Dredging and Pile Driving Monitoring Plan
Sturgeon Monitoring During Pile Driving
60-day Report
9/28/2014 – 11/22/2014

for the

New NY Bridge Project

Revision 0
December 1, 2014

Prepared by
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Document History			
Issue Date	**Description**	**By**	**Revision**
12/1/2014	Submitted per NMFS BO Condition 11.3.12	CC	0

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APPENDICES

1.0 Introduction

This report summarizes the methods and results of sturgeon monitoring during permanent pile driving of [redacted] piles for the period of September 28, 2014 to November 22, 2014. Sturgeon monitoring was conducted per the Dredging and Pile Driving Monitoring Plan, Revision 2 (the Plan) for the New NY Bridge Project (the Project). This Plan was developed to comply with applicable requirements of the New York State Department of Environmental Conservation (NYSDEC) Permit DEC ID 3-9903-00043/00012 issued on March 25, 2013 (NYSDEC Permit) and the September 23, 2014 Endangered Species Act Section 7 Consultation Biological Opinion (BO) issued by the National Marine Fisheries Service (NMFS).

2.0 Monitoring Methods

Tappan Zee Constructors, LLC (TZC) conducted impact pile driving monitoring for permanent [redacted] piles at [redacted] and [redacted] piles at [redacted] and [redacted] from the pile driving barge and a small vessel per the Plan. A barge-based and a vessel-based monitor were on site for all piles driven during the reporting period (Appendix A).

On October 8, 2014 impact pile driving occurred [redacted] Per the Plan, one vessel monitored the Hudson River for injured or dead fish from the start of pile driving to one hour after all pile driving was completed for the day. Figure 1 provides the GPS transects completed by the fish monitoring crew on October 8, 2014. At 12:11 the vessel-based monitors identified a dead shortnose sturgeon north of Pier 24. The location of the fish is provided in Figure 1. Refer to Section 3.1, Appendix A, and Appendix B for more information. Pile driving occurred during ebb current; subsequently, the fish monitoring crew completed several circular and sawtooth patterns south of the existing Tappan Zee Bridge. Fish Monitoring crews continued to monitor for fish while transiting between piers.

3.0 Results

A total of [redacted] piles were impact driven from September 28, 2014 through November 22, 2014. [redacted] piles were installed at [redacted] and [redacted] piles were installed at [redacted].

A total of [redacted] piles were impact driven from September 28, 2014 through November 22, 2014. [redacted] piles were installed at [redacted], [redacted] piles were installed at [redacted], [redacted] piles were installed at [redacted], [redacted] piles were installed at [redacted], and [redacted] piles were installed at [redacted].

Monitoring activities and results from both [redacted] piles are summarized in Appendix A.

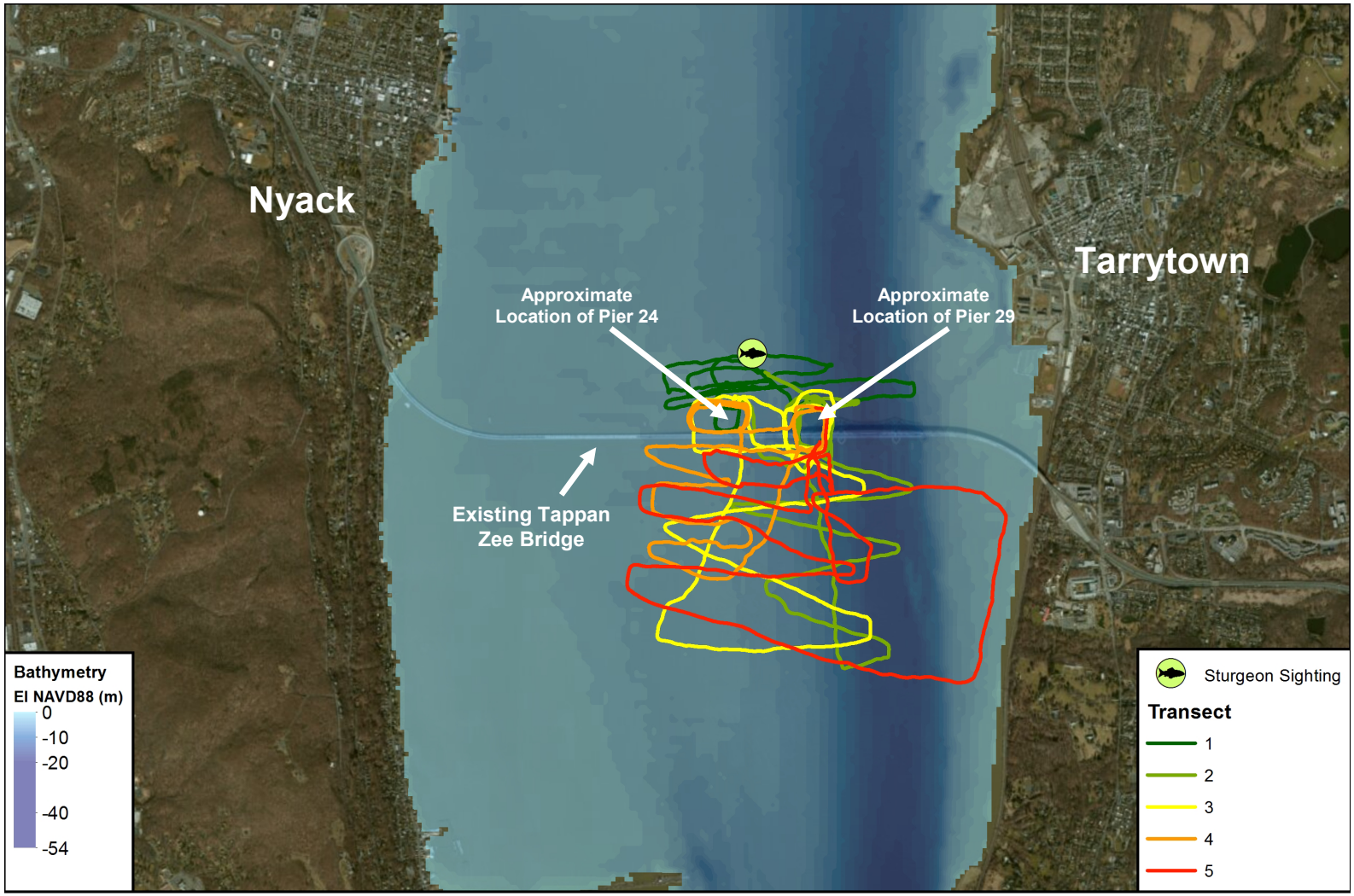
3.1 Observed Sturgeon

On October 8, 2014 a shortnose sturgeon was observed by the vessel-based monitors north of [redacted] at 12:11pm (Figures 1-4). The Oversight Environmental Compliance Manager (OECM) was notified and indicated that the fish was in too far a state of decay for a necropsy based on the *Necropsy Plan* and directed TZC to dispose of the fish per the *Sturgeon Sighting Protocol* after collecting the requisite data. The fish was processed and photographed per the Plan, deposited on the shore above the high water line, and spray painted orange. A Passive Integrated Transponder (PIT) tag was not present. Refer to Appendix A and Appendix B for more information.

On October 24, 2014 a shortnose sturgeon was observed by a TZC vessel in the vicinity of the Tarrytown Marina at 12:07pm (Figures 5-7). TZC was not conducting impact pile driving on October 24, 2014. The Oversight OECM was notified and indicated that the fish was suitable for necropsy based on the *Necropsy Plan* and directed TZC to prepare the fish for necropsy after collecting the requisite data. The fish was processed and photographed per the Plan and transferred to a courier that delivered the fish to Cornell University per the *Necropsy Plan*. A Passive Integrated Transponder (PIT) tag was not present. Refer to Appendix A, Appendix B, and Appendix C for more information.

3.2 Observed Non-sturgeon Species

A total of six fish, not including sturgeon, were observed during the reporting period. Observed species and quantities include four Atlantic menhaden and two striped bass. A summary of the dates, times, condition of the fish, and location of fish observed is provided in Appendix A.



