR fall 2002).

The International Union of Conservation of Nature (IUCN), states: "One of the major threats to native biological diversity is now acknowledged by scientists and governments to be biological invasions caused by alien invasive species. The impacts of alien invasive species are immense, insidious, and usually irreversible. They may be as damaging to native species and ecosystems on a global scale as the loss and degradation of habitats." (Species Survival Commission, IUCN Council, February 2000)

The same concern is echoed in the Convention on Biological Diversity, signed by Canada and ratified in 1992. Article 8. In-situ Conservation (h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.

The Ministry is proceeding with the introductions of wild turkeys beyond their historical range without any environmental impacts studies. All research is narrowly focused on identifying suitable habitat for wild turkeys and confirming success rates by counting the number of wild turkeys through public sightings. Where wild turkey release has already occurred outside of historical range, monitoring responsibility has been transferred to local hunting groups. (MNR January 1999 Memorandum)

The Ministry claims that because of landscape conversion, primarily caused by deforestation, agricultural and climate change, regions of Ontario that were not previously considered suitable habitat for wild turkeys could now sustain turkey populations. (Internal Risk Analysis: Introduction of Wild Turkeys to St. Joseph Island, Ontario, MNR Fall 2002) (Feasibility of Transplanting Eastern Wild Turkey on the Precambrian Shield in Central Ontario, Nguyen, 2001) (pers. comm. Bellany and Pollard MNR 2002). By releasing turkeys in marginal habitats, the Ministry hopes to push their northern limit.

The simplification of landscapes through conversion is considered a loss of habitat for native species and the greatest threat to the preservation of biological diversity. (Species Survival Commission, IUCN 2000) (Global Forest Watch Canada 2000)

The wild turkey program has been successful. There are now thousands of wild turkeys on Ontario's landscape and have established themselves beyond their historical range. The Ministry should now allow wild turkeys to establish their own northern limit naturally and without interference.

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By facilitating wild turkey movements through forced introductions in marginal habitats, the Ontario Ministry of Natural Resources is not only contributing to the further decline of that landscape by introducing a non-native species but is also preventing the restoration of that landscape by permanently altering that landscape. The effect of introducing a non-native species is often irreversible.

The actions of the Ontario Ministry of Natural Resources are not accepted wildlife management principles.

A court action to a planned wild turkey release by The California Department of Fish and Game (DFG) in San Diego County, specifically Cleveland National Forest, was initiated and successfully defended by the California Native Plant Society (CNPS) and Save Our Ranchlands and Forests. (California Native Plant Society and Save Our Forests and Ranchlands vs. California Department of Fish and Game - Super Ct. San Diego County, 1996, No. 694053)

The public raised concerns that wild turkey releases may have effects to sensitive plants and animals. The Superior Court determined that an environmental impact report was required for that project, as the evidence in the administrative record supported a fair argument that releasing wild turkeys in the Cleveland National Forest could result in significant adverse impacts to the environment. As such, the court ordered that the Department set aside the decision to release wild turkeys and prepare an environmental impact report for the project. The Department abandoned that project, and did not pursue releasing turkeys in San Diego County any further.

In late 1999, further concerns were raised regarding additional wild turkey releases in other sites. In California, it is believed that wild turkeys roamed the landscape thousands of years ago but whether wild turkeys should be considered a native or non-native species is undetermined. (pers. comm. Tom Blackinship, DFG). Therefore, the Department decided that, in order to fully disclose and analyze any potential substantial impacts to the environment from the release of wild turkeys, and Environmental Impact Report would be prepared for future wild turkey releases. (Department of Fish and Game Wild Turkey Draft Environmental Impact Report, 2002)

The Department of Fish and Game reviewed existing literature regarding wild turkeys and their relationship to other species and evaluated potential impacts. Through the literature review, they concluded there was no evidence of adverse effects from the introduction of wild turkeys on other species, both plant and animal. However, in a statement released November 4, 2002, the Department of Fish and Game wrote:

“Wild turkeys are well established in a number of locations in California. In recent years, concerns about the potential impacts non-native wild turkeys might have on native plants and animals have increased significantly. This concerns, fuelled in part by scientific information about the negative effects that other non-native species are having on the environment, has prompted the Department to take a closer look at the issues associated with turkeys.”

