

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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1 **American Eel**

2 **Ontario Government Response Statement**

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3 **Protecting and Recovering Species at Risk in Ontario**

4 Species at risk recovery is a key part of protecting Ontario's biodiversity. The  
5 *Endangered Species Act, 2007* (ESA) is the Government of Ontario's legislative  
6 commitment to protecting and recovering species at risk and their habitats.

7 Under the ESA, the Ministry of Natural Resources and Forestry (the Ministry) must  
8 ensure that a recovery strategy is prepared for each species that is listed as  
9 endangered or threatened. A recovery strategy provides science-based advice to  
10 government on what is required to achieve recovery of a species.

11 Within nine months after a recovery strategy is prepared, the ESA requires the Ministry  
12 to publish a statement summarizing the government's intended actions and priorities in  
13 response to the recovery strategy. The response statement is the government's policy  
14 response to the scientific advice provided in the recovery strategy. In addition to the  
15 strategy, the government response statement (GRS) considered (where available) input  
16 from stakeholders, other jurisdictions, Indigenous communities and organizations, and  
17 members of the public. It reflects the best available local and scientific knowledge,  
18 including Traditional Ecological Knowledge, at this time and may be adapted if new  
19 information becomes available. In implementing the actions in the response statement,  
20 the ESA allows the Ministry to determine what is feasible, taking into account social and  
21 economic factors.

22 The Recovery Strategy for the American Eel (*Anguilla rostrata*) in Ontario was  
23 completed on November 22, 2013. To comprehensively consider and address the  
24 complexities associated with the protection and recovery of American Eel, the Ministry  
25 took additional time to prepare this GRS. During this time, the Ministry undertook  
26 enhanced engagement, reviewed recent science and monitoring information, and  
27 sought additional advice from stakeholders and Indigenous communities. All  
28 recommendations provided in the recovery strategy, along with additional jurisdictional,  
29 scientific, cultural and socio-economic information, were considered in developing this  
30 government response statement. This GRS identifies actions that are considered to be  
31 appropriate and necessary for the protection and recovery of the species.

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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32 The American Eel is a fish with a long, snake-like body and fins that extend along its  
33 back, around the tail and along its underside. Juveniles are yellowish-brown in colour,  
34 changing to grey with a pale belly when mature. Adult females from Ontario can be over  
35 one metre in length.

36 **Protecting and Recovering American Eel**

37 American Eels are found along the coastal and inland waters of eastern North America  
38 and range as far north as Greenland, and south to northern South America. The species  
39 has experienced range reductions, local extirpations and substantial declines  
40 throughout much of its North American range, with more significant declines in Ontario  
41 than in other parts of its range.

42 American Eel is listed as an endangered species under the ESA, which protects both  
43 the animal and its habitat. The ESA prohibits harm or harassment of the species and  
44 damage or destruction of its habitat without authorization. Such authorization would  
45 require that conditions established by the Ministry be met.

46 American Eel has differing levels of conservation status and protection in different  
47 jurisdictions across its range. In Canada, the federal Committee on the Status of  
48 Endangered Wildlife in Canada (COSEWIC) assessed American Eel as threatened in  
49 2012; however the species is not currently listed under the federal Species at Risk Act.  
50 In Quebec, the American Eel is considered a species likely to become listed under  
51 Quebec's Act Respecting Threatened or Vulnerable Species. The United States Fish  
52 and Wildlife Service determined in 2015 that the listing of American Eel as threatened  
53 under the United States (U.S.) Endangered Species Act was not warranted; although  
54 the species had been extirpated from parts of its historic range, the population was  
55 determined to be stable overall and not in danger of extinction or likely to become  
56 endangered within the foreseeable future.

57 In Ontario, the American Eel is found within two major drainage systems: the Ottawa  
58 River drainage and the Lake Ontario–St. Lawrence River drainage, and was once  
59 distributed throughout many tributaries of these systems, existing inland to the  
60 headwaters of the Ottawa River watershed and to Niagara Falls on the Great Lakes.  
61 These systems provided a diversity of habitat types for the growth and maturation of  
62 eels. American Eel has undergone a significant range contraction in Ontario, and the  
63 species appears to have been extirpated from many parts of its former Ontario range.  
64 The species is currently known to occur at low densities in Ontario in: parts of the  
65 Ottawa River and its tributaries including the Mississippi, Bonnechere and South Nation  
66 rivers; and the Trent River, upper St. Lawrence River and Lake Ontario in the Lake

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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67 Ontario-St. Lawrence drainage. American Eel has also been detected in several other  
68 tributaries to Lake Ontario, but these eels are thought to be present as the result of a  
69 translocation experiment of eels from the East Coast, rather than eels that naturally  
70 arrived in Ontario.