TAPPAN ZEE CONSTRUCTORS, LLC

Figure 1.
GPS Transects
October 8, 2014 (6-foot Piles,4-foot Piles, and Observed Sturgeon)

Document Path: \\prl-srv3\GIS_Projects\459974_Fluor_AmericanBr_Granite_TraylorBros\195455_TZJDEnvironmental_Design\GIS\Map_Docs\Draft\Sturgeon_Monitoring\2014-11-20_ENV_MAP_October_Transects.mxd

Figure 2. Sturgeon Collected October 8, 2014 (1 of 3)

Figure 3. Sturgeon Collected October 8, 2014 (2 of 3)

Figure 4. Sturgeon Collected October 8, 2014 (3 of 3)

Figure 5. Sturgeon Collected October 24, 2014 (1 of 3)

Figure 6. Sturgeon Collected October 24, 2014 (2 of 3)

Figure 7. Sturgeon Collected October 24, 2014 (3 of 3)

APPENDIX A

Summary of Pile Driving Sturgeon Monitoring Activities

Appendix A
Summary of Pile Driving Sturgeon Monitoring Activities
New NY Bridge Project
NMFS 60-Day Report
9/28/2014 - 11/22/2014

TAPPAN ZEE CONSTRUCTORS, LLC

Report Date: 12/1/2014
Reporting Period: 9/28/2014 - 11/22/2014
Number of Sturgeon Observed: 2

Date	Pier-Pile No.	Start - End Times of Impact Pile Driving	Barge-Based Monitoring Time	Vessel-Based Monitoring Time	Number of Fish Observed	Species	Sturgeon Specimen Log Number	Condition of Fish When Observed	Time Observed	Location Observed (Lat/Long or Barge Name)
9/30/2014		10:15 - 13:55	10:15 - 14:00	10:15 - 17:00	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
		11:45 - 16:03	11:45 - 16:03		0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/1/2014		8:09 - 13:24	8:10 - 13:25	8:09 - 14:27	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
		10:23 - 11:46	10:20 - 11:45		0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/3/2014		9:04 - 14:36	9:00 - 14:35	9:05 - 15:39	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					1	Striped Bass	NA	Decaying	11:07	41 04.3286°N / 73 54.3277°W
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/7/2014		8:48 - 15:26	8:50 - 15:28	8:49 - 16:46	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/8/2014		11:12 - 16:35	11:11 -16:40	11:12 - 18:01	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					1	Shortnose Sturgeon	201410080101	Moderately Decomposed	12:11	41 04.5108°N / 73 53.4244°W
		11:49 - 16:26	11:50 - 16:30		0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/14/2014		8:22 - 12:55	8:22 - 12:50	8:22 - 18:16[a]	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					1	Striped Bass	NA	Decaying	11:22	41 04.3381°N / 73 53.0153°W
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
		10:02 - 18:00	10:00 - 18:00		0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/17/2014		10:53 - 13:22	11:00 - 14:00	10:53 - 14:30	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/20/2014		8:27 - 9:47	8:30 - 10:00	8:28 - 10:49	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/21/2014		8:26 - 16:17	8:00 - 16:45	7:56 - 17:20	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/22/2014		8:03 - 8:30	8:05 - 9:21	8:03 - 10:03	0	NA	NA	NA	NA	NA
10/24/2014		NA	NA	12:00 - 13:00	1	Shortnose Sturgeon	201410240101	Fresh Dead	12:07	41.076133°N / 73.87390°W
10/27/2014		9:34 - 12:56	9:30 - 14:00	9:34 - 17:23	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
		11:12 - 16:20	11:11 - 16:20		0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA

Appendix A
Summary of Pile Driving Sturgeon Monitoring Activities
New NY Bridge Project
NMFS 60-Day Report
9/28/2014 - 11/22/2014

TAPPAN ZEE CONSTRUCTORS, LLC

Report Date: 12/1/2014
Reporting Period: 9/28/2014 - 11/22/2014
Number of Sturgeon Observed: 2

Date	Pier-Pile No.	Start - End Times of Impact Pile Driving	Barge-Based Monitoring Time	Vessel-Based Monitoring Time	Number of Fish Observed	Species	Sturgeon Specimen Log Number	Condition of Fish When Observed	Time Observed	Location Observed (Lat/Long or Barge Name)
10/28/2014		8:57 - 16:00	8:57 - 16:05	8:55 - 17:01	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/30/2014		11:49 - 14:14	11:48 - 14:15	11:48 - 15:23	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
10/31/2014		8:10 - 10:30	8:10 - 10:30	8:09 - 16:13	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
		9:10 - 15:12	9:00 - 15:20		0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
11/3/2014		11:00 - 12:35	11:00 - 12:40	11:01 - 13:52	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
11/4/2014		10:41 - 14:09	10:40 - 14:12	10:40 - 15:10	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
11/5/2014		8:27 - 11:43	8:30 - 11:50	8:27 - 12:57	1	Atlantic menhaden	NA	Fresh Dead	8:36	41.07360°N / 73.88917°W
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
11/7/2014		10:03 - 11:59	10:00 - 12:00	10:02 - 13:10	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
11/10/2014		8:18 - 12:32	8:20 - 12:40	8:18 - 13:33	2	Atlantic menhaden	NA	Fresh Dead	8:26	41 04.4344°N / 73 53.9173°W
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
11/12/2014		9:13 - 12:53	9:13 - 13:00	9:12 - 13:56	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
11/13/2014		14:14 - 15:55	14:15 - 16:05	14:14 - 16:39	0	NA	NA	NA	NA	NA
11/14/2014		8:39 - 14:16	8:20 - 15:00	8:36 - 15:17	0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
					0	NA	NA	NA	NA	NA
11/20/2014		8:00 - 13:03	7:45 - 13:08	8:03 - 14:06	0	NA	NA	NA	NA	NA
					1	Atlantic menhaden	NA	Fresh Dead	10:53	Pier 126 of Existing Bridge[c]
					0	NA	NA	NA	NA	NA

Notes: Non-sturgeon species are not recovered for data collection.

[a] Vessel-based monitoring occurred until official sunset per plan.

[b] No impact pile driving occurred on October 24, 2014. See Section 3.1 for more information.

[c] Fish observed being scavenged upon by a gull on Pier 126 of existing bridge.

APPENDIX B

Vessel-Based Monitoring Data Forms, Sturgeon Chains of Custody, Sturgeon Take Reports, Sturgeon Data Collection Forms, Summary Sheets for Genetic Tissue Samples October 8 and October 24, 2014

Tappan Zee Hudson River Crossing
Vessel-Based Monitoring Data Form

Survey Information | Observation type (circle) : (Survey) Response

Date: 10/8/14	Crew: JLC SJN	Vessel: Parker
Construction Activity: PD 14	Survey Start Time: 0600	Survey End Time: 1930

Weather/Water Conditions (Survey Only)

Air Temperature (°C): 17	Wind Direction: W	Wind Speed (mph): 10 - 15
Cloud Cover: Partly cloudy	Precipitation: N/A	
Wave height: 1'	Tide stage: Flood → ebb	
Water Temperature (°C): 18.9	Water Salinity (ppt): 9.2	

GPS Transect Information

Transect ID Number	Start Time	Finish Time	Starting Loc.	Finish Loc.
20141008-1	1112	1248	41 04.4000 73 53.5493	41°04.4372 73°53.3546
20141008-2	1248	1429	41 04 4372 73 53 3546	41°04.3497 73°53.4976
20141008-3	1429	1542	41 04.3497 73°53.4976	41 04 12 73 53.4847
20141008-4	1542	1651	41 04 1273 73 53 4847	41 04.3082 73 53.1105
20141008-5	1651	1801	41 04.3082 73 53.1105	41°04.1494 73°53.135

Observations (Survey Only)

Other Fish Species: None

Species ID	Quantity	Time Observed	Transect Number	Location Observed (Lat/Long)	Condition (stunned, freshly dead, decaying)

DWR # and Description:

Originated by: Joe Cassone Date: 20141008

Checked by: Paul Moccio Date: 20141009

qc'd PAM 10/9/14

*YYYYMMDDXXZZ (XX = Chronological sample # for ea. date, ZZ = Chronological fish # in ea. sample

Tappan Zee Hudson River Crossing
Vessel-Based Monitoring Data Form

Piscivorous/Scavenging Bird Activity Observed (Circle):	Y	(N)

Comments/Additional Observations:

0800 Observed crewboats recovering port a johns from River
0950 Standing hammers at both [redacted]
1036 Lifting hammer at [redacted]
1053 Hammer on 1st pile at [redacted]
1112 Begin hammering 1st pile at [redacted]
1138 Lifting hammer at [redacted]
1149 Begin hammering at [redacted] pile
☆1220 left hammer
1312 Began hitting 2nd pile [redacted]
1424 Hammer up @ [redacted]
1430 Hammers on piles @ both piers
1437 Begin hammering 3rd pile @ [redacted]
☆1456 Begin hammering 2nd pile [redacted]
1537 Hammer in air @ [redacted]
1548 Begin hammering @ [redacted]
1605 Hammer on final pile at [redacted]
1607 Begin hammering
1616 Will avoid main channel area during transects due to moving of west coast lifts under main span

