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BY FEDERAL EXPRESS

Kevin T. Folk, Acting Chief
Environmental Review and Project Branch
Division of License Renewal
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Re: Additional Comments on NRC Letter Request to the National Marine Fisheries Service for Section 7 Conference Regarding Indian Point Nuclear Generating Units Nos. 2 and 3 Due to Proposed Rule to List Atlantic Sturgeon Critical Habitat in the Hudson River, Dated September 13, 2016

Dear Mr. Folk:

On October 14, 2016, Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC and Entergy Nuclear Operations, Inc. (collectively, “Entergy”) submitted initial comments (the “Initial Comments”) on the request submitted by the Nuclear Regulatory Commission (“NRC”) staff (the “Request”) to the National Marine Fisheries Service (“NMFS”) for a conference pursuant to Section 7 of the Endangered Species Act. NRC’s Request, and its attached technical document titled “Impacts to Proposed Critical Habitat for the Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*), Indian Point Nuclear Generating Units 2 and 3 (collectively, “Indian Point” or “IPEC”), Proposed License Renewal” (the “Evaluation”), address NMFS’s pending proposal to designate the Hudson River (and other areas) as critical habitat for the Atlantic Sturgeon (the “Proposed Rule”).

In its Initial Comments, Entergy, among other things, referred to extensive, validated Hudson River Biological Monitoring Program (“HRBMP”) data demonstrating that sturgeon are not present, or likely to be present, as a result of unfavorable natural conditions, in the IPEC Safety and Security Zone (“SSZ”). Entergy’s Initial Comments also noted that two days prior, on October 12, Entergy received additional responses from NYSDEC and NMFS to Entergy’s FOIL and FOIA requests for sturgeon

tracking information consisting of more than 700 documents and electronic data files (collectively, the “Reponses”).¹ Entergy indicated that it would be reviewing those documents and expected to provide additional comments to NRC and NMFS, and respectfully requested that the conference or consultation schedule provided in the NRC Request be lengthened to allow us to do so.² Entergy received a final response to its FOIA request from NMFS, comprised of an additional 56 documents and two electronic data files, on December 2, 2016.³

This correspondence comprises Entergy’s Additional Comments following its review of the information in these Responses. As set forth in detail below, these Additional Comments provide supplementary information on the distribution of Atlantic Sturgeon in the Hudson River near Indian Point based on 16 years of HRBMP sampling data and NYSDEC/NMFS acoustic tracking data. This supplementary information confirms that Atlantic Sturgeon juveniles in the vicinity of IPEC primarily inhabit in-River transit corridors and further shows that Atlantic Sturgeon are not found in the IPEC SSZ. The confirmed absence of Atlantic Sturgeon from the IPEC SSZ, along with additional information establishing the unsuitability to Atlantic Sturgeon of the SSZ sedimentary environment, demonstrate conclusively that the IPEC SSZ is not “essential to the conservation” of Atlantic Sturgeon and therefore not critical habitat.

1. Background

As an initial matter, and by way of reminder, Entergy emphasizes that the appropriate focus of the Proposed Rule with respect to the IPEC SSZ is juvenile Atlantic Sturgeon.⁴ This is because, as NRC acknowledged in its Evaluation, the best available scientific information confirms that:

- With respect to adult Atlantic Sturgeon:
 - Adults spend most of their adult life outside of the Hudson River.⁵
 - Adults do not spawn in the vicinity of Indian Point because the area is not “consistently freshwater [and therefore], it does not contain habitat associated with” ... “settlement of fertilized eggs, growth and development of early life stages.”⁶

¹ See October 13, 2016 letter from Philip J. Lodico, Associate Counsel NYSDEC to Elise Zoli re Freedom of Information Law Request #W006141-041316. (Although the FOIL response letter is dated October 13, 2016, Entergy received an email with a link to the requested documents on October 12, 2016).

² Initial Comments at 2.

³ See December 2, 2016 letter from Tawand Tonic, Assistant FOIA Coordinator to Eileen Morrison re Request No. DOC-NOAA-2016-001665.

⁴ The use of the term juvenile in these Additional Comments is consistent with the definition of juvenile Atlantic Sturgeon used by NMFS in its 2013 *Biological Opinion for Continued Operations of Indian Point Nuclear Generating Unit Nos. 2 and 3* (“Indian Point BiOp/ITS”), *i.e.*, individuals between 411 mm and 760 mm in total length. See Indian Point BiOp/ITS at 26. As shown in Attachment 3 to these Additional Comments, the great majority of Atlantic Sturgeon captured in the Indian Point Region from 2000-2015 fall within the 411-760 mm size range. See Attachment 3, Figure 2 at 8.

⁵ See Indian Point BiOp/ITS at 28.

⁶ See Evaluation at 7-8.

Indeed, it is scientifically accepted that spawning occurs well upstream of Indian Point, located at River Mile (“RM”) 42, in areas characterized by year-round freshwater and rocky substrates, such as occurs near Hyde Park at RM 83 “which contains freshwater year round with suitable substrate and bedrock” and at RM 70 “which has similar conditions.”⁷

Thus, adult Atlantic Sturgeon are not using the area in the vicinity of IPEC for a critical habitat purpose.⁸

- With respect to Atlantic Sturgeon eggs and larvae:
 - The vicinity of IPEC does not and could not support Atlantic Sturgeon larvae, even in late summer, because: (1) spawning and nursery habitat are considerably upstream from IPEC, such that the distribution of demersal eggs and larvae is not near IPEC; and (2) late summer post-dates the larval development period in the Hudson River.

Thus, Atlantic Sturgeon eggs and larvae are not using the area in the vicinity of IPEC for a critical habitat purpose.

- With respect to Atlantic Sturgeon juveniles, which are the focus of these Additional Comments:
 - There is no credible support for the notion that the vicinity of IPEC is resident habitat for Atlantic Sturgeon.⁹ Rather, the focus in the vicinity of IPEC is on in-River transit corridors.

Below, we provide summaries of attached data and analyses that, together, demonstrate that the IPEC SSZ is not critical habitat for Atlantic Sturgeon and therefore should not be designated as such.

2. NYSDEC/NMFS Acoustic Tracking Data Show that Atlantic Sturgeon are not in the IPEC SSZ

The acoustic tracking data produced by NYSDEC in its recent FOIL response shows that Atlantic Sturgeon juveniles, subadults, and adults are not found in the immediate vicinity of IPEC or in the SSZ. As an example, Figure 1 below is a map created by NYSDEC Staff that we obtained on