71 Like all American Eels, those from Ontario begin life in the Sargasso Sea (near  
72 Bermuda) in the North Atlantic Ocean. American Eels from across the broad species  
73 range all travel there to spawn as one single population (referred to as panmixia). Once  
74 hatched, larval eels are unable to swim; they drift passively with ocean currents and are  
75 distributed along the east coast of North America. Eels mature over several years,  
76 developing the ability to actively swim and migrate inland, including to freshwater rivers,  
77 streams and lakes in Ontario via the St. Lawrence River, where their growth and  
78 maturation continues. Mature American Eels from Ontario, like all other individuals of  
79 the species, must travel back to the Sargasso Sea to reproduce. Factors that cause  
80 eels to arrive at the St. Lawrence River and travel upstream to Ontario are not well  
81 understood.

82 Although American Eels breed as one single population, eels may have different  
83 physical and behavioural characteristics (e.g., size, sex, etc.) depending on the  
84 environmental conditions in which they live. Near the northern extent of the species'  
85 range, including in Ontario, eels typically occur in lower densities and grow more slowly,  
86 maturing at a larger size than eels in the southern part of their range. While these  
87 characteristics were once thought to be influenced by the environment alone, recent  
88 research has shown that genetics may play a role. All eels that reach Ontario naturally  
89 develop into large females that typically spend between 10 to 15 years growing in  
90 Ontario and mature around 20 to 25 years of age (although observations of older eels  
91 have been reported). In recent years, eels in the St. Lawrence-Lake Ontario system  
92 appear to be maturing at smaller sizes and younger ages, but the reasons for this are  
93 presently unknown. The large size of Ontario eels ensures that they have sufficient  
94 energy reserves for their long distance out-migration to the Sargasso Sea. Due to their  
95 large size, eels that mature in Ontario also produce very high numbers of eggs and, at  
96 former levels of abundance, it is thought that Ontario eels may have substantially  
97 contributed to the reproductive potential of the global population.

98 American Eels can live in salt, brackish and fresh water. As their spawning ground is  
99 located outside of Ontario, access between spawning and growth habitat is very  
100 important for the species. In Ontario, eels usually dwell near stream, river or lake  
101 bottoms and burrow in soft bottom material or use rocks, wood or vegetation for cover  
102 during daylight hours. Small American Eels can also use riparian areas, and have a  
103 unique ability to leave the water and move over rough damp surfaces including rocks,

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

---

104 moss, and grass. While eels are growing and maturing, they are primarily nocturnal,  
105 swimming and feeding at night. American Eels do not show a consistent preference for  
106 specific habitat types, temperature, or bottom material, although their densities may be  
107 influenced by water depth and current. Because of their ability to make use of a wide  
108 variety of habitat types, American Eels are considered to be habitat generalists. At their  
109 current abundance levels, the species is not limited by the availability of growth and  
110 maturation habitat within their Ontario range. Access to a diversity of upstream habitats  
111 may be beneficial should species abundance increase.

112 Due to their long life-span and long-distance migrations, American Eel faces a variety of  
113 threats throughout its range. For eels found within Ontario, those of the highest concern  
114 are mortality and injury caused by downstream passage through turbines at hydro-  
115 electric generating stations during out-migration, reduced access to productive growth  
116 habitat caused by in-stream barriers to upstream migration (e.g., navigation, flood  
117 control and hydro-electric dams), and harvesting (historically in Ontario and ongoing in  
118 other jurisdictions). Other threats to the species may include habitat alteration and  
119 fragmentation, changing oceanic conditions as a result of climate change,  
120 contaminants, parasites, and changes in food webs and productivity, as well as the  
121 cumulative impact of all threats acting together. Because the species consists of one  
122 global population, and undertakes long-distance migration across multiple jurisdictions,  
123 actions and activities that affect American Eels outside of the province can limit the  
124 ability of the species to recover in Ontario.

125 As a result of threats, the number of American Eels found within Ontario has declined  
126 significantly. While the American Eel once formed more than 50% of the landed value of  
127 the Lake Ontario commercial fishery, abundance in Ontario has declined by 99% since  
128 the 1970s. Responsive to declining numbers of American Eels, in 2004 and 2005,  
129 Ontario closed the commercial and recreational American Eel fisheries. Commercial,  
130 Indigenous subsistence, and recreational fisheries for both juvenile and mature eels still  
131 exist in parts of eastern Canada and several U.S. states. A fishery for “silver” mature  
132 eels exists in Quebec on the St. Lawrence River and captures eels out-migrating from  
133 Ontario and Quebec waters. Trade restrictions on and shortages of other global eel  
134 species have placed increased pressure on the fishery for juvenile “glass” American Eel  
135 in North America to supply Asian aquaculture markets, resulting in a very high market  
136 value for glass eels collected along the Atlantic coast (over \$2,000/kg, approximately  
137 500 fish).