⊗ = Hit on 10/7/14

[redacted]
11 ⊗ 1st
10 ⊗
9 ⊗
6 ○ 3rd
5 ○ 2nd
2 ⊗
1 ○

1211 - R/V Charlie Morris calls that they see a sturgeon [redacted] 4th
1214 - We recovered sturgeon
☆1240 R/V Charlie Morris informs us that ~~[redacted]~~ @ [redacted] is having problems w/ bubble loops
1327 Chris Cocorro calls to inform us that sturgeon doesn't have to be sent for necropsy due to decomposition of fish, it should be released above high tide mark along rivers

8 ○
7 ○ 3rd
1st ○
4
2nd ○
3
1633 Hammer off final pile at [redacted]
1640 Hammer off final pile at
1650 Both hammers in cradle

Sturgeon Information

Sturgeon Observed (circle): (Y) N		Recovered (circle): (Y) N
Time Observed: 1211	Species (SN)/AT): SN	Fish ID*: 20140080101
Location Recovered (Lat/Lon): 41°04.5108	73 53.4244	Time Recovered: 1214
Water Depth @ Recovery Loc. (ft): 16.9	Recovery Method: net	
Recovered From (circle): (River) Scow		
Condition/Dispostion: Dead, Decaying no eyes or gills, and large hole @ anus		
Photo #s:	Photo Descriptions:	
Weight (g): ≈ 4lbs 202	TL (mm): 759	FL (mm): 684
Interorbital Width (mm): 53.72	Mouth Width (mm): ≈46 (a lot of decay)	Fin Clip? (Y) N
PIT Tag Present? Y (N)	PIT Tag Fitted? Y (N)	PIT Tag #: —
Location Returned (Lat/Lon): 41°06'105	-73 54 58.1	Time Returned: 1845
Water Depth @ Return Loc. (ft): —	Return Method: By hand above high water mark per OEC/M	
Sturgeon Forms Completed (circle): (Sample Collection) Incident Report (Salvage)		

*YYYYMMDDXXZZ (XX = Chronological sample # for ea. date, ZZ = Chronological fish # in ea. sample

APPENDIX E

Sturgeon Take Report - Part A

Photographs should be taken and the following information should be collected from all sturgeon (alive and dead). Please submit all necropsy results (including sex and stomach contents) to NMFS upon receipt. You must also complete and submit the "Sturgeon Data Collection Form"

Observer's full name: Stephen Niero
Reporter's full name: Stephen Niero

Species Identification : Sturgeon (shortnose)

Site of Collection: 1200' N of Tappan Zee Bridge

Date animal observed: 10/8/14 Time animal observed: 1211
Date animal collected: 10/8/14 Time animal collected: 1214

Environmental conditions at time of observation (i.e., tidal stage, weather):
Tide was slack, West wind, choppy waves

Project-related activities on going at time of observation (e.g., pile driving, dredging, etc.):
Impact Hammer

DWR # and Description:			
Originated by:	Steve Niero	Date:	20141008
Checked by:	Paul Moccio	Date:	20141009

191
ac'd PAM
10/9/14

STURGEON DATA COLLECTION FORM

For use in documenting sturgeon injury or mortality incidental to a federal action and exempted pursuant to a NMFS issued incidental take statement

OBSERVER'S CONTACT INFORMATION

Name: First Stephen Last Niero
Agency Affiliation HDR Email Sniero@hdrinc.com
Address 404 Airport Executive Park
Nanuet NY 10954
Area code/Phone number 845-708-8912

SEC 7 UNIQUE IDENTIFIER (PCTS No. Assigned by NMFS)

DATE REPORTED: Month 10 Day 08 Year 2014
DATE EXAMINED: Month 10 Day 08 Year 2014

SPECIES: (check one)
- [X] shortnose sturgeon
- [ ] Atlantic sturgeon
- [ ] Unidentified *Acipenser* species

Check "Unidentified" if uncertain. **See reverse side of this form for aid in identification.**

LOCATION FOUND: [ ] Offshore (Atlantic) [X] Inshore (bay, river, sound, inlet, etc)
River/Body of Water Hudson River City Nyack/Tarrytown State NY
Descriptive location (be specific) ≈1200 ft North of new Pier of New Tappan Zee Bridge, just west of mid span
Latitude 41°04.5108 N (Dec. Degrees) Longitude 73°53.4244 W (Dec. Degrees)

CARCASS CONDITION at time examined: (check one)
- [ ] 1 = Fresh dead
- [X] 2 = Moderately decomposed
- [ ] 3 = Severely decomposed
- [ ] 4 = Dried carcass
- [ ] 5 = Skeletal, scutes & cartilage

SEX:
- [X] Undetermined
- [ ] Female [ ] Male

How was sex determined?
- [ ] Necropsy
- [ ] Eggs/milt present when pressed
- [ ] Borescope

MEASUREMENTS: Circle unit

Fork length	63.4	cm / in
Total length	75.9	cm / in
Length [X] actual [ ] estimate		
Mouth width (inside lips, see reverse side)	*46	cm / in
Interorbital width (see reverse side)	5.4	cm / in
Weight [ ] actual [X] estimate	4lb 2oz	kg / lb

TAGS PRESENT? Examined for external tags including fin clips? [X] Yes [ ] No Scanned for PIT tags? [X] Yes [ ] No

Tag #	Tag Type	Location of tag on carcass
No PIT Tag		

CARCASS DISPOSITION: (check one or more)
- [ ] 1 = Left where found
- [ ] 2 = Buried
- [X] 3 = Collected for necropsy/salvage
- [ ] 4 = Frozen for later examination
- [ ] 5 = Other (describe) _____

Released onshore above High Tide Marker per OEM

Carcass Necropsied? [ ] Yes [X] No
Date Necropsied: _____
Necropsy Lead: _____

PHOTODOCUMENTATION:
Photos/vide taken? [X] Yes [ ] No
Disposition of Photos/Video: _____

SAMPLES COLLECTED? [X] Yes [ ] No

Sample	How preserved	Disposition (person, affiliation, use)
Fin Clip	Ethanol	Stephen Niero HDR

Comments:
* Mouth width measurement is approximate due to decomposition

qc'd PMM 10/9/14

Distinguishing Characteristics of Atlantic and Shortnose Sturgeon

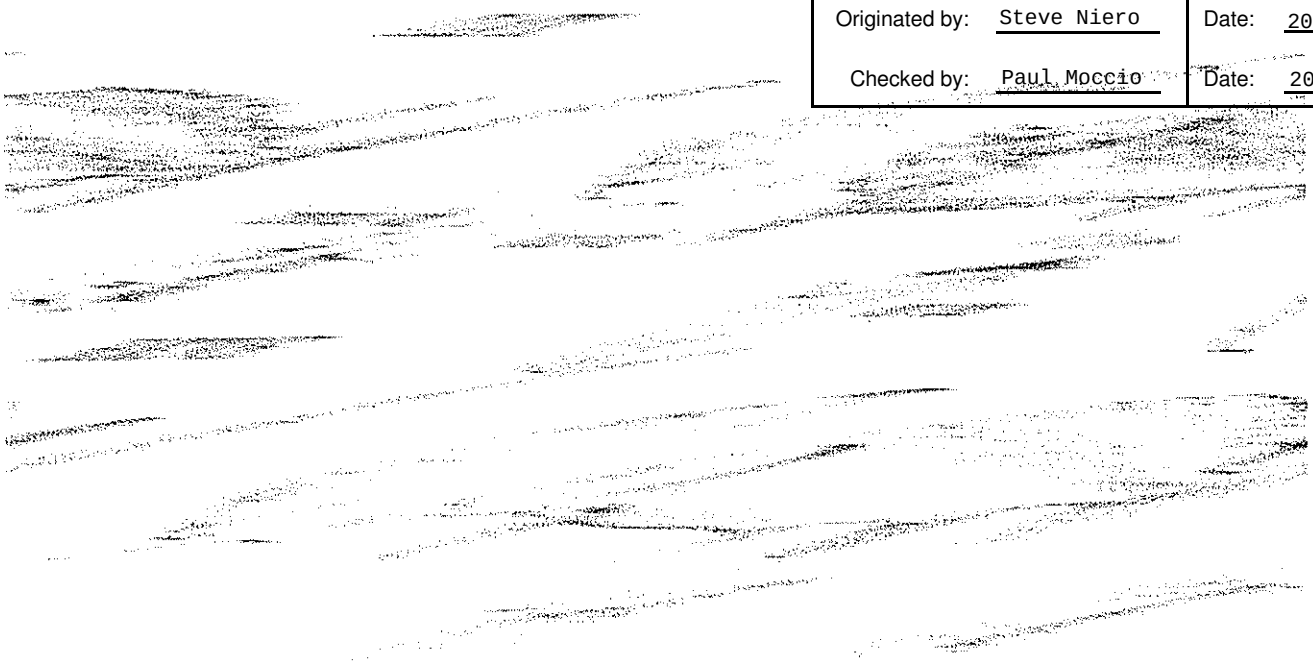
Characteristic	Atlantic Sturgeon, *Acipenser oxyrinchus*	Shortnose Sturgeon, *Acipenser brevirostrum*
Maximum length	> 9 feet/ 274 cm	4 feet/ 122 cm
Mouth	Football shaped and small. Width inside lips < 55% of bony interorbital width	Wide and oval in shape. Width inside lips > 62% of bony interorbital 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