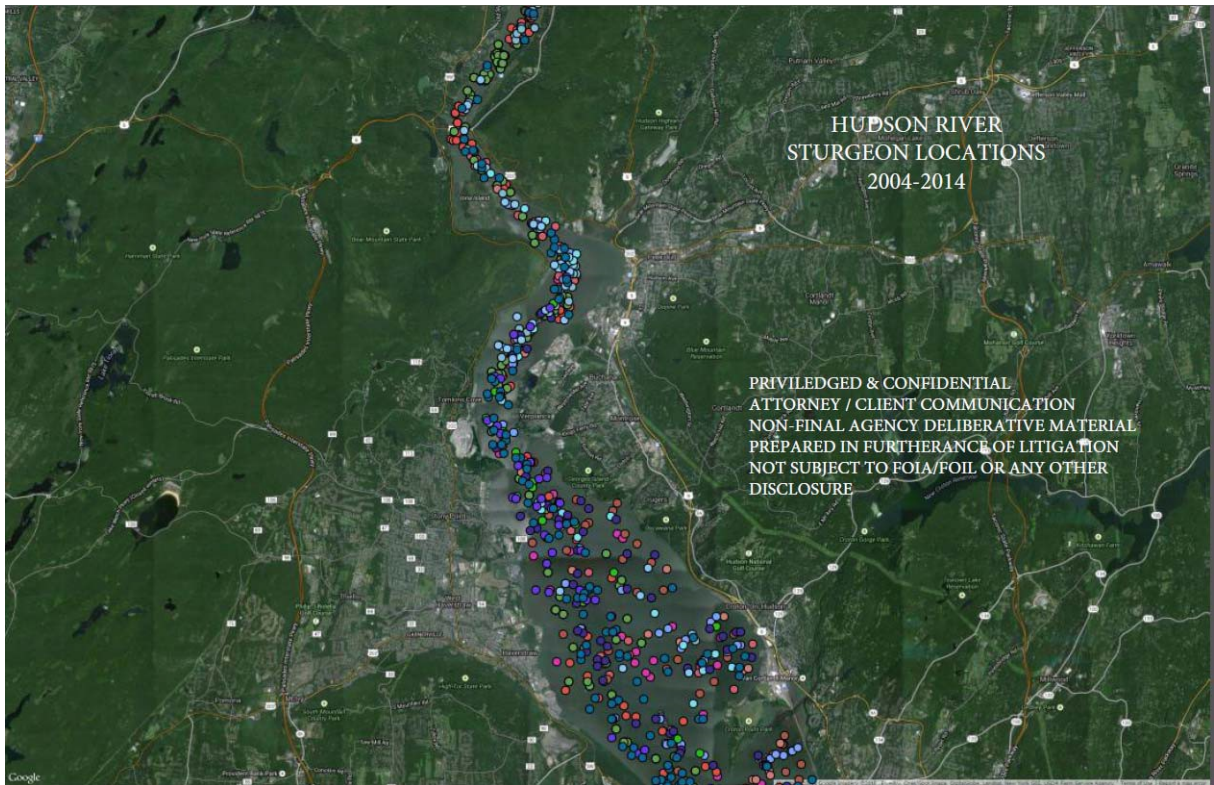
⁷ See Evaluation at 8 (citing NMFS 2013, *Endangered Species Act Section 7 Consultation Biological Opinion for Continued Operations of the Indian Point Nuclear Generating Station, Units 2 and 3, Pursuant to Existing and Proposed Renewed Operating Licenses* (January 30, 2013). ADAMS No. ML13032A256.

⁸ See, e.g., September 1, 2016 letter from Elise Zoli to Kimberly B. Damon-Randall re Endangered and Threatened Species; Designation of Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon – Proposed Rule; NOAA-NMFS-2015-0107 (“Entergy Comments on Proposed Rule”) at 6-7 (discussion of habitat functions “essential to the conservation of the species”).

⁹ See generally Indian Point BiOp/ITS.

October 12, 2016 through our FOIL request. This map reflects 11 years of NYSDEC acoustically tagged sturgeon tracking data collected in the Hudson River near Indian Point from 2004 through 2014.

Figure 1: NYSDEC Map Showing Hudson River Sturgeon Locations Based on Acoustic Tagging Studies Conducted from 2004-2014



NYSDEC has indicated that the colored dots on this map represent the locations of all acoustic-tagged juvenile, subadult and adult life stages of both Atlantic Sturgeon and Shortnose Sturgeon identified by mobile tracking. As the map makes clear, no individuals of any life stage of either sturgeon species present in the Hudson River have been found in the immediate vicinity of IPEC or in the SSZ.¹⁰

We have reproduced the NYSDEC image in Figure 1 to more correctly reflect the scale of Atlantic Sturgeon locations on the map. Specifically, we correct the erroneous impression given by NYSDEC's symbols which, based on the map's scale, are several hundred feet in diameter (*i.e.*, much larger than sturgeon). We plotted the adult, subadult, and juvenile Atlantic Sturgeon tracking data recently received from NYSDEC in the recent FOIL response for the years in Figure 1 plus one

¹⁰ Entergy notes with dismay that NYSDEC Staff strongly resisted Entergy's FOIL requests for its sturgeon tracking information and when it ultimately did provide the information, this map was labeled as "privileged and confidential" and "not subject to FOIA/FOIL or any other disclosure." Thus, Staff appear to have tried to keep hidden important information that would foster improved protection of the species, even though it was paid for by New York State taxpayers (via a public entity).

additional year (*i.e.*, 2004 through 2015) using more appropriately scaled symbols. The re-plotted data are shown in Figure 2 below. In Figure 2, the symbols correspond to the following: red circles = adults; green circles = subadults; yellow circles = juveniles; and white circles = unknown.¹¹

Figure 2: Map Showing Hudson River Atlantic Sturgeon Locations Near Indian Point with Appropriately-Scaled Symbols Based on NYSDEC Acoustic Tagging Studies Conducted from 2004-2015



As Figure 2 shows, when the symbols are more appropriately sized relative to the scale of the map, Atlantic Sturgeon located via NYSDEC's tracking studies are shown to occur in a more limited portion of the River, concentrated near the center in the main channel.¹² Figure 2 also depicts the location of the SSZ and thus demonstrates clearly that between 2004 and 2015 no tagged Atlantic Sturgeon were found inside the SSZ.

To provide certainty with respect to the demonstrated absence of Atlantic Sturgeon in the SSZ, we undertook a study to verify that tagged sturgeon inside the SSZ can be located from a position outside the SSZ. As specified by NYSDEC's sturgeon tracking protocol, the tracking crew in some instances picked up a signal from a tag that was strong enough to allow the crew to effectively pinpoint the tagged fish's location (with a certain range of error), which in NYSDEC's parlance was a "found" determination.¹³ In other instances, however, the signal picked up by the crew was strong enough to

¹¹ The symbols plotted in Figure 2 are for "found" sturgeon detections as opposed to "close" sturgeon detections under NYSDEC's tracking protocol, the distinction between which is discussed below.

¹² In all, Figure 2 represents 9 adult Atlantic Sturgeon at 28 locations; 12 subadults at 44 locations; 28 juveniles at 119 locations; and 9 unknown fish at 14 locations.

¹³ See, *e.g.*, AKRF, *Sturgeon Mobile Tracking for the New NY Bridge at Tappan Zee: 2015 Final Report*, October 2, 2015 (the "2015 AKRF Report"), at 3-4 (included as Attachment 1 to these Additional Comments). This is the same protocol used

have an idea of the fish's location, but not strong enough to pinpoint the fish's location with confidence, which in NYSDEC's parlance was a "close" detection.¹⁴ Figure 3 below depicts the "close" detections reported by NYSDEC's sturgeon tracking crew located within approximately 2.5 km north and south of Indian Point from 2004 to 2015. In this figure, the red circles represent adults, the green circles represent subadults, and the yellow circles represent juveniles.¹⁵

Figure 3: NYSDEC "Close" Detections from 2004-2015



Of the 128 "close" locations in the roughly five km of the River depicted in Figure 3, at least 20 such detections are within about 500 m—the estimated minimum signal range determined by NYSDEC Staff under its searching protocol—of the IPEC SSZ border.¹⁶

The number of "close" detections within about 500 m of the SSZ and the absence of such detections at the immediate boundary of the SSZ present the question of whether, when tracking fish near the SSZ, the NYSDEC tracking crew might have been prevented from receiving a strong enough

by NYSDEC to gather the data presented in Figures 1 and 2 above. According to a document obtained in response to our FOIL request, NYSDEC "found" determinations had an associated error of between 82 and 207 feet. See *NYSDEC Fish Tracking Protocol*, undated memorandum of Amanda Higgs, NYSDEC Hudson River Fisheries Unit, Bureau of Marine Resources.

