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Martin Miller (*Submitted Electronically*)
Chief
Division of Endangered Species
U.S. Fish and Wildlife Service – Region 5
300 Westgate Center Drive
Hadley, MA 01035-9589

Re: U.S. Fish and Wildlife Service, Notice of Petition Finding and
Initiation of Endangered Species Act Status Review – American Eel

Dear Mr. Miller:

The National Hydropower Association (“NHA”) hereby submits its comments on the U.S. Department of the Interior, Fish and Wildlife Service (“FWS”) Notice of Petition Finding and Initiation of Status Review for the American Eel (“Notice”), 70 *Fed. Reg.* 388849 (July 6, 2005). In the Notice FWS has indicated that it is initiating a 12-month review of whether listing of American eel under the Endangered Species Act (“ESA”) is appropriate. NHA appreciates this opportunity to comment on the FWS Notice and submits these timely comments in opposition to the ESA listing of the American eel.

By way of background, NHA is the national trade association committed exclusively to representing the interests of the hydroelectric power industry.¹ Our members represent 61 percent of domestic, non-Federal hydroelectric capacity and nearly 80,000 megawatts overall in North America. Many of our member companies own and operate hydroelectric projects on rivers where American eels are present. Therefore, NHA has a strong interest in the potential listing of the American eel under the ESA. As a preliminary matter, NHA believes it is important to recognize that hydropower projects generally are responsible stewards of the nation’s rivers, producing needed clean, renewable, reliable energy. The continued generation of such power is important to the nation’s energy supply.

With respect specifically to the American eel, many NHA members provide upstream and downstream passage for American eel, working in consultation with Federal and State resource agencies. Further, a number of NHA members are currently working closely with Federal and State agencies to conduct studies on the movement and status of American eel. NHA member companies are also involved in developing and testing potential new downstream eel passage technology, including upgraded turbine units. These actions by NHA members and others will help enhance American eel habitat and population.

¹ NHA’s membership consists of more than 140 organizations including: public utilities, investor-owned utilities, independent power producers, equipment manufacturers, environmental and engineering consultants, and attorneys.

Based on the data available, NHA does not believe that there is sufficient scientific evidence at this time to justify the listing of the American eel under the ESA as more fully discussed below. Accordingly, NHA requests that FWS conclude its status review with a determination that ESA listing of the American eel is not warranted.

A. Consideration of ESA listing of the American eel is not appropriate or justified based on current scientific data which does not show a danger of extinction.

An endangered species is defined as one that is “in danger of extinction throughout all or a significant portion of its range . . .” [16 U.S.C. § 1532(6)]. A threatened species is defined as a species which is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” [16 U.S.C. § 1532(20)]. As stated in Section 4(a) of the ESA [16 U.S.C. § 1533(a)], listing is to be considered for species that are either endangered or threatened based on five stated factors.

Despite the claim in the petition on which FWS bases its Notice, there is insufficient data to prove that the American eel population is in any danger of becoming extinct or any likelihood of becoming extinct, as required by the ESA. In fact, there is insufficient data to demonstrate that the American eel population is even declining. It is well recognized that fish populations fluctuate due to changes in the physical and biological environment affecting them. Because of the unique life history of the American eel, any analysis of the eel population must be expanded beyond short-term and localized variations; rather an analysis of the status of eel must be based on long-term trends across several unique and geographically distant habitats. The evidence presented in the petition, as documented in the Notice, does not demonstrate a long-term trend in population decline. In fact, there is a significant lack of data on eel abundance, as documented by experts and other resource groups.

As stated in *American Eel (Anguilla rostrata) in Lake Ontario and Its Tributaries: Distribution, Abundance, Essential Habitat and Restoration Requirements*, “the data probably underestimates the eel distribution due to the difficulty in sampling for eel, particularly when they are not specifically being targeted.”² Further, as stated in that resource, “fish survey data often do not include eel, even when they may be present. Also, the data primarily identify presence or absence of eel, rather than abundance. Other important biological variables such as length, weight, sex and age are not recorded.”³

The Atlantic States Marine Fisheries Commission (“ASMFC,” a multi-state body that coordinates the conservation and management of fishery resources) has been studying the American eel for years. In its recently released Public Information Document investigating potential changes to its American eel interstate management plan (“PID”),⁴ ASMFC stated that “a compilation of all available information on eel fisheries and biology suggests that the data are fragmented and/or incomplete.” ASMFC further concluded (PID at page 6): “[c]urrent stock status for the American eel is poorly understood due to limited and non-uniform stock assessment efforts and protocols across the range of this species.”