DWR # and Description: _____

Originated by: Steve Niero Date: 20141008

Checked by: Paul Moccio Date: 20141009



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

Dead, decaying No eyes, gills, mouth decayed, Large hole @ anus fins decayed

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 24 hours of observation of fish): by email to Incidental.Take@noaa.gov or by fax (978-281-9394). Questions can be directed to NMFS Protected Resources Division at 978-281-9328.

Appendix C part 2

[redacted]

Certification, Identification and Chain of Custody Form for Submitting Sturgeon Genetic Tissue Samples.[1,2]

(A) CERTIFICATION OF SPECIES (Collector)

I, Stephen T. Nieves (Full Name), hereby certify that I have positively identified the fish or fishes sampled in this shipment as: ☒ shortnose sturgeon; ☐ Atlantic sturgeon; ☐ other ☐ unknown based on my knowledge and experience as a Environmental Scientist (Position Job Title).

Signature: [signature] Date Identified: 10/8/14

Address: 404 Airport Executive Park
Nanuet NY 10954

Phone Number: 845-708-8912

(B) SAMPLE IDENTIFICATION

Species Identification: ☒ shortnose sturgeon; ☐ Atlantic sturgeon; ☐ unknown

Unique ID No: 20141008.01.01; Tissue Type: Fin Clip; Preservative: 95% ETOH;

Location: (River: Hudson; River-km: T2 Bridge Lat/Long: 41°04.5107 73°53.4244;

River Location Description: 1200ft NOF T2 Bridge @ WOT MAN); SPAN

Total Length (TL) of Specimen (mm): 759 Weight of Specimen (g): 4lb 2oz; Sex (if known) unknown

Specific comments on take:

☐ Check here if multiple samples are submitted and use *Field Collection Report* (Appendix 3b) with the data fields listed in this section.

(C) EVIDENCE OF CHAIN OF CUSTODY

1.	[signature]	NER-2014-11317	Shipment via UPS	10/9/14
	Release Signature	NMFS Permit No.	Method of Transfer	Date
	Receipt Signature	NMFS Permit No.		Date
2.				
	Release Signature	NMFS Permit No.	Method of Transfer	Date
	Receipt Signature	NMFS Permit No.		Date
3.				
	Release Signature	NMFS Permit No.	Method of Transfer	Date
	Receipt Signature	NMFS Permit No.		Date

[1] Instructions on next page.

[2] If multiple samples are shipped, attach summary sheet [redacted]

[redacted]

Summary Sheet for Genetic Tissue Samples Collected[1,2]

Date	Species	Unique ID No.	Genetic Tissue Type	Preservative	Location: (River)	Location (River-km)	Location (Lat/Long)	Total Length (mm)	Weight (g)	Sex	Comments
10/8/14	Shortnose Sturgeon	20141008010101	Fin Clip	Ethanol	Hudson	North of T2 Bridge	41°09.5108 73°53.4249	759	4lb 3oz	N/A	Moderately decayed (missing eyes, gills, internal organs, fins were clipped)

1. Please coordinate with NMFS to receive a file copy of this appendix in spreadsheet format and include file on disk with shipment.
2. If multiple samples are shipped, attach this form to supplement Appendix 3a.

Originated by: Steve Niero Date: 20141008
Checked by: Paul Moccio Date: 20141009
DWR # and Description:

ac'd 10/9/14

NMFS Guidelines for Air Shipment of "Excepted Quantities" of Ethanol Solutions

These guidelines have been adapted with permission from the University of New Hampshire Office of Environmental Health & Safety; our appreciation is to Andy Glode for providing reference materials upon which this guide was created.

The U.S. Department of Transportation (DOT: 49 CFR 173.4) and the International Air Transport Association (IATA: 2007 Dangerous Goods Regulations, Sec. 2.7) regulate shipments of ethanol (ETOH) in *excepted quantities*. As a result, specific procedures must be followed as well as certifying proper training of individuals prior to packaging and shipping specimens preserved in ETOH. These guidelines will inform proper shipping and also satisfy certifying requirements. Failure to meet such requirements could result in regulatory fines and/or imprisonment.

Therefore, prior to submitting ETOH preserved samples and appropriate documentation (*e.g.*, a FedEx Airbill) to a carrier, please read, initial and sign this document, affirming you have understood the requirements as outlined. Please include this document in the shipping package and retain a copy for your records.

1) Packages and documents submitted to a carrier must not contain any materials other than those described in this document (*i.e.* containers holding ethanol-preserved specimens and related absorbent and packaging materials). Also, laboratory or sampling equipment, *unrelated documents*, or other goods must be packaged and shipped in separate boxes. (Note: ETOH solutions are not permitted to be transported in checked baggage, carry-on baggage, or airmail.) **I understand (SJD)**

2) Please read the manufacturer's Material Safety Data Sheet (MSDS) for ETOH recognizing ETOH (55 - 100%) is classed as hazardous flammable material (NFPA Rating = 3). Note also, its vapor is capable of traveling a considerable distance to an ignition source causing "flashback." Properly packaging and labeling shipments of ethanol solutions will minimize the chance of leakage, and would also communicate the potential hazard to transport workers in the event of a leak. **I understand (SJD)**

   a) **Quantity Limits:** Small quantities (inner container less than 30 ml, with a maximum net quantity of 500 ml for the entire package) of ETOH can be shipped with "Excepted Quantities" labels without completion of a Dangerous Goods Declaration. (e.g., If shipping vials having a maximum volume of 10 ml each, you may put up to 50 vials in one box.) **I understand (SJD)**

   b) **Package Components:**

   i. ***Inner (primary) packaging (e.g., vial, tube, jar, etc.):*** Do not completely fill inner packaging; allow 10% head-space for liquid expansion. Liquids must not completely fill inner packaging at a temperature of 55°C (130°F). Closures of inner packaging (e.g., vials with tops) must be held securely in place with tape or other positive means. **I understand (SJD)**

   ii. ***Intermediate (secondary) packaging (e.g. Ziplock or other plastic bag):*** Place inner container(s) (*e.g.*, vials with ETOH) into a high-quality plastic bag. Then add an absorbent material cable of absorbing any spillage without reacting with the ethanol. Seal the first bag tightly and then tape the locking seals. Next, seal the inner bag within a second bag for added safety. **I understand (SJD)**

   iii. ***Outer packaging (e.g., cardboard box):*** Ethanol solutions may not be shipped in envelopes, Tyvek® sleaves, or other non-rigid mailers. The dimensions of the outer box must be at least 100 mm (~4 inches) on two sides. Any space between the inner packing containers placed in the outer packaging should be eliminated with additional filler. **I understand (SJD)**

   c) **Package Labels:**

   i. *Dangerous Goods in Excepted Quantities Label* **(Figure 1.):** The label must display a "3" as the ethanol hazard class number using a black marker. You may obtain self-adhesive labels from NMFS, or else, order online. **I understand (SJD)**

   ii. *Name and Address:* The outer container must display the name and address of the shipper and consignee. When re-using shipping boxes, completely remove or black out all unnecessary labels or marks. **I understand (SJD)**

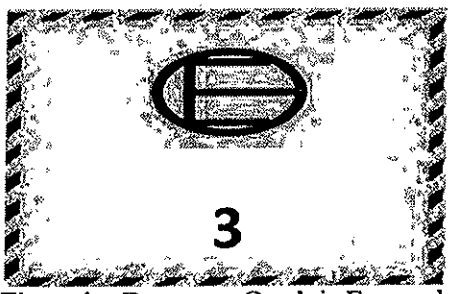


Figure 1. Dangerous Goods in Excepted Quantities label

Tappan Zee Hudson River Crossing
Vessel-Based Monitoring Data Form

Survey Information Observation type (circle) : Survey (Response)

Date: 10/24/14	Crew: JLC CSS	Vessel: Parks
Construction Activity: [redacted]	Survey Start Time: 1200	Survey End Time: 1300

Weather/Water Conditions (Survey Only)

Air Temperature (°C): 14	Wind Direction: N ~~10-15~~	Wind Speed (mph): 10-15
Cloud Cover: 50%	Precipitation: None	
Wave height: 1-2'	Tide stage: Flood	
Water Temperature (°C): 16.5	Water Salinity (ppt): 7.7	

GPS Transect Information

Transect ID Number	Start Time	Finish Time	Starting Loc.	Finish Loc.

