

# JONES DAY

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June 30, 2020

## VIA E-MAIL

Briana A. Grange, Aquatic Biologist,  
Division of Materials and License Renewal  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
(via email at [briana.grange@nrc.gov](mailto:briana.grange@nrc.gov);  
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Re: Sturgeon monitoring under January 30, 2013 Biological Opinion/Incidental Take Statement in connection with Indian Point, including the February 9, 2018 amendment (individually, the “Amendment”; collectively, the “BiOp/ITS”)

Dear Ms. Grange:

This correspondence is submitted on behalf of Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC and Entergy Nuclear Operations, Inc. (collectively, “Entergy”), respectively, the owners and operator of the Indian Point Nuclear Stations, Units 2 and 3 (collectively, the “Stations;” individually, Unit 2 and Unit 3). Entergy respectfully requests (the “Request”) a waiver from, exception to or comparable determination (collectively, a “waiver”) regarding the “make-up days” (“Make-Up Days”) that otherwise may be considered required as a result of the COVID-19-related interruption of April and May (collectively, “spring”), 2020 Monitoring of Atlantic and Shortnose Sturgeon (collectively, “Sturgeon”) at the Stations.

Briefly, Entergy makes this Request on three grounds, each detailed below. First, Make-Up Days at Unit 2 are not practicable, because that Unit *permanently* ceased electric-generating activities (“shut down”) on April 30, 2020. Second, Make-Up Days for Unit 3 within June, July and August (collectively, “summer”) are not practicable or appropriate, because Unit 3 operations will not resume in full until September 2020 and the adverse impacts to non-Sturgeon, non-Endangered Species Act (the “ESA”) species of summer Monitoring would be unduly significant in contravention of New York State Department of Environmental Conservation (“NYSDEC”) mandates. Scheduling Make-Up days during September and October (collectively,

Briana A. Grange, Aquatic Biologist,  
Division of Materials and License Renewal  
Office of Nuclear Reactor Regulation  
June 30, 2020  
Page 2

“autumn”), which would effectively double Entergy’s planned autumn Monitoring, or during November and December (“winter”) of 2020 also is not scientifically supported, practicable or appropriate.<sup>1</sup>

Irrespective of the availability of a waiver, as a demonstration of its environmental stewardship and commitment, Entergy proposes to fund an independent scientific assessment of Sturgeon. (The details are provided below.) Entergy understands that this waiver will be processed without re-initiation of consultation with the Department of Commerce, National Oceanic and Atmospheric Administration’s National Marine Fisheries Service’s (collectively, “NMFS”), and thanks all parties for their efforts here.

### **DISCUSSION<sup>2</sup>**

To support the waiver in this Request, NRC asked that Entergy address the impracticability of and regulatory barriers to scheduling Make-Up Days in summer, autumn and winter 2020 for both Units 2 and 3. Entergy respectfully submits the following in full response to NRC’s request:

- Unit 2 permanently shut down on April 30, 2020, and consequently ceased operating the full circulating water system, with the Ristroph screen and fish return systems (“Ristroph-screen System”), that accompany electric-generation. As such, Unit 2’s full Ristroph-screen System operations are not available to allow performance of Make-Up Days, as contemplated by the BiOp/ITS. This is the case, despite the fact that (consistent with the BiOp/ITS), Unit 2 may

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<sup>1</sup> This Request has the benefit of the intensive Sturgeon monitoring (the “Monitoring”) performed at the Stations performed in 2019 (the “2019 Monitoring”), as further analyzed herein by ASA Analysis and Communications, Inc. (“ASA”). Normandeau Associates, Inc. (“Normandeau”) conducted the Monitoring and prepared the annual report (the “Annual Report”) previously provided to all copied here.

<sup>2</sup> The need for a waiver is assumed here for simplicity, given that the BiOp/ITS could not reasonably anticipate the unique, protracted COVID-19 dynamic. Rather, Section 11.3, #1 sets forth two scenarios: (1) a scheduled outage, or (2) an “emergency situation[] related to unexpected plant outages or extreme weather conditions,” with NMFS providing an example of a Nor’easter.

