

SUPER LAW GROUP, LLC

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Via Electronic Mail and U.S. Mail

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Re: Comments of Riverkeeper, Sierra Club, Natural Resources Defense Council, Center for Biological Diversity, American Littoral Society, Southern Alliance for Clean Energy, Environment America, Earthjustice, Delaware Riverkeeper Network, New York/New Jersey Baykeeper, Casco Baykeeper, Los Angeles Waterkeeper, and the Waterkeeper Alliance Regarding ESA Biological Evaluation for CWA Section 316(b) Rulemaking and Initiation of Formal Consultation on EPA's Final Regulations to Establish Requirements for Cooling Water Intake Structures at Existing Facilities and Amend Requirements at Phase I Facilities.

Dear Ms. Wieting and Mr. Frazer,

We write on behalf of Riverkeeper, Sierra Club, Natural Resources Defense Council, Center for Biological Diversity, American Littoral Society, Southern Alliance for Clean Energy, Environment America, Earthjustice, Delaware Riverkeeper Network, New York/New Jersey Baykeeper, Casco Baykeeper, Los Angeles Waterkeeper, and the Waterkeeper Alliance ("Commenters"). On June 18, 2013, the U.S. Environmental Protection Agency submitted to you a Biological Evaluation, supporting materials, and a request for formal consultation, pursuant to Section 7(a)(2) of the Endangered Species Act, with the National Marine Fisheries Service and the U.S. Fish & Wildlife Service (individually "NMFS" and "FWS", and together "the Services"). The subject of this consultation is EPA's pending release of final regulations to

implement Section 316(b) of the Clean Water Act at existing industrial facilities. Section 316(b) requires EPA to establish regulations that minimize the adverse environmental impact of cooling water intake structures at industrial facilities that are subject to the National Pollutant Discharge Elimination System (“NPDES”).

We have reviewed the Biological Evaluation and supporting materials prepared by EPA, and we are deeply concerned. EPA has not complied with its duty to assist the Services in issuing a Biological Opinion (“BiOp”) by providing “the best scientific and commercial data available or which can be obtained during the consultation for an adequate review of the effects that an action may have upon listed species or critical habitat.” 50 C.F.R. § 402.14(c). We have prepared this letter and supporting materials¹ to assist the Services in obtaining the best available data in order to reach a thorough, comprehensive, and reasoned opinion as to whether EPA’s rule “is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.” 50 C.F.R. § 402.14(g)(4).²

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¹ The supporting materials referred to below are voluminous, totalling over 90 MB. Thus in addition to sending this letter via electronic mail, we will also send you a hard copy of this letter along with a compact disc of the supporting materials.

² “Jeopardy,” with its focus on the survival and recovery of the species, and “the adverse modification of critical habitat” that is prohibited under the ESA, 16 U.S.C. §1536(c)(2), are *not* equivalent or interchangeable terms. *Sierra Club v. U.S. Fish and Wildlife Service*, 245 F.3d 434, 441-43 (5th Cir. 2001). Therefore, EPA and the Services must analyze each of these elements and not “jeopardy” alone.

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1. Summary

EPA’s Biological Evaluation for its proposed cooling water system regulations falls far short of the requirements of the Endangered Species Act. The agency is about to finalize a rule that authorizes power plants to continue operating once-through cooling water intakes that kill many hundreds of billions of organisms annually, including millions of threatened and endangered fish and other animals. The rule also has adverse effects on the habitats of hundreds of endangered species in an action area that includes nearly every major waterbody in the United States. EPA has approached the Services very late in the rulemaking process, within months of a court-ordered deadline to promulgate a final rule, and stated that, even after years of research and policy formulation, it has collected almost none of the information the Services need to determine whether continued operation of these cooling water intakes will avoid jeopardizing the survival or the recovery of listed species or adversely modify their critical habitat.

EPA did conclude that cooling water intakes harm endangered species both directly and indirectly, that cooling water intakes overlap with habitat used by 215 listed aquatic species,³ that there are 21,039 potential interactions between a particular intake and a particular species (meaning that, on average, each species is affected by nearly 100 intakes),⁴ that 94% of all intakes overlap with at least one listed species,⁵ and that 153 facilities kill fish and release waste heat in more than 290 designated critical habitats.⁶ Clearly, the risks of harm to endangered species are both widespread and substantial.

But, with only a handful of exceptions, EPA claims to be unable to quantify or even qualitatively describe the extent of these harms with respect to particular endangered species in particular waterbodies. EPA knows that a great deal of harm is occurring generally, but claims to be unaware of how any particular endangered or threatened populations are holding up under the continued onslaught of habitat modification, impingement, and entrainment caused by cooling water systems regulated under its new rule.

Not having done its homework, EPA now seeks a blank check from the Services to allow power plants to kill endangered species on the flawed basis that its rule may marginally reduce the number of endangered animals that EPA authorizes power plants to kill every year. Of course, any reduction in the killing of endangered species is welcome. But where EPA's regulations allow power plants to kill millions of endangered animals every year, the question is not whether a change that may prevent the deaths of a few animals is good, but whether an EPA action that authorizes the continued killing of millions more jeopardizes the survival or recovery of these species or results in the destruction or adverse modification of critical habitat.

The limited and inadequate record that EPA has presented to the Services cannot support a no jeopardy finding. In fact, the evidence that EPA has provided is so deficient that it likely cannot support any serious analysis by the Services. As Commenters note below, EPA has ignored a wealth of readily available information about the impacts of cooling water intakes on listed species that is available in the academic literature, in government reports authored by other agencies, and even in EPA's own records.

The Services should demand that EPA actually provide them with the best available scientific and commercial data to support a biological analysis. Failing that, the Services must gather and analyze for themselves the readily available information that EPA has ignored, some of which Commenters have attached to this letter.

³ See Biological Evaluation ("BE") at 60.

⁴ See *id.* at 60.

⁵ See *id.* at 61.

⁶ See *id.* at 60 and Table 7-1, 83-88.

Finally, if the Services decide not to seek better information at this time and instead choose to issue Biological Opinions (BiOps) with such a poor base of information and so much residual uncertainty about the harms done by EPA's rule to various listed species, the only possible conclusion is that EPA's proposal to continue the operation of hundreds of existing cooling water systems jeopardizes the continued existence of numerous endangered species, including a number of salmonid and sturgeon Distinct Population Segments, and various species of freshwater mussel. And the only reasonable and prudent alternative to EPA's rule that can avoid jeopardy is a requirement to use closed-cycle cooling at most or all large cooling water intakes, and a requirement for cooling water intake operators to adopt significantly better monitoring practices to measure and avoid impacts on endangered species.

2. Background: significance of the Biological Evaluation

EPA acknowledges in the Biological Evaluation that the status quo it has tolerated for decades, largely unrestricted killing of listed species by cooling water intakes, is illegal:

EPA acknowledges that T&E species have been impacted by CWIS (as documented in Section 3.0) and recognizes that any take of listed species without an incidental take statement or ESA Section 10 take permit is in violation of ESA regulations. . . . [EPA] does not suggest that the status quo, which includes the take of T&E species, is acceptable.⁷

EPA also admits that it is starting from an incredibly poor understanding of the context: there are enormous gaps in EPA's understanding of how many endangered animals are killed by cooling water intakes. EPA's best quantitative estimate looks at just 20 out of the 215 listed species that EPA believes are affected by this rule. Based on documented kills, most of which are not extrapolated out to population-wide values, EPA nonetheless reckons that the annual take of endangered species easily runs to more than 10 endangered sea turtles, 600 Chinook salmon, 60,000 smelt, and 790,000 sturgeon, along with unknown millions of other threatened and endangered organisms from dozens (and possibly hundreds) of different listed species. Sadly, EPA provides the Services with absolutely no information on population viability, distribution, or trends – even for those twenty species – to help put these very limited figures in context.

On this flimsy basis, EPA is asking the Services to opine that a rule that perpetuates this status quo of blind and unmitigated killing, a rule that allows continued operation of once-through cooling systems with only the slightest of reductions in harm, will not jeopardize the continued existence of listed species. But at best, EPA's proposed rule,⁸ which was based on a numeric impingement standard and a case-by-case, open-ended decision making process for

⁷ *Id.* at 65.

⁸ See EPA, *National Pollutant Discharge Elimination System – Cooling Water Intake Structures at Existing Facilities and Phase I Facilities*, Proposed Rule, 76 Fed. Reg. 22,174 (April 20, 2011) (the "Proposed Rule").

entrainment, will have little effects on the number of fish killed. In fact, as explained more fully below, EPA's proposed rule could actually increase the number of fish killed by cooling water intakes. And since the rule likely will not reduce the capacity or flow of cooling water systems (and may even increase them), by extension, the rule also will not reduce the discharge of thermal and chemical pollution from EPA-regulated facilities. Based on the proposal, it appears that EPA may have decided to carry out the mandate of Section 316(b) of the Clean Water Act by creating a rule that allows cooling water systems throughout the United States to kill hundreds of billions of organisms, and discharge thousands of Petajoules of waste heat, fundamentally altering thousands of miles of riverine and estuarine habitat.⁹

The importance of this consultation may be unprecedented for two other reasons. First, almost none of this harm to endangered species has ever been evaluated under the ESA before. Astoundingly, although the ESA has been law for 40 years, EPA has never asked systematically whether these staggering fish kills and ecosystem modifications jeopardize either the survival or recovery prospects of listed species or destroy or adversely modify critical habitat.

Second, because the Clean Water Act is largely administered by the States, there are no other opportunities to evaluate the systemic impact of cooling water intakes on the recovery and survival of endangered populations. With the exception of a handful of facilities owned or controlled by federal agencies, or whose NPDES permits are issued directly by the federal government, this rulemaking is the single federal action that authorizes continuing operation of thousands of cooling water intakes and thermal discharges throughout the United States.

Therefore, this is the only opportunity to conduct an ESA analysis and issue an incidental take statement from a comprehensive perspective that looks at the full range of impacts on the entire U.S. population of most of these endangered and threatened species. This makes EPA's failure to provide the best available commercial and scientific data on the effects of its action and the status of affected species all the more problematic. Any subsequent BiOp and Incidental Take Statement ("ITS") by the Services based on this inadequate compilation or evaluation of data would similarly be inadequate.

3. Complexity and completeness

Unquestionably, this consultation will lead to one (or two) of the most complex and ecologically significant BiOps that the Services have ever been asked to render. Yet the task is

⁹ EPA's BE and its proposed rule should take into account and be coordinated with the States' CWA §303(d) lists, to determine whether the waters impacted by cooling water intake and subsequent discharge are listed due to habitat degradation, temperature, dissolved oxygen levels, or other factors related to once-through cooling water intakes. And EPA should consider the effect of its proposed rule on total maximum daily loads (TMDLs) for temperature in impaired waters, or the absence of such TMDLs. As the lists and TMDLs are subject to EPA approval, they are in EPA's possession and should be considered "available" data.

far from insurmountable. And the federal courts have demanded complete, thorough BiOps that meet all of the ESA's standards in similar or even more complex situations in the past.

For example, because of the national reach and complex effects of pesticides, the Section 7 consultation handbook describes pesticide registration BiOps as among the most complex ever undertaken. Yet NMFS has developed BiOps to support multiple pesticide registrations, one of the notable was EPA's re-registration of six widely used pesticides, including chlorpyrifos, diazinon, and malathion. The 482 page final BiOp concluded that re-registration of those three pesticides jeopardized 28 endangered salmonids and 26 critical habitats. *See Dow AgroSciences LLC v. Nat'l Marine Fisheries Serv.*, 707 F.3d 462, 466 (4th Cir. 2013).

A few years after drafting the consultation handbook, NMFS issued a global BiOp covering the U.S. military's use of Low Frequency Active Sonar from hundreds of ships, located across millions of square kilometers of ocean, in nearly every waterbody on the planet. In that case, NMFS was asked to evaluate the impact of sonar use upon uncounted millions of marine mammals and other animals including endangered species of whales, dolphins, seals, sea turtles and salmon. *See NRDC v. Evans*, 364 F. Supp. 2d 1083 (N.D. Cal. 2003).

The Services also developed a BiOp for the Forest Service on its ongoing use (which began in 1955) of chemical fire retardants throughout all National Forest System Lands. *Forest Serv. Empls. for Env'tl Ethics v. United States Forest Serv.*, 726 F. Supp. 2d 1195, 1202 (D. Mont. 2010). In that case, the Fish and Wildlife Service defined the action area as "all National Forest System lands (totaling 192 million acres) together with a buffer area surrounding those lands" while NOAA Fisheries defined the action area "broadly to encompass lands and waters of the United States with particular emphasis on [Forest Service] lands and adjacent properties." *Id.* Together, the Services considered effects upon 414 listed species. *See id.*

Notably, although the Services completed dauntingly complex BiOps in these cases and others, the courts rejected aspects of these final BiOps because either the action agency or the consulting agency attempted to cut corners. The *Dow AgroSciences* court vacated and remanded the pesticide BiOp primarily because NMFS failed to explain its modelling and chose to rely on water quality data that it acknowledged was outdated and inaccurate, while overlooking more recent data. *See Dow AgroSciences LLC.*, 707 F.3d at 475. Similarly, the *NRDC v. Evans* court rejected the LFA sonar BiOp's conclusions because NMFS authorized adverse modification of critical habitat that was necessary to the recovery of various species and the military deliberately withheld some of the best available scientific information from NMFS, leading NMFS to ultimately issued a no jeopardy opinion that did not include the required incidental take statement. *See NRDC*, 364 F. Supp. 2d at 1127-1139. Finally, the *Forest Service Employees for Environmental Ethics* court rejected the Forest Service's and Fish and Wildlife Service's claims that it was just too hard to do a proper BiOp for "a consultation that involved 387 species and an action area of more than 192 million acres." Cite. The court explained that "Defendants cannot excuse the failure to comply with the law Congress passed by arguing that compliance would be too hard." *Forest Serv. Empls. for Env'tl Ethics*, 726 F. Supp. 2d at 1224. Even when the Services are faced with a complex analytical task in a nationwide or global BiOp, the federal

courts demand and expect that final BiOps will meet the ESA's standards for comprehensive, detailed analysis. The courts will not tolerate illegal shortcuts, failure to consider habitat necessary for species recovery, action agencies that withhold the best available data, or Service BiOps that ignore that data.¹⁰

4. Despite EPA's failures, the Services must gather and use the Best Available Data.

The ESA requires the Services to base their BiOps on the best available commercial and scientific data regarding the effects of a proposed federal action and the status of the affected species. *See, e.g., Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988) ("In light of the ESA requirement that the agencies use the best scientific and commercial data available to insure that protected species are not jeopardized, 16 U.S.C. § 1536(a)(2), the FWS cannot ignore available biological information"); *Miccosukee Tribe of Indians v. United States*, 566 F.3d 1257, 1265 (11th Cir. 2009) ("In deciding what is 'best available' the Service is required to seek out and consider all existing scientific data.") (quoting *Heartwood, Inc. v. U.S. Forest Serv.*, 380 F.3d 428, 436 (8th Cir. 2004)).