¹⁴ *Id.*

¹⁵ The 50 juvenile "close" locations represent 12 separate fish, the 53 subadult locations represent 16 separate fish, and the 25 adult locations represent 6 separate fish.

¹⁶ See 2015 AKRF Report at 3 (reporting 500 m minimum signal detection range).

signal to record a “found” detection for a fish located inside the SSZ because the crew was not able to enter the SSZ and, in effect, had to abandon its pursuit of such a fish. Similarly, there is a theoretical possibility that the crew could have detected the presence of a tagged fish located inside the SSZ from outside the SSZ and known, based on the signal’s direction, that the fish was inside the SSZ, but was unable to get near enough to the fish achieve either a “close” or a “found” detection because of the inability to enter the SSZ.

Although there was absolutely *no* indication in any of the FOIL or FOIA response materials provided by NYSDEC and NMFS, including electronic data files, written reports, or hand-written notes, that the tracking crew was prevented by SSZ restrictions from determining the location of a tagged sturgeon inside the SSZ, Entergy nonetheless determined it would be useful to investigate this potential issue. To do so, Normandeau performed a Field Tag Location Study at Indian Point. The purpose of this study was to determine whether, using industry-standard acoustic tracking equipment, the location of an acoustic tag anchored inside the SSZ could be determined from a position outside the SSZ, and if so, how far away. The Field Tag Location Study and its results are reported in Attachment 2 to these Additional Comments and summarized below.¹⁷

A two-person Normandeau crew in a small boat fixed two activated digital acoustic tags of the same model customarily used by NYSDEC (Lotek MM-MR-16-50 digital acoustic tags) inside the SSZ, each anchored to a buoy located about 50 to 100 feet west of each of the IP2 and IP3 cooling water intake structures, at the depth a sturgeon would likely be swimming, about 2 or 3 feet off the bottom.¹⁸ After deploying the tags, the boat traveled west from the Unit 1 dock, located in between IP2 and IP3, pausing at 100 yard intervals long enough to listen with an industry-standard Vemco VR100 directional hydrophone receiver to detect the location of the tags.¹⁹ The boat then proceeded another 100 yards west and listened again, continuing this procedure until the tags could no longer be located.²⁰ The boat then returned to the vicinity of the original starting point 100 yards west of the Unit 1 dock and repeated the procedure until observations were made throughout an entire 6.25-hour tidal cycle.²¹

The results of the Normandeau’s Field Tag Location Study are summarized in Figure 5 below, which shows the data for each acoustic tag separately. In this figure, the locations of the two acoustic tags are identified by the small triangles on the eastern (shoreward) side of the SSZ, located just upstream and downstream of the middle of the SSZ along the path of the River. Normandeau used the following symbols to represent the tag signal strength at different locations:

- Green = strong (tag ID and ≥ 55 dB);

¹⁷ See Normandeau, *Memorandum re Indian Point Security Exclusion Zone Acoustic Tag Detection Study*, 9 November 2016, January 13, 2017 (“Field Tag Location Study”) (included as Attachment 2 to these Additional Comments).

¹⁸ Tag Field Location Study at 1.

¹⁹ *Id.* Although the Vemco hydrophone system used by Normandeau is not identical to the Lotek tracking system used under NYSDEC’s protocol, the differences between the two systems relate to their relative ease of use, and not their sensitivity or ability to determine with accuracy the location of the Lotek tags used in this study.

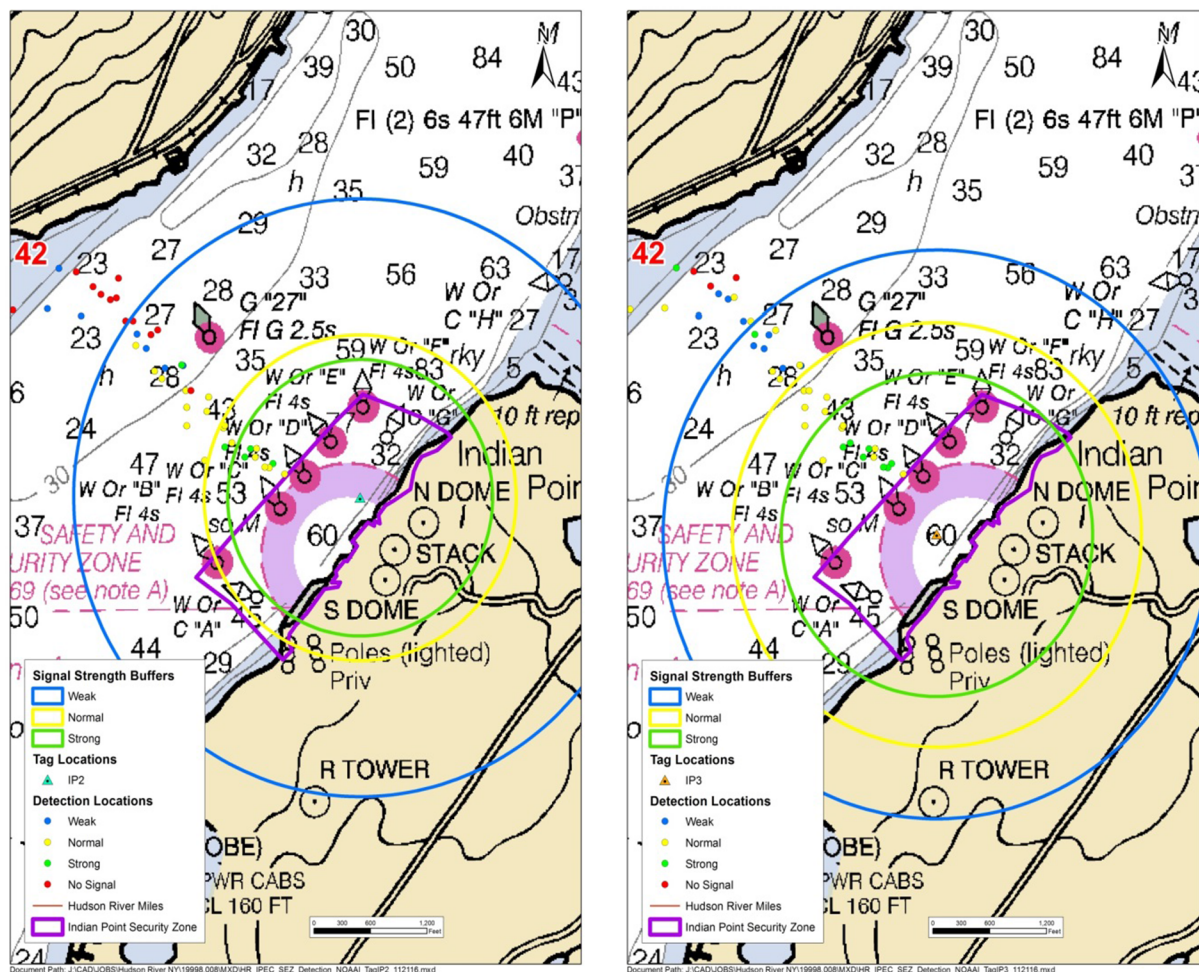
²⁰ *Id.*

²¹ *Id.* at 2.