This conclusion in the PID appears to be based on the *2004 Review of the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Eel* (“2004 Review” at page 2) which confirms the lack of data and protocols. The *2004 Review* (at pages 6-7) documents at least 22 areas of research and review that are needed “to further understand the species’ life history, behavior and biology.” Included in this list are: (i) the identification of appropriate stock assessment methods, and

² S.J. Lary and W.-D.N. Busch. Administrative Report No. 97-01 at 7. U.S. Department of Interior, Fish and Wildlife Service, Lower Great Lakes Fishery Resources Office, Amherst, N.Y., 1997.

³ *Id.*

⁴ *Public Information Document for Potential Changes to the Interstate Fishery Management Plan for American Eel* (approved by ASMFC on November 10, 2004 and issued on February 8, 2005).

then carrying out a reliable stock assessment; (ii) the assessment of recruitment by life stage and limiting factors; (iv) the effects of contaminants on a long-lived species that spends a significant amount of time in the sediments; and (v) the implications and effects of oceanic changes on spawning success and migratory routes.

As further acknowledged by ASMFC in the PID (at page 3), “[p]lanning and regulatory activities require information, specifically, the abundance and status of the species and its habitat.” In addition, the ASMFC stock assessment group recently received testimony from several states that questions the conclusion that American eel populations are in decline. Therefore, the key consideration for FWS in this proceeding should be the lack of data with respect to the status of eels. NHA believes that much more information on American eel abundance needs to be gathered, developed and analyzed before any further consideration of potential listing of American eel under the ESA.

The Notice appears to be limiting the scope of the eel population to be considered in its more comprehensive planned status review. The Notice states (70 Fed. Reg. 38850, “Species Information,” paragraph 1) that “the majority of the American eel population is along the Atlantic seaboard of the United States,” with no reference or citation in support of that conclusion. Therefore, an issue to be addressed before any further consideration of listing of American eel is to determine the exact scope of the eel population, *i.e.*, the range of its habitat in the U.S., Canada, the Gulf of Mexico, the Mississippi River basin, the Caribbean areas, Central America, and potentially northeastern South America. Without such analysis of the correct range, it is unjustified to focus only on the northeastern U.S. Further in the discussion of range/distribution, the Notice implies that the numbers of eels in “the more southerly areas of the range” are smaller numbers (70 Fed. Reg. 38852, “Range, Distribution, and Habitat,” paragraph 1) – but, again, until there is a full assessment of the eel abundance throughout their range, including the southeastern U.S. and further south, there can be no conclusion that the numbers in those areas have decreased.⁵

In the discussion of the life history and characterizations of American eel, the Notice states that “recent analysis” indicates that eel may have genetic variation with latitude (70 Fed. Reg. 38852, “Spawning,” last paragraph). This statement is contrary to the most recent research where, based on a detailed genetic microsatellite loci analyses of a sample of American eel representative of a broad portion of the American eel range, there was no genetic differences associated with distance – and the hypothesis of panmixia for American eel was supported.⁶

Based on ASMFC’s affirmation (in its PID) of the clear need for more information on the eel (including biology and habitat), FWS should find that further procedures for considering listing are not warranted, at least at this time. NHA supports the continuation of research on the status of the eel population, eel habitats that may affect the population, and the aspects of the eel habitats that impact adversely on the population. Such data is critical and necessary before FWS proceeds further on any analysis of the potential listing of the American eel under ESA.

B. The discussions of three factors cited as considering hydro facilities as a detriment to American eel are incomplete and inaccurate.

As acknowledged in the Notice (70 Fed. Reg. 38853), there are five factors to be considered in a proposed

⁵ Further, the Notice appears to omit estuaries as a part of eel habitat (70 Fed. Reg. 38850, under “Species Information”), although later in the Notice there appears to be a recognition of the use of estuaries by eels. Further discussion of habitat should include estuaries and coastal areas as extensively used by eels.

⁶ See, e.g., Thierry Wirth and Louis Bernatchez, *Decline of North Atlantic Eels: A Fatal Synergy?* Proc. R. Soc. Lond. B 270:681-688, 2003.

