



Donna Wales
Ministry of Natural Resources
300 Water Street, Floor 2
Robinson Place North Tower
Peterborough, Ontario K9J 8M5

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Via e-mail: donna.wales@ontario.ca

RE: Ontario Ministry of Natural Resources Invasive Species Discussion Paper - EBR Registry No. 011-9780

Dear Donna,

Thank you for the opportunity to provide comments on the above document, offered as part of Ontario's Ministry of Natural Resources (OMNR) development of new tools to better address invasive species that impact biodiversity and the economy of Ontario. I am submitting comments based on input from my colleagues (Mohammed Alshamlih, Brie Edwards, Jenni McDermid, Sarah Nienhuis), in our respective capacities as WCS Canada¹ scientists specializing in fish and wildlife ecology, conservation biology, and landscape ecology in Ontario. We agree that invasive species are an important threat to conserving native biodiversity and recognize they have important consequences on economic sectors such as agriculture, forestry, and recreation. We are pleased that OMNR has begun to address invasive species in Ontario in a more comprehensive way with an overarching strategy rather than a piecemeal approach to a few targeted species (ECO 2004).

We take this opportunity to reply to the questions requested in the Discussion Paper directly:

1. *The discussion paper identifies that invasive species are a growing threat to Ontario's economy and biodiversity. Do you agree with this statement? If so, what additional measures do you feel need to be taken?*

We agree with this statement. We suggest invasive species are a significant threat to biodiversity and OMNR has been slow to address this in a comprehensive way (ECO 2004). While we are pleased that OMNR considers

¹ Wildlife Conservation Society Canada (www.wcscanada.org) was established in May 2004 as a Canadian non-government organization with a mission to conserve wildlife and wildlands by improving our understanding of and seeking solutions to critical problems that threaten key species and large wild ecosystems throughout Canada. We implement and support comprehensive field studies that gather information on wildlife needs and then seek to resolve key conservation problems by working with many actors, including First Nation communities, Government and regulatory agencies, conservation groups, and industry.

this issue a priority, invasive species management needs to consider a whole-ecosystem approach addressing both the current role and function of invasive species in the ecosystem (e.g., Zavaleta et al. 2001). In general, there is a tension between management of biodiversity versus the economic impacts of invasives throughout this document that stems in part from OMNR's mandate. It is not always clear to the public how OMNR prioritizes one over the other.

In addition to the need for more enforcement and systematic monitoring, we offer the following alternative measures for aquatic species:

Food, pets, and bait

- More thorough investigation of the live food fish, live bait, and aquarium fish trades at borders and point-of-sale.
- Increased frequency of inspection by enforcement officers with expertise in identifying non-native species.
- Research on the sale of non-native species over the internet as a potential trade pathway.

Outreach and education

- Target religious and cultural practices that intentionally release non-native species (e.g., Shiu & Stokes 2008).
- Evaluation of education programs focused on recreation (e.g., fishing, boating).
- Mandatory education as part of licensing and/or other permitting and regulation processes.

For all invasive species we suggest proactive and systematic monitoring. Given the focus on prevention, we suggest there is a need to invest in more comprehensive monitoring to promote early detection of new invasive species, particularly in areas such as Ontario's Far North. We think this is clear option for being able to respond rapidly to control or eradication plans. In addition, this would provide excellent information on the state of biodiversity in Ontario. Finally, we are very supportive of efforts to address fish and wildlife health and disease assessment and monitoring.

- 2. This discussion paper suggests using a risk-based approach to list species. Risk assessments would use the best available scientific information to estimate the likelihood of an invasive species being introduced, and to evaluate the potential consequences of introduction. Do you agree with this approach? If not, what approach should be considered?*

We agree with the use of risk assessments based on the best available science. A framework for listing and prioritizing invasive species should be both quantitative and transparent. However, we are concerned about the financial resources and expertise within OMNR to implement such a listing process.

- We suggest that OMNR consider establishing a risk assessment section directed by OMNR staff with expertise on invasive species.
- While invasive species risk assessments are proposed to be carried out by OMNR, OMNR could accept independent reviews or assessments undertaken in other jurisdictions for listing consideration.
- We strongly recommend that OMNR consider integrating climate projections to assess how future climate may affect spread and management of invasive species during risk assessment.