- Yellow = normal (tag ID and 45 to 54dB);
- Blue = weak (tag ID and ≤ 44 dB); and
- Red = no signal (receiver detects tag, but ID and dB cannot be read by Vemco software).

Normandeau then calculated the mean distance from the tags associated with each signal strength category and drew circular contour lines (*i.e.*, “buffers”) that define the mean distance for each category relative to each tag. The average signal strengths of each strength category used to generate the contours in Figure 4 below are presented in Table 1 of the Field Tag Location Study.

Figure 4: Results of Normandeau Field Tag Location Study for Tags IP2 (Left) and IP3 (Right)



As Figure 4 above shows, the Vemco VR100 hydrophone was able to identify and locate the two stationary tags anchored on the eastern side of the SSZ with “strong” signal strength approximately 1,500 feet away from the tags on average (green contour lines) and generally from outside the SSZ. “Normal” signal strength was achieved approximately 1,900 feet from the tags on average (yellow contour lines), and a “weak” signal (blue contour lines) was detected on average almost 3,000 feet from

the tags and well outside the SSZ, approaching the west bank of the River 4,000 feet away. Based on these tests, Normandeau concluded “there is no reasonable scientific basis for asserting that acoustic-tagged sturgeon within the SSZ could not be located from the Hudson River adjacent to, but outside the SSZ, employing industry standard equipment.”²² Thus, the results of the Field Tag Location Study suggest there is no credible reason to believe that the NYSDEC crew, using the Lotek MAP tracking system, which also is industry standard, would have been unable to locate a tagged Atlantic Sturgeon had it been detected inside the SSZ from a location outside the SSZ.

In light of the results of Normandeau’s Field Tag Detection Study, there is more than sufficient evidence to demonstrate that if tagged sturgeon were in fact in the SSZ, their location could have been determined by the NYSDEC tracking crew. Therefore, the absence of tagged sturgeon in the SSZ in the NYSDEC/NMFS tracking data is not an accident or a function of technological or methodological limitations, but a reality.

3. *NYSDEC, NMFS and HRBMP data Demonstrate that Juvenile Atlantic Sturgeon in the Indian Point Region are Found in the in-River Transit Corridor and not in the SSZ.*

Using NYSDEC, NMFS, and HRBMP data, we are able to determine, on a best available scientific evidence basis, that juvenile Atlantic Sturgeon in the IPEC Region (River Mile 39-46) are found in the in-River transit corridor and not in the SSZ. Entergy’s consultants Normandeau and Dr. John Young (collectively “Normandeau”) reviewed the extensive HRBMP dataset,²³ identified samples in which Atlantic Sturgeon were captured, and determined the location and depth Atlantic Sturgeon have been found in the River from 2000 (the first year GPS location data became available) through 2015. Normandeau then used the information in the HRBMP dataset to define where in the Hudson River’s water column juvenile Atlantic Sturgeon are found. Normandeau next showed that the individual Atlantic Sturgeon found in both the HRBMP dataset and in the NYSDEC/NMFS acoustic tracking datasets are found exclusively in the in-River transit corridor and not in the SSZ. Finally, Normandeau presented information demonstrating that the bottom substrate in the SSZ is primarily influenced by scouring, and thus is not stable soft bottom habitat suitable for Atlantic Sturgeon or their prey. The results of these analyses are detailed in Normandeau’s report *Distribution of Atlantic Sturgeon in the Indian Point Region* (the “Sturgeon Distribution Report”), which is included as Attachment 3 to these Additional Comments and summarized below.

A. Juvenile Atlantic Sturgeon are not found in the water column or the shallows.

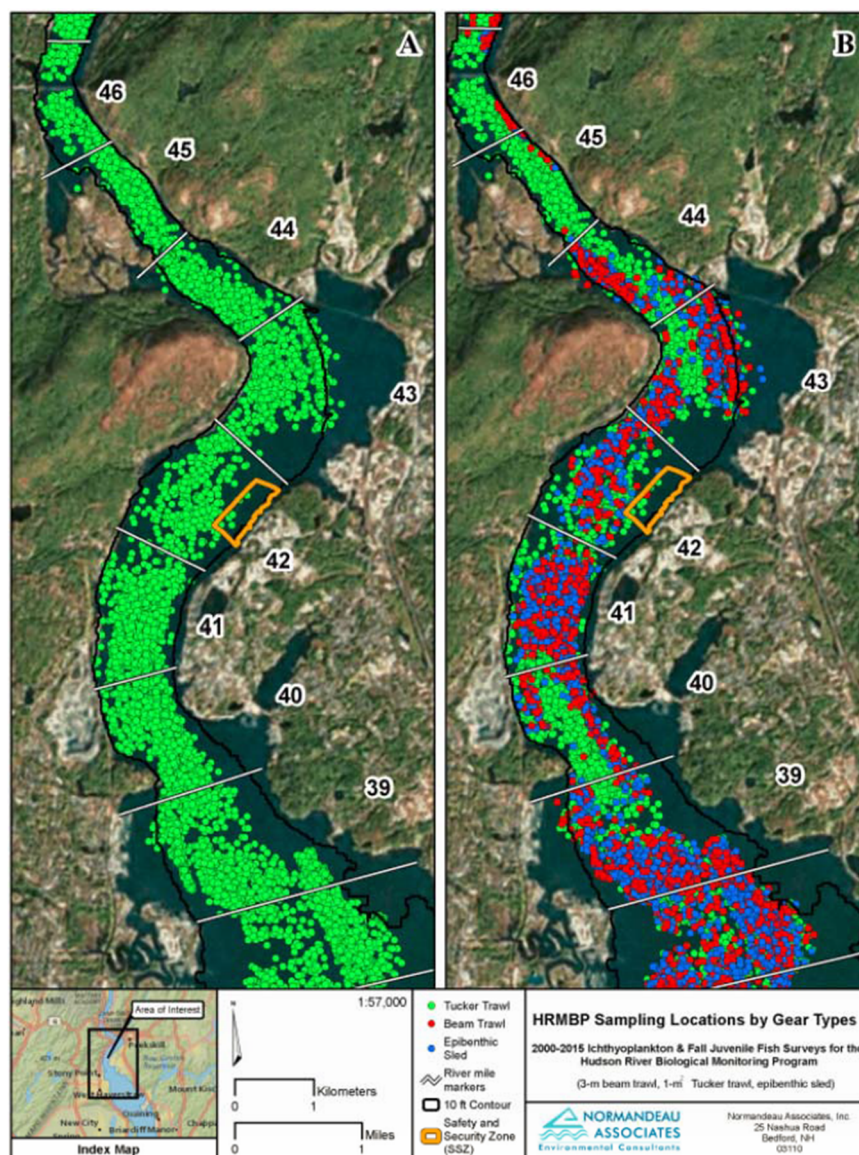
Extensive HRBMP sampling demonstrates that juvenile Atlantic Sturgeon are absent from the water column and shallow areas in the IPEC Region. Figure 5 below is reproduced from Figure 1 of the Sturgeon Distribution Report. The green symbols in this figure show the locations of the 4,018 HRBMP

²² *Id.* at 3.

²³ See Entergy’s Comments on the Proposed Rule for a discussion of the HRBMP various sampling programs and the dataset’s robustness, scope, and quality.