As such the Department did not produce a final Environmental Impact Report and instead is moving forward with a process to develop a comprehensive statewide management plan for California’s wild turkey population.

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In assessing risk with the release of wild turkeys in central Ontario, the Ministry conducted a literature review and determined no adverse impacts would occur from any release. Current wild turkey research is primarily focused with the biology of wild turkeys and the procedures for successful turkey introductions. Very little research exists that explores interactions between wild turkeys and other species. Therefore, reliance on existing studies to determine adverse effects specifically to wild turkey introductions would be insufficient.

However, in 1999 the Ontario Ministry of Natural Resources initiated an experimental release of wild turkeys in the Sudbury region in central Ontario to test their survival in marginal habitat. Laurentian University monitored the release, and the final report concluded that populations of wild turkeys are not likely to persist at latitudes of the present study area without rigorous winter habitat improvement, such as planting of shrubs that bear fruit late into the winter to increase food availability above snow. Supplemental feeding may be the only means of maintaining viable turkey numbers throughout very severe winters. (Feasibility of Transplanting Eastern Wild Turkeys on the Precambrian Shield in Central Ontario, Nguyen 2001)

Many of the wild turkeys released in the Sudbury region became emaciated from the lack of winter food sources and deep snow, and fell victims to predation. The mortality rate of transmitted birds was 92% -100%. (Wild Turkey Meeting Alban September 2001 MNR).

However, the West Arm-French River Wild Turkey Group has reported wild turkey sightings. There is some concern as to whether the turkeys remaining in the Sudbury region are new generations from the original introduced stock or farm-raised turkeys. It was reported that turkeys exhibited very tame behaviour. (pers comm. with Mike Hall biologist Sudbury District office MNR, 2003) (Noelville Experiment Wild Turkey Release 2001 Gobbling Survey Results, West Arm/French River Wild Turkey Group).

To ensure survival of wild turkeys in the Sudbury region, the local hunting group has engaged in landscape enhancement by planting 900 trees and shrubs identified as important food sources. (Wild Turkey Meeting Alban, September 2001) It is not clear as to whether these are native or non-native plants. In addition, there is supplementary feeding of wild turkeys (Wild Turkey Winter Feeding Guidelines, Provincial Wild Turkey Working Group 2001), and there is discussion regarding predator control. (Wild Turkey Meeting Alban, September 2001).

There are many research papers that document the negative impacts of non-native plant and animal species in Ontario, including government documents, especially in the Great Lakes Aquatic system and the Carolinian Forest region. (Ecological Impacts of Fish Introductions: Evaluating the Risk, MNR 2000)

Conservationists have also become concerned that increasingly popular wildlife feeding or baiting practices could expose wildlife to toxic amounts of aflatoxin-contaminated grains (mould in grains). Turkeys are especially susceptible to aflatoxins. (Quist, Bounous, Kilburn, Nettles, Wyatt, Journal of Wildlife Diseases, 2002)

Supplementary feeding also increases predation on nests. (Cooper, Ginnett, Wildlife Society Bulletin, 2000).

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None of these practices are accepted wildlife management principles according to conservation biology, and raise serious concerns regarding the feasibility of wild turkey survival in marginal landscapes and the impacts to native species, especially local predator populations. It has been suggested that the success of wild turkeys in southern Ontario is partially due to the lack of predators. (Feasibility of Transplanting Eastern Wild Turkeys on the Precambrian Shield in Central Ontario, Nguyen 2001)

In addition, wild turkeys have been reported in Killarney Wilderness Provincial Park. (Noelville Experiment Wild Turkey Release 2002 Gobbling Survey Results, West Arm/French River Wild Turkey Group). Wilderness parks are the most ecologically significant areas in the province because the forces of nature are allowed to function freely with little human intervention. The spread of wild turkeys into this area could have irreversible impacts.

