



Indian Point Sturgeon Impingement Quality Assurance Plan and Standard Operating Procedures

Prepared For:
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3.0 Sturgeon Collected from the IP1, IP2 or IP3 Intakes

All sturgeon collected at the intakes of IP1, IP2 or IP3 will be processed as specified in RPM#2, RPM#3, and T&C#3, T&C#4, T&C#5, and T&C#6 of the Opinion. We expect sturgeon collected from the trash racks will be moribund or dead, while sturgeon collected from the Ristroph traveling screens may be alive or dead. Any live sturgeon collected will be released back into the Hudson River at a location away from the intakes and thermal plume as specified by RPM#2 of the Opinion. Each sturgeon collected will be subjected to the following processing:

- Sturgeon will be identified to species with length (total length in millimeters), weight (wet weight in grams) recorded.
- Sturgeon will be checked for previously applied tags, including PIT tags, external streamer tags, acoustic tags, and coded wire tags. If a tag is found, the tag type and identification number will be recorded.
- Genetic samples will be obtained from all sturgeon or sturgeon parts collected from the intakes as specified in Appendix IV of the Opinion.
- All dead sturgeon and sturgeon parts collected will be processed as described below. External criteria will be used to determine, where practicable, if a dead sturgeon was previously dead in the field at the time of collection, based on signs of life (e.g., body movement or opercular movement) or other indications of death (e.g., red or only slightly faded gill filaments, bodily decay, bleached gill filaments, or other signs of morbidity or death prior sample collection (King *et al.* 2010).
- The nature of observed external injuries for all dead sturgeon will be recorded as part of the initial field necropsy performed at the time of collection.
- An “Incidental Report Sturgeon Take – Indian Point” form and a Sturgeon Salvage Form will be completed for each dead sturgeon as specified Appendix II and Appendix III of the Opinion.
- Dead sturgeon or body parts retrieved from the IPEC intakes will be photographed, measured, labeled with a unique sample number, and retained by freezing until delivered on a NMFS-approved schedule to a qualified individual (recommended by NMFS), to perform necropsies.

3.1 Atlantic and Shortnose Sturgeon Field Processing Procedures

External criteria will be used to determine, where practicable, if a dead sturgeon collected at the IP1, IP2 or IP3 intakes was previously dead prior to the time of collection, based on signs of life (King *et al.* 2010). Alive vs. dead (i.e., A_D) status is determined for each sturgeon in the field at the time of collection. There are three classes of sturgeon collected with regard to alive vs. dead status, and two classes of injury, providing six unique alive vs. dead categories of sturgeon coded as follows:

- Alive with no observed injuries (A_D = 1)
- Alive, with one or more observed injuries (A_D = 2)
- Newly dead, with no observed injuries (A_D = 3)
- Newly dead, with one or more observed injuries (A_D = 4)

- Old dead, with no observed injuries (A_D = 5)
- Old dead, with one or more observed injuries (A_D = 6)

A newly dead sturgeon (i.e., one considered to have died within the previous 24 hours) will exhibit one or more of the following features:

- body movement,
- opercular movement,
- red or only slightly faded gill filaments,
- bleeding, or
- no bodily decay.

A previously dead sturgeon (i.e., one considered to have died 24 hours or more before collection) will exhibit one or more of the following features:

- no opercular or body movement,
- bleached gill filaments, or
- bodily decay or other signs of morbidity or death prior sample collection.

Newly dead sturgeon will be processed at the time of collection and either delivered in fresh condition to an individual or facility qualified to carry out necropsy procedures, including pathogenic analysis, as identified by NMFS, or frozen for subsequent delivery and necropsy analysis. Old dead sturgeon will be processed at the time of collection and then frozen until transferred to NMFS or an appropriately permitted researcher to perform necropsy as specified in RPM #3 and T&C #4 of the Opinion.

3.1.1 Species Identification

Three different external features will be used to distinguish juvenile and older Shortnose and Atlantic Sturgeon in the field:

1. the mouth width to eye distance ratio,
2. the presence or absence of bony plates (scutes) found between the base of the anal fin and the midlateral line, and
3. the presence of one or two rows of scutes found along the dorsal midline posterior to the dorsal fin, and along the ventral midline anterior to the anal fin.

To identify the correct sturgeon species, first the ratio of the mouth width to the distance between the eyes is calculated. A Shortnose Sturgeon has a relatively large mouth compared to an Atlantic Sturgeon (see Figure 3-1 and Figure 3-2). Shortnose Sturgeon are reported to exhibit a mouth width to eye distance ratio of greater than 62% (typically 63% to 81%, Musick in Collette and Klein-MacPhee, 2002). An Atlantic Sturgeon has a smaller mouth and exhibits a mouth width to eye distance ratio typically less than 62% (range 43% to 66%, Musick in Collette and Klein-MacPhee, 2002, Table 3-1). The mouth width in mm is measured with calipers inside of the lips, and the distance between the eyes in mm is also measured with calipers (see Figure 3-1). The ratio of the mouth width to the distance between the eyes is calculated by taking the measured mouth width and dividing it by the eye width and multiplying by 100 to express the

number as a percentage. For example, if the measured mouth width is 47 mm and the measured eye width is 64 mm, then ratio is $47/64 = 0.734 * 100 = 73.4\%$, and this fish is likely to be a shortnose sturgeon.

Because there is some overlap between the range of mouth widths to eye width ratios reported for some Atlantic Sturgeon distinct population segments (63% to 66% for both species, Musick in Collette and Klein-MacPhee, 2002), a second characteristic must also be used to distinguish the two sturgeon species. The presence or absence of bony plates (scutes) above the anal fin will also be used to distinguish Shortnose and Atlantic Sturgeon. If two to six scutes at least as large as the pupil of the eye are found above the anal fin in the space between the base of the anal fin and the midlateral row of scutes (see Figure 3-2), then the sturgeon is an Atlantic Sturgeon. If no scutes are found between the base of the anal fin and the midlateral row of scutes, the sturgeon is a Shortnose Sturgeon.

A third characteristic can also be used to verify the sturgeon species identification based on the mouth to eye ratio and the presence or absence of anal fin scutes. This is the presence of a single or double row of scutes in the post-dorsal or pre-anal portions of the body (Smith 1985).