EPA's inadequate BE has left the Services ill-equipped to perform their duty. Under the ESA, EPA must support the Services in rendering their opinions by providing them "with the best scientific and commercial data available or which can be obtained during the consultation for an adequate review of the effects that an action may have upon listed species or critical habitat." 50 C.F.R. § 402.14(d). Instead, EPA has provided exactly the kind of input data to the Services, "limited in scope, heavy on general background information, and deficient in focused and meaningful discussion and analysis of how these large [fish takes], and complex management measures which regulate them, affect endangered [species]" that the courts have rejected when found in a final BiOp. *Greenpeace v. Nat'l Marine Fisheries Serv.*, 80 F. Supp. 2d 1137, 1148 (W.D. Wash. 2000). Those parts of EPA's Biological Evaluation describing the affected species and their habitats are written at a level of generality that prevents the Services from performing any meaningful analysis. And EPA has provided virtually no information to

¹⁰ Although the courts hold the Services to the ESA's demanding standards, once those standards are met the courts will defend the Services' reasoning against all comers. This is illustrated nicely in *Greenpeace v. Nat'l Marine Fisheries Serv.*, where the district court rejected a vague, rushed, and inadequately researched NMFS BiOp for an Alaskan fishery that affected endangered Steller sea lions, condemning the BiOp and the quality of the data underlying that BiOp in harsh terms. *See* 80 F. Supp. 2d 1137 (W.D. Wash. 2000). Thirteen years later, in *State of Alaska v. Lubchenko*, the Ninth Circuit revisited a new BiOp governing the same fishery, and this time it upheld NMFS' BiOp against industry challenges. *State of Alaska v. Lubchenko*, 723 F.3d 1043 (9th Cir. 2013). The difference was that the subsequent BiOp, which concluded "that continuing to authorize fisheries at the levels previously authorized in the fishery management plans would both jeopardize the continued existence of the wDPS [of Steller sea lions] and adversely modify its critical habitat," did not repeat the earlier BiOp's mistakes of "focusing solely on a vast scale" and providing only vague information with little analysis. *Id.* at 1050, 1052. The second time around, NMFS more carefully "consider[ed] the impact of sub-populational decline on a species as a whole." *Id.* at 1052.

the Services about the status of the various populations of threatened and endangered species that are harmed by federally-regulated cooling water systems.

EPA claims that the kind of data that the Services need to their job properly simply do not exist, but this is plainly false. Through this submission, Commenters will do what they can to assist the Services in filling the large gap that EPA has left. It remains incumbent on both EPA and the Services, however, to comply with their respective statutory obligations to ensure that the final BiOp is based on the best available scientific data. It would be arbitrary, capricious, and in contravention of the ESA and APA, for either EPA or the Services to take final agency action in the absence of a first-rate effort on the part of all three agencies to obtain and analyze such data. The ESA does not allow the Services to issue a BiOp based on limited and incomplete analysis if some of the information needed is available but simply could not be analyzed in the time allowed. *Greenpeace*, 80 F. Supp. 2d at 1148. The Services have authority to request that EPA furnish the data necessary to ensure an informed analysis. *See* 50 C.F.R. § 402.14(f).

5. The Biological Evaluation is premised on an unlawful interpretation of the ESA.

At the outset, Commenters note that EPA is attempting to compensate for the deficiencies in its data provision by trying to move the ESA's goalposts. In the Biological Evaluation, EPA is clearly attempting to encourage the Services to accept two unlawful propositions as the basis for the BiOp:

- *EPA suggests that the BiOp should examine only how the rule will change the number of fish killed in comparison to current levels of impingement and entrainment.* For example, EPA's discussion of the "effects of the proposed action" begins with the statement: "This section evaluates the potential effect of the proposed action on ESA-listed species and designated critical habitats. This evaluation is based on comparison of the baseline I&E with that estimated under the final rule." BE at 73 (emphasis added). EPA then argues that its action is benevolent because "[t]he proposed action does not authorize any new activities or increased discharge of pollutants," BE at 81. And EPA concludes with the assertion that "[u]nder the final rule, regulated improvements in CWIS characteristics and operations will have the designed effect of reducing I&E mortality, which in turn is expected to have beneficial effects for some T&E species." BE at 90.
- *EPA also implies that the Services' BiOp need not include a thorough analysis of impacts on listed species or critical habitat because a full ESA analysis can be deferred to a later date.* For example, EPA states that "[u]nder the final rule, all regulated facilities are required to submit baseline source water biological characterization data. Among other data, these studies will identify T&E species present . . . [In addition the rule requires] entrainment studies [that] may identify IM&E of T&E species, information that will be considered by EPA in its determination of BTA for EM on a facility-specific basis, both at the facility

conducting the IM&E study, as well as at nearby facilities.” BE at p. 55. EPA repeats elsewhere in the BE that the five-year NPDES permit cycle provides “an opportunity to regularly review ESA issues and adjust discharge permit conditions or monitoring requirements as needed.” BE at 4.

Both propositions are counterfactual and unlawful, as explained more fully below.

a. There is no such thing as “baseline I&E” or “baseline thermal discharge”

EPA’s first tactic is a transparent effort to game the baseline for the forthcoming BiOp(s). Contrary to EPA’s assertion, there is no such thing as “baseline I&E” (or “baseline thermal discharge”). EPA has regulatory options for implementing the mandate of Section 316(b), that is, how to minimize the adverse environmental impact of cooling water systems. Because EPA is authorizing continued operation of hundreds of existing cooling water intakes, the BiOp must look at the full impact of continuing to operate these intakes, including *all* continuing impingement and entrainment and discharges of thermal pollution, as well as all other impacts, in determining whether EPA’s rulemaking jeopardizes the continued existence of any species or adversely modifies any designated critical habitat.

The ESA demands that federal agencies “afford first priority to the declared national policy of saving endangered species” in light of the “conscious decision by Congress to give endangered species priority over the ‘primary missions’ of federal agencies.” *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 185 (1978). This means that “[w]hen an agency, acting in furtherance of a broad Congressional mandate, chooses a course of action which is not specifically mandated by Congress and which is not specifically necessitated by the broad mandate, that action is, by definition, discretionary and is thus subject to Section 7 consultation.” *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 524 F.3d 917, 929 (9th Cir. 2008). In this case, EPA’s discretion in carrying out its duty under Section 316(b) of the Clean Water Act must be exercised in a manner that neither jeopardizes the recovery or survival of listed species nor adversely modifies critical habitat. *See, e.g., Am. Rivers, Inc. v. U.S. Army Corps of Eng’rs.*, 421 F.3d 618, 631 (8th Cir. 2005) (“[T]he FCA does not mandate a particular level of river flow or length of navigation season, but rather allows the Corps to decide how best to support the primary interest of navigation in balance with other interests. . . . Because the Corps is able to exercise its discretion in determining how best to fulfill the purposes of the reservoir system’s enabling statute, the operation of the reservoir system is subject to the requirements of the ESA.”).

In determining whether EPA’s rule jeopardizes listed species or adversely modifies critical habitat, the Services must “evaluate the current status of the listed species” and “[e]valuate the effects of the action and cumulative effects on the listed species or critical habitat.” 50 C.F.R. §§ 402.14(g)(2)-(3). This requires the Services to distinguish between the pre-action condition of all affected species and critical habitat and the direct, indirect, and cumulative effects of EPA’s action:

“‘Effects of the action’ include both direct and indirect effects of an action that will be added to the ‘environmental baseline.’ The environmental baseline includes ‘the past and present impacts of all Federal, State or private actions and other human activities in the action area’ and ‘the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation.’”

Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv., 422 F.3d 782, 790 (9th Cir. 2005) (citing regulatory definitions found at 50 C.F.R. § 402.02).

The baseline does not include future fish kills or habitat impacts. The courts have held numerous times that where, as here, a federal agency exerts control over ongoing activities, practices or operations that affect listed species, the “effects of the action” include the full future consequences of continuing those activities, practices, or operations.

The prohibition against gaming the baseline is stated clearly and recently in *National Wildlife Federation v. National Marine Fisheries Service*, a case related to continued operation of the Federal Columbia River Power System (FCRPS), an immense series of dams and reservoirs on the Columbia River, most of which were built more than 50 years ago. *See* 524 F.3d 917 (9th Cir. 2008). Dams affect endangered aquatic species in many of the same ways that cooling water intakes do: they modify water temperature, block fish passage, and in the case of hydroelectric dams, can impinge and entrain fish in their intakes. With respect to the FCRPS, the Ninth Circuit affirmed the trial court’s rejection of a BiOp because the BiOp’s jeopardy evaluation compared the effects of the planned operations of the FCRPS to a hypothetical state of operations that “degraded” the baseline by folding in part of the power system’s ongoing impact. *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 524 F.3d 917, 929 (9th Cir. 2008). The court held that it was illegal for federal agencies to attempt to disregard certain ongoing impacts of FCRPS operations, rather than focusing “on whether the action effects, when added to the underlying baseline conditions, would tip the species into jeopardy.” *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 524 F.3d 917, 929 (9th Cir. 2008). The court explained that there was a critical difference between the basic existence of the dams and the discretionary federal decision about how to continue operating them:

“The current existence of the FCRPS dams constitutes an ‘existing human activity’ which is already endangering the fishes’ survival and recovery. *See* ALCOA, 175 F.3d at 1162 n.6 (citing 50 C.F.R. § 402.02). Although we acknowledge that the existence of the dams must be included in the environmental baseline, *the operation of the dams is within the federal agencies’ discretion* under both the ESA and the Northwest Power Act, 16 U.S.C. § 839.”

Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv., 524 F.3d 917, 930-931 (9th Cir. 2008) (emphasis added).

Similarly, in reviewing continued operation of the federal Klamath Irrigation Project, which had operated for more than ninety years “following essentially the same procedures for storing and releasing water,” the Supreme Court stated that the proper focus of a Section 7 consultation was on whether “long-term operation of the Klamath Project was likely to jeopardize the continued existence of the Lost River and shortnose suckers.” *Bennett v. Spear*, 520 U.S. 154, 159 (1997). The year after *Bennett v. Spear* was decided, the Services published a Section 7 consultation handbook that made clear that, with respect to all federal water projects, the effects of construction and past operation of locks, dams, reservoirs, water diversions, and similar modifications form part of the environmental baseline, but BiOps must distinguish between this baseline and the future direct and indirect impacts of continued operation of these water projects. See Consultation Handbook p.4-30. The same is true for water projects that are not built by the federal government. For example, where private dams are licensed by the Federal Energy Regulatory Commission and have existed for many years, continued operation of the dams by a municipality is still subject to ESA consultation and to protective measures designed to achieve a 75%-95% fish passage survival rate for endangered species that encounter the dam. See *Cowlitz Indian Tribe v. FERC*, 186 Fed. Appx. 806, 809 (9th Cir. 2006).

The Services have established court-approved techniques to distinguish the existential impact of physical assets like dams and power plants (the baseline impact) from the effects of their continued operation (the action). For example, in order to distinguish between the harms caused by the existence of dams and reservoirs built decades ago on the upper Missouri River, and the harms caused by their continued operation now, “[t]he FWS [Fish and Wildlife Service] used a ‘run-of-the-river’ baseline in which the dams and physical channel modifications are assumed to be in place, but all floodgates are assumed to be wide open, with no flow control.” *Am. Rivers, Inc. v. United States Army Corps of Eng’rs.*, 421 F.3d 618, 632-633 (8th Cir. 2005). The Eighth Circuit upheld this approach as the correct way to distinguish between the past creation of such physical assets and their future operation. See *Am. Rivers, Inc. v. United States Army Corps of Eng’rs.*, 421 F.3d 618, 632-633 (8th Cir. 2005).¹¹ ”

In *American Rivers*, the Eight Circuit explained that the Army Corps attempts to add “hypothetical continued operation” of dams to the baseline “is essentially a different twist on the argument that the Corps has no discretion in operating the reservoir system. . . . However . . . the FCA ‘clearly gives a good deal of discretion to the Corps in the management of the River. . . .’” *Id.* By analogy with *American Rivers*, EPA’s suggestion that the current level of impingement, entrainment, and thermal discharge should be considered as the “environmental baseline,” and that the jeopardy analysis of its new regulations should ask only whether the new rules decrease or increase these effects, is tantamount to arguing that EPA has no ability to affect the existing level of cooling water intake operations through its choices in this rulemaking. That is plainly untrue. In enacting regulations to implement the broad mandate of Section 316(b) of the Clean

¹¹ For EPA’s rule, the equivalent would be a baseline in which cooling water intakes and their associated diversion canals, walls, and other infrastructure exist in rivers and continue to adversely modify habitat (for example through shoreline hardening), but are not operated.

Water Act, EPA has options for “minimizing adverse environmental impact” through controls on the “location, design, construction, and capacity” of existing cooling water systems. 33 U.S.C. § 1326(b).

For example, in its 2011 proposed rule, EPA’s preferred option would allow existing intakes to continue operating with only slight reductions in current levels of take and no effect whatsoever on thermal discharges. At the other extreme, EPA could determine that to minimize adverse environmental impact it is necessary to end all withdrawals of cooling water in the United States, reducing take to zero. In between these extremes lie options such as Options 2 and 3 in EPA’s proposed rule, which would require all or most of the largest existing facilities to gradually retrofit to closed-cycle cooling systems, in the process reducing direct take from impingement and entrainment by more than 97% and effectively ending the discharge of thermal pollution and its impact on habitat. While some incidental take will continue to occur under these middle-of-the-road options, the take of listed species take likely would drop in parallel with overall mortality, i.e. a decrease of 97% or more from current conditions, and adverse habitat impacts would decline dramatically as well.

The BiOp in *American Rivers* also is another good example of the Services’ ability to comply with their duties under Section 7 of the ESA even when facing a complex challenge involving the impacts of multiple structures spread across hundreds of river miles and multiple endangered species. Although the first BiOp was remanded by a district court for failure to consider all of the future effects of the system’s operation, once the FWS completed a BiOp with the correct scope, the court upheld it against a variety of challenges. See *Am. Rivers, Inc. v. U.S. Army Corps of Eng’rs.*, 421 F.3d 618, 626-627 (8th Cir. 2005).

The principle that the “federal action” under review in a Section 7 consultation includes all future effects of a federal regulation that authorizes continuation of an activity or operation applies in all regulatory settings, not just when dealing with water infrastructure. See, e.g., *Dow AgroSciences LLC v. Nat’l Marine Fisheries Serv.*, 707 F.3d 462 (4th Cir. 2013) (BiOp covering EPA’s re-registration of decades old, commonly used pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) must evaluate all continuing uses of those pesticides); *Ctr. for Marine Conservation v. Brown*, 917 F. Supp. 1128, 1137 (S.D. Tex. 1996) (BiOp regarding Gulf Coast shrimp fisheries asks whether “the continued long-term operation of the shrimp fishery in the southeastern United States [is] likely to jeopardize the continued existence of the Kemp’s ridley sea turtle. . . .”); *Greenpeace v. Nat’l Marine Fisheries Serv.*, 80 F. Supp. 2d 1137, 1143-1144 (W.D. Wash. 2000) (quoting *Conner v. Burford*, 848 F.2d 1441, 1458 (9th Cir. 1988)) (BiOp reviewing the fishery management plans (FMPs) that govern the annual groundfish catches in Alaskan waters must “be equal in scope to the FMPs” because “biological opinions under the ESA must be ‘coextensive’ with the agency action.”).