Observations (Survey Only)

Other Fish Species:

Species ID	Quantity	Time Observed	Transect Number	Location Observed (Lat/Long)	Condition (stunned, freshly dead, decaying)

DWR # and Description: _____

Originated by: Casey Stokes Date: 20141024

Checked by: Paul Moccio Date: 20141027

*YYYYMMDDXXZZ (XX = Chronological sample # for ea. date, ZZ = Chronological fish # in ea. sample

Tappan Zee Hudson River Crossing
Vessel-Based Monitoring Data Form

Piscivorous/Scavenging Bird Activity Observed (Circle):	(Y)	N

Comments/Additional Observations:

12:00 - En route to Fuel up R/V Parker observed a floating sturgeon being eaten by several gulls. Fish appeared to be fresh dead & was collected for processing. 6-7 Gulls eating Recovered sturgeon

Sturgeon Information

Sturgeon Observed (circle): (Y) N		Recovered (circle): (Y) N	
Time Observed: 1207	Species (SN/AT):	Fish ID*: 20141024 0101	
Location Recovered (Lat/Lon): 41.076133 / -73.87390		Time Recovered: 1207	
Water Depth @ Recovery Loc. (ft): 61.	Recovery Method: Net		
Recovered From (circle): (River) Scow			
Condition/Dispostion: Fairly Fresh, No signs of decomposition / Partially Eaten by birds			
Photo #s:	Photo Descriptions:		
Weight (g): 5lb 15oz.	TL (mm): 832	FL (mm): 739	
Interorbital Width (mm): 53	Mouth Width (mm): 40	Fin Clip? Y (N)	
PIT Tag Present? Y (N)	PIT Tag Fitted? Y (N)	PIT Tag #: N/A	
Location Returned (Lat/Lon):		Time Returned:	

*YYYYMMDDXXZZ (XX = Chronological sample # for ea. date, ZZ = Chronological fish # in ea. sample

Tappan Zee Hudson River Crossing
Vessel-Based Monitoring Data Form

Water Depth @ Return Loc. (ft): N/A	Return Method: N/A
Sturgeon Forms Completed (circle): Sample Collection ✓ Incident Report ✓ Salvage	

*YYYYMMDDXXZZ (XX = Chronological sample # for ea. date, ZZ = Chronological fish # in ea. sample

APPENDIX F

Incident Report: Sturgeon Take – Tappan Zee Replacement Project

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

Observer's full name: Casey Stokes
Reporter's full name: " "

Species Identification: Shortnose

Describe project activities (i.e., dredging, pile driving, etc.) ongoing within 24 hours of observation: No In-water Activity

Date animal observed: 10/24/14 Time animal observed: 1207
Date animal collected: 10/24/14 Time animal collected: 1207

Environmental conditions at time of observation (i.e., tidal stage, weather):
Overcast, N winds 10-15

Water temperature (°C) at site and time of observation: ~15
Describe location of fish and how it was documented (i.e., observer on boat):
Observer on boat (HDR Parker)
41.076133 -73.87390

Sturgeon Information:
Species Shortnose

Fork length/(or total length) 739 / 832 Weight 5 lbs 15 oz

Condition of specimen/description of animal
- Most of Gill Tissue Missing
- Tissue Missing from area around cloaca
- Tear on mouth
- 6-7 gulls feeding on fish when spotted

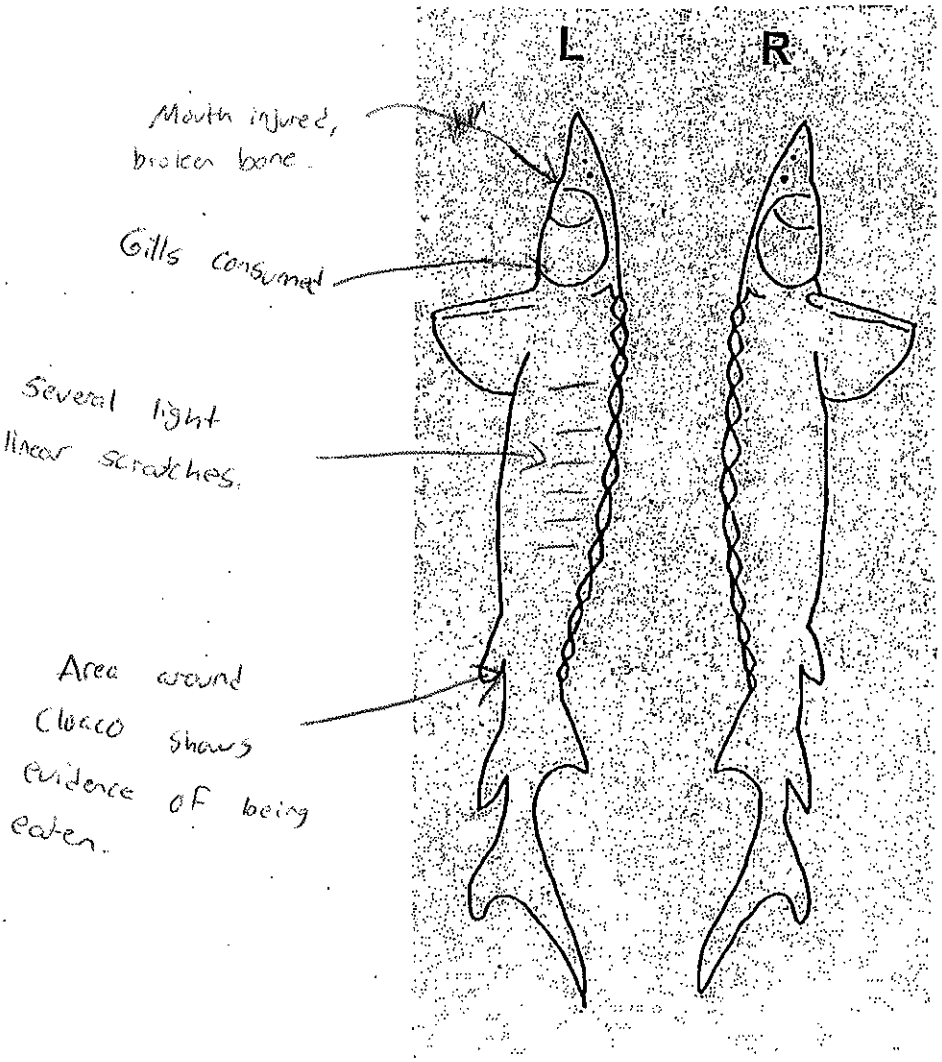
Fish Decomposed: (NO) SLIGHTLY MODERATELY SEVERELY
Fish tagged: YES / (NO) *Please record all tag numbers.* Tag # _____

Photograph attached: YES / (NO)
(please label *species, date, geographic site* and *vessel name* on back of photograph)

DWR # and Description:			
Originated by: Casey Stokes		Date: 20141024	
Checked by: Paul Moccio		Date: 20141027	

Appendix F, continued

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



Description of fish condition:

STURGEON DATA COLLECTION FORM

For use in documenting sturgeon injury or mortality incidental to a federal action and exempted pursuant to a NMFS issued incidental take statement

OBSERVER'S CONTACT INFORMATION
Name: First Casey Last Stokes
Agency Affiliation HDR Email cstokes@hdrinc.com
Address 404 Airport Executive Park
Nanuet, NY 10954
Area code/Phone number 845-708-8900

SEC 7 UNIQUE IDENTIFIER (PCTS No. Assigned by NMFS)
NER-2014-11317

DATE REPORTED:
Month 10 Day 24 Year 2014
DATE EXAMINED:
Month 10 Day 24 Year 2014

SPECIES: (check one)
- [x] shortnose sturgeon
- [ ] Atlantic sturgeon
- [ ] Unidentified *Acipenser* species

Check "Unidentified" if uncertain.
See reverse side of this form for aid in identification.