Looking at the dorsal (top) surface of the fish, an Atlantic Sturgeon will have two rows of scutes between the posterior edge of the dorsal fin and the anterior edge of the caudal fin, one row on either side of the mid-dorsal line. Turning the fish over and looking at the ventral (belly) area between the anterior edge of the anal fin and the pelvic fins, an Atlantic Sturgeon will also have two rows of scutes, one row on either side of the mid-ventral line. If the fish is a Shortnose Sturgeon, it will have a single row of scutes in both the post-dorsal and pre-anal areas, with this row aligned directly down the mid-line. In some Shortnose Sturgeon, particularly on smaller specimens, the post-dorsal row of scutes may be almost completely absent. A comparison of these distinguishing features is shown in Table 3-1.

Table 3-1. Identification characteristics for Atlantic and Shortnose Sturgeon.

Species	Mouth/ Eye Ratio	Anal Fin Lateral Scutes	Post-Dorsal Scutes	Pre-Anal Scutes
Atlantic Sturgeon TAXON = 29	<62%	2 to 6 bony plates present	Double row	Double row
Shortnose Sturgeon TAXON = 27	>62%	Absent	Single row or absent	Single row

3.1.2 Field Processing Procedures

Processing of sturgeon at the time of collection at the IP1, IP2 or IP3 intakes will include the following:

1. Identify each Atlantic and Shortnose Sturgeon caught in each sample using the external features listed above in Section 3.1.1.
2. All alive Atlantic and Shortnose Sturgeon are handled with care and returned to the Hudson River away from the intakes and thermal plume after being identified, closely examined for injuries and other factors affecting their condition, examined for external and

internal tags, measured to the nearest millimeter total length (TL) and to the nearest millimeter fork length (FL) and weighed to the nearest gram (wet weight).

3. Alive Atlantic Sturgeon greater than 250 mm TL and alive Shortnose Sturgeon greater than 300 mm TL that have not been tagged may be PIT tagged if in good condition and released following the procedures listed below.
4. Record all pertinent sturgeon data on the Sturgeon M2 data sheet (see Section 3.1.3 below).
5. Any Atlantic or Shortnose Sturgeon that is dead at capture is processed in the field and then placed on ice and transported to the laboratory, where it will be frozen and saved for the NMFS.
6. Notify the IPEC 3 Control Room (914.254.8277) and NMFS within 24 hours as required by RPM #5 and T&C #6. Complete an "Incidental Report – Sturgeon Take – Indian Point" form as specified in Appendix II of the Opinion and shown in Figure 3-3.
7. Photographs will be taken and a Sturgeon Salvage Form (Appendix III of the Opinion and shown as Figure 3-4) is completed.
8. Every reasonable effort should be taken to release any live Atlantic and Shortnose Sturgeon in the same condition as at the time of collection. If, in the judgment of the principal investigator or co-investigators, complete processing of Atlantic or Shortnose Sturgeon at the time of capture is likely to endanger the survival of the fish, the minimum processing of identification to species will be performed and the fish will be released with a comment made on the data sheet describing the reasons why full processing was not completed.
9. Taxonomic features used to distinguish Shortnose and Atlantic Sturgeon (Section 3.1.1 above) will be documented on the M2 Data Sheet (Section 3.1.3 below) under the variables EYE WIDTH, MOUTH WIDTH, MOUTH/EYE RATIO, LATERAL ANAL SCUTES, POST-DORSAL SCUTES, and PRE-ANAL SCUTES. Check the data recorded for these variables recorded against Table 3-1 in Section 3.1.1 above to be sure that all values agree with the assigned taxon code.
10. Take at least five photographs of each sturgeon collected. Additional photographs should be taken if one or more injuries are observed. One purpose of taking photographs is to verify taxonomy based on external traits and to document the condition of each fish. Taxonomy of the smaller (juvenile) sturgeon may be more variable compared to larger fish, and the photographs will be used to document this variability. Recaptured fish will be also be photographed because of their importance to the management program. Photographs of injuries will document where on the fish they are located and the nature and severity of the injury. In the field of view of each photograph, include a paper label with TASK_CD, SAMPLE, FISH_ID, TAXON, DATE, TIME, LENGTH, and INJURY written on it. The five photographs (digital images) taken for each sturgeon will include:
 - a) a close up of the eyes with a millimeter ruler for scale,
 - b) a close up of the mouth with a millimeter ruler for scale,
 - c) a close up side view of the base of the anal fin to reveal the presence or absence of anal scutes,
 - d) a view of the entire left side of the sturgeon, and
 - e) a view of the entire right side of the sturgeon.

- f) If the sturgeon has one or more external injuries or suspected tag wounds, one or more additional photographs will be taken to illustrate the wound(s) from a lateral, ventral or dorsal view with a pointer or a millimeter ruler used to identify each injury or abnormality observed.
11. Check all Atlantic Sturgeon and Shortnose Sturgeon for external tags and internal (PIT) tags and record all pertinent data on the Sturgeon M2 data sheet (Section 3.1.3 below).
12. Cornell University tagged Hudson River sturgeon (Atlantic and Shortnose Sturgeon) greater than 200 mm TL in 1993 and 1994 with two yellow USFWS Floy tags, one at the base of the left pectoral fin and the other at the anterior base of the dorsal fin. Atlantic Sturgeon between 60 mm TL and 140 mm TL were also tagged with magnetic tags and released in Newburgh Bay in October of 1994. These magnetic tags were inserted in either the head region or under the 4th dorsal scute. However, Normandeau will not scan live sturgeon for magnetic tags because recovery and reading of the tag if detected would require killing the fish.
13. Examine each sturgeon for an external Carlin-Ritchie disc dangler tag inserted through the dorsal fin.
14. Scan each sturgeon caught with a hand-held PIT tag reader (BioMark Pocket Reader/EX with Memory) along its entire dorsal length of the body to search for a previously applied PIT tag.
15. Scan each sturgeon caught with a Lotek receiver to search for an active previously applied acoustic tag.
16. Each sturgeon caught with a tag present will be assigned a REL_REC = 2 and have the tag number or description of the mark recorded on the Sturgeon M2 data sheet (Section 3.1.3 below).
17. A comment will also be written to describe the condition of the tag insertion site for each recaptured sturgeon.
18. Length (mm TL and mm FL), wet weight (grams), condition at time of capture, and sex if readily apparent, are determined and recorded on the Sturgeon M2 data sheet (Section 3.1.3 below) for each sturgeon caught.
19. A genetic tissue sample must be taken from all sturgeon collected as specified in Appendix IV of the Opinion (Figure 3-5) by removing a 1.0 cm² finclip from the tip of the soft fin area of the pelvic fin using a clean pair of sharp scissors. Previously tagged Atlantic or Shortnose Sturgeon will not have a genetic sample taken unless the fish is dead.
 - a) Cross contamination of genetic samples must be avoided. For each fish sampled use a new pair of surgical gloves and new scalpel blade or clean scissors for cutting and handling the sample. If contamination occurs discard the sample.
 - b) The scissors will be washed clean in an antiseptic bath (70% isopropyl alcohol or 90% ethanol) before and after being used to obtain each tissue sample to prevent cross contamination of the genetic material in each tissue sample.
 - c) Place a 1 cm² clip of pelvic fin section in a vial with the preservative (95-100% ethanol). Be sure to use ethanol that has not been denatured with methanol or