When the government regulates private activities on federal lands through plans or policies, the federal action reviewed in a Biological Opinion includes all subsequent regulated activities, and not just any incremental changes from the last plan or policy. The elements of a plan that protect listed species, such as road closures or other use restrictions, are balanced

against aspects of the plan that might injure species, such as continued (or expanded) road use, logging, or off-road recreational use authorizations. All are considered “relevant factors” in reaching a final determination as to whether continued use of the federal lands under the plan jeopardizes the continued existence of species in the plan area. *See, e.g., Ctr. for Biological Diversity v. Bur. of Land Mgmt.*, 422 F. Supp. 2d 1115, 1138, 2006 U.S. Dist. LEXIS 14675 (N.D. Cal. 2006) (rejecting as arbitrary and capricious a biological opinion that involved both recreational use of critical habitat as well as offsetting protection measures); *cf. Ctr. for Biological Diversity v. Bur. of Land Mgmt.*, 2011 U.S. Dist. LEXIS 114039 (D. Az., Sept. 30, 2011) (upholding a BiOp that reviewed BLM land use regulations for Arizona that included both activities likely to cause take of endangered tortoises and also offsetting conservation measures, stating that, “despite impacts [on endangered tortoises] from OHV use and grazing . . . FWS adequately assessed the current status of the desert tortoise population and its critical habitat, analyzed the possible future effects resulting from the RMPs, considered all relevant factors and the best available scientific data, and provided a reasoned and rational explanation supporting its ‘no jeopardy’” and ‘no adverse modification’ determinations.”); *See also Forest Serv. Empls. For Env’t Ethics v. U.S. Forest Serv.*, 726 F. Supp. 2d 1195, 1200 (D. Mont. 2010) (Forest Service’s ongoing practice of annually “dumping millions of gallons of chemical fire retardant on national forests” required consultation with Services that considered the full ongoing impacts of all fire retardant use).

Many agencies facing a Section 7 consultation on rules or plans that govern ongoing operations or activities have tried to game the baseline in a similar way and failed. There is no such thing as “baseline I&E” or “baseline thermal discharge.” The Services must include all the relevant factors in a jeopardy and adverse modification determination – above all, the adverse consequences of allowing hundreds of cooling water intakes to continue killing millions of listed organisms. The Services must determine whether, taken as a whole, and in light of baseline and cumulative effects, EPA’s regulation will avoid jeopardizing the continued existence of all of the 215 affected species and will protect their habitat, whether designated as critical or not.¹²

Finally, even if EPA’s approach of evaluating only the increase or decrease in “baseline I&E” were legal, the fact is that EPA’s proposed rule is actually likely to increase harm to endangered species. As compared to the current trends, which began a decade ago, in which a rising number of plants are retrofitting to closed-cycle systems, EPA’s proposal is likely to both

¹² All impacts to habitat must be considered as part of the jeopardy analysis, because habitat impacts in turn affect species and thus may contribute to jeopardy. *See Miccosukee Tribe of Indians of Florida v. FWS*, 566 F.3d 1257, 1262-63 (11th Cir. 2009) (describing biological opinion which found that continued flooding of non-designated Cape Sable seaside sparrow habitat would lead to species extinction); 50 C.F.R. § 222.102 (“Harm in the definition of ‘take’ in the Act means an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering.”); *cf.* 16 U.S.C. § 1533(a)(1)(A) (listing “destruction, modification, or curtailment of [] habitat” as one rationale for listing species as endangered or threatened).

reduce the number of existing intakes that are ultimately retrofitted to closed-cycle cooling systems and to increase the total flow of cooling water through those existing intakes. Thus, EPA's proposal likely will *increase* the number of listed organisms killed directly in cooling water intakes and also increase the volume of thermal discharge pollution released that adversely modifies the habitat of listed species.

To understand why EPA's proposed rule likely will have such effects, it is necessary to first understand the regulatory status quo. In the absence of a federal rule, a few states have adopted policies phasing out all use of once-through cooling, but most states make case-by-case decisions to regulate cooling water intakes pursuant to the "best professional judgment" provisions of EPA's NPDES regulations. *See* 40 C.F.R. § 125.3. "Best professional judgment" determinations under the Clean Water Act consider a limited number of factors. In practice, "EPA's record shows numerous instances of existing facility retrofits to closed-cycle"¹³ under this long-standing approach.

But in the proposed rule, EPA's preferred option abandons the limited factors of the best professional judgment standard in favor of an open-ended set of factors that the state's permitting director deems to be "relevant." 76 Fed. Reg. 22,174, 22,204 (col. 2). Permitting agencies are then simply told to choose the technology the agency deems "warranted." 76 Fed. Reg. at 22,283 (col. 2). And EPA now explicitly invites permitting directors to determine that "no additional control requirements are necessary beyond what a facility is already doing." 76 Fed. Reg. 22,262 (col. 2). To the extent that EPA's proposed rule encourages States to consider a broader range of factors than they currently use in settings standards for cooling water intakes, and encourages permittees to provide more complex justifications for lax regulatory standards, EPA's rule is likely to slow an already glacial regulatory process even further and to lead some plants that may have been forced to retrofit under the old process to avoid retrofits.

EPA also plans to worsen the status quo by unlawfully extending the schedule for making BTA determinations. Although the Clean Water Act clearly requires that BTA determinations be made and revisited every five years, Under EPA's proposed rule permitting directors will be given up to eight years from the effective date of the new rule to make BTA decisions with respect to impingement, and an indefinite schedule for controlling entrainment.¹⁴

EPA's new rule also replaces a commonly used and fairly stringent regulatory standard for comparing different cooling system options, called the "wholly disproportionate" standard, with an open-ended formula. Since the 1970's, EPA and many state permitting authorities have used the "wholly disproportionate" test to interpret Section 316(b) (EPA writes permits directly

¹³ 76 Fed. Reg. at 22,204 (col. 1).

¹⁴ *See* 76 Fed. Reg. 22,248 (col. 1) ("As proposed, facilities would have to comply with the impingement mortality requirements as soon as possible . . . (not to exceed eight years as described below) . . . With respect to entrainment requirements, under the proposal, existing facilities must comply as soon as possible . . .").

for facilities in a few states). Under the “wholly disproportionate” test, a BTA analysis begins with consideration of the best performing and available technology to reduce entrainment or impingement – which is almost always cooling towers. Only if the Director rejects the best performing technology because its costs were “wholly disproportionate” to the benefits it provided could the Director consider the next most effective technology. In the absence of a final 316(b) Phase II rule governing existing facilities, many states and EPA Regional Offices have used some variation of this approach. This approach has contributed to the above-noted retrofits of many cooling water intakes in recent years. But EPA now plans to do away with the “wholly disproportionate” standard and substitute instead a far weaker cost benefit analysis, under which a Director may reject any technology if the costs “are not justified” by the benefits.¹⁵

Further, EPA’s rule worsens the status quo by introducing a new provision that grandfatheres the use of existing once-through cooling systems at many new generating units built at existing power plants, including repowered¹⁶ or replaced generating units at these facilities. Such repowerings and replacements of existing power plants are occurring frequently in the current economic circumstances because many older plants have reached the end of their useful life at a point where fuel switching from coal to natural gas makes compelling economic sense. As just one example, the 50 year old B.L. England power plant near Cape May, New Jersey is scheduled to repower over the next five years. It will close down two generating units cooled by an antiquated once-through cooling system. These fifty year old turbines have run as peaking units only for the past ten years. These units will be replaced with a single combined-cycle turbine that is more powerful than either of the two old units, and will run at a much higher capacity factor. But the New Jersey Department of Environmental Protection has already decided that this powerful new turbine can use the 50 year old once-through cooling system rather than a closed-cycle cooling system, despite the fact that there is already a functional closed-cycle cooling system on site that supports a third turbine. The New Jersey Department of Environmental Protection referenced the pending federal rule in concluding that the new turbine, which will kill at least a billion organisms a year by using the existing closed-cycle cooling system, should be exempted from federal regulations for new units that otherwise would have required the use of a cooling tower.¹⁷

Thus, there are two primary effects of EPA’s departure from the “best professional judgment” decision making process, abandonment of the “wholly disproportionate standard,” and grandfathering of repowered or replaced facilities. First, many existing intakes that would otherwise have been retrofitted to closed cycle cooling in the coming years now will not be.

¹⁵ Proposed 40 C.F.R. § 125.98(e), 76 Fed. Reg. at 22,288 (col. 1).

¹⁶ Repowering is the practice of rebuilding and replacing the major components of an existing power plant.

¹⁷ New Jersey Department of Environmental Protection, Division of Water Quality, Bureau of Surface Water Permitting, BL England Generating Station, NJPDES Permit Number: NJ0005444, Response to Comments, at 16 of 40.

Second, many of the high capacity factor new generating units that are being built to replace low capacity factor older units will be grandfathered under EPA's new rule, greatly increasing the "actual intake flow" of existing cooling water intakes. As such, the net effect of EPA's new rule over the coming years is likely to be an increase in the number of listed animals killed by cooling water intakes, and an increase in the area of habitat that is adversely modified by thermal discharge, when compared to the situation that would exist if current trends were extended into the future.

The proposed rule is likely to increase harm in other ways as well, for example, by weakening the definition of "species of concern" under the Clean Water Act in a way that would actually exclude many rare, endemic or uniquely valuable species from future environmental analyses. For a more detailed critique of the ways in which EPA's proposal actually worsens the status quo, see the attached comments on EPA's 2011 proposal.¹⁸

b. Now is the only opportunity to prepare a comprehensive and meaningful Biological Opinion.

EPA's other tactic is to imply that the Services should issue superficial BiOps that will somehow be supplemented later. This is illegal and unrealistic. As discussed above, EPA is promulgating an enormously important regulation that will affect hundreds of listed species and their habitats. For most existing intakes, no federal agency will be involved in the reissuance of their NPDES permit because these permits are issued by state agencies. The EPA rule is the only federal action affecting these intakes. Now is the only opportunity for the Services to complete a comprehensive biological opinion.¹⁹

EPA's statements about how future studies of impingement and entrainment will factor into future NPDES permit reviews are confusing, if not outright misleading. Most NPDES permits are issued by States, not EPA. The requirements to perform future studies under EPA's proposed rule will be enforced by States, not EPA. And the studies themselves are to be performed and supervised not directly by (under-resourced) state agencies, but rather by the permittees, with "peer review" by experts that are paid by and report to permittees.²⁰ Thus, it is

¹⁸ Comment Letter from Riverkeeper, Inc., Natural Resources Defense Council, Sierra Club, Waterkeeper Alliance, Earthjustice, Environmental Law And Policy Center, Clean Air Task Force, Network For New Energy Choices, California Coastkeeper Alliance, Soundkeeper, Inc., Delaware Riverkeeper Network, Save The Bay – Rhode Island, Friends Of Casco Bay, NY/NJ Baykeeper, Hackensack Riverkeeper, Santa Monica Baykeeper, San Diego Baykeeper, Scenic Hudson, American Littoral Society, And Conservation Law Foundation, re National Pollutant Discharge Elimination System – Cooling Water Intake Structures at Existing Facilities and Phase I Facilities, 76 Fed. Reg. 22,174 (April 20, 2011), Docket ID No. EPA-HQ-OW-2008-0667, dated August 18, 2011 (hereinafter "August 2011 Comment Letter").

¹⁹ In addition, a properly done BiOp or ITS under ESA section 7 should be incorporated into the 316(b) rule itself as the federal action permitting state regulators to issue permits for cooling water intake systems in their NPDES permits.

²⁰ See August 2011 Comment Letter, at 42-44, 71-72, 82, 160.

unclear under what legal authority EPA believes it can ensure that these studies are conducted at all, much less in an adequate manner, or how EPA will have a meaningful opportunity to make use of the study results.

Nor is it obvious how EPA intends to use the “five-year cycle” for issuing NPDES permits to periodically review ESA compliance at cooling water systems. *See* BE at 4. First, most periodic NPDES reviews and permit reissuances are conducted by the States, not EPA, pursuant to agreements that delegate administration of the NPDES program to state authorities. Generally speaking, EPA is not directly involved in writing or periodically reviewing NPDES permits for cooling water intakes.

Second, many of the states that administer the NPDES program have not examined the effects of existing cooling water intakes in decades and have ignored existing federal law that requires them to review the impacts of cooling water intakes in every NPDES permit cycle.²¹ These states either do not review the effects of a cooling water intake at all, or they conduct a perfunctory review summarized as “no significant change” in a single sentence placed in a draft NPDES permit fact sheet.²² EPA has rarely, if ever, challenged these practices.

Third, the NPDES permit backlog for the large power plants that are the main users of cooling water is so great that the five-year permit cycle often takes ten years or more to complete. At coal fired power plants alone, more than 87 million MWh of generation operates without an up-to-date permit as of 2011, and nationwide, 255 existing power plants were operating on expired permits. Many of these permits (at least 65) were expired for more than an entire five-year permit cycle,²³ with a number operating on permits that expired in 1995 or earlier. As noted above, EPA’s proposed rule would only worsen this problem by creating an extended timeline of up to eight years from the effective date of the new rule before BTA

²¹ For example, Section 402(a)(1)(A) of the Clean Water Act authorizes issuance of NPDES permits for point source discharges “on condition that such discharge will meet ... all applicable requirements under sections [301 and 306],” one of which is section 316(b)’s requirement that cooling water intake structures reflect BTA. Thus, every time a permit writer issues or re-issues a NPDES permit, he or she must ensure that the facility still complies with Section 316(b). Both EPA’s suspended Phase II regulations, and EPA’s proposed rule, also require explicitly that BTA determinations be revisited with each five year permit cycle. This requirement is found at 40 C.F.R. § 125.98 in both the suspended and proposed versions of the rules.

²² *See* GRACE Communications Foundation, Sierra Club, Riverkeeper, Waterkeeper Alliance, River Network, “Treading Water; How States Can Minimize the Impact of Power Plants on Aquatic Life,” Available at <http://www.gracelinks.org/3124/power-plants-kill-fish-treading-water-report>.

²³ Commenters have attached a list, compiled in 2011, of coal plants with cooling water intakes operating on expired permits; 18 of these were more than 10 years overdue.

decisions are made for impingement, and EPA is setting an indefinite deadline for BTA decisions regarding entrainment.²⁴

Once EPA promulgates the Phase II 316(b) regulations, it will in all likelihood wash its hands of the vast majority of all future impacts to listed species and their habitats, except in the very few instances where it retains NPDES permitting authority for regulated facilities.²⁵ Such an approach to ESA compliance is not reasonably certain to avoid harm and therefore is not lawful. The Services must complete a full BiOp now, while it is still possible for EPA to issue a final rule that meets its ESA obligations to avoid jeopardy to listed species, avoids adverse modification of critical habitat, and implements all reasonable and prudent alternatives to jeopardy and/or reasonable and prudent measures to minimize incidental take.

6. EPA has not presented the Best Available Data to the Services.

EPA has clearly failed in its obligation to provide the Services with the best available commercial and scientific data on the effects of its proposed rule and the status of the listed species affected by it. To properly support a formal consultation, EPA should have ensured that its Biological Evaluation contained “the best scientific and commercial data available or which can be obtained during the consultation for an adequate review of the effects that an action may have upon listed species or critical habitat.” 50 C.F.R. § 402.14(d). Instead, EPA’s submission is an exercise in box-checking: it provides limited information in the categories typical for such a document (*see* 50 C.F.R. § 402.12) and falls far short of providing the best available data for the Services’ consideration, despite having access to this best available commercial and scientific data.²⁶

²⁴ *See* 76 Fed. Reg. 22248 (“As proposed, facilities would have to comply with the impingement mortality requirements as soon as possible . . . (not to exceed eight years as described below) . . . With respect to entrainment requirements, under the proposal, existing facilities must comply as soon as possible . . .”).