Nonetheless, the persistence of wild turkeys in the Sudbury has encouraged the Ministry to continue introduction in other regions in central Ontario. In December of 2002, it released turkeys in Lanark County near Ottawa, and is currently proposing to introduce wild turkeys onto St. Joseph Island, in the North Channel in the Sault Ste. Marie region.

A preliminary habitat evaluation for St Joseph Island was conducted in 1999. The report notes a distinct absence of Ontario-based information, despite recent successes in wild turkey reintroductions in southern Ontario. It further notes that the great dissimilarities between the climates and habitat types for most U.S. based studies and this region detracted from the value of much information. The report concludes that good suitable habitat exists on St Joseph Island to support an introduction of wild turkey. However, the report failed to explore island ecosystem dynamics, densities requirements and competitive roosting sites with other birds that nest near water, such as the Great Blue Heron.

Ruff and Sharp-Tailed Grouse live on St. Joseph Island. It has been suggested that decline of ruffed grouse in some areas may be due to the increase in wild turkeys. The Ruffed Grouse Society has suggested that competition for succulent herbaceous vegetation might occur in winter months. However, they note that this would largely be limited to those regions where ruffed grouse populations are low and isolated. (Internal Risk Analysis: Introduction of Wild Turkeys to St. Joseph Island, Ontario, MNR 2002) An island could be considered an isolated or fragmented habitat.

Furthermore, a 1992 study, reports that wild turkeys have been documented to lay their eggs in ruffed grouse nests. The results being that these nests failed to hatch live grouse chicks. (Stoll, Ohio Department of Natural Resources, Ohio Journal of Science, 1992).

The rapid population growth over the past several decades are partly a result of the species' reproductive biology, characterized by early sexual maturity (1 year), polygamous mating, and average clutch size of 10 to 12 eggs annually per female. Once introduced, it is expected that wild turkey populations will multiple rapidly. Indeed, the initial spring releases of 96 birds in 1984 and 1985 to the Napanee district in Ontario, multiplied to an estimated 800 by September 1985. (Wild Turkey Management Plan For Ontario, MNR 1985)

The Ontario Ministry of Natural Resources is planning further wild turkey releases outside of their historical range. Some releases are scheduled from January 2003 through to March 2003. (Environmental Bill of Rights Registry Number PB02E6024). Once wild turkeys are released, then is becomes impossible to eradicate the species.

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The expansion of non-native species has had serious and irreversible impacts on the natural environment. I have included two examples of species that are native to some parts of Ontario but have expanded beyond their historical range. This expansion into different regions not considered part of their historical range makes them non-native species to that region, and has shown to have adverse ecological impacts.

White-tailed deer are native to deciduous hardwood forests, such as the Carolinian Forest of southern Ontario. Primarily an American species, its historical range in Ontario was limited to southern Ontario.

According to the Canadian Wildlife Service, when Europeans first explored the northern half of the continent they found deer in only the most southerly parts of Canada and this situation had not changed much at Confederation. At that time there were no deer in Nova Scotia and they were not numerous in New Brunswick. Deer were in southern Quebec and their range extended some distance down the St. Lawrence River and up the Ottawa River. Although deer were numerous in southern Ontario, none had penetrated northward beyond Lake Nipissing.