other chemical additions. Use the vials and paperwork provided by NOAA-NOS within Ziploc bags.

- d) Label the genetic sample vial using a waterproof pen (Sharpie) with the sample number and fish ID number. Then place this properly closed vial in a small Ziploc bag labeled with an Internal and External label as specified by Appendix IV (Figure 3-5).
 - e) Place the Ziploc bag containing the genetic tissue sample vial in a cooler on ice. Upon returning to the laboratory the tissue samples are to be kept refrigerated until shipped to NOAA-NOS as specified in Appendix IV of the Opinion (Figure 3-5).
 - f) Record on the Sturgeon M2 data sheet (Section 3.1.3 below) that a tissue sample was taken.
20. Obvious abnormalities or injuries are entered on the Sturgeon M2 data sheet (Section 3.1.3 below) as specified in the data coding instructions for each sturgeon caught. The status, type and location of each injury observed on each sturgeon caught are described by entering the codes for the variables INJURY_STATUS, INJURY_TYPE, and INJURY_LOC on the Sturgeon M2 data sheet (Section 3.1.3 below). It is important to distinguish between injuries that are recent and likely caused by our sampling activities and those injuries that occurred to the sturgeon before it was captured in the sample.
 21. An alive sturgeon is one that exhibits body movement and opercular movement, and other signs of life. An alive sturgeon that is bleeding from the mouth, body, fins or gills at the time of capture, or has an open wound with little evidence of infection or healing, is considered to be a recent or “new” injury and assigned an INJURY_STATUS = 1.
 22. If the sturgeon is alive and has one or more injuries, the injury is internal but visible (e.g., scoliosis, lordosis), or is an external injury that shows signs of infection or healing, it is considered to be an “old” injury that occurred prior to collecting the fish and assigned an INJURY_STATUS = 2.
 23. A dead sturgeon that was recently killed (newly dead, within 24 hours) will exhibit red or slightly faded gill filaments upon examination by lifting the operculum and examining the gills is assigned an INJURY_STATUS = 1.
 24. A dead sturgeon that was previously killed will exhibit bodily decay, bleached gill filaments, or other signs of morbidity and is assigned an INJURY_STATUS = 2.
 25. If it is not possible to classify an alive or dead sturgeon according to injury status, INJURY_STATUS = 3 is entered on the Sturgeon M2 data sheet (Section 3.1.3 below) and a comment is added to explain the observations leading to this status assignment.
 26. TASK CD, SAMPLE, UNIT, LOCATION, FISH_ID, TAXON, DATE, TIME, LENGTH, and INJURY and will be written on a paper label and included within the field of view of each photograph taken.

3.1.3 Sturgeon M2 Data Sheet

The Sturgeon M2 data sheet (Figure 3-6) is used to record all pertinent information associated with the collection and field processing of each Atlantic Sturgeon or Shortnose Sturgeon from IPEC. There is one record for each fish caught. The term “enter” appears in the data sheet coding instructions below for all variables assigned a numeric classification or code as specified in this SOP. The term “record” indicates the data is a measurement variable that should be written to the precision and format specified in this SOP. The term “N/A” indicates this variable is not applicable to the present task.

VARIABLE NAME	CODING INSTRUCTIONS
TASK CODE:	Enter 90 = Indian Point Surgeon Impingement
SAMPLE:	Enter a unique, four digit, sample tracking number
UNIT:	Enter Indian Point Unit Number: 1 = Unit 1 2 = Unit 2 3 = Unit 3
LOCATION:	Enter Location code: 1 = Ristroph traveling screens 2 = trash racks 3 = forebays 4 = other
INTAKE BAY:	Enter the intake bay where the sturgeon was collected from either LOCATION = 2 or 3; See Figure 3-7 for IP2 and Figure 3-8 for IP3 intake bay locations: 1 = bay 1 2 = bay 2 3 = bay 3 4 = bay 4 5 = bay 5 6 = bay 6 7 = service water bay 8 = Unit 3 south end trash rack #8 9 = Unit 3 north end trash rack #9
DATE:	Record date (Month/Day/Year) of sample collection
TIME:	Record time of sample collection (military time; 24 hour clock)
TAXON:	Enter: 27 = Shortnose Sturgeon 29 = Atlantic Sturgeon 70 = unidentified sturgeon
REL_REC:	Enter: 1 = Not previously tagged or marked 2 = Recapture