²⁵ For most NPDES permits, the only other conceivable nexus for federal action is EPA’s ability, under Section 402(d) of the Clean Water Act, to object to state-issued NPDES permits. But surely EPA does not seriously propose to seek 1200+ individual consultations with the Services. And even if EPA planned to combine the pending BiOps with thousands of future, site-specific BiOps, this would not avoid the need for the Services to reach a conclusion about jeopardy now and issue an incidental take statement. *See Forest Serv. Emples. for Env’tl. Ethics v. U.S. Forest Serv.*, 726 F. Supp. 2d 1195, 1229 (D. Mont. 2010) (“programmatic” biological opinions are not excused from the incidental take requirement). If this site-specific BiOp approach is indeed the direction that EPA is suggesting to the Services, it is illegal because it is not reasonably certain to avoid jeopardy to listed species and adverse modification of critical habitat. The Services and EPA “may not rely on plans for future actions to reduce threats and protect a species.” *Or. Natural Resources Council v. Daley*, 6 F. Supp. 2d 1139, 1154 (D. Or. 1998).

²⁶ EPA did not even collect and evaluate all Incidental Take Statements, Incidental Take Permits, and state, federal and/or permittee monitoring reports or studies on endangered and threatened species and their habitat (whether designated “critical” or not) related to currently permitted facilities. With these comments we are providing additional data and information to be considered by the agencies, which also indicate the incompleteness of EPA’s data gathering.

For the most part, the Biological Evaluation is written at a level of generality consistent with high school textbooks. EPA spends five pages defining, in single paragraphs, ecosystems such as the “intertidal zone,” the “pelagic zone,” and “rivers and streams.” See BE at 15-19. But EPA never identifies the actual rivers, intertidal zones, and other ecosystems affected by cooling water intakes and discharges, or quantifies the extent of those impacts. EPA simply contends that it is impossible to do so. But as explained below, it is quite possible to identify the reaches affected by once-through cooling water systems and use available models to quantify the impacts that cooling systems have upon them, such as the temperature increase caused by thermal discharges.

EPA then spends another 35 pages listing the 215 endangered species that it believes are affected by the continued operation of existing cooling water systems and describes most of the genera (not species) affected by the rule in broad terms, with a sentence or two on their life history. See BE at 19-54. EPA never once discusses the status of any of these listed species: population trends, number of breeding individuals, distribution, etc.

Further, EPA never presents the kind of information necessary to determine whether the survival or recovery of even a single listed species is jeopardized by the continuing operation of once-through cooling water systems. The BE provides no information on the existence of important sub-populations of listed species, except for those officially listed as Distinct Population Segments, and no information on the impacts that the rule might have on such important sub-populations. It contains no meaningful data on habitat modification generally, nor on designated critical habitats in particular.

The BE also fails to include well-documented and easily accessible information about other ongoing projects that affect listed species, such as dredging operations in the Delaware River, the operation of the Klamath and Columbia River power systems, or the impacts that Gulf, Pacific, and Atlantic coast fisheries have on sea turtles, sturgeons, and numerous other listed species caught as bycatch. Thus, in addition to not providing sufficient data about the status of the species affected or the effects of impingement, entrainment, and thermal discharges on those species, EPA has also provided woefully insufficient information on the environmental baseline or relevant cumulative effects. Overall, the data provided by EPA to the Services is insufficient to specify levels of incidental take that might occur for any of the species affected by this rule, even in broad or order of magnitude terms.

Instead, EPA repeatedly claims that it lacks adequate information about the affected species. As these comments show with respect to just a few species and locations, EPA clearly made little or no effort to find that information, despite the fact that these models and data are readily available. The agency has no excuse as to why it overlooked and failed to provide the Services with this information.

For example, EPA states that, after searching through impingement and entrainment studies from 98 facilities, the agency could not find any examples in the last 20 years of

impingement and entrainment of listed species; the examples they did find were limited to eight species. *See* BE at 62-67. But the 98 facilities EPA looked at make up less than 10% of the universe of existing facilities regulated under Section 316(b). With only a small fraction of EPA's resources and innate knowledge of the subject, Commenters were able to quickly identify several recent examples of cooling water systems harming endangered species, including impacts on species not discussed by EPA. These are discussed below.²⁷

*a. Columbia Generating Station – Intakes and Thermal Discharge Harm Salmonids*²⁸

On May 7, 2012, NOAA wrote to EPA, requesting consultation on EPA's possible approval of a state-issued NPDES permit for the Columbia Generating Station in Washington. Two ESA-listed species of steelhead and salmon live in the Hanford Reach of the Columbia River near the plant, and the area is designated critical habitat for the species. NOAA explained that adult Upper Columbia River steelhead are known to spawn near the intake and discharge structures and juveniles inhabit this area. Although the Columbia Generating Station uses a closed-cycle cooling system that withdraws 98% less water than comparable once-through systems, NOAA concluded that even this limited intake was likely to adversely affect listed

²⁷ In addition to the resources discussed below, Commenters provide two more general exhibits. The first is a Sierra Club report entitled *Giant Fish Blenders: How Power Plants Kill Fish & Damage Our Waterways*, which includes citations to data and studies on impacts to threatened and endangered species. This includes evidence of direct harm to listed species including: Gulf sturgeon; Alabama shad; saltmarsh topminnow; mangrove rivulus; green, Kemp's Ridley, loggerhead and leatherback sea turtles in the Gulf of Mexico; shortnose sturgeon in the Hudson River; three species of endangered turtles in New York harbor; and a number of listed species in California coastal waters, for example the impingement and entrainment at the Pittsburg and Contra Costa plants in the San Francisco Bay Delta of more than 300,000 listed fish per year, including Sacramento splittail, chinook salmon, steelhead trout, Delta smelt and Longfin smelt. The study also notes the indirect harms to species that are dependent on healthy populations of fish that are subject to impingement and entrainment. The report describes how power plant intake structures harm these species and also names 17 power plants with one-through cooling systems. Second, Commenters provide a table of representative *Coal-Fired Power Plants using Once-Through Cooling with Endangered Species Impacts*, with plant name, state, water body, daily intake capacity, and the identities of listed species living in the water body that are likely threatened with impingement or entrainment, and in a few cases, records of harm to listed species from these power plants.

²⁸ Attached to this comment letter are the following three documents: (1) Letter from the United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, to U.S. Environmental Protection Agency, Region 10, re: Columbia Generating Station – NPDES permit renewal by State of Washington, dated May 7, 2012; (2) Letter from the United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, to U.S. Nuclear Regulatory Commission, re: Columbia Generating Station, Consultation No. I/NWR/2011/05286, dated June 11, 2012; and (3) Memorandum from Briana Balsam, Biologist, Office of Nuclear Reactor Regulation to Jeremy J. Susco, Acting Chief, Office of Nuclear Reactor Regulation, re: Conclusion of Informal Section 7 Consultation with U.S. Fish and Wildlife Service of Columbia Generating Station and Section 7 Consultation Report, dated June 13, 2012.

species by killing fry; therefore, it requested formal consultation. Since once-through cooling systems kill approximately 50 times as many fish, it follows that NOAA's concerns would be fifty times more significant at a comparable plant with a once-through cooling system. Although EPA's consultants reviewed the Columbia Generating Station's NPDES permit in preparing the BE, they did not look beyond it to any other cooling water intakes on the Columbia River.

b. Impingement and Entrainment of Atlantic Sturgeon in the Delaware River

On the East Coast, power plants have documented the repeated killing of both shortnose and Atlantic sturgeon in the last ten years. The continued existence of the recently-listed Atlantic sturgeon, in particular the Delaware River Atlantic sturgeon, a genetically unique component of the New York Bight Distinct Population Segment (DPS), is potentially jeopardized by continuing operation of once-through cooling systems on the Delaware.

With respect to Atlantic sturgeon, we respectfully direct the Services' attention to the comment letters sent to NOAA Fisheries by the Delaware Riverkeeper Network, dated April 6, 2012²⁹ and June 12, 2012³⁰, highlighting the need for immediate designation of critical habitat in the Delaware River and commenting on the Section 7 consultation on the U.S. Army Corps of Engineers' planned dredging of the Delaware River main channel (the "Deepening Project"). We also respectfully direct the Services' attention to the July 19, 2013 comments of the Natural Resources Defense Council regarding NMFS' recent draft "batched" BiOp for a number of Atlantic fisheries.³¹ NRDC's comments, and the attached expert reports, identified significant concerns about the validity of NMFS' most recent estimates of Atlantic sturgeon abundance throughout their range. Because the studies cited in and attached to NRDC's and the Delaware Riverkeeper Network's comments are already in NOAA's possession, we do not append them now. The Services' obligation to use the best available commercial and scientific data necessarily includes studies and comments submitted to the Services during previous consultations.

²⁹ See attached letter from DRN to NOAA re Endangered Species Act Section 7 Consultation Biological Opinion -- re Critical Habitat Designation, ESA Section 7 Consultation on the Deepening Project, and Monitoring on the Atlantic Sturgeon in the Delaware River, dated April 6, 2012, at 1-2 (hereinafter "DRN April 2012 Letter").

³⁰ See attached Letter from DRN to NOAA re ESA Section 7 Consultation on the Deepening Project's Effects on Atlantic Sturgeon and Shortnose Sturgeon in the Delaware River, dated June 12, 2012.

³¹ See Comment Letter from NRDC to NOAA re Endangered Species Act Section 7 Consultation Biological Opinion -- Endangered Species Act Section 7 Consultation on the Continued Implementation of Management Measures for the Northeast Multispecies, Monkfish, Spiny Dogfish, Atlantic Bluefish, Northeast Skate Complex, Mackerel/Squid/Butterfish, and Summer Flounder/Scup/Black Sea Bass Fisheries [Consultation No. F/NER/2012/01956], dated July 19, 2013.

We also direct the Services to the recent NMFS BiOp for the killing of shortnose and Atlantic sturgeon at the Indian Point nuclear generating station on the Hudson River.³² In that opinion, NMFS found that even with protective measures and improved monitoring efforts, the Indian Point station on the Hudson is expected and permitted to take 564 shortnose sturgeon and 416 Atlantic sturgeon over the next twenty years. The opinion also is notable for purposes of this consultation because it demonstrates consideration of both climate change and thermal discharge impacts at a level that EPA could have performed, even if only on a case study basis, but did not perform.

As Delaware Riverkeeper Network noted in its 2012 letters, the status of the Delaware River Atlantic sturgeon is “extremely precarious” for a number of reasons, beginning with the fact that while “there were once 180,000 spawning female Atlantic sturgeon in the Delaware River[,] NMFS’ latest population estimate based on fisheries bycatch data is that there is a mean of 87 spawning adult Atlantic sturgeon annually in the Delaware River.” DRN April 2012 Letter at 1-2. Of these few remaining adults:

[T]he best available scientific and commercial data recently released by NMFS demonstrat[e] a 38% intercept rate for Atlantic sturgeon in Northeast fisheries with an average mortality rate of 20% in sink gillnets (27% in monkfish fisheries) and 5% in otter trawls.

DRN April 2012 Letter at 5.

This dire context makes it all the more significant that “the open water intake cooling systems at Hope Creek Generating Station and the Salem Nuclear Generating Stations on the Delaware River . . . are likely to result in the impingement and entrainment of various life stages of Atlantic sturgeon. PSEG Nuclear, LLC found a dead Atlantic sturgeon on the Salem facility’s intake structure trash bars on March 18, 2011.” DRN April 2012 Letter at 6. Again in March and July of 2013, PSEG filed reports with the Nuclear Regulatory Commission indicating that the Salem power plant impinged at least one juvenile shortnose sturgeon and one juvenile Atlantic sturgeon.³³ Sturgeon may also be impinged and entrained at the Delaware City Refinery’s cooling water intake, on the Delaware side of the estuary.

The Mercer power plant has also killed both species of sturgeon through impingement and entrainment. According to the Delaware River Basin Priority Conservation Areas and

³² See NMFS, NOAA, *Dept. of Commerce, Biological Opinion for Continued Operations of Indian Point Nuclear Generating Unit Nos. 2 and 3* (Jan. 30, 2013).

³³ See attached Letter from PSEG Nuclear LLC to U.S. Nuclear Regulatory Commission, re: Report of Impingement of Atlantic Sturgeon; Salem Generating Station Unit No. 1; Docket No. 50-272, dated March 29, 2013 and Letter from PSEG Nuclear LLC to U.S. Nuclear Regulatory Commission, re: Report of Impingement of Shortnose Sturgeon; Salem Generating Station Unit No. 1; Docket No. 50-272, dated August 1, 2013.

Recommended Conservation Strategies Final Report, prepared by The Nature Conservancy, the Partnership for the Delaware Estuary and the Natural Lands Trust, the area of the Delaware River in which Mercer's intakes are located is likely spawning habitat for Atlantic sturgeon and juvenile overwintering habitat for shortnose sturgeon.³⁴ In fact, according to a report submitted by PSEG (owner of the Mercer plant) to the New Jersey Department of Environmental Protection, the intake system at Mercer has killed shortnose sturgeon in the past (without an incidental take permit) and is estimated to kill eight juvenile Atlantic sturgeon annually (also unpermitted take). By comparison, in its July 2012 final BiOp for the Army Corps' Deepening Project, NMFS authorized the incidental take of only 9 Atlantic sturgeon over the 15 year period of dredging and annual maintenance.³⁵ Mercer impinges nearly this many Atlantic sturgeon in a year.

Notably, not one of the published peer-reviewed studies provided to NOAA and listed in the DRN April 2012 Letter bibliography provided by Delaware Riverkeeper Network was cited by EPA in its Biological Evaluation. The peer-reviewed literature is, obviously, available data.

Nor did EPA provide any of the reports referenced in the attached letters from Delaware Riverkeeper Network that were developed by the New Jersey Department of Environmental Protection or the Delaware Department of Natural Resources and Environmental Conservation. In fact, from the face of the Biological Evaluation, it appears that EPA did not make any kind of systematic effort to reach out to colleagues in state government about the impacts of cooling water intakes on threatened and endangered species and their habitats. Yet state agencies directly regulate the overwhelming majority of the cooling water intakes affected by EPA's pending rule and protect habitat in the vicinity of the intakes, and thus are more likely than EPA to possess information about harm to listed species. Thus, it appears that EPA is not taking seriously its duty to provide the Services with the best available data. The commenters urge the Services to contact state environmental and wildlife protection agencies directly.³⁶

³⁴ See The Nature Conservancy, the Partnership for the Delaware Estuary and the Natural Lands Trust, "Delaware River Basin Priority Conservation Areas and Recommended Conservation Strategies Final Report," Appendix II: Diadromous Fish Habitat Maps, November 2011.

³⁵ See attached National Marine Fisheries Service Endangered Species Act Biological Opinion, by Army Corps of Engineers (ACOE), Philadelphia District, dated July 11, 2012, Considering Deepening of the Delaware River Federal Navigation Channel (Reinitiation).