Briana A. Grange, Aquatic Biologist,  
Division of Materials and License Renewal  
Office of Nuclear Reactor Regulation  
June 30, 2020  
Page 3

- undertake incidental, time-limited use of a single circulating water pump to facilitate radioisotope-management and to meet other nuclear and operational mandates. Since the timing of such incidental usage is not known, it could not reasonably be expected to involve the integrative planning required for the Monitoring.
- With respect to Unit 3, three conceptual timeframes are possible in 2020: summer, autumn or winter Make-Up Days. None is reasonably practicable or appropriate, as set forth here:
  - The summer period is not practicable for the following reasons: (1) Entergy continues to operate at Indian Point (as well as fleet-wide) under a COVID-19 pandemic plan that prioritizes remote work and minimizes non-nuclear safety or nuclear security-related outside consultant access to the Stations, and therefore is not prepared for outside consultants to undertake Monitoring at Unit 3 until the autumn period; (2) NMFS, NRC, NYSDEC and Entergy selected Monitoring dates to advance scientifically targeted periods of Sturgeon presence in the Indian Point region, while avoiding adverse harm to non-ESA species that are present in the summer period; and (3) Entergy is not authorized by NYSDEC to conduct Monitoring outside of specifically allotted autumn 2020 plan, and given the specter of significant, adverse, summer impacts to non-ESA species is highly unlikely to be approved by NYSDEC to do so because of the impacts to forage species, e.g., Bay Anchovy and river herring (consisting of Blueback Herring, Alewife and American Shad), the last of which is under an Estuary-wide fishing moratorium.
  - The autumn period is not appropriate for the following reasons: (1) Entergy is already performing intensive Monitoring in autumn that NMFS, NRC, NYSDEC and Entergy determined were more than adequate to assess those months (and to interpolate annually), thus rendering a

Briana A. Grange, Aquatic Biologist,  
Division of Materials and License Renewal  
Office of Nuclear Reactor Regulation  
June 30, 2020  
Page 4

- doubling of days in autumn scientifically unnecessary and needlessly harmful to the out-migrating non-ESA juveniles<sup>3</sup>; and (2) Entergy cannot move forward to double autumn Make-Ups Days without NYSDEC's prior approval, which Entergy does not believe will be forthcoming, because of that period's importance to out-migrating non-ESA juveniles. To illustrate the scientific premise, in the attached report, ASA has calculated, with 95% confidence, that the likelihood of any more than what amounts to a random single take in Make-Up Days (numbering twenty five days or the full complement of the spring allocations) is less than 4%.
- The winter period is neither practicable, nor appropriate for the following reasons: (1) there is no credible scientific evidence of Sturgeon presence in the winter period both in proximity and at a size reasonably susceptible to collection by Indian Point that would support the value of Make-Up Days Monitoring at that time, when the data indicates deep channel outmigration in autumn; and (2) Entergy has no reasonable assurances that NYSDEC will authorize Make-Up Days during this period, including owing to the historic presence and therefore potential impingement of American Tomcod and White Perch. In addition, Entergy respectfully notes that winter monitoring for the Normandeau consultant team would require to significant outside presence for the most part of two daily twelve-hour shifts; while the Normandeau team has worked in challenging environments to advance directed science to facilitate our understanding of the Atlantic Tomcod and Striped Bass populations, winter work with no reasonable expectation for Sturgeon insight, but that will certainly adversely impact Atlantic Tomcod, is not consistent with that history or our goals.

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<sup>3</sup> The dominance of April in contributing to historic collections at Unit 3 means that autumn collections are less likely to identify Sturgeon, despite the fact that the Monitoring is already intensive, including by the U.S. Environmental Protection Agency's standards for impingement verification monitoring (where once a month monitoring is specified).

Briana A. Grange, Aquatic Biologist,  
Division of Materials and License Renewal  
Office of Nuclear Reactor Regulation  
June 30, 2020  
Page 5