VARIABLE NAME	CODING INSTRUCTIONS
FISH_ID:	Enter the fish identification number (1-999) assigned sequentially within each sample to each Atlantic or Shortnose Sturgeon processed
LENGTH_TOTAL:	Measure and record total length of each Atlantic or Shortnose Sturgeon to the nearest mm (refer to Figure 3-1)
LENGTH_FORK:	Measure and record fork length of each Atlantic or Shortnose Sturgeon to the nearest mm (refer to Figure 3-1)
WEIGHT:	Measure and record wet weight of each Atlantic or Shortnose Sturgeon to the nearest gram
EYE WIDTH:	Measure and record interorbital width of Atlantic or Shortnose Sturgeon to the nearest mm (refer to Figure 3-1)
MOUTH WIDTH:	Measure and record mouth width of Atlantic or Shortnose Sturgeon to the nearest mm (refer to Figure 3-1)
MOUTH/EYE RATIO:	Record the mouth width dividing by the eye width to the nearest whole percentage (e.g. 45% or 73%)
LATERAL ANAL SCUTES:	Enter a code for the presence or absence of scutes (bony plates at least as large as the pupil of the eye) found between the base of the anal fin and the mid-lateral row of scutes (refer to Figure 3-2): 1 = no scutes found just above base of the anal fin 2 = two to six scutes found just above the base of the anal fin
POST-DORSAL SCUTES:	Enter a code for the presence or absence of scutes (bony plates at least as large as the pupil of the eye) found along the dorsal surface between the base of the dorsal fin and the caudal (tail) fin (refer to Figure 3-2): 1 = one row of scutes found along the dorsal mid-line, or absent 2 = two rows of scutes, one on either side of the dorsal mid-line
PRE-ANAL SCUTES:	Enter a code for the presence or absence of scutes (bony plates at least as large as the pupil of the eye) found along the ventral surface between the base of the anal fin and the pectoral fins (refer to Figure 3-2): 1 = one row of scutes found along the ventral mid-line 2 = two rows of scutes, one on either side of the ventral mid-line
A_D:	Enter the code for condition of the observed fish at the time of collection: 1 = alive, no injury observed 2 = alive, injured 3 = newly dead (within 24 hours), no injury observed

VARIABLE NAME	CODING INSTRUCTIONS
	4 = newly dead (within 24 hours), injured 5 = old dead (more than 24 hours), no injury observed 6 = old dead (more than 24 hours), injured
INJURY_STATUS:	Enter a code for injury status: Blank = no injury observed 1 = new injury 2 = old injury 3 = both old and new injuries (describe each in comments)
INJURY_TYPE:	Enter a code for type of injury observed: Blank = none (used for A_D=1 fish only) 1 = tag wound 2 = gash or cut 3 = crushed 4 = scale loss 5 = hemorrhage 6 = fin rot 7 = body fungus 8 = skeletal deformities (lordosis or scoliosis) 9 = lesions or ulcers 10 = lamprey wound 11 = tumor(s) 12 = blindness 13 = emaciated 14 = parasites 15 = gas bubble disease 16 = other anomaly (describe in comments) 17 = multiple injuries (list in comments) 18 = missing multiple fins 19 = external abraision
INJURY_LOC:	Enter a code for location of injury observed: Blank = none (used for A_D=1 fish only) 1 = head 2 = opercle(s) 3 = eyes 4 = body 5 = caudal peduncle 6 = tail fin 7 = dorsal fin 8 = anal fin 9 = pectoral fin(s) 10 = pelvic fin(s) 11 = more than one combination of fins

VARIABLE NAME	CODING INSTRUCTIONS
	12 = multiple locations (list in comments)
	13 = other
TISSUE:	Blank = no sample taken 1 = tissue sample taken.
PHOTO:	Record the number of digital photographs taken Blank = no photos taken 1-7+ = photos taken
PIT TAG NUMBER:	Record 15 digit PIT tag number if present
CARLIN-RITCHIE:	Record 5 digit Carlin Ritchie tag number if present
FLOY DART TAG:	Record the Floy dart tag number if present
ACOUSTIC TAG MARK CD:	N/A
ACOUSTIC TAG:	Record the VEMCO or Lotek tag number if present
SEX:	Enter: 1 = male 2 = female Blank = not determined
COMMENTS:	Blank = no comments 1 = Describe any pertinent information entered or recorded in the Sturgeon M2 card type that may affect data interpretation in the lines at the bottom of the data sheet

Figures

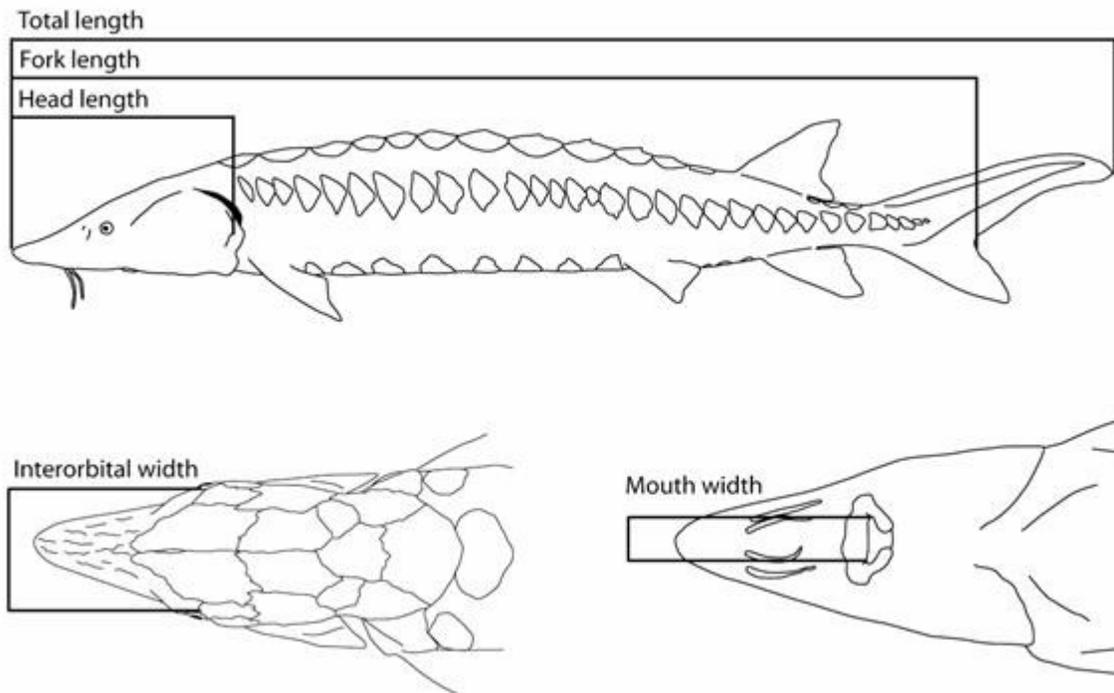


Figure 3-1. Five measurements relevant to field processing of sturgeon (reproduced from Figure 3-1 of NOAA Technical Memorandum NMFS-NE-215; May 2010).