³⁶ A few examples of records of power plant take that are available to EPA (and the Services) and that EPA (or if it fails to do so, the Services) must gather and consider before a BiOp can issue are: 1) records accumulated pursuant to incidental take permits issued by NOAA to seven California power plants in 2008 (see NOAA, "Taking and Importing of Endangered Species; Taking of Sea Turtles Incidental to Power Plant Operations," 73 Fed. Reg. 19826 (April 11, 2008); 2) records from the Crystal River Energy Complex, a plant for which NMFS consulted in 1999 and issued a BiOp and instructions on record keeping to monitor take of sea turtles; and 3) records from at least the following NPDES permits for coal fired power plants with once-through cooling systems that include impingement and entrainment monitoring requirements for listed species to be performed by the permittee and/or states: Morgantown GenOn in Maryland; Big Cajun II in Louisiana (pallid sturgeon); Nine Mile Entergy plant in Louisiana

At the current level of fishery bycatch, vessel strikes, and continued operation of cooling water intakes, the loss of the genetically unique Delaware River component of the New York Bight DPS of Atlantic sturgeon is very possible. And this is before the cumulative impacts of climate change and new dredging in the Delaware are taken into account. With fewer than 100 breeding adults in the river every year, every single fish counts. The loss of the Delaware River population would jeopardize the entire DPS.³⁷ The best available data show that the loss of juvenile sturgeon at cooling water intakes in the Delaware River, notably the intakes of the Mercer and Salem generating stations, is a serious blow to an irreplaceable population of endangered Atlantic sturgeon.

c. Taking of Endangered Sea Turtles in Florida: the St. Lucie Nuclear Plant Case Study

As a power plant that kills five separate species of endangered sea turtles, the St. Lucie nuclear plant provides a powerful example of the harm that cooling water intakes cause to listed species. But it is also an object lesson in the failures of case-by-case regulatory efforts to protect listed species, whether under Section 316(b) of the Clean Water Act or Section 10 of the Endangered Species Act.³⁸

Florida Power and Light's (FPL) St. Lucie nuclear power plant began operation of Unit 1 in 1976 and Unit 2 in 1983. The plant is on Hutchinson Island, about eight miles southeast of Ft. Pierce, Florida. For twenty years, no biological opinion governed the operation of this cooling system and its effects on sea turtles.³⁹ It appears that the Nuclear Regulatory Commission ("NRC") only initiated formal consultation after it determined that an increasing number of sea turtles were being captured and killed at the St. Lucie plant and there was no allowance for such take.⁴⁰

(pallid sturgeon); New Madrid, Missouri; Bridgeport Energy Facility, Connecticut (sturgeon), and the Monroe plant in Michigan.

³⁷ See NOAA, *Endangered and Threatened Wildlife and Plants; Threatened and Endangered Status for Distinct Population Segments of Atlantic Sturgeon in the Northeast Region*, Final Rule, 77 Fed. Reg. 5880, 5883 (Feb. 6, 2012).

³⁸ The documents referred to in this discussion of the St. Lucie plant are attached to this comment letter.

³⁹ Cover letter from United States Nuclear Regulatory Commission to Florida Power and Light Company, re: Biological Opinion, St. Lucie Plant, Units 1 and 2 (TAC NOS. MA6374 and MA6375), dated May 18, 2001, attaching National Marine Fisheries Service, National Oceanic and Atmospheric Administration, United States Department of Commerce, "Biological Opinion" re: the St. Lucie Nuclear Power Plant, at 1-2 ("NMFS Biological Opinion on St. Lucie Plant").

⁴⁰ *Id.* at 2.

NMFS issued a BiOp in 1997, but NRC and NMFS reinitiated formal consultation shortly thereafter, in 1999,⁴¹ and again in 2006,⁴² in both cases because incidental take limits were exceeded, and in 2005 when an endangered small-tooth sawfish was found in the intake canal.⁴³ In fact, consultation has been ongoing between NMFS and the NRC since 2007 and a new BiOp is expected soon.⁴⁴

For all this consultation, NMFS' involvement has not effectively reduced the risks to endangered sea turtles from the St. Lucie cooling water intakes. A total of 6,576 turtles of all five listed species were removed from the St. Lucie intake canal during the 23-year period from 1976-1999.⁴⁵ Yet in the subsequent 12 years, from 2001-2013, a total of 8,198 turtles were captured, including 67 injuries/mortalities.⁴⁶ After the deaths of hundreds of sea turtles at the FPL plant, including fifteen years of take since NMFS first got involved, FPL now purports to be "developing a plan to install turtle excluder grating at the offshore intake structures."⁴⁷

There are also serious questions about the adequacy of monitoring and reporting of take at St. Lucie and at other power plants. The ESA requires that incidental take statements establish clear triggers for subsequent consultation if there is a risk of jeopardizing the species. *See Miccosukee Tribe of Indians v. United States*, 566 F.3d 1257, 1271-72 (11th Cir. 2009) (citing 50 C.F.R. § 402.14(i)(4)). Further, action agencies must report on "the progress of the action and its impact on the species to the Service."⁴⁸ But at St. Lucie, while it appears that mortality reports are sent to the NRC (and presumably are forwarded to NMFS), it is unclear whether reports on the monthly non-lethal entrainment and impingement of sea turtles are also forwarded to the NRC and NMFS. And a 2009 Government Accountability Office report concluded that the extent to which the Services require ongoing monitoring in BiOps varies from action to action, that the consistency with which the Services track monitoring reports varies from field office to field office, and that the Services lack complete monitoring information for many of their formal consultations.⁴⁹ Clearly, this system exhibits potential for communication breakdown between the applicant, the State, any federal action agency, and the Services.

⁴¹ *Id.* at 2-3.

⁴² NRC, "Biological Assessment, St. Lucie Nuclear Power Plant Units 1 and 2, Reinitiation of Section 7 Consultation to Include Sea Turtles" (August 2007).

⁴³ *See* Letter from Frank Gillespie, NRC, to David Bernhart, NOAA, (Feb. 24, 2006).

⁴⁴ FPL St. Lucie Plant Annual Environmental Operating Report, at 18 (2012).

⁴⁵ NMFS Biological Opinion on St. Lucie Plant, Units 1 and 2, at 6.

⁴⁶ FPL Marine Turtle Removal Monthly Summary (August 2013)

⁴⁷ FPL St. Lucie Plant Annual Environmental Operating Report, at 18 (2012).

⁴⁸ 50 C.F.R. § 402.14(i)(3).

⁴⁹ U.S. Gov't Accountability Office, *Endangered Species Act: The U.S. Fish & Wildlife Service Has Incomplete Information About Effects on Listed Species From Section 7 Consultations*, GAO-09-550 (2009).

The poor implementation, inadequate monitoring, lengthy delays, and above all, the decades long failure to actually reduce harm to turtles at the St. Lucie plant, all indicate that the Services cannot be reasonably certain that the listed species protection efforts at this one plant are effective. And St. Lucie is in that minority of plants that are directly regulated by a federal agency and submit monitoring reports that are available to NMFS. Under EPA's proposed rule, the situation at state-regulated facilities will be worse, and harder to monitor.

The Services and EPA "may not rely on plans for future actions to reduce threats and protect a species." *Or. Natural Resources Council v. Daley*, 6 F. Supp. 2d 1139, 1154 (D. Or. 1998). The agencies should be "reasonably certain" that promised future actions will occur before concluding that a threatened species is not jeopardized. *Northwest Envtl. Advocates v. EPA*, 268 F. Supp. 2d 1255, 1273 (D. Or. 2003). Neither the Services nor EPA can be reasonably certain that a roll out of endangered species protections one cooling water intake at a time under EPA's proposed rule, at facilities regulated by states, will actually occur. And even if listed species protections are put in place through case-by-case decisions, as EPA envisions, this scheme is not reasonably certain to control the killing of listed species or avoid damaging their habitat. The example of the St. Lucie plant strongly suggests that the Services cannot have reasonable confidence that EPA's proposed rule will achieve even the small reductions in take of listed species that EPA projects.

d. Thermal Discharge Causing Widespread Adverse Habitat Modification

EPA also failed to present the Services with readily available data about the extent to which existing cooling water intakes discharge thermal loads that adversely modify the habitats of hundreds of listed species.⁵⁰ In the Biological Evaluation, EPA catalogued all of the reasons that temperature is considered a "master environmental variable for aquatic ecosystems" and the many ways in which it may adversely affect endangered species and their habitats (BE p.70-71), but never attempted to quantify the impacts of thermal discharge on habitats and never considered or attempted to evaluate the impact of thermal discharges on specific habitats or species. Even a cursory review shows that EPA has ignored readily available information about the specific harms to listed species and their habitats caused by thermal discharges.

For example, Madden *et al.* (2013) reviewed "federal datasets documenting water temperature at intakes and discharges from power plants during the summer in the United States between 1996 and 2005."⁵¹ They point out that, since 1974, the Energy Information

⁵⁰ "Significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering" constitutes the taking of endangered species. 50 C.F.R. § 222.102.

⁵¹ N. Madden, A. Lewis and M. Davis, "Thermal effluent from the power sector: an analysis of once-through cooling system impacts on surface water temperature," 8 Environ. Res. Lett., Article ID 035006, at 2 (2013).

Administration has compiled systematic records of water withdrawals, discharges, and temperatures from power plants using once-through cooling systems, which make up the bulk of the regulated universe by volume under Section 316(b). They also identify other sources of information on once-through cooling system thermal discharges to make up for deficiencies in the EIA database. Using an approach similar to the one that EPA used to identify overlaps between endangered species and cooling systems generally, Madden *et al.* used the presence of high numbers of endangered species as a proxy for biodiversity to focus their analysis on 33 watersheds where very high aquatic biodiversity (more than 10 imperiled species) overlap with high thermal discharges. See Madden *et al.* at 3 and Figure 2, at 5. The authors then examined the Upper Catawba watershed in North and South Carolina as an example of one such watershed. They found that all five power plants in the Upper Catawba “reported discharging water that exceeded state limits on ΔT and maximum discharge temperatures during the summer (figure 3). However, their NPDES permits revealed that all five power plants had been granted thermal variances that allowed them to exceed state water quality limits[.]” Madden *et al.* at 5. EPA is currently reviewing two of these permits directly, but the wider point is clear: EPA’s rule will continue the operation of cooling water intakes that are poorly regulated at the state level and are located in watersheds where they are likely to impinge, entrain, and adversely modify the habitat of listed species. EPA could use a technique like this to focus on high priority watersheds.

Note that EPA provided no information to the Services about the Catawba watershed. But EPA’s direct review of permits in the watershed, coupled with the fact that thermal discharges into the Catawba were linked to mass die-offs of striped bass in 2004, 2005, and 2010,⁵² strongly suggest the potential for direct or indirect effects on listed species living in various reaches of the Catawba, including different sturgeon and freshwater mussel species.

The Union of Concerned Scientists and independent scientists from a number of governmental and academic laboratories have formed a collaboration called “Energy and Water in a Warming World” (EW3), which has also closely examined existing water withdrawal and thermal discharge data. At the outset, it is worth noting that EW3 identified major inaccuracies in the Energy Information Administration data on water withdrawals that EPA has based part of its own regulatory analyses upon. The problems vary from the unfortunate, such as power plants reporting estimated rather than measured values, to the egregious: “201 freshwater-cooled coal and natural gas plants nominally reported water use to the EIA but claimed to withdraw and consume no water at all (Figure 8). Such reporting is obviously in error: these plants could not run without water.” EW3 at 21. Based on their size and operations, EW3 estimates that this “mistake” leads to unreported withdrawals of 1.1 trillion to 2.6 trillion gallons. See EW3 at 22.

EW3 also identified 350 power plants that discharge wastewater at peak summer temperatures exceeding 90 degrees Fahrenheit, and singled out power plants in the upper Dan

⁵² See A Report of the Energy and Water in a Warming World Initiative “Freshwater Use by U.S. Power Plants; Electricity’s Thirst for a Precious Resource” November 2011, at 29, available at www.ucsusa.org/publications (hereinafter “EW3”).

River of North Carolina and Virginia for peak summertime discharges exceeding 110 degrees Fahrenheit, a temperature that is generally lethal to wildlife and far in excess of most state standards. *See* EW3 at 27-29. The Dan River is home to rare and endangered freshwater fish and mussels, including the James spinymussel.

In its 2011 publication, “Freshwater Use by U.S. Power Plants; Electricity’s Thirst for a Precious Resource,” EW3 compiled a record of thermal discharges from power plants that have caused and have potential to cause significant harm to aquatic organisms:

- In the summer of 2010, Tennessee River water temperatures rose above 90°F, forcing the Browns Ferry nuclear plant in Athens, AL, to drastically cut its output for nearly five consecutive weeks in order to meet water quality standards. A similar event occurred in August of 2007 and 2011.
- Until Georgia Power retrofitted the Plant Harllee Branch coal-fired power plant on the Lake Sinclair reservoir on Georgia’s Oconee River with a cooling tower in 2002, extensive fish die-offs had been common.
- In August 2007, the Riverbend and G.G. Allen coal plants discharged cooling water in excess of water quality based effluent limits designed to protect fish in North Carolina’s Catawba River. The plants were forced to cut back power generation in an effort to comply with these limits.
- In 2006, Quad Cities Reactors near Cordova, Illinois reduced power output because thermal discharges exceeded water quality based effluent limits. In 2012, the plant’s owners sought a 316(a) variance to increase the temperature of their discharge.
- In summer 2012, the Braidwood Nuclear Plant, in Illinois, raised the temperature of its receiving water body to 102°F.
- Throughout 2012, the E.D. Edwards plant, also in Illinois, required a special variance to continue operating because it could not comply with extant thermal limits designed to protect aquatic organisms.
- The Joliet, Will County, and LaSalle power plants, also in Illinois, needed similar thermal variance throughout the summer of 2012 (in the case of LaSalle, the variance was required from March).
- In the summer of 2012, the Cumberland and Gallatin coal plants in Tennessee both had to curtail operations in order to meet thermal discharge limits set to protect the Cumberland River.

- The Dresden nuclear plant in Illinois exceeded thermal limits set to protect the DesPlaines and Kankakee Rivers in 2012 (and later received a provisional variance to these limits).
- To avoid violating thermal limits, the Monticello nuclear plant in Minnesota reduced power output throughout August 2006 and August 2010.

To overcome the gaps in current temperature data sets, scientists have also developed thermal exchange models for evaluating the interactions between power plant discharges and the environment that allow for a more systematic assessment of the effects of EPA's decision to allow continued operations of once-through cooling systems. Miara *et al.* (2013) describe "a simulation model of power plant operations, the Thermoelectric Power and Thermal Pollution Model (TP2M)" that "simulates the operations of contemporary and emerging power plants according to climate and hydrology conditions, engineering requirements, electricity demand and environmental regulation," and is "coupled to a regional biogeophysical model, the Framework for Aquatic Modeling in the Earth System (FrAMES) . . . a spatially distributed hydrology model with gridded river networks (3 min) that simulate transport, mixing and re-equilibration of water temperatures along river reaches at a daily time step" in order to "quantify, in high-resolution, regional patterns of thermal pollution, electricity generation on a single power plant and regional scale, river temperatures and power plant efficiency losses associated with changes in available cooling water that incorporates climate, hydrology, river network dynamics and multi-plant impacts."⁵³

This kind of modeling analysis could assist the Services in trying to quantify and estimate the effects on various aquatic habitats of the thermal discharges from hundreds of once-through cooling systems that will continue to operate under EPA's rule. EPA should have run such models for itself, or sought the assistance of these or similar modelers. Notably, after running different configurations of the model, one of Miara *et al.*'s findings is that "by significantly reducing the amount of heat input to the river system, conversion to [cooling towers] result in the greatest improvements for aquatic ecosystem indicators." Miara *et al.* at 7 (Col. 2).