ESA listing [per Section 4(a)(1) of the ESA]. The petition has argued that hydropower facilities are a threat to the status of American eel based on three of the factors: (1) limitations on habitat/range, (2) inadequacy of existing regulatory mechanisms, and (3) other natural or manmade factors affecting continued existence. NHA here provides its comments on these three factors considered in the Notice as they relate to hydropower projects. In summary, any further action by FWS in this proceeding should correct any implications that hydroelectric projects may be the sole, or even a primary, source of adverse impact on the American eel. In addition, in any future action FWS should identify and confirm the significant regulatory mechanisms currently being used to enhance eel habitat and population. Further action by FWS in this proceeding must also identify and analyze the numerous other factors that may have had, or are having, an adverse impact on eels.

(1) The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range – Under this factor, the Notice references two issues relative to the hydro industry with regard to American eel habitat, *i.e.*, alleged alteration of stream flow by hydro facilities, and the alleged loss of upper tributary habitat due to dams (70 Fed. Reg. 38854-55). As noted above, most hydropower facilities on rivers in the northeastern U.S. (the area focused on by the Notice) where American eels are present have been in existence for decades, and a large number for close to 100 years or more. If, as claimed in the petition, a decline in the population of American eel in the past several decades can be demonstrated, then that claim in itself refutes any assertion of nexus between the alleged decline in eel population and hydropower projects (certainly in the northeastern U.S.) – the hydropower projects predate the decline by many decades. There is no evidence, and certainly not substantial evidence, presented in this proceeding to support the conclusion that the habitat impacts of hydropower projects along the northeastern U.S. are a primary factor in the alleged decline of the eel population.⁷

The Notice states that altering stream flows “may limit upstream recruitment” by affecting upstream migration – and further gives hydroelectric facilities as the sole example (70 Fed. Reg. 38854, “Alterations of Stream Flow,” paragraph 3). Many hydro facilities do not alter stream flow to any significant degree, and obviously not all hydro facilities are peaking facilities or water storage facilities as the Notice references. With respect to claims of loss of upper tributary habitat (70 Fed. Reg. 388545, “Loss of Upper Tributary Habitat”), the Notice claims that the sole cause of this “significant loss of habitat” is dams. However, even the Notice acknowledges that the installation of eel ladders has improved that situation (*Id.* at paragraph 3) – and, as noted above, many hydro owners have installed, or are installing, such facilities.

Additionally, there are many other factors that contribute to, and have significantly impacted, stream and river flow. For example, there have been substantial increases in impervious surface areas in extensive portions of the American eels’ range due to residential/commercial and industrial development. Increases in impervious surface result in marked increases in surface stormwater runoff, which in turn cause marked fluctuations in flows in streams and rivers. In one study in New Hampshire⁸ the amount of impervious surface area in a river drainage increased by 50% over a 10-year period, from 1990 to 2000.

⁷ The argument in the Notice that dams have caused the alleged decline in eel population, despite the fact that such dams predate the claimed decline by decades, is contradictory to the position taken in the Notice with respect to wetlands. For example, the Notice acknowledges that the loss of wetlands “has likely” impacted the eel population; however, the Notice discounts that impact due to the time discrepancy – *i.e.*, that wetlands have been lost over many years (*see, e.g.*, Ralph W. Tiner, *Assessing Cumulative Loss of Wetland Functions in the Nanticoke River Watershed Using Enhanced National Wetlands Inventory Data*, June 2005).

⁸ *See, e.g.*, David Justice and Fay Rubin, *Developing Impervious Surface Estimates for Coastal New Hampshire*, December 2002.

Furthermore, if *arguendo* hydro facilities are a factor in a change in eel habitat, they are certainly not the only factor – and all such factors should be considered before any listing decision. NHA does not attempt here to provide a comprehensive listing of such other potential contributors to any alleged decline in eel population, but here lists some significant factors that were omitted from the Notice. Studies have documented that changes in ocean currents, with cycles of warming and cooling, may have a direct impact on the eel population.⁹ Further, there are at least two predators to eels that have undergone a significant resurgence along the eastern seaboard of the U.S. in the past few decades – striped bass and pacific salmonids. Striped bass are known to prey on eels and their numbers have increased with the alleged decline in the eel population.¹⁰ The pacific salmonids, introduced into Lake Ontario and the other Great Lakes in large numbers over the past twenty years, are piscivorous – and their increase corresponds to the period of claimed decline in the eel population.¹¹ In addition, the eel swimbladder nematode parasite (*Anguillicola crassus*) has also been noted to be of concern regarding their impact on the health of the eel population.¹²

There are also other areas where evaluation may be necessary, such as the impact of potential low levels of thiamine in eel (due to extensive feeding on alewife), and such as endocrine disrupters affecting fish (potentially affecting eels). Further, what consideration has FWS given to the impacts of other restrictions on habitat such as ship and canal locks? And what consideration has FWS given to commercial and/or recreational bait fishery? All of these, and potentially numerous other, factors should be considered before a determination on the potential ESA listing.