138 The American Eel has long had an important role for Indigenous peoples in Ontario.  
139 The Algonquins of Ontario (AOO) consider the American Eel to be sacred and have  
140 significant spiritual, material and sustenance values. The decline of American Eel within

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

---

141 Ontario waters results in a loss of knowledge of and experience with this species,  
142 means that eels are no longer available for nutritional and medicinal purposes, and  
143 affects opportunities to sustain the ceremonial and spiritual practices of Indigenous  
144 communities that have been associated with American Eel.

145 AOO's landmark report *Returning Kichissippi Pimisi to the Ottawa River Basin*, and two  
146 volumes of Traditional Ecological Knowledge, identify the importance of the relationship  
147 with American Eel to the Algonquin people and other Indigenous communities, and their  
148 interest and role in the recovery of the species.

149 **Actions to Date**

150 Many groups have taken steps in support of American Eel protection and recovery in  
151 Ontario by advancing our knowledge of the species, its habitat and threats, and  
152 undertaking actions to minimize threats known to impact the species. Recovery efforts  
153 have been undertaken by Indigenous peoples, hydro-electric power generators,  
154 commercial fishers, non-government organizations, universities and government.

155 Recovery efforts that have advanced our knowledge of the species include filling site-  
156 specific knowledge gaps through species surveys, the collection of Traditional  
157 Ecological Knowledge (TEK), investigating habitat requirements, and conducting public  
158 outreach and education. Actions to minimize the impact of threats to the species have  
159 included developing and evaluating methods to provide safe downstream passage, the  
160 installation, operation, and monitoring of eel ladders for upstream passage, and trapping  
161 of mature eels for safe transfer below hydro-electric generating stations.

162 In addition to these efforts, an experimental translocation of approximately 4 million  
163 immature eels from the Atlantic coast into Lake Ontario was undertaken between 2006  
164 and 2010 to mitigate the effects of turbine mortality on eels. Early results from this  
165 program were unexpected; sex, size and age at maturity of the translocated eel  
166 reflected the characteristics of the donor stock rather than wild Ontario eels. This  
167 created uncertainty as to whether the translocated eels have sufficient energy reserves  
168 and ability to migrate to and reproduce in the Sargasso Sea. As a result, such long-  
169 distance translocations of American Eel are not supported as a recovery tool until the  
170 results of the program can be fully evaluated. Shorter distance experimental  
171 translocations of immature eel from the St. Lawrence River to the Ottawa River have  
172 also occurred in recent years and require further evaluation as a potential recovery tool.

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

---

173 **Considerations in Developing a Goal**

174 The status of American Eel in Ontario has implications for provincial biodiversity and  
175 affects Indigenous communities that have long-standing relationships with the species.  
176 In preparing the government's recovery goal for American Eel in Ontario, both biological  
177 and cultural considerations were taken into account.

178 Despite efforts to fill knowledge gaps, much information is still unknown about the  
179 American Eel in Ontario, including: the distribution and number of eels in the province;  
180 the factors that influence the arrival of young eels to Ontario; safe, cost-effective ways  
181 to provide downstream passage at large hydro-electric generating stations; and the  
182 potential risks associated with providing upstream passage without safe downstream  
183 passage. In the absence of this information, establishing baseline estimates and setting  
184 measureable and achievable targets for American Eel abundance within Ontario is a  
185 challenge. Similarly, expanding the distribution of eel beyond the current range in the  
186 absence of effective mitigation associated with downstream passage may pose risks to  
187 the species' persistence in Ontario and have implications for the global population.

188 The protection and recovery of American Eel in Ontario will build on the ongoing efforts  
189 and knowledge of Indigenous communities, the waterpower industry, and other  
190 committed stakeholders and organizations. Activities will focus on strategically  
191 assessing and addressing passage issues, continued cooperative work in research and  
192 monitoring, protection and management of American Eels and their habitat, and the  
193 Province of Ontario working with other jurisdictions for the global protection and  
194 recovery of American Eel.

195 The province's goal for American Eel will focus on increasing the likelihood that eels  
196 that grow and mature in Ontario can successfully out-migrate, by working collaboratively  
197 to mitigate current threats. Of the eels that enter Ontario as juveniles, this will result in a  
198 rising trend, measurable over 25 years (around one eel generation), in the proportion of  
199 eels that leave the province as mature adults.