Tucker trawl samples taken the Indian Point Region (RM 39-46) from 2000 through 2015. The Tucker trawl samples the water column from 10 feet above the bottom to the surface in areas where the River is at least 10 feet deep. The blue and red symbols, respectively, show the locations of epibenthic sled and beam trawl (*i.e.*, bottom) samples.²⁴

Figure 5: Locations of HRBMP Samples in the IPEC Region from 2000-2015



As Figure 5 shows, HRBMP Tucker trawl samples comprehensively cover the pelagic (*i.e.*, water column) areas within the IPEC Region. In the more than 4,000 samples of the water column in the IPEC Region from 2000-2015, not a single Atlantic Sturgeon juvenile, larva or egg was captured. The virtual

²⁴ Samples located within the SSZ were collected prior to September 11, 2001.

absence of Atlantic Sturgeon in the comprehensive HRBMP Tucker trawl sampling clearly demonstrates that Atlantic Sturgeon are not found in the water column of the IPEC Region.

Just as the IPEC Region Tucker trawl data show that Atlantic Sturgeon are not found in the water column, data from the HRBMP's Longitudinal Beach Seine Survey ("BSS") demonstrate that juvenile Atlantic Sturgeon are not found in nearshore shallow areas. The BSS is designed to determine the seasonal abundance, occurrence, and distribution of young-of-year fishes in the shore zone (< 10 feet deep) on either shore along the length of the River. The BSS began in 1974 and has continued annually to present, with sampling typically performed during ten alternate weeks from early July to late October of each year. All sampling is performed during the day, with 100 randomly-selected beaches sampled per week among the River's 12 geographic regions between the George Washington Bridge and the Troy Dam above Albany. In the IPEC Region, there are 22 fixed beach seine sites identified and available for sampling along both the east and west shorelines. Three to five of these sites are randomly selected for sampling during each week. All caught fish are identified to species and enumerated without subsampling into length classes representative of young-of-year, yearling, and older age categories. A total of 15,953 beach seine samples were collected in the Hudson River under the BSS from 2000 through 2015, including 699 samples collected in the IPEC Region. In all, these samples captured a total of 1,524,958 fish of multiple species, *zero* of which were Atlantic Sturgeon. Thus, the BSS provides strong evidence that juvenile Atlantic Sturgeon do not inhabit Hudson River shoreline areas less than 10 feet in depth.

In summary, the near absence of juvenile Atlantic Sturgeon from HRBMP Tucker trawl and BSS samples confirms the longstanding scientific consensus that juvenile Atlantic Sturgeon are not found in the water column or shallow areas, but instead inhabit deeper waters near the bottom.²⁵

B. HRBMP data show that juvenile Atlantic Sturgeon are found near the bottom at depth.

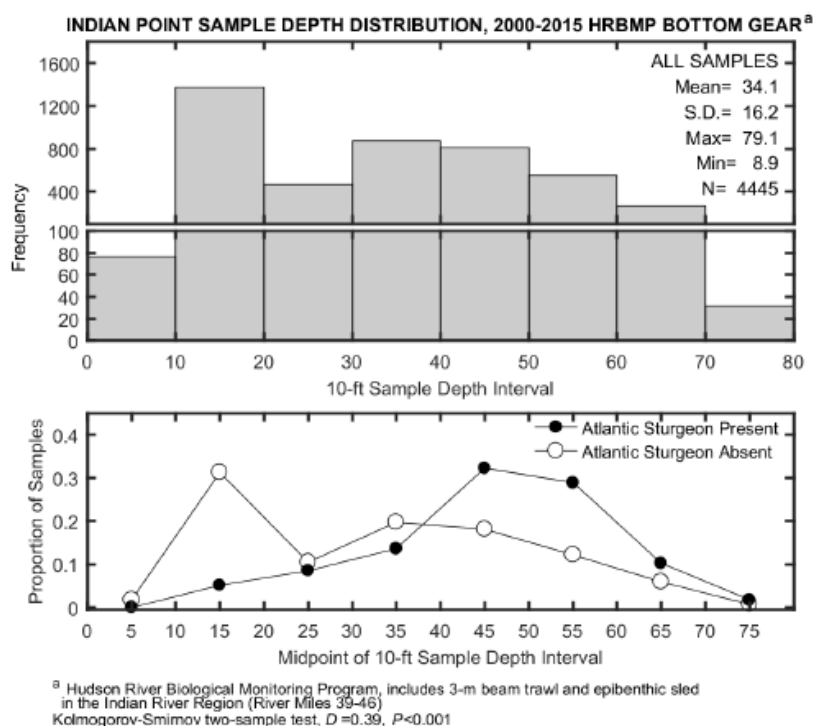
Having confirmed that juvenile Atlantic Sturgeon are not found in the water column, Normandeau excluded the Tucker trawl samples from further consideration and reviewed HRBMP bottom sampling (*i.e.*, epibenthic sled and beam trawl) to determine the depths at which juvenile sturgeon are found.²⁶ Normandeau first divided all bottom samples²⁷ into 10-foot depth intervals and then compared the depths of samples in which sturgeon were captured to the depths of samples in which no sturgeon were captured. The results of this analysis are summarized in Figure 5 of the Sturgeon Distribution Report, which is reproduced below as Figure 6.

²⁵ See, *e.g.*, Proposed Rule at 35706; Indian Point BiOp/ITC at 42.

²⁶ Figure 2 and Table 1 of the Sturgeon Distribution Report confirm that the great majority of Atlantic Sturgeon collected in the HRBMP sampling were juveniles.

²⁷ As noted, the locations of bottom samples are shown in Figure 5 above.

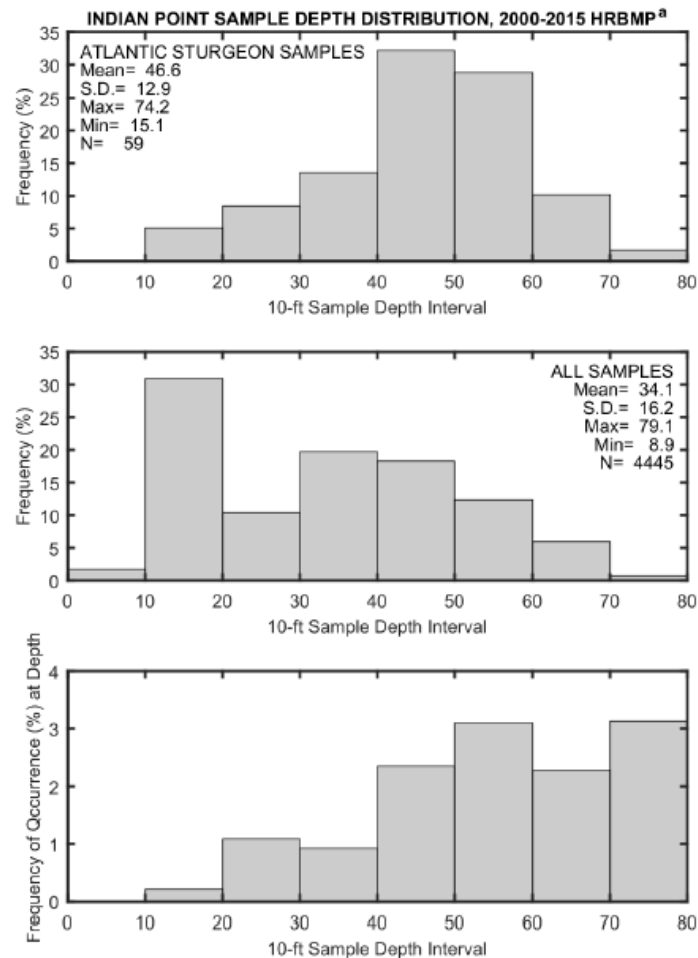
Figure 6: Depth Distributions of 2000-2015 HRBMP IPEC Region Bottom Sampling With and Without Sturgeon Captures



As the bottom panel of Figure 6 above shows, the samples which contained Atlantic Sturgeon captures are skewed deeper, which peak at 45-55 feet, than the no-sturgeon samples, which peak at 15 feet.