Since then human activities, including the cutting and burning of blocks of forests, the seeding of agricultural crops, the winter feeding of cattle, the reduction of competitors such as mule deer, elk, moose, and bison, and the restriction of hunting of white tails have helped this deer to extend its range northward and westward. Long-term easing of the severity of winters may have been an important factor. Whatever the exact combination of causes, the range of the white-tailed deer extended considerably during the late 19th and the first half of the 20th centuries. (Canadian Wildlife Service, 2002)

Deer in Canada are relatively free of serious diseases or parasites, however they carry a parasite that impacts on other wildlife. Known as meningeal worm or brain worm, it is a serious disease of moose and caribou - two wildlife species native to central and northern Ontario. It attacks the meninges, or membranes, surrounding the brain and spinal chord. Meningeal worm is a parasite of white-tailed deer, who are adapted to it. However, it is deadly to moose, and there is a long history of moose mortality in regions where the two species overlap in their distribution. (Canadian Wildlife Service, 2002)

Deer are now present as far north as Hearst, Ontario (pers. comm. Charlie Baxter, Constance Lake First Nation, 2001), and while many welcome the appearance of deer in the far north for hunting purposes, their occupation of traditional caribou habitat singles the decline of woodland caribou. Woodland Caribou are deep forest dwellers, and depend on old-growth boreal forests to survive

White-tail deer have steadily moved north as old growth boreal forests have been clearcut and replaced with fast growing deciduous trees. As a consequence, woodland caribou have retreated and now occupy the very last track of pristine boreal forest. The serious loss of their habitat has placed them on the Canadian Species At Risk list. (Committee on the Status of Endangered Wildlife in Canada, 2002)

If we were to seriously embrace the Ontario Ministry of Natural Resources' claim that landscape conversion alone is enough to justify the propagation of a new or preferred species, then it would render null and void any restoration efforts to preserve a species at risk and its habitat.

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There is currently a raging debate over the ecological impacts of fish stocking in the Great Lakes and especially the stocking of salmonines. The emerging science on this issue is showing that the introduction of new aquatic species in the Great Lakes is having adverse effects on the Great Lakes aquatic system and hindering restoration efforts. Stephen S. Crawford, Ph.D., Axelrod Institute of Ichthyology, University of Guelph, recently published a study: Salmonine introductions to the Laurentian Great Lakes: an historical review and evaluation of ecological effects, that concludes that the ongoing introduction of non-native salmonines poses an ecologically-significant risk to the Great Lakes ecosystem and its native organisms, and that the introductions should be terminated. This includes the introduction of Atlantic salmon, native to the St. Lawrence River and eastern Lake Ontario.

This has convinced the MNR's Director of Fish and Wildlife, Cameron Mack to ask the Great Lakes Fishery Commission to establish a "third party, expert panel" to examine the ecological effects associated with the ongoing stocking of non-native salmonines in the Great Lakes basin. I have submitted the most current correspondence to this effect.

Below is the Executive Summary of the report, Salmonine introductions to the Laurentian Great Lakes: an historical review and evaluation of ecological effects. (S. Crawford, Canadian Special Publication of Fisheries and Aquatic Science, 2001)

Executive summary

The goal of this report is to provide an historical review and evaluation of documented ecological effects associated with salmonine introductions to the Laurentian Great Lakes. To date, no comprehensive reviews or evaluations have been conducted by any of the Great Lakes fisheries management agencies that participate in, or support, ongoing salmonine introductions. The absence of such a review is noteworthy, especially in light of evidence from the scientific literature that salmonine introductions have had significantly-negative ecological effects on the native members of the Great Lakes community.

History of salmonine introductions

The introduction of salmonines to the Great Lakes dates back to the 1870s, when natural populations of native salmonines in the Great Lakes (e.g. lake charr, brook charr, Atlantic salmon in Lake Ontario) were in severe decline. These declines were largely attributed to human activities, especially habitat degradation (urbanization, damming, deforestation, agriculture) and overharvesting. Early salmonine introductions in the Great Lakes began with the development of hatchery technology, like the Newcastle facility constructed by Samuel Wilmot for rehabilitation and support of native Atlantic salmon in Lake Ontario. Several non-native salmonines were released by both American and Canadian agencies into the Great Lakes during the early (1870-1960) era of introductions:
Atlantic salmonines:
Atlantic salmon (Salmo salar), outside of Lake Ontario
Brown trout (Salmo trutta)
Pacific salmonines:
Chinook salmon (Oncorhynchus tshawytscha)
Coho salmon (Oncorhynchus kisutch)
Rainbow trout (Oncorhynchus mykiss)
Kokanee (Oncorhynchus nerka)
Chum salmon (Oncorhynchus keta)
Cutthroat trout (Oncorhynchus clarkii)