LOCATION FOUND: [ ] Offshore (Atlantic) [x] Inshore (bay, river, sound, inlet, etc)
River/Body of Water Hudson River City Tarrytown State NY
Descriptive location (be specific) Floating in River
Latitude 41.076133 N (Dec. Degrees) Longitude 73.857390 W (Dec. Degrees)

CARCASS CONDITION at time examined: (check one)
- [x] 1 = Fresh dead
- [ ] 2 = Moderately decomposed
- [ ] 3 = Severely decomposed
- [ ] 4 = Dried carcass
- [ ] 5 = Skeletal, scutes & cartilage

SEX:
- [x] Undetermined
- [ ] Female [ ] Male

How was sex determined?
- [ ] Necropsy
- [ ] Eggs/milt present when pressed
- [ ] Borescope

MEASUREMENTS: circle unit
Fork length 73.9 (cm) / in
Total length 83.2 (cm) / in
Length [x] actual [ ] estimate
Mouth width (inside lips, see reverse side) 4.0 (cm) / in
Interorbital width (see reverse side) 5.3 (cm) / in
Weight [x] actual [ ] estimate 5 lb. 15 oz. kg / (lb)

TAGS PRESENT? Examined for external tags including fin clips? [x] Yes [ ] No Scanned for PIT tags? [x] Yes [ ] No

Tag #	Tag Type	Location of tag on carcass
N/A	N/A	N/A

CARCASS DISPOSITION: (check one or more)
- [ ] 1 = Left where found
- [ ] 2 = Buried
- [x] 3 = Collected for necropsy/salvage
- [ ] 4 = Frozen for later examination
- [ ] 5 = Other (describe) _____

Carcass Necropsied?
[ ] Yes [ ] No
Date Necropsied: _____
Necropsy Lead: _____

PHOTODOCUMENTATION:
Photos/vide taken? [x] Yes [ ] No
Disposition of Photos/Video: _____

SAMPLES COLLECTED? [x] Yes [ ] No

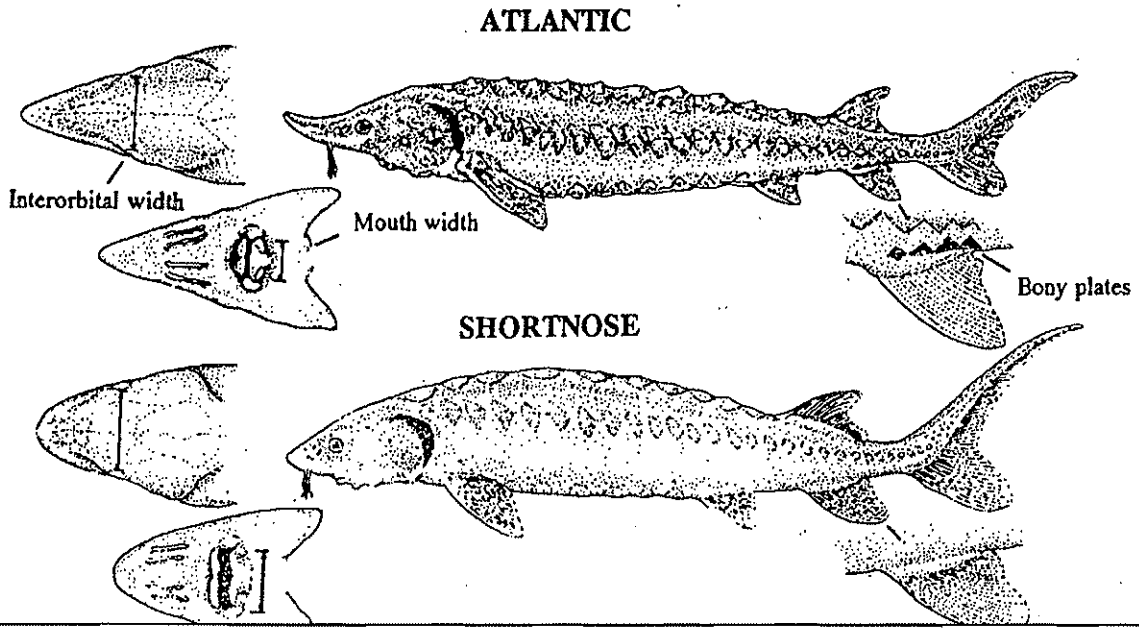
Sample	How preserved	Disposition (person, affiliation, use)
Pelvic Fin Clip	Ethanol	

Comments:
- Most of gills and cloaca area missing; 6-7 gulls were feeding on it
- Tear on Mouth

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

Characteristic	Atlantic Sturgeon, *Acipenser oxyrinchus*	Shortnose Sturgeon, *Acipenser brevirostrum*
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.**

See comments on first page

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 (Stephania Bolden, Stephania.Bolden@noaa.gov, 727-824-5312) or Atlantic Sturgeon Recovery Coordinator (Kelly Shotts, Kelly.Shotts@noaa.gov, 727-551-5603)

Appendix 3a:

Certification, Identification and Chain of Custody Form for Submitting Sturgeon Genetic Tissue Samples.[1,2]

(A) CERTIFICATION OF SPECIES (Collector)

I, Casey Stokes (Full Name), hereby certify that I have positively identified the fish or fishes sampled in this shipment as: [X] shortnose sturgeon; [ ] Atlantic sturgeon; [ ] other [ ] unknown based on my knowledge and experience as a Environmental Scientist (Position Job Title).

Signature: [signature] Date Identified: 10/24/14

Address: 404 Airport Executive Park Nanuet, NY 10954

Phone Number: 845-708-8400

(B) SAMPLE IDENTIFICATION

Species Identification: [X] shortnose sturgeon; [ ] Atlantic sturgeon; [ ] unknown

Unique ID No: 201410240101; Tissue Type: Whole fish/Fin Clip; Preservative: Ice/Ethanol

Location: (River: Hudson; River-km: 67; Lat/Long: 41.076133/-73.87390

River Location Description: Off shore / 6' of water);

Total Length (TL) of Specimen (mm): 832 Weight of Specimen (lbs): 5# 15 oz.; Sex (if known) N/A

Specific comments on take: Fish missing most of gill tissue, and tissue around cloaca; 6-7 gulls feeding on sturgeon when spotted -Damage/Tear due to mortality

[ ] Check here if multiple samples are submitted and use *Field Collection Report* (Appendix 3b) with the data fields listed in this section.

(C) EVIDENCE OF CHAIN OF CUSTODY

	Signature	NMFS Permit No.	Method of Transfer	Date
1.	[signature] Release Signature	NER-2014-11317 NMFS Permit No.	Handed off Method of Transfer	10/24/14 1910 Date
	[signature] Receipt Signature	NMFS Permit No.		10/24/14 Date
2.	Release Signature	NMFS Permit No.	Method of Transfer	Date
	Receipt Signature	NMFS Permit No.		Date
3.	Release Signature	NMFS Permit No.	Method of Transfer	Date
	Receipt Signature	NMFS Permit No.		Date

---

[1] Instructions on next page.

[2] If multiple samples are shipped, attach summary sheet in Appendix 3b.

Appendix 3b Summary Sheet for Genetic Tissue Samples Collected[1,2]

Date	Species	Unique ID No.	Genetic Tissue Type	Preservative	Location: (River)	Location (River-km) ~~Lat~~	Location (~~Lat~~/Long)	Total Length (mm)	Weight (~~g~~)lbs	Sex	Comments
10/24/~~04~~ 05	SN	20HH0240101	~~Whole Fish~~/Fin Clip	Ice/~~Ethanol~~	Hudson	41.076133	-73.87390	832	5#15oz.	N/A	~Most of Gill Tissue Eaten -Tissue around Cloaca Eaten

1. Please coordinate with NMFS to receive a file copy of this appendix in spreadsheet format and include file on disk with shipment.
2. If multiple samples are shipped, attach this form to supplement Appendix 3a.