KEY TO THE SPECIES OF STURGEONS IN NEW YORK

A. Width of mouth inside the lips slightly more than one-half the distance between the eyes. Gill rakers 17 to 27 (average 21.6). Postdorsal and preanal shields paired. Two to six bony plates at least as large as the pupil of the eye between the anal fin base and the lateral row of scutes. Viscera pale or only slightly pigmented.

Acipenser oxyrinchus

Atlantic sturgeon, p. 47

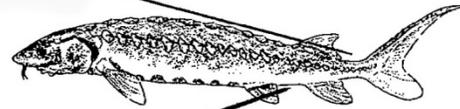


B. Anal fin rays 19 to 29. Gill rakers 22 to 29, average about 25. Dorsal and lateral shields pale and contrasting with darker background color of the body.

Acipenser brevirostrum

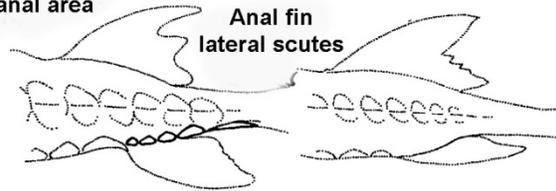
Shortnose sturgeon, p.44

Post-dorsal area



Pre-anal area

Anal fin
lateral scutes



Bony plates are present along the anal fin of the Atlantic sturgeon (left) but absent in the shortnose sturgeon (right).

A'. Width of mouth inside lips more than three-fifths the distance between the eyes. Gill rakers 22 to 40. Postdorsal and preanal shields in a single row. No large scutes between the base of the anal fin and the midlateral row of scutes. Viscera black.

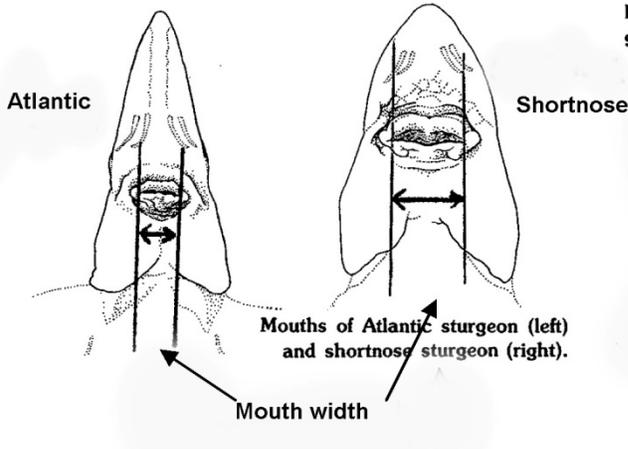


Figure reproduced from Smith, C.L. 1985. *The Inland Fishes of New York State*. NYSDEC, Albany, NY. 522 pp.

Figure 3-2. Distinguishing taxonomic features of Hudson River Atlantic Sturgeon and Shortnose Sturgeon (from Smith, C.L. 1985. *The Inland Fishes of New York State*. NYSDEC, Albany, NY).

APPENDIX II Incident Report Sturgeon Take – Indian Point

Photographs should be taken and the following information should be collected from all sturgeon (alive and dead) found in association with the Indian Point intakes. Please submit all necropsy results (including sex and stomach contents) to NMFS upon receipt.

Observer's full name: _____

Reporter's full name: _____

Species Identification: _____

Site of Impingement (Unit 2 or 3, CWS or DWS, Bay #, etc.): _____

Date animal observed: _____ Time animal observed: _____

Date animal collected: _____ Time animal collected: _____

Environmental conditions at time of observation (i.e., tidal stage, weather):

Date and time of last inspection of intakes: _____

Water temperature (°C) at site and time of observation: _____

Number of pumps operating at time of observation: _____

Average percent of power generating capacity achieved per unit at time of observation: _____

Average percent of power generating capacity achieved per unit over the 48 hours previous to observation: _____

Figure 3-3. Incident report form for incidental take of Atlantic Sturgeon or Shortnose sturgeon by impingement at the IPEC cooling water intakes (Appendix II of the Opinion).

Sturgeon Information:

Species _____

Fork length (or total length) _____ Weight _____

Condition of specimen/description of animal

Fish Decomposed: NO SLIGHTLY MODERATELY SEVERELY

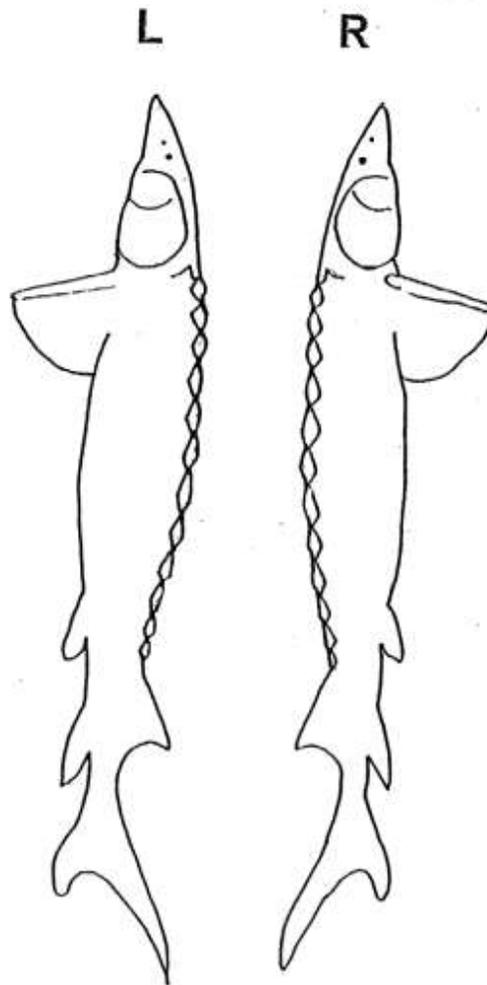
Fish tagged: YES / NO *Please record all tag numbers.* Tag # _____

Photograph attached: YES / NO

(please label *species, date, geographic site* and *vessel name* on back of photograph)

(Figure 3-3 continued, page 2 of 3).