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Masu salmon (Oncorhynchus masou)
Pink salmon (Oncorhynchus gorbuscha)
Arctic salmonines
Arctic charr (Salvelinus alpinus)

These early salmonine introductions were intended to develop self-sustaining, wild-reproducing populations to support food, commercial or recreational fisheries. With the exception of brown trout and rainbow trout populations in some Great Lakes tributaries, the early introductions failed to achieve their objectives. Pink salmon, a non-native Pacific salmonine unofficially released to Lake Superior in 1956, quickly established self-sustaining, wild-reproducing populations in the Great Lakes.

Beginning in the mid-1960s, American and Canadian fisheries agencies began an intensive round of salmonine introductions to the Great Lakes that included brown trout, rainbow trout, chinook salmon, coho salmon and kokanee. The objectives for these introductions were (1) to develop self-sustaining, wild-reproducing populations to exert biological control of non-native planktivorous fishes, and/or (2) to develop new recreational fisheries. Alewife and rainbow smelt had become abundant in the Great Lakes, and in some cases were considered to be an aesthetic, economic and ecological nuisance. Both alewife and rainbow smelt had been introduced by humans to the Great Lakes; alewife were released unintentionally, and rainbow smelt were released intentionally as food for introduced Atlantic salmon.

Recently, continued declines in the abundance of alewife in Lake Michigan and Lake Ontario have raised arguments about whether to decrease stocking of salmonines and prevent a collapse in the alewife populations, or to maintain/increase stocking and support the expanding recreational fisheries. In either case, it has become clear that biological control of alewife and rainbow smelt is no longer a major objective for fisheries managers. Ironically, the alewife and rainbow smelt that were originally considered a novelty, then a nuisance, are now considered by sportsmen and fisheries managers to be a valuable food resource for introduced salmonines. Currently, the only major objective for salmonine introductions in the Great Lakes is the development and maintenance of recreational fisheries.

Despite explicit ecological warnings made in the 1960s about the potential for ecological damage resulting from salmonine introductions, American and Canadian fisheries agencies continued with their Great Lakes salmonine introduction programs. Neither American nor Canadian fisheries agencies conducted comprehensive pre- or post-introduction ecological evaluations of salmonine introductions. Since the 1960s introductions of salmonines to the Great Lakes have increased dramatically, with estimates of total stocking in excess of 745 million fish released during the period 1966-1998, an average of more than 61,000 fish released every day for 33 years. The vast majority (i.e. >91%) of these introduced salmonines have been released by American hatcheries.

Effects of introductions on the introduced salmonines

Introduced salmonines have generally survived and grown well in the Great Lakes ecosystem, especially when feeding on forage fishes such as alewife and rainbow smelt. Recently, concerns have been expressed about the decline observed in growth and survival rates of introduced salmonines in the Great Lakes basin, especially chinook salmon. It has been hypothesized that stocking of the introduced salmonines has led to reductions in the availability of their forage base, especially alewife. Introduced salmonines have

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developed a reputation for dispersion and migration, especially in the open-lake environments of the Great Lakes basin. These movements have been described at the intra- and inter-basin level, and have been associated with colonisation of habitat where the fish had not previously been stocked.

There is a high degree of uncertainty regarding reproduction of the introduced salmonines in the Great Lakes. For species such as brown trout and rainbow trout, reproduction can reach levels that support wild populations, especially in cases where the population is stream-resident. However, for pelagic species such as chinook and coho salmon, the ability to maintain populations through wild reproduction is highly suspect. Some researchers have argued that the quantity and quality of spawning habitat in Great Lakes tributaries are limiting factors for reproduction. In many cases, populations of introduced salmonines are thought to be heavily stocked beyond levels of reproduction observed in the wild, primarily to support the put-grow-and-take recreational fisheries.