200 Although the effects of recovery actions undertaken in the immediate future may not be  
201 realized for one or more eel generations (25 years+), immediate efforts aimed at  
202 reducing anthropogenic mortality are required to achieve long-term outcomes  
203 associated with improved escapement success. Undertaking focused research, and  
204 incorporation of an adaptive framework to setting American Eel passage priorities will  
205 inform longer-term actions as immediate and short-term outcomes are achieved and  
206 allow for the integration of new information and technologies as they become available.

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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207 Ongoing monitoring will enable tracking of the progress and efficacy of recovery  
208 activities and determining whether recovery actions need to be adjusted.

209 **Government's Recovery Goal**

210 The government's goal for the recovery of American Eel is to increase the proportion of  
211 individuals that successfully migrate out of the province, within 25 years, by reducing  
212 threats to American Eel throughout its current Ontario range, and working with other  
213 jurisdictions to understand and address global threats.

214 Ontario recognizes that efforts to support American Eel protection and recovery must  
215 consider the necessity of maintaining strong cultural, spiritual and material connections  
216 for Indigenous peoples with American Eel in Ontario. In collaboration with communities,  
217 the government will jointly prioritize recovery actions to enable sustainable cultural  
218 experiences and practices, including maintaining species distribution and returning  
219 American Eel to strategic areas where feasible. As American Eel recovery proceeds  
220 over several generations, longer-term facilitation of range increases may be necessary  
221 to support cultural and biological needs for the species.

222 **Immediate Actions**

223 Providing safe upstream and downstream passage at priority locations is key to  
224 achieving the recovery goal for American Eel. Reducing downstream passage mortality  
225 and undertaking efforts to increase the number of eels that survive out-migration  
226 addresses a critical threat to the species in Ontario. Facilitating the movement of eels to  
227 upstream habitat may also be important for recovery, but there is currently uncertainty  
228 about the risks associated with providing upstream passage where safe downstream  
229 passage is not assured. Providing upstream passage may create an ecological sink  
230 when there is high likelihood of mortality during downstream passage, negatively  
231 impacting the global population of American Eel. To ensure that actions are in the best  
232 interest of the species, decisions about where to facilitate upstream passage of eels  
233 must take into account the amount of habitat required by the species, and the risk that  
234 eels may be killed when migrating back downstream. An understanding of the  
235 cumulative impact of downstream passage through multiple hydro-electric generating  
236 stations, and the threshold mortality level at which upstream passage is no longer of  
237 benefit to the species is critical to this decision-making. Potential ecological and socio-  
238 economic risks and factors, and feasibility must also be considered in developing  
239 practical solutions that support American Eel protection and recovery in Ontario.

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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240 To fully address these considerations, and ensure recommended actions are  
241 implemented in an effective way, decisions must be made in a collaborative and  
242 prioritized manner, and informed by evidence-based cumulative effects analysis that  
243 acknowledges uncertainty and is inclusive of Indigenous communities and interested  
244 and involved stakeholders. Applying an adaptive approach to fish passage actions to  
245 track results and adjust management strategies will allow actions to proceed without full  
246 certainty of local and external influences and outcomes, and learning from site-specific  
247 actions to be progressively and strategically applied, with further upstream actions being  
248 undertaken as downstream actions are successful.

249 Establishing ways to measure and track recruitment (the number of young eels arriving)  
250 and escapement (the number of mature eels leaving) in Ontario will aid in  
251 understanding the status of the species, the effectiveness of recovery efforts, and  
252 tracking progress toward meeting recovery goals. In the St. Lawrence River, counts of  
253 immature eels moving upstream through eel ladders at two major hydro-electric facilities  
254 provide an indication of the number of eels entering the Lake Ontario-St. Lawrence  
255 system over time. A similar index has not been established in the Ottawa River. An  
256 index of mature eels escaping from the St. Lawrence River is available through counts  
257 of eels caught in Quebec's St. Lawrence River eel fisheries, but the current contribution  
258 of eels from Ontario is not well understood. A target for the proportion of American Eels  
259 entering Ontario that successfully leave the province can be developed based on:  
260 research on the cumulative effects of downstream mortality; indices of recruitment and  
261 escapement for the Ottawa River and Lake-Ontario St. Lawrence River systems; and  
262 outcomes of analysis to identify priority locations to provide upstream and downstream  
263 passage.