The Miara *et al.* study also examines the cumulative effects of a scenario in which the current cooling configuration in the Northeast remains in place and thermal pollution load remains similar to current conditions, combined with the anticipated climate change in the Northeast. The anticipated impacts of climate change over the coming decades include "increases in ambient temperatures and precipitation" and "higher seasonal fluctuation of stream flow" leading to "reduced river discharge in mid-northern latitudes (i.e. Northeastern US) despite an increase in precipitation. Combined low flow and rising temperatures will result in a warming of rivers." *Id.* at 8. The model indicates a greater than 100% increase "in unsuitable habitat for

⁵³ Ariel Miara, Charles J. Vorosmarty, Robert J. Stewart, Wilfred M. Wollheim and Bernice Rosenzweig, "Riverine ecosystem services and the thermoelectric sector: strategic issues facing the Northeastern United States," 8 *Environ. Res. Lett.*, Article ID 025017, at 2 (2013).

fishes with maximum average weekly temperature thresholds of 24 C (cold) and 29 C (cool) [in the Northeast].” *Id.* The study also indicates a similar increase in unsuitable habitat “for fishes with 34 C (warm) thresholds,” but this could be mitigated by heightened efficiency and enforcing otherwise applicable water quality standards on thermal discharges (i.e. ending the use of CWA Section 316(a) variances). *Id.*

Applying the same models, Stewart *et al.* (2013) found first that 28.4% of all the heat generated at inland Northeastern thermoelectric plants was transferred directly to rivers via once-through cooling systems (by comparison, the amount of heat converted to electricity was only marginally greater at 34.3%).⁵⁴ The following table is adapted from Stewart *et al.* (*See id.* at 4). It quantifies the impact of once-through cooling (“OTC”) waste heat on major river basins in the Northeast.

Basin	Electricity produced with OTC (TWh/yr)	OTC Heat Input to River (PJ/yr)	Temp. Increase at River Mouth (deg C) (all generation)			Heat attenuated by riverine ecosystem (%) (all generation)		
			Summer	Winter	Annual	Summer	Winter	Annual
Atlantic (all rivers)	250.4	1055	1.9	0.9	0.9	11.9	12.9	11.3
Penobscot	1.7	7.6	0.2	0.1	0.1	7.6	22.3	10.5
Merrimack	13.3	25.5	1.0	0.6	0.6	19.1	33.6	22.2
Connecticut	23.4	50.3	0.8	0.4	0.5	20.3	39.6	23.8
Hudson	36.1	252.3	5.0	2.4	2.5	6.4	7.5	6.2
Delaware	12.2	86.7	2.7	0.9	1.1	12.9	11.9	12.5
Susquehanna	33.8	239.7	2.9	1.3	1.5	11.1	11.6	9.7
James	24.5	177.6	8.2	3.1	3.9	21.5	13.9	18.1

These figures clearly show the significant impacts of all this waste heat. For example, the Connecticut and Merrimack Rivers absorb and dissipate almost 25% of the heat generated at thermoelectric plants along their banks, meaning that they continually experience significant warming for much of their length. And the effect upon the estuaries at the mouths of all these rivers is substantial. In summer time, when many threatened and endangered species approach their thermal tolerance limits and dissolved oxygen impairments in coastal aquatic habitats are at their worst, the Hudson, Delaware, Susquehanna and James rivers are all several degrees warmer

⁵⁴ See Robert J. Stewart, Wilfred M. Wollheim, Ariel Miara, Charles J. Vorosmarty, Balazs Fekete, Richard B. Lammers and Bernice Rosenzweig, “Horizontal cooling towers: riverine ecosystem services and the fate of thermoelectric heat in the contemporary Northeast US,” 8 *Environ. Res. Lett.*, Article ID 025010 at 3 (2013).

at the mouth than they would otherwise be.⁵⁵ The thermal discharges from once-through cooling systems that will continue to operate under EPA's rule contribute to dissolved oxygen impairments that affect dozens (if not hundreds) of listed species and their habitats.

The impact of thermal discharges into these rivers is equivalent in scale to many decades (or in the case of the Hudson and the James Rivers, more than a century) of anticipated climate change. Put differently, ending this adverse impact on the habitat of hundreds of listed species would help to buy humanity and these species another 100 years to recover and adapt to the coming changes in our climate.

Stewart *et al.* conclude that “[i]n aggregate, OTC plants produce all of the total net annual heat loads to rivers.” Stewart *et al.* at 6. The researchers then mapped the dissipation of those heat loads, finding that hundreds of river miles in most of the listed river systems are between 1 and 5 degrees warmer in summer due to these discharges. See Stewart *et al.* at 6. Effectively, the “thermal plumes” in major Northeastern rivers take over the whole river for hundreds of miles.

Stewart *et al.* also provide EPA with a way to quantify and locate adverse habitat modifications, instead of just giving up. Their paper lists 12 common aquatic species and their average weekly temperature tolerance and uses the model results to quantify the number of river kilometers that are rendered unsuitable by discharges from once-through cooling systems regulated by EPA's rule. Since the model described in these papers is a gridded network, temperature values are determined for each point in the grid, thus the model provides the exact locations of the affected reaches in the Northeast. All of the supporting data and figures for these studies are available to the Services electronically. Even if EPA fails to act on this information, using these modelling techniques and results, and taking the species discussed in Stewart *et al.* as proxies for endangered species with similar thermal tolerances, the Services could quantify and precisely locate the habitats adversely affected by EPA's decision to authorize continued operation of once-through cooling systems.

Again, EPA provided none of this readily available information in its consultation package; it simply threw up its hands and claimed that it was “not possible” to evaluate the impacts of individual facilities whose continued operation will be authorized by this rule. BE at 37. For most of the species discussed in the BE, EPA simply asserts that “EPA does not have sufficient data to evaluate to what extent these species have also been affected by environmental alterations or indirect effects of existing CWIS and associated discharges.” See BE at 41-53. EPA repeated this claim with respect to all listed cranes and storks, marine birds, shorebirds, waterfowl, Everglade Snail Kite, all of the eighty three listed species of clams, as well as corals,

⁵⁵ Note, however, that the model does not account for tidal dilution, which is an important variable in the Hudson, Delaware, and James rivers.

Atlantic salmon, logperch, multiple minnow species, Pacific eulachon, Smalltooth sawfish,⁵⁶ Tidewater goby, Unarmored threespine stickleback, Pacific salmonids, rockfish species, seven sturgeon species, three sucker species, six Western trout species, whales, pinnipeds, manatees, sea otters, endangered species of sea turtles, and fifteen species of freshwater snails. Despite EPA's obvious lack of diligence in seeking out the best available information about these species, the fact is that the Services can obtain a great deal of information about these species with only a modicum of effort. It falls to the Services to obtain these data and analyze them on its own, or to extend the consultation period and refuse to issue a BiOp until EPA fulfills its statutory duty to provide the best available information for the Services' review.

e. Invasive Species in Thermal Plumes

Another area in which EPA failed to provide the best available data to the Services is with respect to the role of these thermal plumes in sheltering and promoting the growth of invasive species that harm threatened and endangered native species. EPA notes correctly that invasive species are a stressor affecting listed species and that "[t]hermal discharges from 316(b) facilities may extend the seasonal duration of non-resident organisms, allowing transient summer species to become permanently established in geographic areas beyond their historical range." But EPA provides only the example of increased abundance and overwintering of "the predacious ctenophore *Mnemiopsis leidyi*" in Mount Hope Bay, Massachusetts. This comb jelly is a seasonal resident native to the Atlantic coast. EPA's observation downplays the seriousness of this problem.

EPA failed to inform the Services of a far more worrying development: in recent years, scientists have documented the role of thermal plumes as protective niches for Asian clams (*Corbicula fluminea*) and quagga mussels (*Dreissena bugensis*), two highly invasive species that threaten dozens of listed freshwater bivalves in waterbodies already affected by large, regulated cooling water intakes (including waterbodies designated as critical habitat for bivalves). More than a decade ago, Mitchell *et al.* (1996) found that quagga mussels are present in abnormally high concentrations in areas affected by the thermal discharge plume of a power station and posited that, by decreasing the severity of wintertime low temperatures, thermal plumes create an opening for these invasives to establish and spread.⁵⁷ Thermal plumes were also the launching point for an Asian clam invasion of the Connecticut River.⁵⁸

⁵⁶ Charlotte Harbor, Florida is in the National Estuary Program and is designated critical habitat for the smalltooth sawfish.

⁵⁷ Jeremy S. Mitchell, Robert C. Bailey, and Richard W. Knapton, "Abundance of *Dreissena polymorpha* and *Dreissena bugensis* in a warmwater plume: effects of depth and temperature," 53 *Can. J. Fish. Aquat. Sci.* 1705, 1710 (1996).

⁵⁸ See D.E. Morgan, M. Keser, and J.T. Swenarton, "Population dynamics of the Asiatic clam, *Corbicula fluminea* (Muller) in the Lower Connecticut River: Establishing a foothold in New England," 22 *J. of Shellfish Research* 193-203 (2003).

Last year, Simard *et al.* (2012) found that the thermal plume of the Gentilly-2 nuclear power plant in Quebec, on the north shore of the St. Lawrence River, now provides a stable winter home for a population of invasive Asian clams.⁵⁹ With this discovery, the Asian clam has extended its northern boundary to include the entire United States.

These scientific studies, and others like them,⁶⁰ are readily available to the Services. Their findings should be reviewed and considered by EPA and the Services as they evaluate whether continued operation of existing once-through cooling systems jeopardizes the continued existence of numerous species of freshwater bivalves and/or adversely modifies their critical habitats. EPA did not include these or similar studies in its bibliography for the BE.

f. Connecticut River – Mount Tom Generating Station Biological Assessment

The most egregious example of EPA's failure to provide the best available data is EPA's failure to discuss information that is obviously in its possession, such as EPA Region 1's 2012 Biological Assessment for reissuance of a NPDES permit to the Mount Tom Generating Station, located on the Connecticut River.⁶¹ Because it is in the non-delegated state of Massachusetts, Mount Tom is one of the few NPDES permitted facilities that EPA actually regulates directly. In preparing a Biological Assessment, although Region 1 focused on the portion of the Connecticut River near Holyoke, Massachusetts, the agency compiled a great deal of information that would be beneficial to the Services in determining the effects of EPA's rule throughout the length of the river.

The Biological Assessment for Mount Tom contains relevant information about conditions in the Connecticut River, including average seasonal flows and temperatures, habitat quality, and a host of water quality indicators, as well as information about the species found in the area. Among other highly relevant facts, the Biological Assessment states that the population of shortnose sturgeon in the Connecticut River appears to be stable at around 1000 fish (orders of magnitude below historic levels), and is divided into two breeding populations above and below the Holyoke Dam. The Assessment also provides important information about the breeding success of these fish, for example, the presence of high numbers of reproductive organ tumors that may have a negative effect on fecundity and are believed to be associated with PAH contamination in the Connecticut River. Finally, the Assessment reviews multiple stressors on sturgeon throughout the Connecticut River and concludes that continued operation of the cooling

⁵⁹ See M. Anouk Simard, Annie Paquet, Charles Jutras, Yves Robitaille, Pierre U. Blier, Réhaume Courtois and André L. Martel, "North American range extension of the invasive Asian clam in a St. Lawrence River power station thermal plume," 7 *Aquatic Invasions* 81–89 (2012).

⁶⁰ *E.g.*, I.C. Rosa, J.L. Pereira, R. Costa, F. Goncalves and R. Prezant, "Effects of upper-limit water temperatures on the dispersal of the Asian clam *Corbicula fluminea*," *PLoS One* 7 e46635 (2012).

⁶¹ See EPA Region 1, Water Permits Branch, Office of Ecosystem Protection, "Biological Assessment Mount Tom Generating Station National Pollution Discharge Elimination System Permit Reissuance (Permit No. MA0005339)," dated May 25, 2012.

water intake at Mount Tom likely will impinge and entrain specific numbers of adult, juvenile, and larval shortnose sturgeons at the Mount Tom plant, and therefore will adversely affect listed organisms, requiring formal consultation with the Services that the Commenters believe is presently ongoing.

EPA could have included information from this and other water-body specific research, such as EPA's investigations in the Catawba and Dan River watersheds, noted above. Clearly, this information would aid the Services in evaluating the effect of authorizing continued operation of multiple cooling water intakes on the Connecticut, Catawba, and Dan Rivers. Yet EPA chose to simply state that there was no available information about the effects of intakes on particular waterbodies or species affected by this rule.

7. The Services cannot reach a no jeopardy finding on the basis supplied by EPA.

Although it is short on specifics, EPA's Biological Evaluation provides a great deal of alarming information on the broad trends, risks to listed species and critical habitat, and pervasive environmental damage caused by cooling water intakes. As noted above, cooling water intakes regulated under this rule affect 215 listed aquatic species and discharge waste heat into 290 designated critical habitats.⁶² In addition, EPA points out that:

- “Overall, aquatic species are disproportionately imperiled relative to terrestrial species. For example, 39 percent of freshwater and diadromous fish species . . . , 67 percent of freshwater mussels . . . and 48 percent of crayfish . . . are classified as T&E.” BE at 3.
- “Proximity to T&E species and/or designated critical habitat (in addition to consideration of Essential Fish Habitats) is a documented concern at many power plant facilities.” BE at 3. There is an extremely high degree of overlap between listed species' habitat and cooling water intakes. *See* BE at 55-62.
- “For T&E species, I&E from CWISs may represent a substantial portion of annual reproduction. Consequently, I&E may either lengthen species recovery time, or hasten the demise of these species much more so than for species that are abundant. For this reason, the population-level and social values of T&E losses are likely to be disproportionately higher than the absolute number of losses that occur.” BE at 3.
- The available data likely understates threats to listed species because regulators do not routinely revisit concerns surrounding threatened and endangered species during relicensing or permitting proceedings. *See* BE at 4.

⁶² *See* BE at 60 and Table 7-1, 83-88. The 290 designated critical habitats overlap each other (i.e. the same habitat is used by multiple species).

- Endangered species are rarely found in impingement and entrainment samples because sample sizes are small and by definition listed species are rare. “T&E species are found at low population densities, and the volume of water sampled by facility-level impingement and entrainment studies is low. Thus, it is likely that many T&E species suffered IM&E outside of sampling periods and are never recorded.” BE at 63-64. Therefore, the absence of listed species in sampling data does not mean they aren’t being killed. If listed species are present in the vicinity of cooling water intakes, they can be killed periodically even if individuals are not found during rare sampling episodes.
- EPA’s investigation of NPDES permits for facilities known to overlap with the ranges of multiple endangered species found that none of the permits contained conditions aimed specifically at protection of listed species and there was little or no analysis related to listed species at these facilities. *See* BE at 4.
- “The operation of CWISs and discharge returns significantly alter patterns of flow within receiving waters, both in the immediate area of the CWIS intake and discharge pipe, and in mainstream waterbodies. Flow alteration may be particularly disruptive in inland riverine settings. Flow alterations can create changes in the overall aquatic habitat and thus affect T&E species in a number of ways.” BE at 68.
- “Many T&E species are particularly vulnerable to degraded water quality” (BE at 69) and “many aquatic organisms subject to the effects of cooling water withdrawals reside in impaired (i.e., CWA 303(d) listed) waterbodies. Accordingly, they are potentially more vulnerable to cumulative impacts from other anthropogenic stressors.” BE at 65.