One of the more alarming effects that introductions have had on the non-native salmonines is the alteration of the life-history characteristics of the introduced species. Shifts from 'normal' patterns have been observed in body form and function, feeding and spawning behaviour. Such life-history shifts can be expected when organisms are transplanted to novel environments, and are subjected to novel ecological and evolutionary pressures.

Effects of introductions on the receiving Great Lakes ecosystem

Non-native diseases (e.g. furunculosis, whirling disease) and parasites (e.g. Philonema oncorhynchi, Ergasilus nerkae) may have been introduced to the Great Lakes along with the introduced salmonines. Of all the Great Lakes species, native salmonines (lake charr, brook charr) are likely the most susceptible to these new diseases and parasites. The intensive culture of hatchery-reared salmonines poses a threat to native fishes by artificially increasing the disease and parasite 'reservoir' that native fishes are exposed to in the wild.

Predation by introduced salmonines on native species in the Great Lakes basin is a serious concern because the stocked fish are 'generalist, vertebrate predators' - they have the ability to feed on a wide variety of prey species. This danger is particularly evident in Great Lakes tributaries where juvenile and stream-resident salmonines forage on a common supply of native species, including a variety of invertebrates and fishes. In the open-lakes, many introduced salmonines forage primarily on alewife and rainbow smelt, however they also feed on native sculpins, bloater, and yellow perch - at levels that may pose a significant threat to the supporting forage populations. It has been predicted that introduced salmonines will switch to alternate, native species as alewife populations decline and/or stocking for the recreational fisheries increases. This switch in behaviour can expose the populations of native forage species to the risk of excessive mortality, especially in situations where stocking programs exceed carrying capacity of the native community.

Competition between introduced salmonines and native species in the Great Lakes basin has been investigated by a limited number of experimental studies. In tributaries, there is evidence that the larger and more aggressive introduced salmonines outcompete smaller native species (e.g. brook charr) for limited food, cover and stream position. In open-lake environments, studies have shown that introduced salmonines forage voraciously on the same species that is dominant in lake charr diets (i.e. the declining alewife popula-

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tions). Spatial bioenergetic models have shown that lake zones of growth potential for lake charr and chinook salmon have a high degree of overlap. There is also evidence of spawning-phase chinook salmon directly interfering with spawning lake charr in one of the last two self-sustaining populations in Lake Huron.

Genetic alteration of native species by introduced salmonines in the Great Lakes can be either direct or indirect. There is evidence of direct alteration effects, such as hybridization and introgression with native species. Indirect effects, like those associated with declines in population abundance of native species, have occurred as a result of intensive stocking of introduced salmonines.

Environmental alterations by introduced salmonines have been reported in both tributaries and open-lake environments of the Great Lakes basin. In tributaries, spawning salmonines dig up nests or superimpose their redds on the habitat of native species. These physical alterations have been shown to have community-level effects on the abundance and distribution of native fishes and invertebrates in the tributaries. Spawning runs of introduced salmonines have also been shown to transport significant levels of contaminants upriver from the lakes.

Community alteration occurs when the structure or function of a native community is affected by introduced species. In the Great Lakes basin, community structure has been affected by the feeding habits and competitive interactions of the introduced salmonines. In open-lake environments, introduced salmonines have taken on a dominant role as upper-level predators - yet they exist in numbers often more determined by hatchery production capacities than by the characteristics of the ecological community they live in. In Great Lakes tributaries, introduced salmonines have been shown to alter community ecology by increasing the levels of limiting nutrients and toxins picked up in the open-lake environments. A conspicuous example of this kind of community alteration occurs when introduced salmonines embark on massive, and typically lethal, spawning runs into the tributaries. The spawning runs of the introduced salmonines stand in contrast to the typical stream-resident or lake-resident tendencies of the native brook and lake charrs, respectively.