264 A number of organizations are involved in efforts to minimize and monitor the adverse  
265 effects of dams and hydro-electric facilities on American Eel. The review and updating  
266 of best management practices will ensure that the best available information is provided  
267 to inform those developing and implementing mitigation plans. Development of  
268 standardized monitoring protocols will aid in understanding the species' status, the  
269 impact of hydro-electric facilities and the effectiveness of mitigation actions, and  
270 tracking progress toward meeting recovery goals.

271 The following actions are immediate provincial priorities that will contribute to Ontario's  
272 recovery goal, and will be undertaken by 2020. All six immediate actions are considered  
273 high priority, and will be both led and supported by government. Implementing a plan to  
274 provide passage at priority locations will require ongoing efforts beyond 2020, and  
275 evaluation of the plan will occur after 10 and 20 years. Ongoing monitoring will be



DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

---

276 required to track the implementation and efficacy of these recovery actions, and  
277 determine whether adjustments are required.

278 **Actions:**

- 279 1. Collaborate with Indigenous communities to identify and  
280 evaluate activities and mechanisms that support and enable  
281 American Eel cultural values and experiences.
- 282 2. Develop system-specific cumulative mortality models and  
283 downstream survival thresholds for Ontario.
- 284 3. Evaluate indices of recruitment and escapement for the Ottawa  
285 River and Lake Ontario-St. Lawrence River systems, and  
286 establish standard indices where necessary. Develop and  
287 monitor targets for proportional escapement.
- 288 4. Develop an implementation plan for the provision of American  
289 Eel passage in Ontario, including identification of priority  
290 locations on main-stem rivers and their tributaries, and  
291 recommendations for the sequencing of implementation.  
292 Identification of priority passage locations and implementation  
293 sequencing will:
- 294 ○ involve a collaborative decision-making process that  
295 includes government, Indigenous, and waterpower  
296 representatives as well as other key stakeholders;
  - 297 ○ be informed by science (including the development of  
298 survival thresholds, understanding of site specific and  
299 cumulative mortality effects, and knowledge of the  
300 effectiveness of existing upstream and downstream  
301 passage) and include consideration of feasibility and  
302 socio-economic factors and risks; and,
  - 303 ○ incorporate sufficient flexibility to allow for adaptive  
304 management based on the results of effectiveness  
305 monitoring.

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

---

- 306 5. Undertake actions identified in the passage implementation  
307 plan, evaluate the plan's implementation and effectiveness after  
308 10 and 20 years, and update actions and targets as needed.
- 309 6. Undertake collaborative development, review and update of  
310 best management practices for minimizing and monitoring the  
311 adverse effects of hydro-electric facility operations on American  
312 Eel, including developing standardized protocols for evaluating  
313 species presence at a location, undertaking surveys to monitor  
314 mortality rates (e.g., through tail-water surveys), and marking  
315 and tagging eels.

316 **Short and Long-term Actions**

317 Protecting and recovering species at risk is a shared responsibility. No single agency or  
318 organization has the knowledge, authority or financial resources to protect and recover  
319 all of Ontario's species at risk. Successful recovery requires inter-governmental co-  
320 operation and the involvement of many individuals, organizations and communities. In  
321 developing the government response statement, the Ministry considered what actions  
322 are feasible for the government to lead directly and what actions are feasible for the  
323 government to support its conservation partners to undertake.

324 In addition to the actions required to be initiated by 2020 to support immediate recovery  
325 efforts, the government endorses the following actions as being necessary for the  
326 protection and recovery of American Eel. The government will support conservation,  
327 agency, municipal and industrial partners and Indigenous communities to undertake  
328 activities to protect and recover American Eel. Support for the implementation of these  
329 actions may be provided through funding, agreements, permits (including conditions)  
330 and advisory services.

331 Actions identified as "high" will be given priority consideration for funding under the  
332 ESA. The government will focus its support on these high-priority actions over the next  
333 five years. Annual priority actions for government support across all species will be  
334 established and communicated to encourage collaboration and reduce duplication of  
335 effort.

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

---

336 **Focus Area: Management and Protection**  
337 Objective: Work together to protect American Eel and its habitat, strategically  
338 improve upstream access to growth and rearing habitat and  
339 downstream access to spawning grounds, and minimize threats to  
340 the species.

341 Many groups and organizations in Ontario have been involved in stewardship and  
342 management actions in support of American Eel recovery, including non-government  
343 organizations, Indigenous groups and communities, hydro-electric facility operators,  
344 commercial fishers, conservation authorities, and fish and game clubs. The ongoing  
345 protection and recovery of American Eel will require continued joint efforts amongst  
346 government and many such conservation partners, through knowledge development  
347 and sharing, and the implementation of protection and recovery actions.