It is worth underscoring that Unit 3 is scheduled to permanently shut down no later than April 30, 2021. Accounting for the COVID-19 interruptions in Monitoring in April/May 2020, the 2019 Monitoring represented approximately 75% of the total remaining operational period for the Ristroph-screen System capable of undergoing Monitoring under the BiOp/ITS, i.e., from April 1, 2019 through May 31, 2021. Unit 2's closure already has effected a more than 60% reduction in circulating water flows (based on efficient flow curves over the last five years). Further, Unit 2 was predicted to have a disproportionate impact to Sturgeon, with the BiOp/ITS allocating 73% of the Shortnose and 68% of the Atlantic Sturgeon take to Unit 2. *See, e.g.,* Amendment, p. 6 of 25 ("Take of live and dead sturgeon is likely to occur ... at an *average rate* of 19 shortnose and 13 Atlantic sturgeon per year at IP2 through April 2024 and 7 shortnose and 6 Atlantic sturgeon per year at IP3 through April 2025.") (Emphasis added.) Thus, Unit 3's remaining few months of operations are not reasonably likely to adversely impact Sturgeon recovery, and the Make-Up Day Monitoring is unlikely to produce scientifically valuable Sturgeon information.

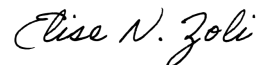
*Nonetheless, Entergy remains committed to an approach that meets the letter and spirit of the BiOp/ITS and the ESA.* To that end, while it requests this waiver, Entergy proposes that, no later than September 1, 2020, Entergy will allocate \$100,000 to Dr. Ike Wirgin to advance Sturgeon science in a manner reasonably acceptable to NRC, NMFS, NYSDEC and Entergy. Entergy suggests that an ideal subject to advance Sturgeon recovery would be the calculation of reductions of by-catch, using Dr. Wirgin and his co-author's existing peer-reviewed, published satellite-based distribution model for the express purpose of reducing Sturgeon bycatch. *See* Breece, M.W., et al., *Satellite driven distribution models of endangered Atlantic sturgeon occurrence in the mid-Atlantic Bight*, ICES Journal of Marine Science, 75:2, 562-71 (2017); *see also* Stein, A.B., et al., *Atlantic Sturgeon Marine Bycatch and Mortality on the Continental Shelf of the Northeast United States*, North American Journal of Fisheries Management, 24:1, 171-83 (2003) (immediately observed mortality of Atlantic Sturgeon, in sink gill nets, was 22%, 1989-2000).

In sum, Entergy respectfully submits that NRC: (1) waive Make-Up Days as not practicable, nor appropriate, in the summer, autumn or winter period in 2020; and (2) accept Entergy's proposal to improve scientific understanding of Sturgeon. Again, we welcome the

Briana A. Grange, Aquatic Biologist,  
Division of Materials and License Renewal  
Office of Nuclear Reactor Regulation  
June 30, 2020  
Page 6

opportunity to discuss this request in detail at your earliest convenience, with NRC, NMFS and NYSDEC.

Very truly yours,



Elise N. Zoli

Enclosure

cc: Julie Crocker ([julie.crocker@noaa.gov](mailto:julie.crocker@noaa.gov)), Endangered Fish Recovery Branch Chief,  
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May 21, 2020

Entergy Nuclear Operations, Inc.

Subject: Analysis of 2019 Sturgeon Monitoring

I have completed analysis of the 2019 Sturgeon Monitoring Program conducted by Normandeau Associates, Inc., at the Indian Point Energy Center. Of course, with no observed takes during the 2019 monitoring, the statistical techniques that can be applied to the data are limited, but nevertheless important inferences about the potential for future sturgeon takes are still possible.

Please contact me if you have any questions about the analysis or its application.

Sincerely,

A handwritten signature in black ink that reads "John Young". The signature is written in a cursive style with a large, stylized "Y" and "J".

Vice President & Principal Scientist

## Statistical Analysis of 2019 Sturgeon Monitoring

Sampling of impingement for sturgeons occurred on 100 unit days (50 days at Unit 2 and 50 days at Unit 3) during the months of April, May, September, and October in 2019. April and May were targeted for monitoring because previous impingement sampling at IPEC from 1974-1990 had demonstrated these were peak months of potential impingement for both sturgeon species, Atlantic and Shortnose Sturgeon.

By way of background and as the Biological Team previously has provided, the spring peak coincided temporally with a gill net fishery targeting the American Shad spawning run. Adult Shortnose Sturgeon and sub-adult Atlantic Sturgeon were incidentally caught in this fishery. Neither species could have been legally kept, and therefore would have been released back to the river. Observed immediate discard mortality of sturgeons caught in gillnets have been reported to range from 2.3% (Bahn et.al. 2012) to 22% (Stein et.al. 2004), with some higher observations (ASMFC 1998). In addition to immediate mortality, one study reported that 20% of sturgeon released live from gillnets were released with injuries (Collins et.al. 1996). Thus, we previously identified the spring peak of impingement at Indian Point as a likely result of collection of dead or moribund sturgeons that were killed or injured in that fishery. That fishery no longer exists.