- We suggest OMNR also create processes to include traditional knowledge to support listing and invasive species management where there are gaps in scientific knowledge (e.g., Ontario's Far North).

Finally, we could not find any reference to listing in the *Ontario's Invasive Species (OIS) Strategic Plan*. It is unclear how the listing process and the categories (#3 below) emerge from or are linked to the OIS Strategic Plan.

3. *The discussion paper suggests assigning listed species to categories. Suggested categories include: a category targeting prevention and eradication, and a category targeting prevention of spread and control. Do you agree with categorizing species? What additional categories should be considered?*

We agree with the use of categories to support prioritization and identify strategies and actions appropriate for the species or circumstances. However, we suggest a modification of these categories as follows:

- 1) Prevention.
- 2) Control and containment, reducing the presence of the invasive species limiting further spread.
- 3) Eradication and restoration.

We suggest prevention and eradication be in their own categories or identified as a component of both categories explicitly regardless of whether the invader is established or not. Prevention should be a priority for invasive species management.

We acknowledge that prevention requires the collaboration of several agencies, however, OMNR should take a leadership role the coordination of control efforts and education of inspection officers. Further, control and containment require indefinite investments of time, money, and tools to keep the invasive species under control. The Ministry should elaborate on opportunities for partnerships and funding to address control efforts. Finally, although eradication efforts also typically require large short-term investments, successful removal can be achieved and provides the best chance for native biodiversity to recover in some systems (Myers et al. 2000, Zavaleta et al. 2001). Priority tools and actions should be based on a critical review of eradication vs. control and containment approaches and consider the need for restoration in invasive species management. Restoration may depend on one vs. multiple invasive species, the number of invasive species, and the extent to which they have eliminated native species and their functional role in the community and ecosystem. Currently, neither the Strategic Plan nor the discussion document consider restoration or the planning associated with returning systems back to their previous condition once invasive species are removed or "under control".

4. *The discussion paper acknowledges there are many non-native species in Ontario that are not a threat, and that provide significant benefits to Ontarians and suggests listing allowed species. Do you agree with this approach? Can you explain how this approach would provide an overall benefit to Ontarians?*

In general, we agree that a proposed list of allowed species would be beneficial because it would provide clarity on what is legal to possess, sell, buy, or propagate without penalty. We also suggest that this list reflect regional differences due to climate change and current ecosystem status. For example, rainbow trout that are "allowed" in southern Ontario should not be allowed in northern Ontario. To support a public review of this list, however, it would be necessary to provide the historical context for why these species are not considered a "threat" to native biodiversity in the ecosystems where they are found. The allowed list should be reviewed and modified on a regular basis and OMNR should clarify when and how species can be delisted from the "allowed" list.

5. *The discussion paper lists exemptions that could apply to listed species and carriers. Some examples include, research on listed invasive species, live specimens used for educational purposes, species that are consumed as food provided they are dead and eviscerated, carriers could be exempt provided research shows they are not a risk for transporting invasive species. Are there additional exemptions that should be considered?*

Other than scientific and/or educational research, we are not in favour of creating exemptions. Those applying for exemptions should still be required to address the risks associated with their work and be managed accordingly.

6. *The discussion paper references the use of management plans for high-risk species. Are there specific cases where adherence to the control measures listed in a management plan may reduce the level of risk associated with the proposed control/eradication measures and improve the likelihood of eradication?*

Management plans for invasive species need to be designed within an ecosystem context. These plans should include clear goals and objectives based on the risk assessment and may also differ across the region (e.g., Far North vs. southern Ontario). We would anticipate that a management plan would include provisions for a number of alternatives and scenarios, including "doing nothing", "control and containment", and "eradication and restoration". The Ministry should avoid the use of templates or lengthy documents and ensure that actions are designed strategically by knowledgeable individuals.

7. *The threats posed by invasive species are of such societal significance that no one government or agency can solely be responsible to prevent their spread. The discussion paper suggests that OMNR should expand its partnerships with a broader suite of organizations. Do you feel this approach is appropriate?*

We agree with the need for partnership for both program development and delivery. We are, however, wary of the statement as experience shows this is usually a consequence of budget cuts with a tendency to download responsibilities to other parties. We are aware of the restructuring and financial challenges OMNR is facing. It is not clear how much of the work we expect OMNR to do, will be "downloaded" to partners. Regardless of partnership opportunities, we expect a strong leadership role from OMNR who should be in charge of listing and assessment as well as management planning and enforcement of regulations and other tools identified through the risk assessment and management planning process. It is possible that other partners could support control and eradication efforts more efficiently than OMNR.