348 With the continued closure of the American Eel fisheries in Ontario, the most significant  
349 threats the species faces within the province are associated with their migration: safe  
350 passage downstream as they move to their spawning grounds, and access to upstream  
351 habitat suitable for growth and maturation.

352 While threats associated with dams and hydro-electric turbines must be addressed to  
353 support American Eel recovery, hydro-electricity continues to be an important electricity  
354 source for Ontario. Hydro-electric power plays a critical role in the reliability of the  
355 provincial electricity system, and is valued for its role in achieving provincial renewable  
356 energy and climate change commitments. The implementation of actions to reduce  
357 greenhouse gas emissions within Ontario will help to fight global climate change, and  
358 the impact of changes in global climate on American Eel.

359 Alterations to dams (including those for navigation, flood control and power generation)  
360 and hydro-electric facilities to provide improved passage can require significant design  
361 modifications and financial investment. Undertaking these modifications during other  
362 physical work (e.g., re-design, upgrades or re-development) may reduce these costs  
363 and increase the feasibility of these actions.

364 Although additional information is required to make informed decisions about providing  
365 upstream passage, implementing actions to mitigate the effects of hydro-electric  
366 facilities on American Eel can be undertaken immediately. Currently, upstream passage  
367 is provided at Chaudière Falls on the Ottawa River and the R.H. Saunders hydro-  
368 electric facility on the St. Lawrence River, and is thought to provide a benefit to the  
369 species. Prioritizing additional locations for the safe upstream and downstream passage  
370 of eel will be completed by 2020, and implementation of the actions identified will be  
371 supported at that time.

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

---

372 In order to achieve recovery for American Eel, the Ontario government will continue its  
373 efforts to manage and protect American Eel and its habitat through implementation of  
374 the Endangered Species Act. As a transition species under the ESA, the development  
375 of a habitat regulation is not necessarily required for American Eel. Eels are habitat  
376 generalists, and at their current level of abundance, sufficient habitat is available for  
377 growth and maturation in Ontario. As a result, a habitat regulation will not be developed  
378 for the species. As a migratory species, American Eel depends on access to and from  
379 its spawning grounds, and may use unique habitats during migration. Research to  
380 identify important migratory characteristics will inform the development of habitat  
381 direction for the species.

382 **Actions:**

- 383 7. **(High)** Take immediate steps to reduce mortality of out-  
384 migrating American Eel, monitor effectiveness of actions, and  
385 adjust as necessary. Actions may include:
- 386 ○ trap and transfer of adult eels around dams and hydro-  
387 electric facilities;
  - 388 ○ altering operations at hydro-electric facilities; and,
  - 389 ○ modifying hydro-electric facilities and associated  
390 infrastructure as strategic opportunities arise (e.g., during  
391 facility redesign, upgrades or redevelopment).  
392 **(government-supported)**
- 393 8. **(High)** Continue to work together with the waterpower industry,  
394 and federal and provincial agencies to provide improved  
395 upstream access (e.g., installation of ladders, upstream  
396 transfer) for eels to above the Chaudière Falls hydro-electric  
397 dam in the Ottawa River drainage and above the Robert Moses-  
398 Robert H. Saunders hydro-electric dam in the Lake Ontario-St.  
399 Lawrence drainage, and at additional locations identified  
400 through passage implementation planning **(government-led  
401 and supported)**.
- 402 9. **(High)** Protect the American Eel and its habitat through the  
403 ESA, including:

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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- 404                                   ○ continuing to implement, promote compliance with and  
405                                   enforce conditions found in authorizations under the  
406                                   ESA, such as but not limited to, adhering to mitigation  
407                                   plans required under regulation; and,
- 408                                   ○ developing guidance for proponents and partners on the  
409                                   areas of general habitat protected under the ESA for  
410                                   American Eel. **(government-led)**
- 411                                   10. Maintain closures of commercial and recreational American Eel  
412                                   fisheries until Ontario populations can support sustainable  
413                                   harvest. **(government-led)**
- 414                                   11. Identify and consider American Eel protection and recovery  
415                                   efforts in developing and amending provincial Fisheries  
416                                   Management Zone (FMZ) plans, where appropriate and  
417                                   applicable. **(government-led)**
- 418                                   12. Work with communities and all sectors to implement, monitor  
419                                   and report on progress towards Ontario’s Climate Change  
420                                   Strategy and Climate Change Action Plan to reduce greenhouse  
421                                   gas emissions. **(government-led)**

422	<b>Focus Area:</b>	<b>Research and Monitoring</b>
423	Objective:	Improve understanding of the distribution and abundance of
424		American Eel in Ontario, the threats it faces, and how to minimize
425		impacts on the species in order to focus protection and
426		management efforts.