Historical impingement sampling did not indicate any distinct peak in sturgeon impingement during the fall. Nonetheless, September and October were selected for the current monitoring because 1) these two months were representative for sturgeons, with historic September takes slightly higher, and 2) impingement of other species, whose survival rates could be reduced by the monitoring, typically are relatively low, with the possible exception of juvenile Alosids. The juvenile herrings (American Shad, Alewife, and Blueback Herring) emigrate from the estuary in the fall and impingement may occur as they pass the IPEC intakes. Impingement mortality rates for these small prey species are higher than for the more robust species, such as the *Morone* and sturgeons.

Typically, during historic monitoring, Unit 2 impinged approximately twice as many sturgeons as Unit 3, and Atlantic Sturgeon were more than 10 times as common as Shortnose Sturgeon (the latter, already classified as endangered during the period of impingement monitoring). Since impingement monitoring ceased after 1990, the abundances of both sturgeon species have changed over the last 3 decades, and the gill net fishery has ceased to operate. These changes rendered the expected number of sturgeons that would be impinged in the future uncertain. The take limits for both species were established based on the historic impingement data, and estimated current population sizes relative to when impingement was monitored. Thus, we understand that take limits for operation of the IPEC units' final years of operation were established by NMFS, with the monitoring program undertaken by IPEC designed to estimate the actual number of takes, with an acceptable level of uncertainty.



Table 1 Take limits for sturgeon impingement during renewed operating license, according to 2013 BIOP and ITS. Source: NMFS Amended ITS February 9, 2018.

Period	Unit	Shortnose	Atlantic	Combined
Total (through 2024 or 2025)	1	1	1	2
	2	133	91	224
	3	56	48	104
Annual	1	-	-	
	2	71	31	102
	3	32	41	73

No Atlantic Sturgeon and no Shortnose Sturgeon were collected in 50 days of monitoring at Unit 2 and at Unit 3 in 2019. Nonetheless, sturgeon impingements can be considered to have a large degree of randomness. Thus, the statistical uncertainty of the observed result must be considered.

Given the observed result of 0 sturgeons, the most appropriate statistical model to use in quantifying the uncertainty would be to consider the occurrence of a sturgeon to follow a binomial distribution<sup>1</sup>, with probability of occurring on a random day defined as  $p$ . Thus, the built-in assumptions of this model are:

- 1) The period of monitoring (April-May and September-October) is representative of the unsampled months.

In fact, if the historical pattern of seasonality were to hold to the present, April would be the most likely month for takes to occur. Thus, contribution of April as  $\frac{1}{4}$  of the monitoring effort may cause an overestimate of probability of daily take with respect to the entire year.

- 2) Sturgeon impingements are singular events.

During the 1970s, sturgeon impingement events at IPEC were more common than in later years. Estimated total impingement of Shortnose Sturgeon<sup>2</sup> from 1974-1979 (6 years) was 44, and from 1980-1990 (11 years) was 27. Estimated total impingement of Atlantic Sturgeon was 1,194 from 1974-1979 (again, 6 years), but only 150 from 1980-1990 (again, 11 years). Although the reason for the decline in impingement events is not clear,

<sup>1</sup> The binomial distribution describes random events that can be classified into two categories, e.g. success or failure. The distribution has a single parameter,  $p$ . In this context,  $p$  is the probability of a sturgeon being impinged on a single day of unit operation. If the unit operates on  $N$  days, the probability that  $x$  days will have a sturgeon impingement is  $\Pr(x) = \binom{N}{x} p^x (1 - p)^{N-x}$ .

<sup>2</sup> Enclosure 1 of letter from Entergy to USNRC on 7/1/2009.

it probably involves several factors, including number of operating days for each IPEC unit, and technology employed at the intake structure, which changed across the period. Whatever the reason for the decline, the more recent data from 1980-1990 are a more useful model for sturgeon impingement now than are the data from the 1970s when the original screens and cooling pumps were in use. From 1980-1990, at Unit 2 sturgeon impingement occurred as a singular event (only one sturgeon impinged) 38 times, and of two sturgeon on the same date 2 times (Table 2). At Unit 3, singular impingement occurred on 39 days, of two sturgeon on 4 days, and of 3 or more sturgeon on the same date on 1 day (Table 2). Thus, the more recent data on impingement supports that sturgeon takes are typically rare and usually singular events.