Thus EPA’s Biological Evaluation, while vague, provides a great deal of negative information demonstrating that cooling water intakes may jeopardize the survival and recovery of listed species, or may adversely modify designated critical habitat. And EPA has failed to provide the kind of site-specific, quantitative data that would be needed to demonstrate that it will comply with its statutory obligation to avoid jeopardy and adverse modification.

Despite EPA’s failure to provide the best available data, it is ultimately the obligation of the Services to issue comprehensive BiOps that reach a well-reasoned final opinion about whether EPA’s action will jeopardize the continued existence of any species or adversely modify habitat. Under guidance issued by the Services, when faced with pervasive uncertainty and an obligation to complete a BiOp promptly, the Services must “develop the biological opinion with the available information[,] giving the benefit of the doubt to the species.” Handbook at 1-7; *see also Natural Res. Defense Council v. Kempthorne*, 506 F. Supp. 2d 322, 360 (E.D. Cal. 2007) (agency cannot abdicate responsibilities by characterizing available information as uncertain, in the face of uncertain information Congress intended to give benefit of the doubt to the endangered species); *Rock Creek Alliance v. U.S. Fish & Wildlife Serv.*, 390 F. Supp. 2d 993, 1008, (D. Mont. 2005) (“[A] tie in the evidence should go to the species, especially because of female mortality. FWS must demonstrate a rational explanation for its conclusions, and given the

clear possibility that bears are at least not increasing, contemplating the loss of additional bears related to the mine is not rational.”), *accord Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988) (requirement to use the best available information must always be met because “to hold otherwise would eviscerate Congress’ intent to give the benefit of the doubt to the species.”).

In the face of so much information about the potential of cooling water intakes to cause harm, so little information to suggest that endangered species can continue to withstand this harm, and so little effort by EPA to provide the best available data or establish a regulation that positions the agency to closely monitor and control harm to endangered species in the future, the prudent way to give the benefit of the doubt to listed species is to conclude that EPA’s rule will jeopardize their continued existence.

NMFS’ 2012 Biological Opinion on the U.S. Army Corps of Engineers’ nationwide permit program provides a recent example of this kind of jeopardy finding in the face of poor information.⁶³ The Biological Opinion addressed the Army Corps’ decision to renew more than 40 nationwide general permits that collectively authorized, *every year*, tens of thousands of actions that involve dredging, filling, and modification of tens of thousands of acres of aquatic and wetland habitats throughout 45 of the 50 states.

NMFS concluded that the Army Corps’ nationwide permits – which set up a system of one-time authorizations with little follow up, notification of permitted activities, and monitoring by the Army Corps – authorized the kinds of activities known to cause substantial harm to listed species and left the Corps blind to the impacts its permitting might have and unable to respond to emergent problems:

[T]he U. S. Army Corps of Engineers has failed to insure that the Nationwide Permits it proposes to use to authorize activities in navigable and other waters of the United States are not likely to jeopardize the continued existence of endangered and threatened species under the jurisdiction of the National Marine Fisheries Service and are not likely to result in the destruction or adverse modification of critical habitat that has been designated for these species. . . .

[T]he evidence available suggests that the USACE has not structured its proposed Nationwide Permit Program so that the USACE is positioned to know or reliably estimate the general and particular effects of the activities that would be authorized . . . and, by extension, be positioned to know or reliably estimate the general and particular effects of those discharges on endangered and threatened species. The USACE also has not structured its proposed Nationwide Permit Program so that it is positioned to take actions that are necessary or sufficient to prevent the activities that

⁶³ NMFS, NOAA, U.S. Dept. of Commerce, *National Marine Fisheries Service Endangered Species Consultation Biological Opinion on U.S. Army Corps of Engineers’ Nationwide Permit Program* (Feb. 2012).

would be authorized by the proposed Nationwide Permits from individually or cumulatively degrading the quality of the waters of the United States that would receive those discharges. It has not structured its proposed Nationwide Permit Program so that the USACE is positioned to *insure* that endangered or threatened species and designated critical habitat are not likely to be exposed to [harm] . . . [a]nd it has not structured its proposed Nationwide Permit Program so that the USACE is positioned to *insure* that endangered or threatened species and designated critical habitat do not suffer adverse consequences if they are exposed to [harm].

To satisfy its obligation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended, the USACE must place itself in a position to (a) monitor the direct, indirect, and cumulative impacts of the activities the proposed Nationwide or General permits would authorize, (b) monitor the condition of those effects on the subwatersheds or watersheds in which those activities occur, (c) monitor the consequences of those effects for listed resources under NMFS' jurisdiction, and (d) take timely and effective corrective actions when the consequences of those actions exceed measurable standards and criteria.⁶⁴

In this rule, EPA is setting itself up in much the same situation: EPA is prepared to authorize the operation of cooling water intakes despite the fact that they cause harms that the agency has not yet managed to assess, and has no future plans to assess. The information provided by EPA is so clearly inadequate that the Services cannot reasonably conclude that EPA's regulation will avoid jeopardizing the continued existence of endangered or threatened species and will avoid destroying or adversely modifying designated critical habitat. The only appropriate conclusion for a BiOp based on EPA's limited data provision is a jeopardy finding like that reached in the Army Corps BiOp.

8. The deadline for EPA to issue a final rule is likely to be extended; the Services should take this opportunity to demand that EPA provide the Best Available Data.

The Services cannot reasonably conclude that EPA's 316(b) regulations will avoid jeopardy based only on the limited information provided by EPA about the harms to listed species from continued operation of existing cooling water intakes. Nor, on this basis, can the Services issue quantified incidental take statements with clear triggers for subsequent action. In these circumstances, one option open to the Services is to reach a jeopardy conclusion and set forth a reasonable and prudent alternative to EPA's rule.

But "[w]here significant data gaps exist," the Services' handbook lays out another alternative as well: "if the action agency concurs, extend the due date of the biological opinion until sufficient information is developed for a more complete analysis." Handbook at 1-7. At this stage, gathering and analyzing new information is the only defensible alternative to issuing a

⁶⁴ *Id.* at 223-224.

jeopardy opinion. EPA has not provided the best available data, and the Services cannot issue opinions that are not based on the best available data.

Commenters have demonstrated that EPA has ignored readily available information sources ranging from government reports to thermal modeling analyses. The Services' Handbook explains what is to be done in such cases:

If relevant data are known to be available to the agency or will be available as the result of ongoing or imminent studies, the Services should request those data and any other analyses required by the regulations at 50 CFR §402.14(c), or suggest that consultation be postponed until those data or analyses are available

Handbook at 1-6.

9. Closed-Cycle Cooling Technology should be the focus of any Reasonable and Prudent Alternative (RPA) analysis or Reasonable and Prudent Measures (RPM) analysis.

Unfortunately, EPA's Biological Evaluation did not provide the Services with information on closed-cycle cooling technology. More information about closed-cycle cooling would assist the Services to select Reasonable and Prudent Alternatives in case of a jeopardy finding, and to develop Reasonable and Prudent Measures for inclusion in an incidental take statement. Again, Commenters seek to assist the Services in filling this gap.

Closed-cycle cooling technology provides the only reasonable and prudent alternative means for EPA to minimize the adverse environmental impacts of cooling water intakes under Section 316(b) of the Clean Water Act.

To that end, we attach to this letter our comments to EPA on its proposed rule as published in 2011.⁶⁵ Those comments discussed the use of closed-cycle cooling in detail, including the technical and economic feasibility of a national rule that would require widespread use of cooling towers. Of course, Commenters cannot bridge the data gap left by EPA alone, and encourage the Services to seek additional information.

Widespread adoption of closed-cycle cooling in place of once-through cooling intakes is a valid Reasonable and Prudent Alternative:

1. closed-cycle cooling is almost certain to avoid jeopardizing endangered species by reducing impingement and entrainment by 98% and eliminating thermal discharges;
2. closed-cycle cooling is consistent with the purposes of EPA's rule – minimizing the adverse environmental impact of cooling water intakes;

⁶⁵ August 2011 Comment Letter.

3. closed-cycle cooling is consistent with EPA's authority – EPA considered such options in developing this rule; and
4. closed-cycle cooling is economically and technologically feasible.

See 50 C.F.R. §402.02 (defining the elements of a Reasonable and Prudent Alternative).

In developing its cooling water intake rule, EPA had before it regulatory options – national categorical standards based on the performance of closed-cycle cooling systems (Options 2 and 3 from the proposed rule) – that would protect the environment at a reasonable cost to industry, create jobs, and cause no significant adverse effects on the environment, electric reliability, or consumer prices. EPA unlawfully rejected these options in favor of preserving the status quo. Closed-cycle cooling is a feasible and readily affordable technology. A national, categorical entrainment standard based on that technology could include a narrow safety-valve variance to properly take account of site-specific factors for those plants fundamentally different than the majority.

EPA can and should establish a uniform national standard based on the use of closed-cycle cooling technology: EPA determined that closed-cycle cooling is a best performing technology⁶⁶ and that numerous existing facilities had retrofitted to closed-cycle.⁶⁷ During the rulemaking process, EPA expressed concern that “closed-cycle cooling is not practically feasible in a number of circumstances” that “are not isolated or insignificant.”⁶⁸ But Congress gave EPA the ability to subcategorize regulated industries and to offer variances precisely to address such concerns. *See* 33 U.S.C. § 1311(n) (fundamentally different factors variance). And properly crafted variance provisions have been upheld under Section 316(b) before. *See Riverkeeper, Inc. v. U.S. EPA*, 358 F.3d 174, 193-94 (2d Cir. 2004).

As the attached comments explain more fully, Options 2 and 3 from EPA's proposed rule, both of which involve conversion of many existing intakes to closed-cycle systems, are technically and economically feasible. It is technically feasible to set uniform national standards because closed-cycle cooling and other technologies are available to the industry as a whole and EPA has the ability to issue variances in the rare case where it is technically infeasible. As the comments show in detail, the technical issues that EPA raised in the preamble to the proposed rule are not serious obstacles to widespread adoption of closed-cycle cooling.

The attached analysis also shows that closed-cycle cooling retrofits are economically feasible – they are well within the economic reach of virtually all regulated entities. The economic feasibility test under the Endangered Species Act is a test of affordability, not a cost-

⁶⁶ *See* 76 Fed. Reg. at 22,203 (col. 3).

⁶⁷ *See* 76 Fed. Reg. at 22,204 (col. 1).

⁶⁸ 76 Fed. Reg. at 22,207 (col. 1).

benefit analysis. The “economically and technologically feasible” language in the Act does not require an agency to “balance the benefit to the species against the economic and technical burden on the industry before approving an RPA” because this would be inconsistent with the purposes of the ESA. *Delta Smelt Consol. Cases v. Salazar*, 760 F. Supp. 2d 855, 955 (E.D. Cal. 2010). As the Supreme Court has explained, Congress determined that the protection of endangered species is, literally, priceless. *See TVA v. Hill*, 437 U.S. 153, 184 (1978) (“The plain intent of Congress in enacting this statute was to halt and reverse the trend toward species extinction, whatever the cost. This is reflected not only in the stated policies of the Act, but in literally every section of the statute.”).

For these reasons, as explained more fully in the attached comments to EPA, a rule that requires widespread adoption of closed-cycle cooling is a reasonable and prudent alternative to EPA’s preferred option, which jeopardizes the continued existence of many species. In fact, it is the only reasonable and prudent alternative.

10. A closed-cycle cooling rule is the only option that allows the services to develop a defensible incidental take statement.

Better information about closed-cycle cooling is also necessary because, without it, the Services cannot develop valid incidental take statements. By reducing the take of endangered species and the instances of adverse habitat modification by more than 98%, the use of closed-cycle cooling will bring incidental take of listed species down to a level that is actually manageable and quantifiable for the Services.

A BiOp that concludes that a federal action does not violate Section 7(a)(2) of the ESA must include an incidental take statement that “specifies the impact, i.e., the amount or extent, of such incidental taking on the species.” 50 C.F.R. 402.14(i); *see also* 16 U.S.C. § 1536(b)(4). An incidental take statement must set “a ‘trigger’ for further consultation at the point where the allowed incidental take is exceeded, a point at which there is a risk of jeopardizing the species.” *Miccosukee Tribe of Indians v. United States*, 566 F.3d 1257, 1271-72 (11th Cir. 2009) (citing 50 C.F.R. § 402.14(i)(4)).

In their handbook on ESA consultations, the Services determined that to set the trigger, incidental take may be quantified through the number of individuals killed or the extent of habitat disturbed. In either case, however, “a specific number . . . or level of disturbance to habitat must be described.” Handbook p. 4-50. Subsequent to issuance of the Services’ handbook, the federal courts have repeatedly held that Congress clearly expressed a preference for numerical population counts in incidental take statements and therefore the number of individual animals of a species that may be taken incidentally through a federal action must be specified unless the Services and EPA can establish that no numerical value could be practically obtained. *See Oregon Natural Res. Council v. Allen*, 476 F.3d 1031, 1037 (9th Cir. 2007) (invalidating incidental take statement that used habitat markers in place of a number of animals without explaining why determining a number of animals was impracticable); *Arizona Cattle Growers’ Ass’n v. United States Fish and Wildlife Service*, 273 F.3d 1229, 1250 (9th Cir. 2001)

(same); *Miccosukee Tribe of Indians v. United States*, 566 F.3d 1257, 1274 (11th Cir. 2009) (invalidating take statement and discussing cases in which Services managed to express take in numerical form even for “elusive” species including snakes and sea turtles). Even if a BiOp logically concludes that a federal action poses no jeopardy to the continued existence of endangered species, an agency that does not provide the Services with enough data to set numeric limits in the incidental take statement risks seeing the BiOp vacated. *Id.*

If EPA hopes that the Services will reach a no jeopardy and no adverse modification conclusion, and hopes to obtain an incidental take statement, then it should have provided the Services far better information. EPA’s shoddy work creates a heavy burden for the Services. Blanket statements that there are no better data on the impacts of cooling water intakes or the current status of hundreds of endangered species do not build a convincing case that it is impractical to specify the amount of incidental take, particularly where Commenters can readily identify better data for particular species. “Moreover, even where numerical values are improper, an ITS still must contain some surrogate for defining the amount or extent of incidental take.” *NRDC v. Evans*, 364 F. Supp. 2d 1083, 1136 (N.D. Cal. 2003) (citing *Arizona Cattle Growers’ Ass’n v. United States Fish and Wildlife Service*, 273 F.3d 1229, 1239 (9th Cir. 2001)). EPA’s failure to provide information about the extent of habitat needed to preserve endangered species would make even this fallback option a difficult one for the Services.

Although Commenters hope to aid the Services in filling the information gap left by EPA, the fact is that EPA’s rule affects hundreds of endangered species in thousands of ecosystems across the United States. The only realistic way to issue a legally adequate incidental take statement is to first reduce the severity of the rule’s impacts such that the overwhelming majority of facilities no longer pose a serious threat to endangered species. Closed-cycle cooling is likely to reduce the impingement and entrainment of many endangered species at individual facilities down to single digits or tens, instead of hundreds or even thousands. And by eliminating the thermal discharge problem, closed-cycle cooling essentially ends the widespread adverse modification of aquatic habitats. The residual incidental take will occur at a small enough number of facilities, and will affect a lesser number of species, such that the problem of quantifying take can be solved.