However, even *assuming arguendo* that FWS is able to present in this proceeding substantial record evidence demonstrating a decline in eel populations as a result of an alleged alterations of stream flow by dams and as a result of an alleged loss of upper tributary habitat due to dams, that does not necessarily dictate that American eel should be listed under the ESA. As more fully discussed below, both of these issues can be handled, and are being addressed, through regulatory authorities by the Federal resource agencies in the hydro licensing process [e.g., Federal Power Act (“FPA”) Section 18 prescriptive authority]. No action on American eel under ESA is warranted.

(2) Inadequacy of Existing Regulatory Mechanisms – The Notice addresses the question of whether resource agencies have taken adequate actions to protect the American eel with respect to hydro facilities (70 Fed. Reg. 38857). NHA believes that there are substantial regulatory tools through the FPA for imposing whatever regulatory protections are necessary and supported by the record. The Federal agencies are using this authority in current licensing proceedings to address such issues with respect to the American eel without an ESA listing.

NHA believes that the regulatory mechanisms available relative to hydropower facilities are substantial and are properly implemented by the Federal Energy Regulatory Commission (“FERC”) and the resource agencies. The Federal agencies [through FWS and through U.S. Department of Commerce, National Oceanic Atmospheric Administration, National Marine Fisheries Service (“NOAA Fisheries”)] are actively involved in issuing conditions to the licensing of hydroelectric facilities under FPA Section 18, and FERC accepts those Section 18 conditions as part of the relicensing process. Further, even when they don’t impose mandatory conditions under Section 18, the Federal agencies (FWS and NOAA Fisheries)

⁹ See, e.g., B. Knights, *A Review of the Possible Impacts of Long-term Oceanic and Climate Changes and Fishing Mortality on Recruitment of Anguillid eels of the Northern Hemisphere*, November 2002.

¹⁰ See, e.g., R.A. Richards and P.J. Rago, *A Case History of Effective Fishery Management: Chesapeake Bay Striped Bass*, 1999.

¹¹ See, e.g., E.L. Mills, et al., *Lake Ontario: Food Web Dynamics in a Changing Ecosystem (1970-2000)*, 2003.

¹² See, e.g., Lary and Busch 1997, *supra*, at 16.

often reserve their authority, thereby allowing them to initiate fishway prescription proceedings where deemed appropriate at a later time. As documented by FERC, a substantial number of hydro projects are in, or will be entering, the relicensing phase (with significant FWS and/or NOAA Fisheries involvement), where these issues can be studied and addressed if found to be problematic.

Through these hydro licensing proceedings, NHA member companies spend millions of dollars a year to study potential environmental impacts and implement protective measures to mitigate for those demonstrated impacts, including addressing American eel issues where relevant. The existing regulatory structures provide adequate protection for the American eel.

(3) Other Natural or Manmade Factors Affecting Continued Existence – The Notice highlights hydropower turbines as a threat to the American eel, particularly to female eels as they leave river systems to spawn (70 Fed. Reg. 38858). These assertions are not supported by substantial evidence and do not consider other important factors that are necessary for analysis.

The Notice argues (70 Fed. Reg. 38858, “Hydropower Turbines,” paragraph 1) that certain radio-tracking studies at the Lockwood Project in Maine (in 2002) demonstrate that “40 percent or more” of the adult migrating eel are entrained and killed each year. However, the Lockwood Project 2002 downstream eel passage study was really a pilot study that consisted of a sample size of 5 eels, with no control eels used. Based on the results of that study [filed with FERC in the Maine Department of Marine Resources (MDMR) 2002 Kennebec River Diadromous Fish Restoration Annual Progress Report] it was concluded that 1 eel had successfully passed the Lockwood Project via an overflow surface gate, 2 eels had passed via unknown routes, and 2 eels had passed via the turbines and did not continue migrating. On that basis MDMR concluded that 2 of the 5 eels (*i.e.*, the 40%) were presumed to be injured or dead. However, FWS should question whether a pilot study with only 5 eels provides clear guidance on the impact of hydro projects generically.