*Table 2 Occurrence of single and multiple sturgeon impingements per sample day for shortnose sturgeon and Atlantic sturgeon (1980-1990) at IPEC Unit 2 and Unit 3. Source: Enclosure 1 of Entergy letter to USNRC July 1, 2009.*

Number of Sturgeon Observed in a day	Unit 2			Unit 3		
	Shortnose Sturgeon	Atlantic Sturgeon	Total Sturgeon	Shortnose Sturgeon	Atlantic Sturgeon	Total Sturgeon
1	7	31	38	5	34	39
2	0	2	2	0	4	4
3	0	0	0	0	1	1

3) Dates on which monitoring occurred can be considered to be randomly selected from possible dates.

Sample dates during 2019 were fixed at 3 days per week at each unit during each month sampled. Because IPEC units are baseloaded and operate the same with respect to cooling water withdrawals regardless of day-of-the-week, the days sampled can be considered a random sample of possible dates.

With acceptance of these three assumptions, the maximum likelihood method can be used to place 95% confidence on the upper bound of the daily probability of sturgeon impingement (Figure 1). With the additional assumption that the Unit 2 probability is twice the Unit 3 probability, which is supported both by the prior impingement data and reflected in the imposed take limits (Table 1), then the upper 95% confidence bounds are 0.0253 for Unit 2 and 0.0127 for Unit 3. The maximum likelihood estimates are the observed values of 0 for both units.