Draw wounds, abnormalities, tag locations on diagram and briefly describe below



Description of fish condition:

Figure 3-3 (continued, page 3 of 3).

STURGEON SALVAGE FORM

For use in documenting dead sturgeon in the wild under ESA permit no. 1614 (version 05-16-2012)

INVESTIGATORS'S CONTACT INFORMATION Name: First _____ Last _____ Agency Affiliation _____ Email _____ Address _____ Area code/Phone number _____		UNIQUE IDENTIFIER (Assigned by NMFS) DATE REPORTED: Month <input type="checkbox"/> <input type="checkbox"/> Day <input type="checkbox"/> <input type="checkbox"/> Year 20 <input type="checkbox"/> <input type="checkbox"/> DATE EXAMINED: Month <input type="checkbox"/> <input type="checkbox"/> Day <input type="checkbox"/> <input type="checkbox"/> Year 20 <input type="checkbox"/> <input type="checkbox"/>																											
SPECIES: (check one) <input type="checkbox"/> shortnose sturgeon <input type="checkbox"/> Atlantic sturgeon <input type="checkbox"/> Unidentified <i>Acipenser</i> species <i>Check "Unidentified" if uncertain .</i> See reverse side of this form for aid in identification.	LOCATION FOUND: <input type="checkbox"/> Offshore (Atlantic or Gulf beach) <input type="checkbox"/> Inshore (bay, river, sound, inlet, etc) River/Body of Water _____ City _____ State _____ Descriptive location (be specific) _____ _____ Latitude _____ N (Dec. Degrees) Longitude _____ W (Dec. Degrees)																												
CARCASS CONDITION at time examined: (check one) <input type="checkbox"/> 1 = Fresh dead <input type="checkbox"/> 2 = Moderately decomposed <input type="checkbox"/> 3 = Severely decomposed <input type="checkbox"/> 4 = Dried carcass <input type="checkbox"/> 5 = Skeletal, scutes & cartilage	SEX: <input type="checkbox"/> Undetermined <input type="checkbox"/> Female <input type="checkbox"/> Male How was sex determined? <input type="checkbox"/> Necropsy <input type="checkbox"/> Eggs/milt present when pressed <input type="checkbox"/> Borescope	MEASUREMENTS: circle unit Fork length _____ cm / in Total length _____ cm / in Length <input type="checkbox"/> actual <input type="checkbox"/> estimate Mouth width (inside lips, see reverse side) _____ cm / in Interorbital width (see reverse side) _____ cm / in Weight <input type="checkbox"/> actual <input type="checkbox"/> estimate _____ kg / lb																											
TAGS PRESENT? Examined for external tags including fin clips? <input type="checkbox"/> Yes <input type="checkbox"/> No Scanned for PIT tags? <input type="checkbox"/> Yes <input type="checkbox"/> No <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%; border-bottom: 1px solid black;">Tag #</td> <td style="width:30%; border-bottom: 1px solid black;">Tag Type</td> <td style="width:40%; border-bottom: 1px solid black;">Location of tag on carcass</td> </tr> <tr> <td style="border-bottom: 1px solid black;"> </td> <td style="border-bottom: 1px solid black;"> </td> <td style="border-bottom: 1px solid black;"> </td> </tr> <tr> <td style="border-bottom: 1px solid black;"> </td> <td style="border-bottom: 1px solid black;"> </td> <td style="border-bottom: 1px solid black;"> </td> </tr> </table>			Tag #	Tag Type	Location of tag on carcass																								
Tag #	Tag Type	Location of tag on carcass																											
CARCASS DISPOSITION: (check one or more) <input type="checkbox"/> 1 = Left where found <input type="checkbox"/> 2 = Buried <input type="checkbox"/> 3 = Collected for necropsy/salvage <input type="checkbox"/> 4 = Frozen for later examination <input type="checkbox"/> 5 = Other (describe) _____	Carcass Necropsied? <input type="checkbox"/> Yes <input type="checkbox"/> No Date Necropsied: _____ Necropsy Lead: _____	PHOTODOCUMENTATION: Photos/video taken? <input type="checkbox"/> Yes <input type="checkbox"/> No Disposition of Photos/Video: _____ _____																											
SAMPLES COLLECTED? <input type="checkbox"/> Yes <input type="checkbox"/> No <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%; text-align: left;">Sample</th> <th style="width:30%; text-align: left;">How preserved</th> <th style="width:40%; text-align: left;">Disposition (person, affiliation, use)</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			Sample	How preserved	Disposition (person, affiliation, use)																								
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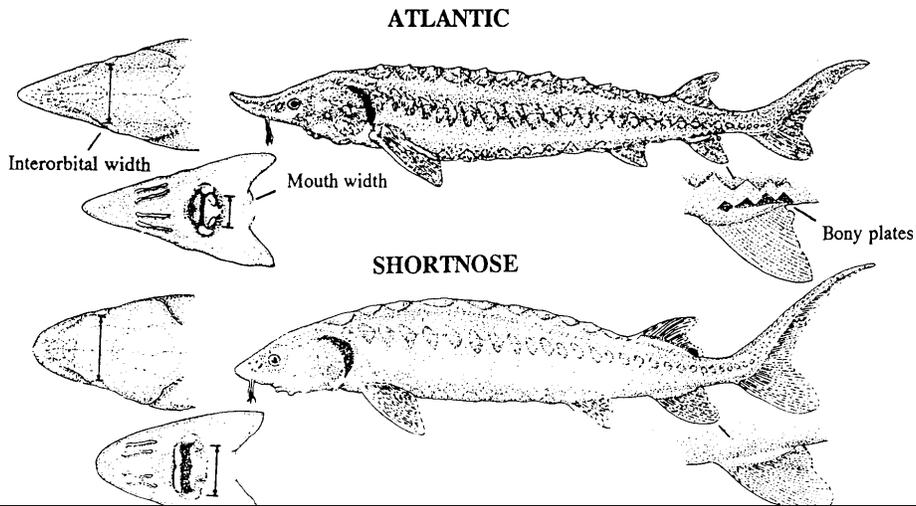
Comments:

Figure 3-4. Sturgeon salvage form (Appendix III of the Opinion).