To normalize for sampling effort at different depths (a function of the HRBMP's sampling program design), Normandeau adjusted the depth distribution of samples in which Atlantic Sturgeon were captured by dividing the frequency of bottom samples in each 10-foot depth interval containing sturgeon by the frequency of all samples in each 10-foot depth interval. The result, a representation of catch-per-unit-effort for each 10-foot depth interval is presented in the bottom panel of Figure 6 in the Sturgeon Distribution Report and reproduced below as Figure 7.

Figure 7: Atlantic Sturgeon Depth Distribution in IPEC Region Adjusted for Sampling Effort



As the bottom panel in Figure 7 above shows, when appropriately adjusted for sampling effort, the deepest depth intervals have the greatest frequency of occurrence of Atlantic Sturgeon.²⁸ Thus, HRBMP bottom sampling demonstrates that juvenile Atlantic Sturgeon in the IPEC Region are typically found near the bottom and at depth.

C. Based on observed Atlantic Sturgeon distributions and bottom substrate composition, the SSZ is not critical habitat.

The Endangered Species Act, the Proposed Rule, and relevant case law make clear that, except in specific circumstances determined by NMFS, critical habitat “shall *not* include the entire geographical

²⁸ The deepest sampling depth interval, 70-80 feet, is determined by the HRBMP sampling protocol. There is no evidence from HRBMP data that Atlantic Sturgeon would not be found in greater depths, if sampled. Thus, the 80-foot maximum sampling depth interval is not considered a limit on possible Atlantic Sturgeon depths in the River.

area which *can be occupied* by the threatened or endangered species.”²⁹ Thus, simply because an area can be occupied by an Atlantic Sturgeon is not, without more information, a basis to designate an area as critical habitat. Rather, the analysis must be more searching, because to be a critical habitat, the area in question must be “essential to the conservation of the species”³⁰ Stated plainly, “essential” habitat must in fact be essential.

As described in the Proposed Rule and in the NRC Evaluation, the features essential to the conservation of Atlantic Sturgeon with respect to juveniles include the presence of soft bottom substrate to support benthic prey necessary to support juvenile foraging, water of sufficient depth, and appropriate physiochemical parameters (*e.g.*, temperature, salinity, and oxygen concentrations).³¹ As NMFS recognized in the Proposed Rule, “*repeated use of an area by the listed entity suggests the presence of essential physical or biological features.*”³² By the same logic, non-use of an area accessible to the listed entity indicates the absence of essential physical or biological features. Thus, the portion of the River characterized by the depths at which Atlantic Sturgeon are consistently found represents a reasonable estimate of the portion of the river that is “essential to the conservation of the species” and therefore can be reasonably considered critical habitat. Conversely, areas of the River where Atlantic Sturgeon are not found can reasonably be excluded from consideration as critical habitat. Normandeau’s findings with respect to Atlantic Sturgeon distribution in the IPEC Region, based on its analysis of the HRBMP and the NYSDEC/NMFS sturgeon datasets, are detailed in the Sturgeon Distribution Report.

To characterize the juvenile Atlantic Sturgeon in-River transit corridor (and therefore critical habitat) in the IPEC Region, Normandeau superimposed on a map of the IPEC Region (1) the locations of all sturgeon captured in the HRBMP from 2000-2015 and (2) all tagged sturgeon locations from the NYSDEC and NMFS acoustic tracking programs from the same period. This map, which is Figure 9 in the Sturgeon Distribution Report, is reproduced below as Figure 8. In Figure 8, the yellow symbols represent NYSDEC and NMFS tagged Atlantic Sturgeon detections,³³ and the red symbols represent the locations of Atlantic Sturgeon captured in the HRBMP program.

²⁹ See 16 U.S.C. § 1532(5)(C) (emphasis added); Proposed Rule at 35702 (emphasis added); *see also, e.g., Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1067 (9th Cir. 2004), *amended*, 387 F.3d 968 (9th Cir. 2004) (“In the ordinary course, any endangered or threatened species may have some habitat that is not deemed critical habitat.” (citing 16 U.S.C. § 1532(5)(C))).

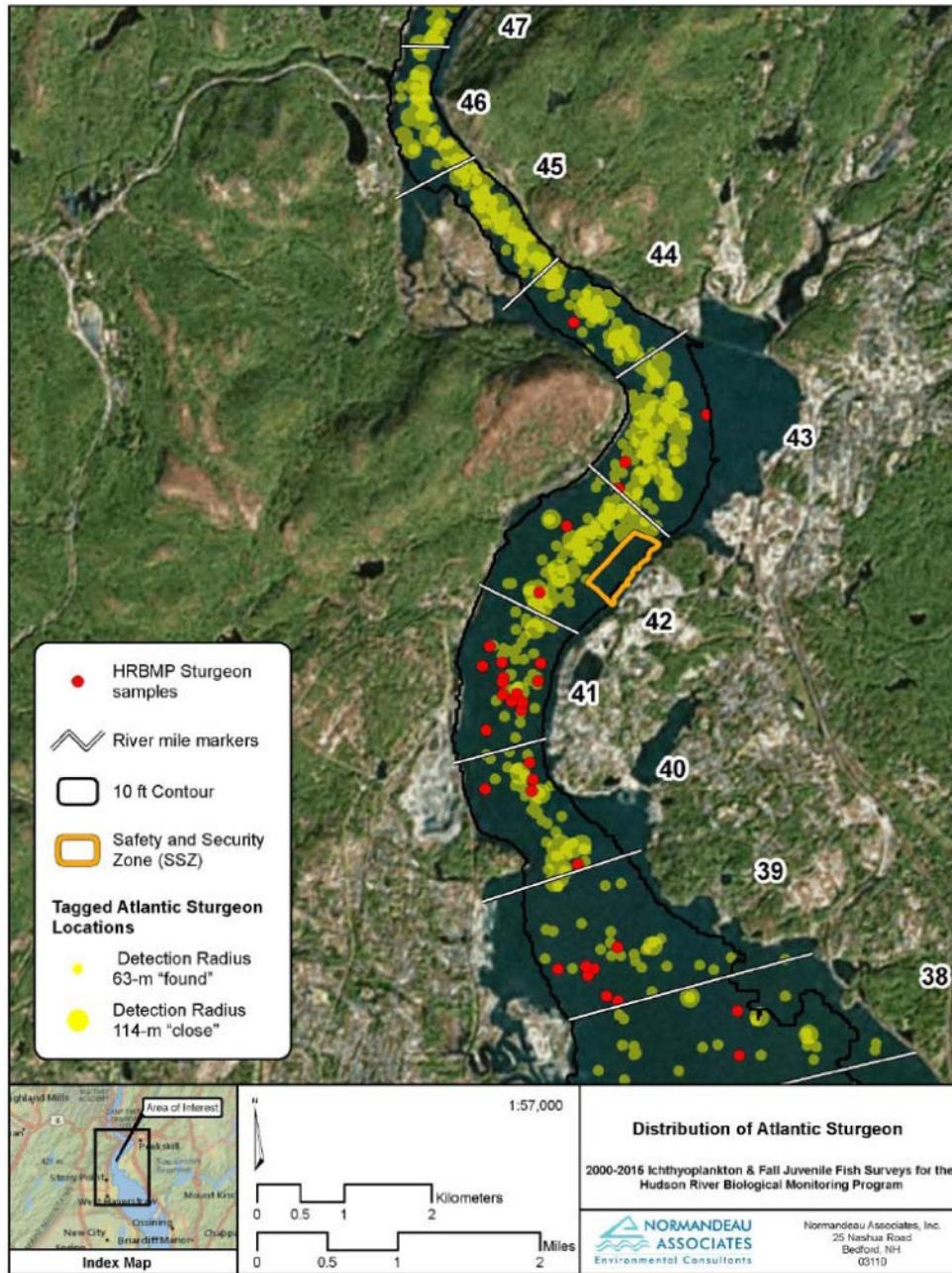
³⁰ See 16 U.S.C. § 1532(5)(A)(1); 50 C.F.R. § 424.12(b)(1)(ii).