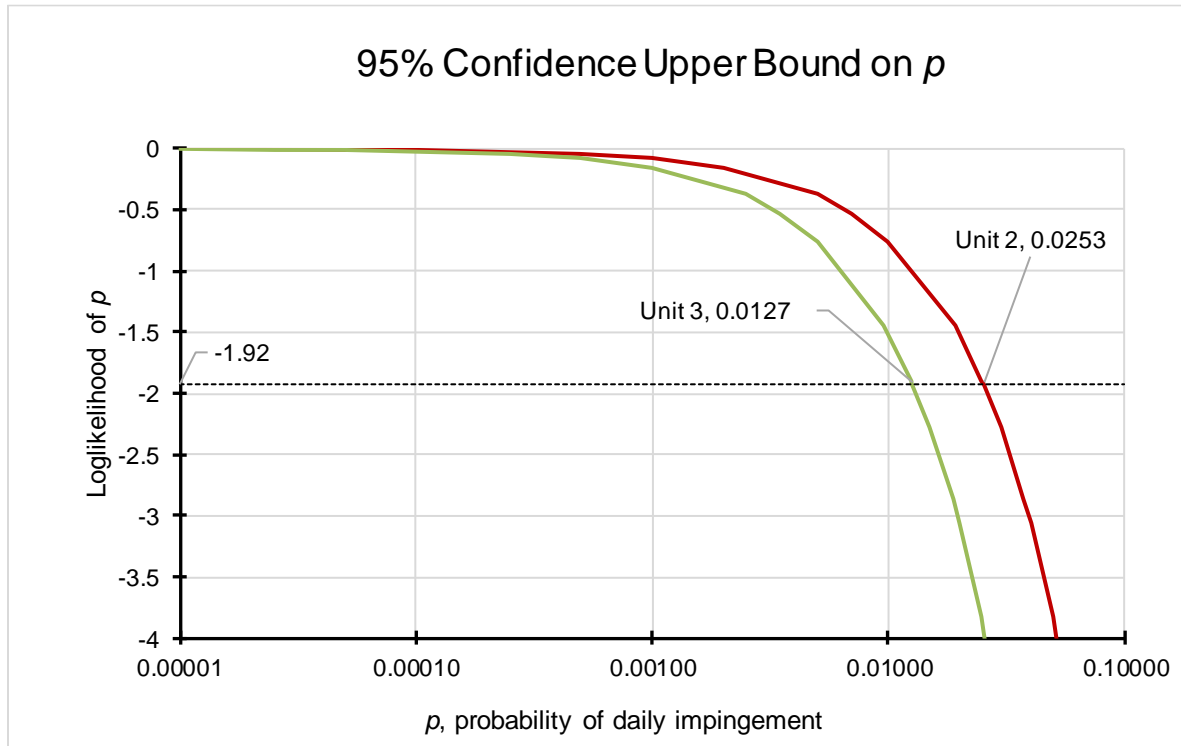


Figure 1 Likelihood profile for  $p$  (probability of a sturgeon impinged during a unit day of operation), given 0 occurrences in 50 sampled days for each unit. Unit 3 probability is fixed at  $\frac{1}{2}$  of Unit 2 probability. Values of  $p$  at point where the profile likelihood is -1.92 are the 95% confidence for the upper bounds of  $p$ .

We can use this result to assess the probability for sturgeon takes during the period of continued Unit 3 operation. Using the upper 95% confidence bound on  $p$  (0.0127 for Unit 3), the probability for additional takes can be estimated for the 345 remaining days of operation from 5/20/20 to 4/30/2021 (Figure 2). Even using the upper bound for  $p$ , there would be a 55% chance of 4 or fewer takes, and essentially a 100% chance that there would be no more than 10 takes. Annual take limits for Unit 3 are 32 Shortnose Sturgeon, 41 Atlantic Sturgeon, and 73 total sturgeon. Thus, even using the 95% confidence upper bound on  $p$ , derived by 2019 monitoring, partly during the month of highest expectation for sturgeon takes, the calculated probability of exceeding the annual take limits at IPEC is negligible.