Distinguishing Characteristics of Atlantic and Shortnose Sturgeon (version 07-20-2009)

Characteristic	Atlantic Sturgeon, <i>Acipenser oxyrinchus</i>	Shortnose Sturgeon, <i>Acipenser brevirostrum</i>
Maximum length	> 9 feet/ 274 cm	4 feet/ 122 cm
Mouth	Football shaped and small. Width inside lips < 55% of bony interorbital width	Wide and oval in shape. Width inside lips > 62% of bony interorbital width
*Pre-anal plates	Paired plates posterior to the rectum & anterior to the anal fin.	1-3 pre-anal plates almost always occurring as median structures (occurring singly)
Plates along the anal fin	Rhombic, bony plates found along the lateral base of the anal fin (see diagram below)	No plates along the base of anal fin
Habitat/Range	Anadromous; spawn in freshwater but primarily lead a marine existence	Freshwater amphidromous; found primarily in fresh water but does make some coastal migrations

* From Vecsei and Peterson, 2004



Describe any wounds / abnormalities (note tar or oil, gear or debris entanglement, propeller damage, etc.). Please note if no wounds / abnormalities are found.

Data Access Policy: Upon written request, information submitted to National Marine Fisheries Service (NOAA Fisheries) on this form will be released to the requestor provided that the requestor credit the collector of the information and NOAA Fisheries. NOAA Fisheries will notify the collector that these data have been requested and the intent of their use.

Submit completed forms (within 30 days of date of investigation) to: Northeast Region Contacts – Shortnose Sturgeon Recovery Coordinator (Jessica Pruden, Jessica.Pruden@noaa.gov, 978-282-8482) or Atlantic Sturgeon Recovery Coordinator (Lynn Lankshear, Lynn.Lankshear@noaa.gov, 978-282-8473); Southeast Region Contacts- Shortnose Sturgeon Recovery Coordinator (Stephanie Bolden, Stephanie.Bolden@noaa.gov, 727-824-5312) or Atlantic Sturgeon Recovery Coordinator (Kelly Shotts, Kelly.Shotts@noaa.gov, 727-551-5603).

(Figure 3-4 continued, page 2 of 2).

APPENDIX IV of the Indian Point Biological Opinion

Procedure for obtaining fin clips from sturgeon for genetic analysis

Obtaining Sample

1. Wash hands and use disposable gloves. Ensure that any knife, scalpel or scissors used for sampling has been thoroughly cleaned and wiped with alcohol to minimize the risk of contamination.
2. For any sturgeon, after the specimen has been measured and photographed, take a one-cm square clip from the pelvic fin.
3. Each fin clip should be placed into a vial of 95% non-denatured ethanol and the vial should be labeled with the species name, date, name of project and the fork length and total length of the fish along with a note identifying the fish to the appropriate observer report. All vials should be sealed with a lid and further secured with tape.

Please use permanent marker and cover any markings with tape to minimize the chance of smearing or erasure.

Storage of Sample

1. If possible, place the vial on ice for the first 24 hours. If ice is not available, please refrigerate the vial. Send as soon as possible as instructed below.

Sending of Sample

1. Vials should be placed into Ziploc or similar re-sealable plastic bags. Vials should be then wrapped in bubble wrap or newspaper (to prevent breakage) and sent to:

Julie Carter
NOAA/NOS – Marine Forensics
219 Fort Johnson Road
Charleston, SC 29412-9110
Phone: 843-762-8547

- a. Prior to sending the sample, contact Russ Bohl at NMFS Northeast Regional Office (978-282-8493) to report that a sample is being sent and to discuss proper shipping procedures

Figure 3-5. Appendix IV of the Indian Point Biological Opinion specifying procedures for obtaining fin clips from sturgeon for genetic analysis.

Indian Point Sturgeon Project
Sturgeon Data Sheet

Page ___ of ___

CARD TYPE	TASK CODE	SAMPLE	UNIT	LOCATION	BAY	DATE	TIME
M2	90					m m d d y y	h h m m

Taxon	Rel_Rec	Fish_ID	Total Length (mm)	Fork Length (mm)	Weight (gm)	Eye Width (mm)	Mouth Width (mm)	Mouth/Eye Ratio			
Scutes	Lat. Anal	Post-Dorsal	Pre-Anal	A-D	Injury status	Injury	Injury_loc	Tissue Photo	Sex	Carlin-Ritchie Tag Number	Floy Dart Tag Number
PIT Tag Number					Acoustic Tag Mark_CD	Acoustic Tag Code		Comment			

Comments: _____

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PIT Tag Number					Acoustic Tag Mark_CD	Acoustic Tag Code		Comment			

Comments: _____

IPEC_Sturgeon.at 7/2014

Figure 3-6. Indian Point Project Sturgeon M2 Data Sheet.