427 Collaborative research has been ongoing within Ontario, and knowledge has been  
428 collected and synthesized to better understand American Eel in the province and  
429 address key threats. Notwithstanding these efforts, additional knowledge gaps remain  
430 related to American Eel abundance and distribution within Ontario, behaviour and  
431 habitat requirements. Additional knowledge will improve understanding of threats to the  
432 species and the best methods to reduce threats. Continuation of research and  
433 monitoring currently underway, and support for new and emerging research areas is  
434 required to increase American Eel knowledge to support the species protection and  
435 recovery. Continued shared efforts between governments, Indigenous communities, the  
436 waterpower industry and non-government organizations and stewardship groups is  
437 required to reach these objectives.

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

---

438 Much is still unknown about the factors that influence the number of young eels arriving  
439 in Ontario, and additional research is required to better understand this, and how it may  
440 affect provincial recovery goals. Understanding American Eel distribution and habitat  
441 requirements for all life stages is critical to the protection of the species and its habitat,  
442 and required to inform decision-making on the provision of eel passage at barriers and  
443 hydro-electric generating stations. Both general and site-specific research is needed to  
444 address fish passage-related threats to American Eel recovery in Ontario, and the  
445 challenges associated with providing downstream passage will require ongoing efforts  
446 to develop and build safe, cost-effective and feasible options to minimize impacts.  
447 Decisions as to when and where to provide passage must be informed by an  
448 understanding of how eels currently move at a location, the habitat features they use  
449 and the length of time eels spend in Ontario before out-migrating.

450 As early results of the experimental translocation of east coast American Eels to Ontario  
451 were not as expected, continued evaluation of this experiment, as well as translocations  
452 from the St. Lawrence River to the Ottawa River, are required to better understand  
453 whether translocation may be a potential future recovery tool.

454 **Actions:**

455 13. **(High)** Continue to undertake technical and biological research  
456 to evaluate and improve the effectiveness of methods for the  
457 provision of safe downstream passage through hydro-electric  
458 generating stations. **(government supported)**

459 14. **(High)** Increase knowledge of current distribution and  
460 abundance of American Eel, as well as historic range, through:

- 461 ○ targeted surveys for the species;
- 462 ○ collection of community, local, and Traditional Ecological  
463 Knowledge; and,
- 464 ○ increasing public awareness of eel and encouraging the  
465 reporting of American Eel sightings and submission of  
466 American Eel data to the Ministry's central repository at  
467 the [Natural Heritage Information Centre](#) and partners.  
468 **(government-led and supported)**

469 15. Undertake research to improve the understanding of factors  
470 influencing recruitment of eels to Ontario, including life history

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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471 characteristics and the potential role of genetics. **(government**  
472 **supported)**

473 16. Continue to evaluate the efficacy and outcomes of the  
474 experimental conservation translocation of eels from the Atlantic  
475 coast to Ontario, and from the St. Lawrence River to the Ottawa  
476 River. **(government led and supported)**

477 17. Investigate local movement patterns, including existing  
478 opportunities for upstream and downstream passage, to improve  
479 understanding of local migratory routes and timing.  
480 **(government supported)**

481 18. Investigate habitat use, specifically the use of riparian corridors,  
482 and overwintering locations. **(government supported)**

483 <b>Focus Area:</b>	<b>Inter-jurisdictional Collaboration</b>
484 Objective:	Work actively with other jurisdictions to reduce threats to American 485 Eel throughout its range, share knowledge and collaborate on 486 science, monitoring and management to understand and protect 487 the global population.

488 Effectively addressing the threats facing American Eel requires action at provincial,  
489 national, and international scales, from governments, organizations and individuals. The  
490 American Eel found within Ontario are part of a global population with a single spawning  
491 location, but differing conservation status and levels of protection in different  
492 jurisdictions. Where stock assessment has occurred in individual jurisdictions, more  
493 northern indices generally show declines, while southern indices do not. The variation in  
494 protection among jurisdictions, the occurrence of American Eel in shared boundary  
495 waters, and the number of responsible jurisdictions throughout the species' range  
496 contribute to the complexity of American Eel management at both an interprovincial and  
497 international scale.