Taken together, this body of evidence supports the conclusion that the ongoing introduction of non-native salmonines poses an ecologically-significant risk to the Great Lakes ecosystem and its native organisms, and that the introductions should be terminated. (S. Crawford, Canadian Special Publication of Fisheries and Aquatic Science, 2001)

The intent of this proposal is to establish a sustainable wild turkey population in Wildlife Management Unit 45, St. Joseph Island. Once a sustainable population of wild turkey in Wildlife Management Unit 45 is achieved, a hunting season will be introduced providing new opportunities for Ontario residents. It is anticipated that it will take 3-5 years to obtain a sustainable population. (Environmental Bill of Rights Registry Number PB02E6024).

No hunting opportunities will be immediately lost because of an injunction order.

The applicant makes application for an injunction until a full environmental assessment can be considered and/or approved by the Ontario Ministry of Environment and Energy.

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References

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2) Wild Turkey Management Plan for Ontario (Fish and Wildlife Branch, MNR 1985)

3) 2000 Ontario Wild Turkey Status Report (Fish and wildlife Branch, MNR January 2001)

4) Wild Turkey Management Plan for Ontario (Fish and Wildlife Branch, MNR 1994)

5) Article 8. In-situ Conservation of the Convention on Biological Diversity

6) Wild Turkey Working Group Final Assessment of the Sudbury Experimental Wild Turkey Study release Site (January 1999 memo, Fish and Wildlife Branch, MNR)

7) California Native Plant Society and Save Our Forests and Ranchlands vs. California Department of Fish and Game - Super Ct. San Diego County, 1996, No. 694053 (California Department of Fish and Game, Sacramento, Calf.)

8) California Department of Fish and Game Draft Environmental Impact Report - Summary only, 2002, Sacramento, Calf.

9) California Department of Fish and Game. Letter to All Interested Parties (November 4, 2002) Sacramento Calf.

10) Feasibility of Transplanting Eastern Wild Turkeys on the Precambrian Shield in Central Ontario (Linh P. Nguyen 2001, School of Graduate Studies and Research, Laurentian University, Sudbury Ontario August 2001)

11) Meeting minutes of the West Arm/French River Wild Turkey (Alban), researchers from Cambrian College and MNR staff (Fish and Wildlife Branch, MNR September 2001)

12) Summary Report from the West Arm/French River Wild Turkey Group (Spring 2001 gobbling survey memo, Fish and Wildlife Branch, MNR)

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14) Ecological Impacts of Fish Introductions: Evaluating the Risk (Kerr, S.J. and R. E. Grant, RE Grant . 2000. Fish and Wildlife Branch, MNR)

15) The effect of dietary aflatoxin on wild turkey poults (Quist, Bounous, Kilburn, Nettles and Wyatt, Journal of Wildlife Dieases, 2000. Vol. 36. No. 3 pp. 436-444)

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18) Habitat evaluation for Wild Turkey on St. Joseph Island (H. Cooper, Sault College 1999)

19) An Internal (MNR) Risk Analysis assessing the expected effects of the release of wild turkeys at St. Joseph Island (Fish and Wildlife Branch. MNR Fall 2002)

20) Wild Turkey Egg Laying in Ruffed Grouse Nests - Brief Note (Robert J. Stoll Jr., Ohio Department of Natural Resources, Ohio Journal of Science, 1992. Vol. 92 No. 3 pp. 70-71)

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22) The World Conservation Union (IUCN) Species Survival Commission, http://www.iucn.org/themes/ssc/pubs/policy/invasivesEng.htm

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24) Salmonine introductions to the Laurentian Great Lakes: an historical review and evaluation of ecological effects. (S. Crawford, Canadian Special Publication of Fisheries and Aquatic Science, 2001)
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