APPENDIX C

Sturgeon Necropsy Report
October 24, 2014

Sturgeon Necropsy
Final Memorandum
Specimen #201410240101
Reported to NYSTA: October 24, 2014
Necropsy performed: October 24, 2014
Final Report filed by examiner: November 12, 2014
Final Memorandum filed with agencies: November 13, 2014

A dead shortnose sturgeon[1] was recovered by Tappan Zee Constructors at 12:07pm on Friday, October 24, 2014. The fish was found in the Hudson River just north of the Tappan Zee Bridge and just outside of the Tarrytown Boat Club in Westchester County on the eastern side of the river. In accordance with the conditions of the NMFS Biological Opinion (September 2014) and the DEC environmental permit ID 3-9903-00043/00012, the sturgeon was recovered, examined, and determined to be suitable for necropsy based on procedures detailed in the Dredging and Pile Driving Monitoring Plan and the Sturgeon Necropsy Plan for the New NY Bridge project. In accordance with these Plans, the sturgeon was immediately placed on ice and transferred the same day by AKRF to Dr. Rod Getchell at Cornell University's College of Veterinary Medicine for necropsy to determine the potential cause of mortality.

Dr. Getchell, in consultation with Dr. Paul Bowser, has performed a visual examination of the sturgeon and has provided a Final Necropsy Report detailing his findings (see attached). The Final Report includes an assessment, based on gross pathology, histology, and bacteriology, of the likelihood that the sturgeon mortality was related to project activities including exposure to elevated sound pressure levels, interaction with the dredge bucket, or vessel strike.

During the necropsy, external processing was performed on the sturgeon to visually evaluate, via the presence of lacerations or amputation, the possibility of vessel collision, or interaction with the dredge bucket as the potential cause of death. Internal processing was conducted to detect the presence of lesions on the external surface of organs or tissues consistent with barotrauma (e.g., hemorrhage, hematoma, perforated swim bladder) that would indicate exposure to elevated sound pressure levels during pile driving. To further assess the possibility of barotrauma as the cause of death, histopathology was used to evaluate microscopic-hemorrhages on the internal organs. To assess the possibility of natural mortality, the sturgeon was also examined for signs of bacterial or viral infection, parasite load, and starvation. Bacterial cultures, viral isolation, skin scrapings, and examination of food content in the digestive tract were used to evaluate the potential for natural mortality as the cause of death. The detailed procedures for external and internal processing are described in the Sturgeon Necropsy Plan.

[1] Species identification was based on the ratio of interorbital width to mouth width and the absence of scutes above the anal fin.

Necropsy Findings

Based on the final results of the necropsy, Dr. Getchell concludes that “there was no evidence to suggest this fish was exposed to any barotrauma or other impacts besides the perforations and missing gills that appeared to be due to scavenging.” He noted that the most obvious observation was the absence of gills and the presence of several perforations, most likely caused by scavenging. These observations are illustrated in Figures 1 through 4 in the Final Necropsy Report and are in agreement with those made by the TZC sturgeon monitoring crew that recovered the sturgeon (see Appendix F – Incident Report: Sturgeon Take – Tappan Zee Replacement Project). At the time of recovery, the sturgeon was being scavenged by 6-7 gulls, according to TZC’s Incident Report.

Gross internal and external examination revealed “no apparent lesions besides perforations”. Moreover, “the internal organs appeared normal by both gross and histological means” as illustrated in Figures 5 through 16. As shown in Figures 5 through 7, the swim bladder was in tact at the time of necropsy and not perforated or ruptured as might occur in the case of barotrauma. These results suggest that vessel interaction and barotrauma caused by exposure to underwater noise were unlikely causes of mortality for this sturgeon. The estimated time of death for this sturgeon further support this contention.

Following the examination of preliminary histological samples, Dr. Getchell has determined that, “fixed tissues supports an estimation of time of death to be 24 to 48 hours”, which would have been sometime between noon on Wednesday, October 22nd and noon on Thursday, October 23rd. Project-related activities, including pile driving, were suspended on Wednesday and Thursday, October 22nd and 23rd due to inclement weather and TZC discontinued pile-driving activities at 9:21 am on Wednesday, October 22nd; dredging activities have not occurred since November 2013. Given this time frame, it is unlikely that the cause of mortality was project-related as project activities had not occurred during the time period in which the sturgeon was estimated to have died.

While the official diagnosis remains “open”, the weight of the evidence presented in the Final Necropsy Report leads the Thruway Authority to conclude that this sturgeon mortality was not related to dredging, underwater noise associated with pile driving, or vessel activity.

Cornell University

Aquatic Animal Health Program
Dept. of Microbiology and Immunology
College of Veterinary Medicine
Cornell University
Ithaca, NY 14853-6401
Tel: (607) 253-4028 Fax: (607) 253-3384

Case number:	FPL2014-013	**Report Date:**	11/12/2014
Date received:	10/24/2014	**Diagnosticians:**	Getchell

Client Name:	Justin Krebs	**Type of sample:**	1 whole fish
		Species:	Shortnose Sturgeon (*Acipenser brevirostrum*)

History: On Friday October 24, 2014, a dead sturgeon was discovered by Tappan Zee Constructors (TZC) in the vicinity of the construction zone for the New NY Bridge. The fish was determined to be relatively fresh. The gills were mostly missing, but what remained on the underside of the operculum was still bright red. However the eyes were slightly opaque. Justin Krebs consulted with Kathy Hattala at DEC to get a second opinion and she concurred that the fish was fresh enough for necropsy. The fish was placed on ice and transported to Cornell the same day. Delivery occurred at 11PM. Water quality measurements not taken.

Presentation: The fish was delivered to Cornell AAHP on October 24, 2014 by Elizabeth Matamoros of AKRF.

Gross examination: The Shortnose Sturgeon weighed 2230 grams, with a total length of approximately 830 mm. Briefly, the carcass has been scavenged by an unknown predator, with its gills and lower portion of intestines missing. The stomach was also perforated. Minimal post-mortem decomposition had begun. Multiple photos were taken; no apparent lesions besides the perforations were evident.

External and internal gross observations were as follows: The most obvious observation was the missing gills, which appeared to have been removed by a scavenger such as a gull. From the attached photos (Fig 1-4) it can be seen that two perforations are present near the right pectoral fin and the vent, also likely to have been caused by a scavenger. The internal organs appear normal. Photos are included in Figs. 5 to 8. There was a minor perforation of the stomach and the loss of the distal portion of the intestine, probably due to scavenging.

Histological examination: Examination of fixed tissues supports an estimation of time of death to be 24 to 48 hours and demonstrated the normal appearance of the following organs: heart, liver, kidneys, spleen, intestine, stomach, and ovary. Several histological photos of heart, intestines, liver and ovary tissues are included (Fig. 9-12). Additional fixed tissues, that had to be decalcified to allow for their sectioning, have now been processed and examined; they include operculum, gill, muscle, and skin (Fig. 13-16). All of the histological photos are taken through the 10X objective lens.

Laboratory results:
Bacteriology: A kidney loop sample were inoculated onto TSA/5%SB and incubated at room temperature. No significant growth has occurred.

Toxicology: None performed.

Virology: Frozen aliquots of kidney/spleen/liver were archived.

Diagnosis:
Open

Cornell University

Aquatic Animal Health Program
Dept. of Microbiology and Immunology
College of Veterinary Medicine
Cornell University
Ithaca, NY 14853-6401
Tel: (607) 253-4028 Fax: (607) 253-3384

Comments: The gross and histopathogical observations suggest that specimen submitted was fresh, meaning the fish had died within 24 to 48 hours prior to discovery. The internal organs appeared normal by both gross and histological means. There was no evidence to suggest this fish was exposed to any barotrauma or other impacts besides the perforations and missing gills that appeared to be due to scavenging.

Cornell University

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Images: Fig. 1. Whole Shortnose Sturgeon

Fig. 2. Perforation of body wall posterior to right pectoral fin.