8. *New enabling tools are suggested, including the need to enable the listing of species by other agencies, and new tools to help enable control. What specific enabling provisions should be considered?*

We agree with the consideration of enabling tools including those identified in the paper. Other suggestions include considering the use of conservation authorities in the listing of invasive species and enabling other federal and provincial agencies to address control directly (e.g., MTO, DFO). Finally, enabling and working with First Nations to locate and address invasive species within their traditional territories represents another important opportunity for consideration.

9. Please share any additional comments you feel would be relevant to this discussion paper.

Lack of attention to invasive species issues in the Far North. The discussion document and the Strategic Plan identify the causes for the high number of invasive species in Ontario due to a highly industrialized and urban society with global and locally mobile human populations as well as a high density of transportation and opportunities for moving across borders. Although such drivers are significantly lower than in the south at present, invasive species are an important priority in the Far North because of anticipated industrial development (e.g., Ring of Fire) and the need for infrastructure (e.g., roads) to support remote developments such as mines and hydroelectric facilities. Recognizing this, the Far North Science Advisory Panel's Report, *Science for a Changing Far North*, recommended that new development should be planned to "prevent the introduction of invasives" (2010: 104). Access management associated with new roads and infrastructure as well as development projects (e.g., forestry, mining) should address monitoring and actions focused on exclusion of invasive species. Other opportunities to address invasive species more proactively in the Far North include monitoring of fish and wildlife health and disease as well as inspection and cleaning of trucks and equipment associated with developments and access to reduce the risk of accidental introduction. Rather than rely on project-level environmental assessment and piecemeal land use planning that tend to increase edge effects and fragmentation in intact landscapes, OMNR should take a leadership role and use this opportunity to provide explicit guidance on invasive species mitigation and management in the Far North in the context of regional planning, including strategic access planning.

We suggest OMNR prioritize the Far North with respect to invasive species because:

- The Far North contains globally significant aquatic and terrestrial ecosystems, with a high degree of intactness and ecological integrity. These systems currently have little or no form of protection.
- For aquatic species at least, a natural barrier between primary watersheds in the Far North reduces the likelihood of natural expansion of invasive species.
- Despite the resiliency of the Far North ecosystems, they tend to have fewer species and smaller food webs and communities. Invasive species could have a disproportionate impact on ecosystems as a consequence.
- There is a general lack of scientific data on fish, wildlife, and ecosystem processes in the Far North and few tools to addressing conservation planning and cumulative effects of development and impacts due to climate change.

Invasive species and climate change. Ontario considers native species invasive if their introduction or spread can be linked to our changing climate. While this appears precautionary, it is not clear how OMNR will address species' adaptation to climate change under this definition. Research by OMNR suggests that the effects of climate change on communities and ecosystems are difficult to generalize because of complexities associated with biotic interactions (e.g., Varrin et al. 2007). In addition, assisted migration of native species to areas outside their geographic range is one of the adaptation tools OMNR is exploring for addressing climate change and supporting biodiversity, according to *Climate Ready: Ontario's Adaptation Strategy and Action Plan* (2011: 57). Although the OIS Strategic Plan alludes to range expansion due to climate change, it would be helpful to make the links between these plans more explicit. We suggest OMNR consider the implications of the proposed definition more critically given climate change adaptation planning.

Lack of attention to restoration. There is no attention to concepts of restoration and rehabilitation in this document. We suggest that restoration could be an important consideration in the face of climate change and

responses to invasive species, especially if eradication is considered. Restoration also provides important learning opportunities for understanding ecosystem function and the impacts of our approaches to managing invasive species (e.g., pesticides, herbicides, fire, grazing management) (e.g., Smith et al. 2006). In the Far North, it is essential that restoration of impacted ecosystems (e.g., mines, new roads, infrastructure) and climate change (e.g., stocking) as well as recreational opportunities (e.g., remote fishing) focus on native species.

Thank you again for this opportunity to comment. I would be happy to discuss these comments further.

Sincerely yours,



Cheryl Chetkiewicz, Ph.D.
Associate Conservation Scientist

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