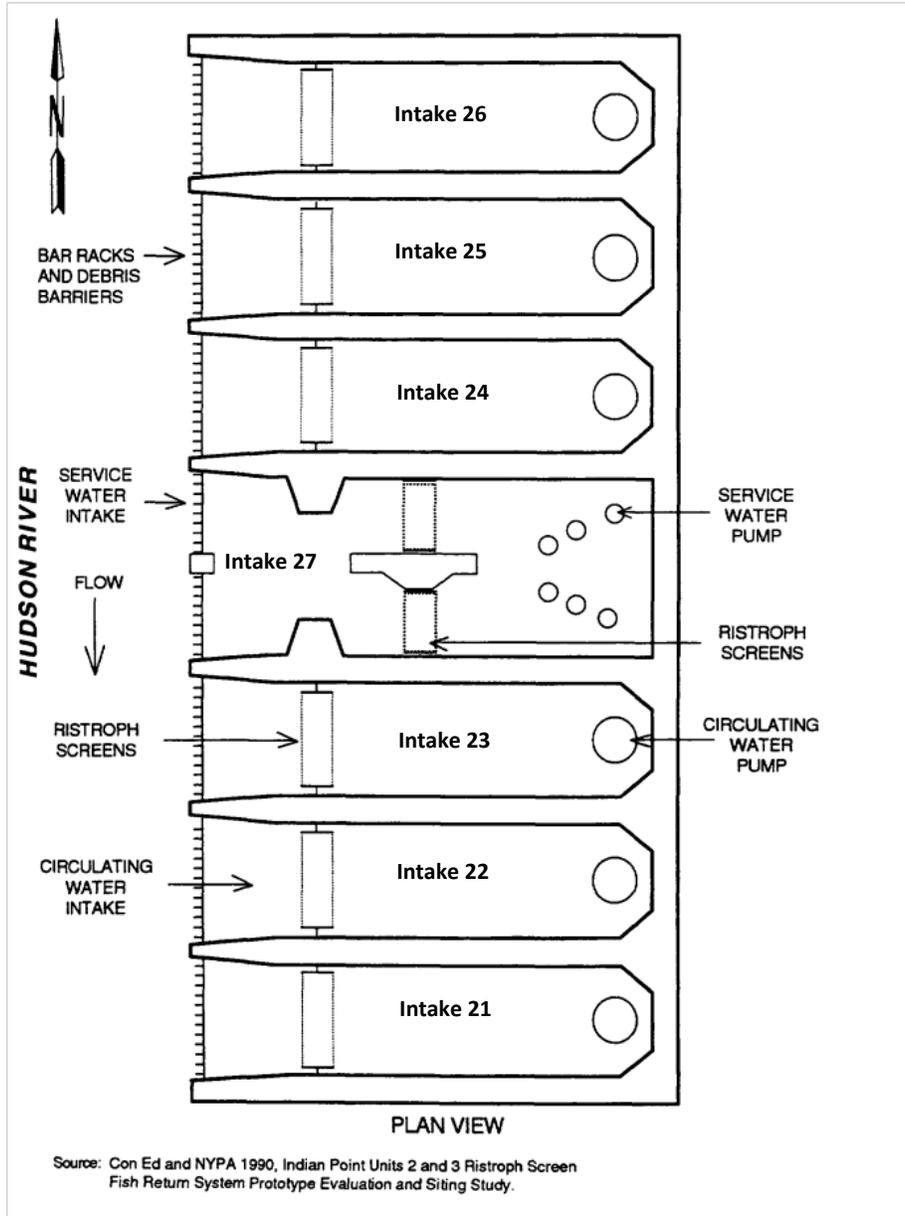


Figure 3-7. Indian Point Unit 2 (IP2) cooling water intake structure in plan view showing the location and numbering of each intake bay.

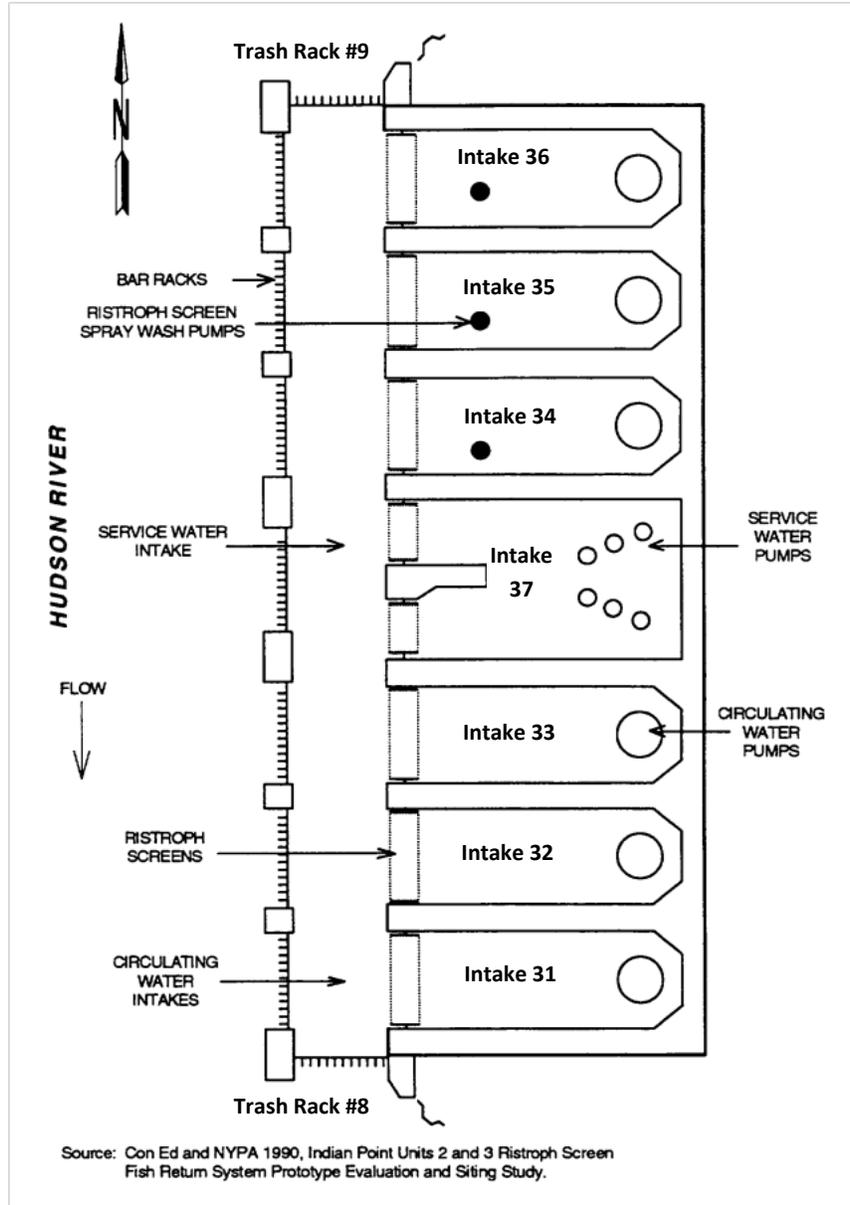


Figure 3-8. Indian Point Unit 3 (IP3) cooling water intake structure in plan view showing the location and numbering of each intake bay.