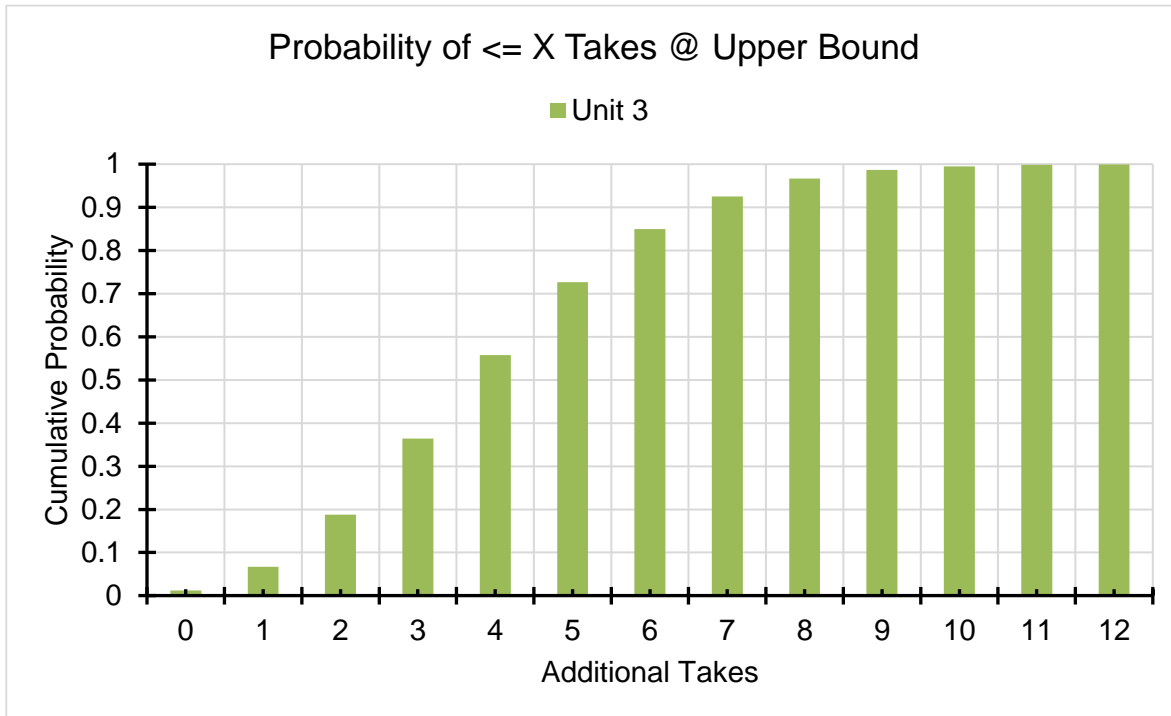
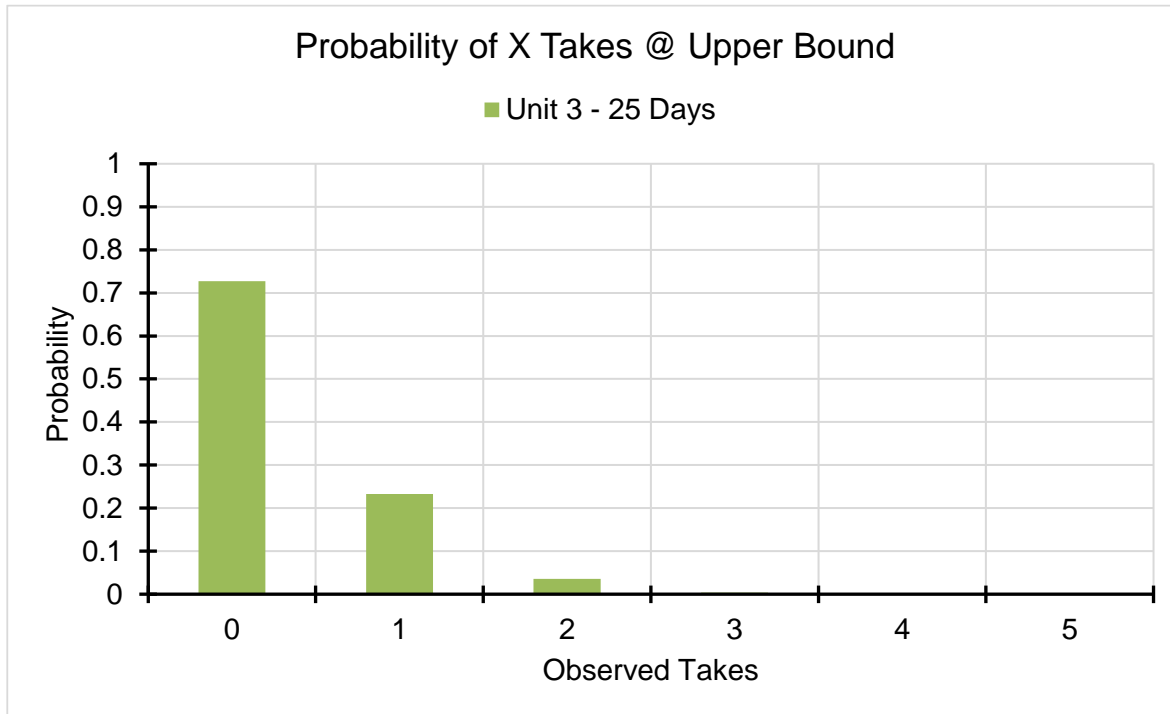


Figure 2 Cumulative probability distribution for additional sturgeon takes over 345 days of Unit 3 operation, using the 95% confidence upper bound for  $p$  from 2019 monitoring results.

This same information can be used to assess the efficacy of making up the scheduled monitoring days in 2020 that were missed due to Covid-19 responses. For 25 days of additional monitoring (i.e. the missed monitoring of Unit 3 in April 2020), and again using the upper 95% confidence bound for  $p$ , the expectation would be approximately 73% chance of 0 takes, 23% chance of 1 take, and 4% chance of 2 takes (Figure 3).



*Figure 3 Probability distribution for observed sturgeon takes at Unit 3 over 25 days of additional monitoring, using the 95% confidence upper bound for  $p$  from 2019 monitoring results.*

In summary, while the estimated probability of future takes based on the 2019 monitoring result is zero, even using the conservative upper 95% confidence bound of the probability of impinging a sturgeon during a day of operation, future sturgeon takes at IPEC still would be expected to be far below the take limits. Given this expectation, making up missed monitoring days would produce very little additional information on the fate or biological characteristics of Hudson River sturgeons, at considerable cost per fish observed. Making up missed days would also subject other impinged fishes to the stress of diversion to the holding tanks and would reduce their probability of survival after return to the river. Although no other species are endangered, some are in low relative abundance (e.g. river herrings and American Shad) and of concern to state regulators who are attempting to reduce man-induced mortality sources.

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