11. The BiOp(s) must significantly improve monitoring and reporting of impacts on listed species.

As EPA acknowledges in the Biological Evaluation, the status quo is abysmal in terms of monitoring and reporting on impacts to endangered species. *See* BE at 4-5. Cooling water intakes cause considerable and illegal harm to endangered species. This harm is rarely reported and is not subject to any kind of systematic review – not at the watershed, regional, or national level, nor even at a single site over time. EPA’s review of NPDES permits found little or no consideration of endangered species, and EPA acknowledges that, even under the best of circumstances, endangered species have low population densities and are rarely found in periodic impingement and entrainment sampling.

Currently even when listed species or species of concern are greatly affected by a cooling water intake, reports may not reach state or federal regulators in a timely manner, or at all. For example, on January 14, 2012, the Palm Beach Post reported that the cooling water intake at the St. Lucie power plant in Florida had killed between 50 and 75 Goliath grouper – a long-lived top predator – on a single day in August 2011. The Goliath grouper was for many years a federally listed threatened species, although thanks to a fishing moratorium the Florida population is believed to be recovering and the species was delisted several years ago. The Goliath grouper is still a protected fish in Florida waters. “Although the fish kill occurred in late August, the Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection and U.S. Nuclear Regulatory Commission did not learn of the magnitude of the loss until December, sparking concern by officials and outrage by researchers.”⁶⁹ From the reporting, it appears that neither the EPA nor the Services were directly informed of this fish kill even six months later, although Commenters hope very much that the Services were later informed of this fish kill by their colleagues in Florida.

This kind of lax reporting environment is unacceptable. It is no surprise that EPA has a hard time locating data on fish kills at cooling water intakes. As a condition of any BiOp(s), the Services should require EPA to dramatically improve its ability to monitor and report on the status of endangered species. Among many other measures, this should include:

- Develop *mandatory* standard NPDES permit requirements, procedures, and reporting methods for anticipating, evaluating, and reporting take of endangered species;
- Develop monitoring requirements that include surveying fish to find parasitic life stages of endangered bivalves that are attached to the gills or other parts of fish killed by intakes;
- Require the use of hydrophones and other acoustic monitoring equipment near intakes in all rivers in which tagged endangered species are known to be present, in order to better understand the abundance and behaviors of listed individuals in the area near an intake;
- Create a response capacity at EPA that can rapidly address reported take of listed species and any situations in which a cooling water intake causes sufficient harm to trigger review under the terms of an incidental take statement.

With respect to monitoring, however, by far the most significant change that NMFS can require is to demand that permittees regulated under EPA’s rule undertake environmental metagenomic sampling to detect the presence of endangered species in or near an intake, rather than relying on impingement and entrainment assessments conducted once a decade or less.

⁶⁹ Christine Stapleton, “Nuke Plant Fish Kill Leads to Improved Reporting Procedures,” *Palm Beach Post* (Jan. 14, 2012), <http://www.palmbeachpost.com/news/news/state-regional/nuke-plant-fish-kill-leads-to-improved-reporting-p/nL3C9/>.

EPA admits that current monitoring practices are very unlikely to detect the presence of endangered species. And even when impingement and entrainment sampling are carried out by experienced biologists, the early life stages of listed species (eggs, larvae) are frequently difficult or impossible to distinguish from closely related species and are not reported or are lumped into a single genera.

There is no reason to continue EPA's dependence on such limited data. With the dramatic advances in genetics and bioinformatics, and with the rapid and significant decreases in the cost, time, and complexity of shotgun sequencing, chip-based analysis, and related techniques, there has been an explosion in the use of metagenomic sampling. Today, researchers throughout the United States can sample environmental media for genetic markers (or whole genomes) of multiple species at the same time. The National Academy of Sciences has been heavily promoting the use of environmental metagenomic analyses for several years.⁷⁰ It is quite feasible at this point for any facility operating a cooling water intake to periodically collect water samples, as well as samples of entrained and impinged biomass, and have them tested to detect DNA sequences unique to listed species known to inhabit the area.

12. As a condition of any BiOp, the Services must demand that EPA's rule ensures that all NPDES permits authorizing operation of a cooling water intake state clearly that permitted facilities must obtain an Incidental Take Permit under Section 10 of the ESA if there are listed species or critical habitat in the vicinity of the facility that may be adversely affected by its operation.

EPA's Biological Evaluation repeatedly makes reference to the NPDES permitting process and the possibilities of protecting endangered species through that process. As discussed above, the NPDES process does not and cannot excuse EPA from complying with its obligations under Section 7 of the ESA. Before finalizing this rule, EPA, with the advice of the Services, must reasonably conclude that its rule is not likely to jeopardize the survival, recovery, or critical habitat of listed species. But the Endangered Species Act applies not just to EPA and the Services; it extends to private actors too.

Particularly where, as here, the information provided by EPA is so shoddy that it precludes any possibility of serious analysis, EPA cannot abuse the Section 7 consultation process in a way that would insulate future take of listed species or adverse modification of critical habitat from the protections of the Act. EPA must make clear to regulated entities that, however EPA chooses to fulfill its duties under Section 7 of the Act, nothing in this consultation process can eliminate the strict obligation imposed on industrial facilities by Section 9 of the Act not to take endangered species or harm their habitat.

⁷⁰ See, e.g., Committee on Metagenomics: Challenges and Functional Applications, National Research Council, *The New Science of Metagenomics*, National Academies Press (2007), available at http://www.nap.edu/catalog.php?record_id=11902.

Functionally, the way for the Services to accomplish this is to insist that, as a term or condition of any BiOp, EPA's rule must be amended to require that all NPDES permits authorizing operation of a cooling water intake include a clause stating that:

- a. Compliance with a NPDES permit does not ensure compliance with the Endangered Species Act; and, therefore
- b. NPDES permitted facilities that take in cooling water or discharge waste head must obtain an Incidental Take Permit under Section 10 of the ESA if there are listed species or critical habitat in the vicinity of the facility, because these species and habitat may be adversely affected by operation of the cooling system.

13. The Services must clarify how they will address the ongoing and rapid listing of hundreds of species and their critical habitats.

The FWS is under judicially enforceable deadlines to clear hundreds of species from the ESA listing backlog this year and in the coming two years. On May 10, 2011, the FWS entered into a Stipulated Settlement Agreement in the case of *WildEarth Guardians v. Salazar*, in the United States District Court for the District of Columbia; and on July 12, 2011, the FWS entered into a Stipulated Settlement Agreement in the case of *Center for Biological Diversity v. Salazar*, also in the United States District Court for the District of Columbia. These agreements require FWS to make listing decisions on more than 250 species by certain dates, including listing decisions on more than 150 species by September 30, 2013. The ESA requires that concurrent critical habitat designations be made on those dates as well. *See* 16 U.S.C. §1533(a)(3)(A) and (b)(6)(C).

Commenters are concerned that EPA's inadequate BE became outdated as soon as it was printed and that the same will be true of any BiOps that the Services issue for EPA's proposed rule in the next few months. In light of the unprecedented, rapid and ongoing expansion of the number of listed species and their critical habitats, EPA and the Services must explain how they intend to review the impacts of EPA's proposed cooling water intake regulations on these species and critical habitats.

14. NMFS has additional responsibilities under the Marine Mammal Protection Act and the Essential Fish Habitat provisions of the Magnuson-Stevens Act.

NMFS' oversight responsibilities with respect to EPA's regulation of cooling water intakes are broader than the Section 7 consultation process. Under the Marine Mammal Protection Act (16 U.S.C. 1361 et seq.), NMFS is responsible for ensuring that marine mammals are not taken through EPA's action and that any impact on them from EPA's rule is negligible. The Biological Evaluation does not discuss marine mammals in a significant manner, although EPA does note generally that more than a dozen listed species of marine mammals may be

harmed through impingement (sea otters and pinnipeds), thermal discharge (manatees), and indirectly by cooling water intakes (all of the preceding, plus whales). *See* BE at 32-33, 50-52.

EPA concluded that it lacks sufficient data to evaluate how marine mammals are affected by cooling water intakes. Without sufficient data, however, neither EPA nor NMFS can conclude that the impact on these species from regulated cooling water intakes is always negligible. The Biological Evaluation discusses circumstances in which cooling water intakes may have an important impact on marine mammals. For example, the Biological Evaluation recounts how many groups of West Indian Manatees have become dependent on power plant thermal discharges to provide overwintering habitat in areas outside their historic winter range. EPA writes that, “due to the high degree of seasonal exposure to the thermal plume of the power plants and threat of cold shock should the power plant go off-line suddenly, it was judged that the manatee would be susceptible to thermal and chemical alterations in their immediate environment.” BE at 51.

The Commenters are concerned that this inadequate BE constitutes the sum total of EPA and NMFS’s information gathering efforts under the MMPA. We ask that NMFS please clarify how the Biological Evaluation and the ESA Section 7 consultation process relate to NMFS’ oversight responsibilities under the MMPA, and what other research and analysis activities NMFS is planning to complete in order to fulfill its MMPA duties.

Similarly, under Section 305 of the Magnuson-Stevens Fisheries Act and its implementing regulations, NMFS must “coordinate with and provide information to other Federal agencies to further the conservation and enhancement of essential fish habitat.” 16 U.S.C. § 1855(b)(1)(D). Correspondingly, EPA must “consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat.” *Id.* § 1855(b)(2). EPA’s regulation governs the continued operation of numerous cooling water intakes located in essential fish habitats. These intakes kill fish in and dramatically alter the ecosystems of these habitats.

Like the ESA, the Magnuson-Stevens Act also requires EPA and NMFS to “use the best scientific information available regarding the effects of the action on EFH and the measures that can be taken to avoid, minimize, or offset such effects.” 50 C.F.R. § 600.920(d). And EPA is required to provide NMFS with a written assessment of the rule’s effects on essential fish habitat. *See id.* §600.920(e)(1). But the Biological Evaluation includes barely any information or analysis related to the endangered species that it is supposed to focus on; it makes no mention at all of the hundreds of billions of other fish killed by cooling water intakes every year, including the many billions killed in essential fish habitats. EPA has not provided a written assessment of the impact that its rule will have on these habitats, on fish populations, or on regulated fisheries. EPA’s Biological Evaluation is not even adequate to meet its original purpose of assessing impacts on listed species; it certainly cannot double as a written assessment of impacts to essential fish habitat.

Cooling water intakes have notorious and substantial adverse effects on commercial and recreational fisheries and essential fish habitat. To take just two examples, the Delaware Estuary in the vicinity of the Salem Nuclear Generating Station is designated essential fish habitat for sixteen species of fish.⁷¹ The Salem Nuclear Generating Station withdraws billions of gallons of cooling water from this essential fish habitat every day, killing more than 800 million “age one equivalent” fish – i.e., billions of actual fish, eggs, and larvae – every year.⁷² Similarly, the Hudson River is also designated as essential fish habitat for numerous species. In the 1990s and early 2000s, five power plants on the Hudson River (Indian Point, Bowline, Roseton, Lovett and Danskammer),⁷³ caused year-class reductions estimated to be as much as 79 percent, depending on fish species.⁷⁴ The generators’ 2000 analysis of three of these plants predicted year-class reductions of up to 20 percent for striped bass, 25 percent for bay anchovy, and 43 percent for Atlantic tomcod, even without assuming 100 percent entrainment mortality.⁷⁵ New York State has concluded that these losses could seriously deplete any reserve or compensatory capacity needed to survive unfavorable environmental conditions.⁷⁶

Because the intakes regulated under EPA’s new rule have such substantial adverse effects, the only appropriate form of essential fish habitat consultation under the Magnuson-Stevens Act is expanded consultation. *See* 50 C.F.R. § 600.920(i). And this expanded consultation must be initiated at least 90 days prior to a final EPA decision on the proposed 316(b) rule. *See id.* §600.920(i)(4). NMFS makes textual and GIS descriptions of essential fish habitats widely available. As a starting point, EPA should have submitted to NMFS a list of all essential fish habitats overlapping regulated intakes and thus affected by this rule. Commenters are disappointed that EPA has not taken even this basic first step, yet somehow seeks to conclude its consultation with NMFS and issue a final rule shortly.

⁷¹ U.S. Nuclear Regulatory Commission, Essential Fish Habitat Assessment for the Proposed License Renewal for the Salem Nuclear Generating Station and Hope Creek Generating Station 16-17 (2011), *available at* pbdupws.nrc.gov/docs/ML1103/ML110320664.pdf.

⁷² Versar, *Technical Review and Evaluation of Thermal Effects Studies and Cooling Water Intake Structure Demonstration of Impact for the Salem Nuclear Generating Station* at § VI-4 (Revised Final Report) (1989) (reported on an “equivalent adult” basis). Thirty (30) million pounds of bay anchovy and weakfish are lost each year due to entrainment and impingement at Salem compared to 6.8 million pounds of yearly commercial landings between 1975-1980.

⁷³ The Lovett plant has since closed, Danskammer has announced closure in the near future.

⁷⁴ 67 Fed. Reg. at 17,138, citing John Boreman and Phillip Goodyear, *Estimates of Entrainment Mortality for Striped Bass and Other Fish Species Inhabiting the Hudson River Estuary*, American Fisheries Society Monograph 4:152-160, 1988

⁷⁵ *Id.*, citing Consolidated Edison Company of New York, Draft environmental impact statement for the state pollutant discharge elimination system permits for Bowline Point, Indian Point 2 & 3, and Roseton steam electric generating stations (2000).

⁷⁶ *Id.*

Please explain how, and on what timeline, NMFS and EPA intend to comply with their respective obligations under the Magnuson-Stevens Fishery Act and the Marine Mammal Protection Act.

15. Request for meeting

The Services' Section 7 consultation handbook states that the action agency and the Services should involve other interested parties in discussions related to the consultation, including to the development of reasonable and prudent alternatives to the proposed rule and reasonable and prudent measures to mitigate the impacts of incidental take. *See Handbook at 4-7.* Commenters respectfully request an opportunity to meet with the Services and EPA to discuss the issues raised in this letter and our concerns related to this consultation.

16. Conclusion

We hope that the data referred to in this letter and the attached documents are helpful to the Services in this consultation process. Despite the shortcomings of EPA's submission, it is arbitrary and capricious and not in accordance with the Endangered Species Act for the Services to issue or for EPA to rely on a BiOP that does not draw on the best available scientific and commercial data. *See, e.g., Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988). The attached information is just a small sample of the available data that Commenters were able to assemble on a short timeline and with limited resources. We hope that this submission assists the Services in delineating the large volume of available data that is far better than what EPA provided in its Biological Evaluation and supporting materials, and we also hope that the Services are able to establish a research process that collects and makes use of that information.

In the absence of better information about the status of hundreds of endangered species affected by intakes, however, the benefit of the doubt must be given to endangered species. "Congress has spoken in the plainest of words, making it abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities, thereby adopting a policy which it described as 'institutionalized caution.'" *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 194 (1978).

Given the volume of information available about the lethal effects of cooling water systems on endangered species, the fact that EPA's rule will achieve, at best, only a modest reduction in impingement and little or no reduction in entrainment and thermal discharge, the significant risk that EPA's rule will in fact increase both entrainment and thermal discharge, and the lack of any data to suggest that populations of threatened and endangered species are recovering despite these impacts, it is difficult to see how the Services can avoid a finding of jeopardy if they insist on issuing a BiOp based on the presently available information. Alternatively, we believe that the Services must demand that EPA make a sincere effort to provide the Services with the best available data about the effects of its action and the listed species harmed by it.

We also hope to hear from you soon with regard to MMPA and Magnuson-Stevens Act compliance and our request to meet with the Services. Thank you for your consideration of these comments.

Sincerely,



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