³¹ See Evaluation at 3-4; *see also* Proposed Rule at 35708.

³² Proposed Rule at 35708 (emphasis added).

³³ This figure includes both “found” and “close” detections as discussed above and detailed in the 2015 AKRF Report. The size of the yellow symbols corresponds to the reported accuracy of “found” and “close” detections. Tagged sturgeon include juveniles, adults, and subadults.

Figure 8: IPEC Region Atlantic Sturgeon Locations from HRBMP, NYSDEC and NMFS Datasets



As Figure 8 shows, Atlantic Sturgeon, particularly in the immediate vicinity of Indian Point, are generally found in the deeper transit corridor of the River, and not along the edges. This is consistent with the scientific understanding of Atlantic Sturgeon life history, as described in Entergy's Initial Comments, and Normandeau's analysis of the depth distribution of juvenile Atlantic Sturgeon discussed above.

Most significantly, Figure 8 shows that in the combined HRBMP, NYSDEC, and NMFS datasets, no Atlantic Sturgeon were found within the IPEC SSZ. Based on the absence of Atlantic Sturgeon from the SSZ in three extensive datasets spanning 16 years of sampling and tracking, it is reasonable to conclude that this area is not used by Atlantic Sturgeon, and therefore categorically excludes the area of SSZ from designation as critical habitat.

The distribution of Atlantic Sturgeon near, but outside the IPEC SSZ, is likely due to local factors other than just depth determining the actual parts of the local environment inhabited by the sturgeon. As noted above, the presence of soft bottom substrate is considered essential for juvenile Atlantic Sturgeon critical habitat. Sweka *et al.* (2006) confirmed as much, stating:

Soft/deep areas of Haverstraw Bay yielded the most consistent catches of juvenile Atlantic Sturgeon. Haley (1999) also showed a strong preference by juvenile Atlantic Sturgeon for deep water and they also preferred areas of mixed silt substrates, which would correspond to our “soft” classification. These areas may be associated with higher abundance of preferred food of juvenile Atlantic Sturgeon (Haley 1999). Although soft/deep areas were those most frequently used, some of the largest catches in a single net set came from areas with hard bottoms and shallow depths (< 20 ft.) Catches outside soft/deep areas were much more variable than those in soft/deep areas and it is possible that when relatively large catches were encountered in non-soft/deep areas that the fish were migrating through such areas as opposed to using them as preferred habitat.³⁴

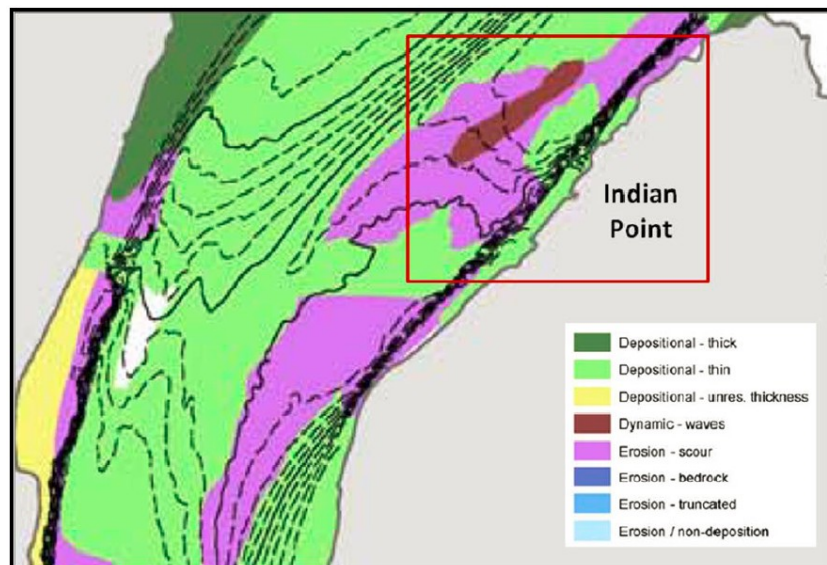
As discussed in the Sturgeon Distribution Report, a 2011 analysis performed by the engineering firm Enercon Analysis, Inc. (“Enercon”) in connection with the proposed installation of Cylindrical Wedgewire Screens (“CWW”) as alternative cooling technology at Indian Point demonstrates that such soft substrate is lacking within the SSZ.³⁵ Figure 9 below is a reproduction of Figure 4 from the 2011 Enercon Report, which is map of the immediate vicinity of Indian Point showing the sedimentary environment near Indian Point based on acoustic backscatter from sidescan sonar imagery.³⁶

³⁴ Sweka, J. A., J. Mohler, and M. J. Millard, 2006. *Relative abundance sampling of juvenile Atlantic Sturgeon in the Hudson River*. March 2006. (prepared for NYSDEC). Available at: <https://www.fws.gov/northeast/fisherycenter/pdfs/JuvenileASNFinalReport.pdf>.

³⁵ Enercon, *IPEC CWW Dredging Step 1 – Draft White Paper Postulated Contamination Characterization* (November 2011) (hereinafter the “2011 Enercon Report”).

³⁶ This image is Figure 7 of the Sturgeon Distribution Report.

Figure 9: 2011 Enercon Report Map of Sedimentary Environment near Indian Point



As Figure 9 above shows, the area immediately adjacent to IPEC, which corresponds to the IPEC SSZ, is characterized primarily by erosion-scour (purple shading), while the area toward the center of the River is characterized by depositional environments (green shading).

To visualize the relationship between sedimentary environment, Atlantic Sturgeon locations, and the IPEC SSZ, Normandeau superimposed the sturgeon locations and the SSZ over the Enercon Report figure, which is Figure 10 of the Sturgeon Distribution Report and presented as Figure 10 below.