498 Given the unusual life history of American Eel, its broad geographic range, and the  
499 threats it faces outside of Ontario, it is recognized that actions outside of this province  
500 will be required for the recovery of this species within the province. Similarly, actions  
501 taken outside of the province, and the associated impacts on the population, may affect  
502 whether or not Ontario can achieve its protection and recovery objectives for American  
503 Eel. Recognizing this, Ontario will continue to actively work with other jurisdictions  
504 including Indigenous communities, and federal, provincial and state governments and

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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505 agencies, to reduce threats to American Eel, and achieve shared research, monitoring  
506 and management objectives.

507 Ontario supports the listing of American Eel as threatened under the federal *Species at*  
508 *Risk Act* (SARA), based on COSEWIC's 2012 assessment. Federal listing would help to  
509 provide better consistency in the protection of American Eel across its range, support  
510 the evaluation of provincial commercial and recreational harvests, and provide federal  
511 leadership in collaboration amongst jurisdictions within and outside of Canada.

512 The long-term protection, recovery, and management of American Eel will require  
513 working in concert with and the support of groups and organizations within and outside  
514 of Ontario, including for threat mitigation and research to address knowledge gaps.

515 **Actions:**

516 19. **(High)** Work with and influence other jurisdictions in ongoing  
517 efforts to protect American Eel and reduce mortality of  
518 downstream migrating eels (e.g., through mitigation of turbine  
519 mortalities, reduced mortality associated with downstream  
520 fisheries, development of safe passage technologies, etc.) to  
521 improve outcomes for American Eels out-migrating from Ontario.  
522 **(government-led and supported)**

523 20. **(High)** Coordinate efforts and share information with Indigenous  
524 communities and other jurisdictions including the federal  
525 government, Quebec, and partners in the eastern United States,  
526 to contribute to collaborative and coordinated research and  
527 monitoring of American Eel, and management of threats  
528 throughout their range (including through inter-provincial and  
529 national eel science and management groups). **(government**  
530 **led and supported)**

531 21. Continue to advocate for federal listing of American Eel under  
532 SARA to support coordinated national and international efforts to  
533 protect and recover the species. **(government-led)**

534 22. Continue to manage and monitor the state of the Lake Ontario-  
535 St. Lawrence River and Ottawa River ecosystems and  
536 associated fish community in partnership with U.S. agencies and  
537 the province of Quebec, respectively, through mechanisms such  
538 as the Great Lakes Fishery Commission, the Lake Ontario



DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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539 Lakewide Action and Management Plan, and the Ottawa River  
540 Fisheries Management Group and FMZ12 Plan. **(government-**  
541 **led)**

542 23. Support knowledge and information sharing to improve  
543 efficiency, consistency and coordination among organizations  
544 and individuals involved in American Eel stewardship,  
545 monitoring, and research in Ontario (e.g., web-based information  
546 access, knowledge exchange forum, etc.). **(government-**  
547 **supported)**

548 24. Support public education and outreach, and partnerships to  
549 increase awareness of American Eel and its threats, and  
550 involvement in recovery actions. **(government-supported)**

#### 551 **Implementing Actions**

552 Financial support for the implementation of actions may be available through the  
553 Species at Risk Stewardship Program. Conservation partners are encouraged to  
554 discuss project proposals related to the actions in this response statement with the  
555 Ministry. The Ministry can also advise if any authorizations under the ESA or other  
556 legislation may be required to undertake the project.

557 Implementation of the actions may be subject to changing priorities across the multitude  
558 of species at risk, available resources and the capacity of partners to undertake  
559 recovery activities. Where appropriate, the implementation of actions for multiple  
560 species will be co-ordinated across government response statements.

#### 561 **Reviewing Progress**

562 The ESA requires the Ministry to conduct a review of progress towards protecting and  
563 recovering a species not later than five years from the publication of this response  
564 statement. The review will help identify if adjustments are needed to achieve the  
565 protection and recovery of the American Eel.

#### 566 **Acknowledgement**

567 We would like to thank all those who participated in the development of the Recovery  
568 Strategy for American Eel (*Anguilla rostrata*) in Ontario and those individuals and

DRAFT Government Response Statement  
to the  
Recovery Strategy for the American Eel in Ontario

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569 organizations who provided valuable input and advice during the development of this  
570 government response statement, for their dedication to protecting and recovering  
571 species at risk.

572 **For Additional Information:**

573 Visit the species at risk website at [ontario.ca/speciesatrisk](http://ontario.ca/speciesatrisk)

574 Contact your [MNRF district office](#)

575 Contact the Natural Resources Information Centre

576 1-800-667-1940

577 TTY 1-866-686-6072

578 [mnr.nric.mnr@ontario.ca](mailto:mnr.nric.mnr@ontario.ca)

579 [ontario.ca/mnrf](http://ontario.ca/mnrf)