The Notice further argues (70 Fed. Reg. 38859, “Hydropower Turbines,” paragraph 2) that hydropower turbines are a documented threat to female American eels. The Notice summarily concludes that a high percentage of gravid females are lost to the turbines. However, there is no support referenced for that conclusion. Further, the Notice states a “particular concern” about the St. Lawrence River/Lake Ontario stock based on the turbines at the hydroprojects on the St. Lawrence River, citing to Castonguay, *et al.* (1994a). However, Castonguay, *et al.*, does not support the Notice’s conclusion applied to the St. Lawrence River. The Notice states that female eels coming out of the Lake Ontario/St. Lawrence River represent a significant, possibly 19%, portion of the total female spawners for all of American eel, and these are impacted by the turbines at the U.S. and Canadian hydroprojects on the St. Lawrence River (70 Fed. Reg. 38859). But Castonguay, *et al.*, does not state that Lake Ontario/St. Lawrence contributes 19% of the stock. Rather, Castonguay, *et al.*, stated that the freshwater flow coming out of Lake Ontario/St. Lawrence River is 19% of the total flow from what is characterized as a major portion of the eels’ range, exclusive of areas south of the U.S. Thus, the Notice is mischaracterizing what Castonguay, *et al.*, said. Further, large portions of the American eel range to the south are excluded from analysis, and the complete range of the American eel is not documented; despite the fact that eels in the southern portion of the range mature substantially earlier,¹³ which could have a significant impact on the analysis.

Finally, relative to non-indigenous species, the Notice fails to acknowledge the impact of the invasion of the dreissenid mussels in the analysis of “Displacement by or Competition with Nonnative Species” (70 Fed. Reg. 38859). The dreissenid mussels have dramatically changed the ecology of Lake Ontario and the St. Lawrence River (and potentially other areas as well), at a time almost coincident with the alleged

¹³ See, e.g., G.S. Helfman, D.E. Facey, L.S. Hales, Jr., and E.L. Bozeman, Jr., *Reproductive Ecology of the American Eel*, American Fisheries Society Symposium 1:42-56. 1987.

beginning of the decline of the American eel population. John Casselman (OMNR Lake Ontario fishery biologist) has long argued that the mussels have impacted eel biology/habitat in the St. Lawrence/Lake Ontario system. This information should be considered in the FWS proceeding.

C. FWS should consider additional factors in its analysis.

In addition to the factors listed in the Notice, FWS should consider the energy policy implications and the economic impacts of such a potential ESA listing for the American eel, particularly when NHA believes that the scientific data is not yet available to support a decision for listing.

NHA recognizes that an ESA listing analysis, strictly speaking, is not to consider the economic impacts of such a listing. However, economic and energy policy factors should be considered in the context of at least one of the five factors above – the availability of adequate regulatory mechanisms. The implications of listing a species as threatened or endangered are significant, for example imposing significant additional burdens on hydroelectric facilities. NHA presumes that such an ESA listing would also impose a significant economic burden on other industries and commerce as well. Whereas additional protection for certain truly endangered species is appropriate and necessary, where there is insufficient evidence to prove that the American eel population is in jeopardy, imposition of the severe limits and burdens caused by an ESA listing are inappropriate.

In summary, enhancements for American eel are being required and implemented through the imposition of FERC license conditions including FPA Section 18 requirements. Additional regulatory limitations on top of the mitigation measures already provided may result in the closing of some hydro projects which are on the margin of being economic and cannot bear the costs of additional regulatory burdens (particularly smaller projects). In addition to the economic loss suffered to a region as a result of such a shutdown of a hydro facility, that region would also be deprived of the clean, pollution-free, reliable energy that hydro provides. How does a region make up for the loss of energy then? Most agree that the energy supply would have to come from fossil sources – sources that contribute to acid rain and other pollutants, which also clearly have an impact on riverine systems and, therefore, potentially the American eel.

Once again, NHA would like to thank the FWS for providing this opportunity to comment on the potential consideration of the listing of American eel under the ESA. The Association will continue to remain engaged in this effort and monitor ongoing developments. NHA staff is also prepared and willing to work with the FWS to address any of the comments raised in this letter. For additional information, please feel free to contact NHA's Linda Church Ciocci or Jeffrey A. Leahey, Esq. at 202.682.1700.

Sincerely,



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