Figure 10: Map Showing Relationship of Sedimentary Environment, Atlantic Sturgeon Distribution, and IPEC SSZ

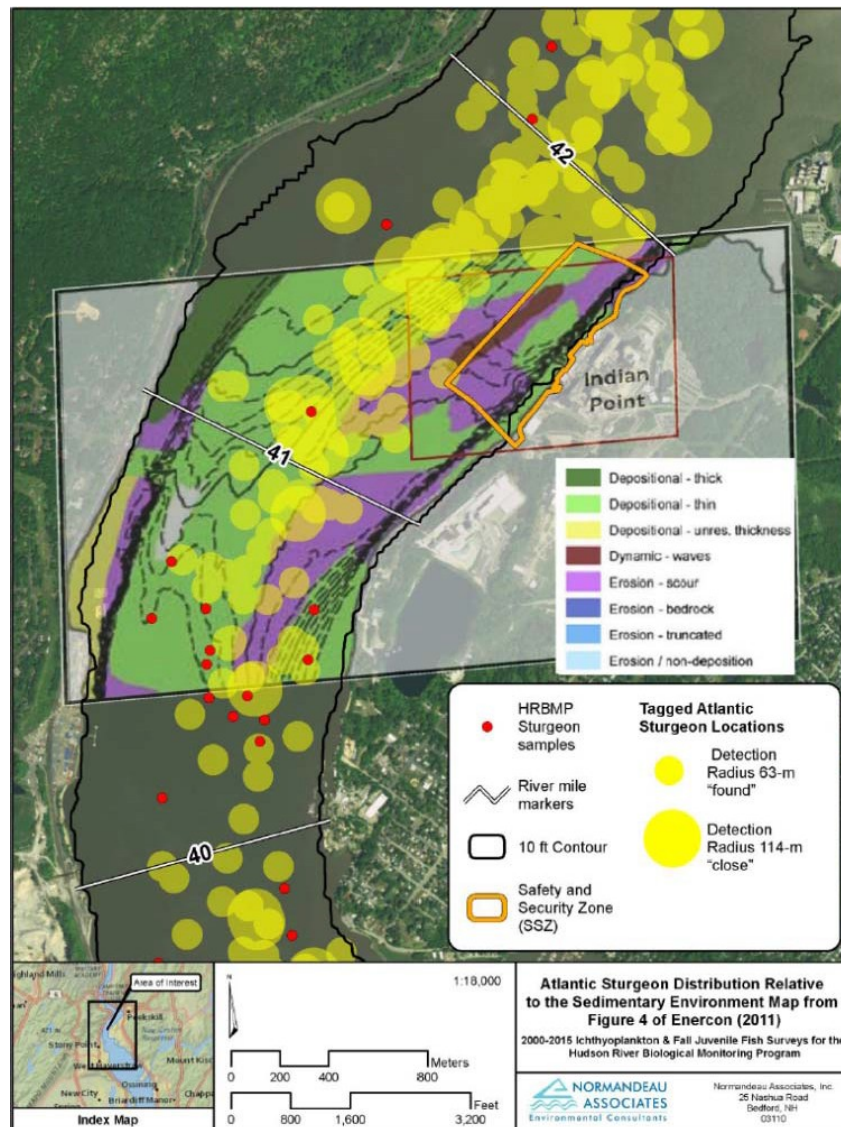


Figure 10 clearly shows that Atlantic Sturgeon were found almost exclusively in areas characterized by depositional sedimentary environments and generally not in scouring environments as are present inside the IPEC SSZ. This provides strong evidence of the unfavorable nature of the SSZ sedimentary environment for Atlantic Sturgeon.³⁷

³⁷ See also Applied Science Associates, Inc., *Analysis of Potential Sedimentation Effects of Proposed Cylindrical Wedgewire Screens for Intake of Cooling Water at Indian Point Energy Center*, March 29, 2013, at Figures B-1, B2, and B-4 (sidescan and multibeam data confirming the absence of depositional areas within the SSZ) (included as Attachment 4 to these Additional Comments).

The non-favorability to Atlantic Sturgeon of the sedimentary environment in the SSZ is further supported by Figure 5a in the Enercon Report, which is reproduced below in modified form as Figure 11. Figure 11 shows multibeam bathymetry and sediment core data to show that only a small area (green/yellow shading) within the IPEC SSZ is depositional (as shown by the presence of bottom sediments), while a significant portion of the area outside the SSZ is depositional.

Figure 11: Maps Showing Relationship of Sedimentary Thickness, Atlantic Sturgeon Distribution, and IPEC SSZ

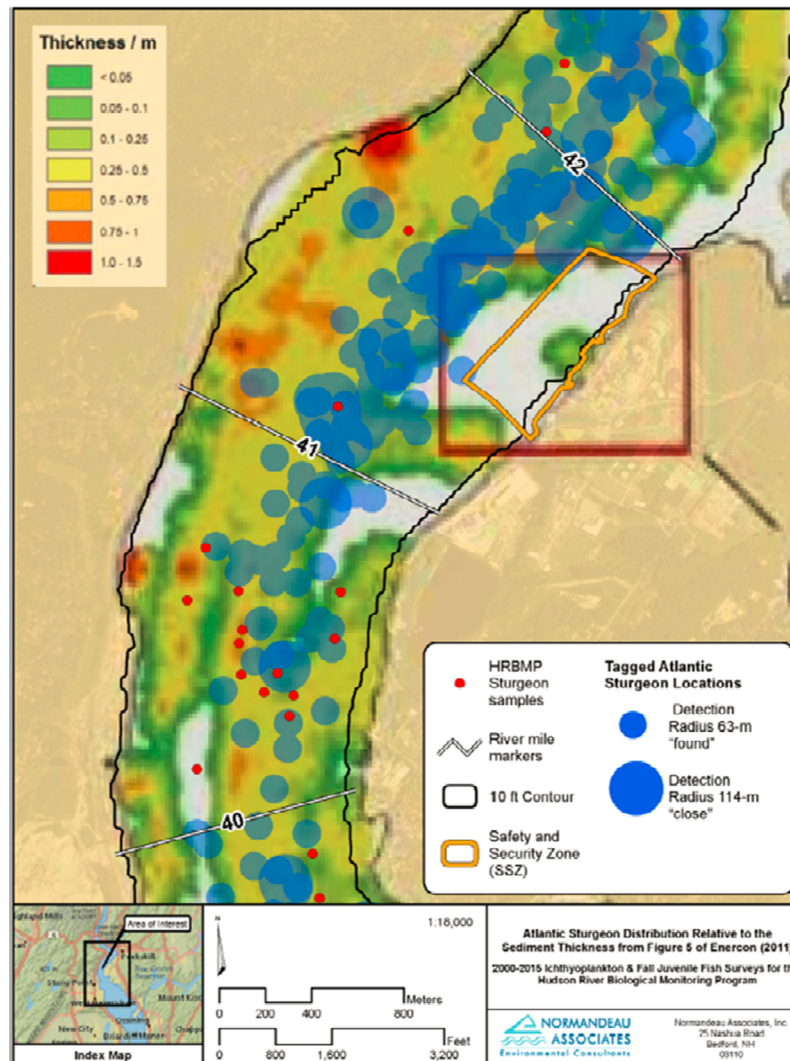


Figure 12 demonstrates again that Atlantic Sturgeon generally are found in the depositional areas characterized by thicker sediments, and not in areas with little or no sediment that would provide poor habitat for the establishment of benthic prey upon which Atlantic Sturgeon feed. Thus, the IPEC SSZ would provide relatively poor feeding habitat for Atlantic Sturgeon, even if the water would otherwise be deep enough to be considered habitat.

* * *

In conclusion, the supplemental information in these Additional Comments confirms, on a best available evidence basis, that the IPEC SSZ is not critical habitat for Atlantic Sturgeon and should not be designated as such.

On behalf of Entergy, we appreciate your consideration of these Additional Comments and welcome any questions you may have.

Sincerely,

Elise N. Zoli

Elise N. Zoli

Enclosures

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