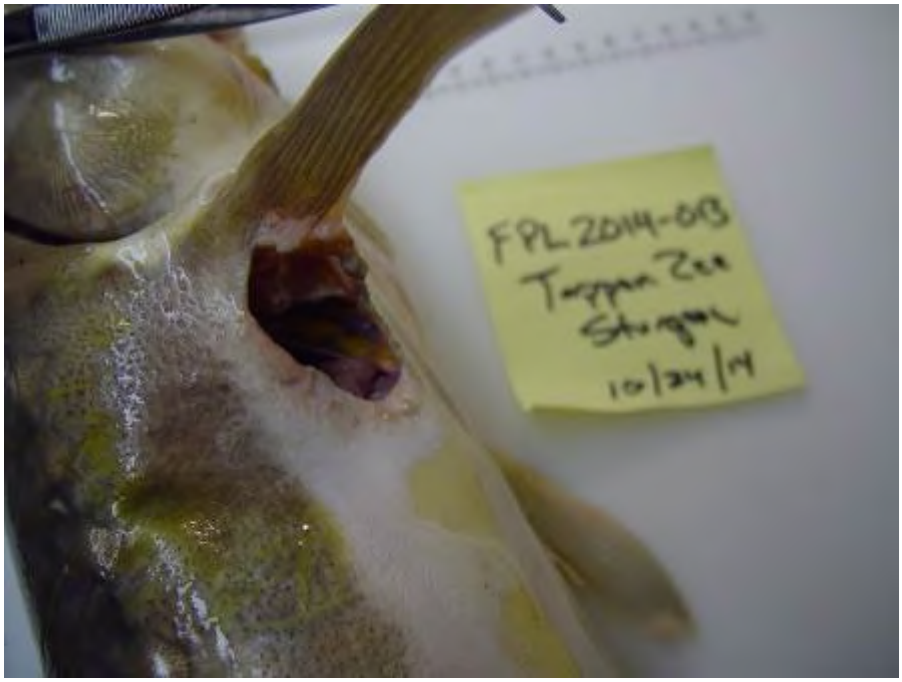

Fig. 3. Perforation of body wall posterior to pelvic fins.

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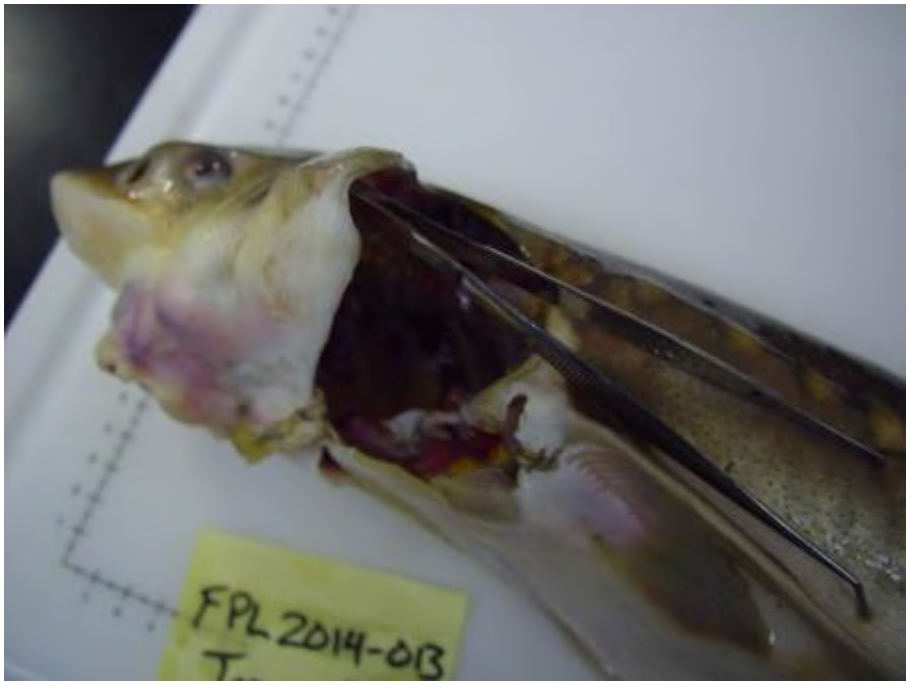
College of Veterinary Medicine
Cornell University
Ithaca, NY 14853-6401
Tel: (607) 253-4028 Fax: (607) 253-3384

Fig. 4. Opercula cavity with gills missing.



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Ithaca, NY 14853-6401
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Fig. 5. Internal view of coelomic cavity with normal liver, stomach, intestines, ovary and swim bladder visible.

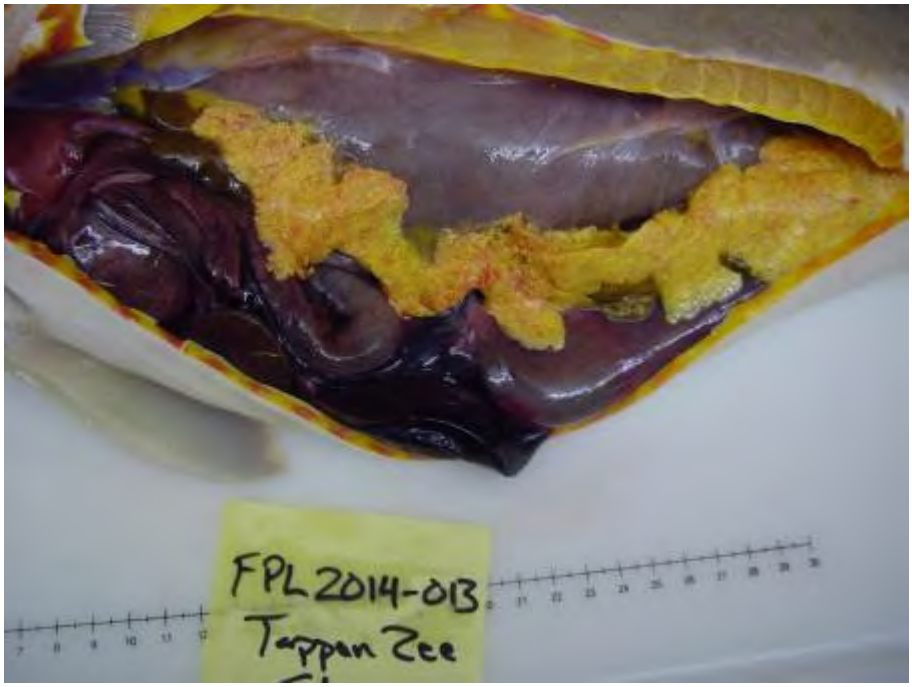

Fig. 6. . Closer internal view of coelomic cavity with the normal heart, liver, stomach, intestines, ovary and swim bladder visible.

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Fig. 7. Posterior portion of coelomic cavity with normal swim bladder, ovary, intestines, and liver visible.

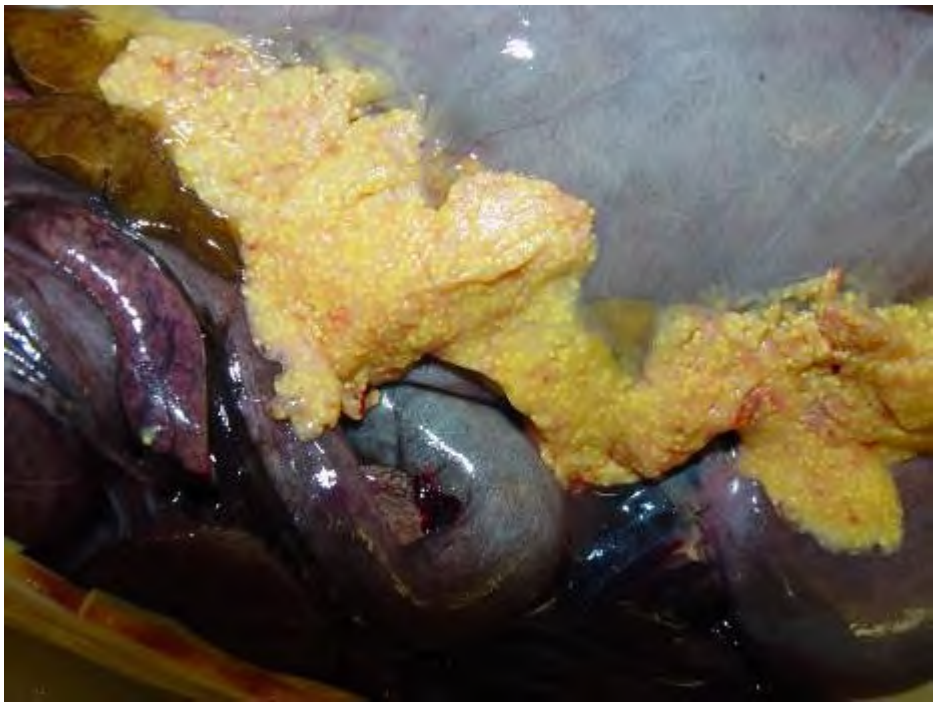

Fig. 8. Upper coelomic cavity with normal heart and liver visible.

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Fig. 9. Histological section of heart with fat layer visible in lower left.

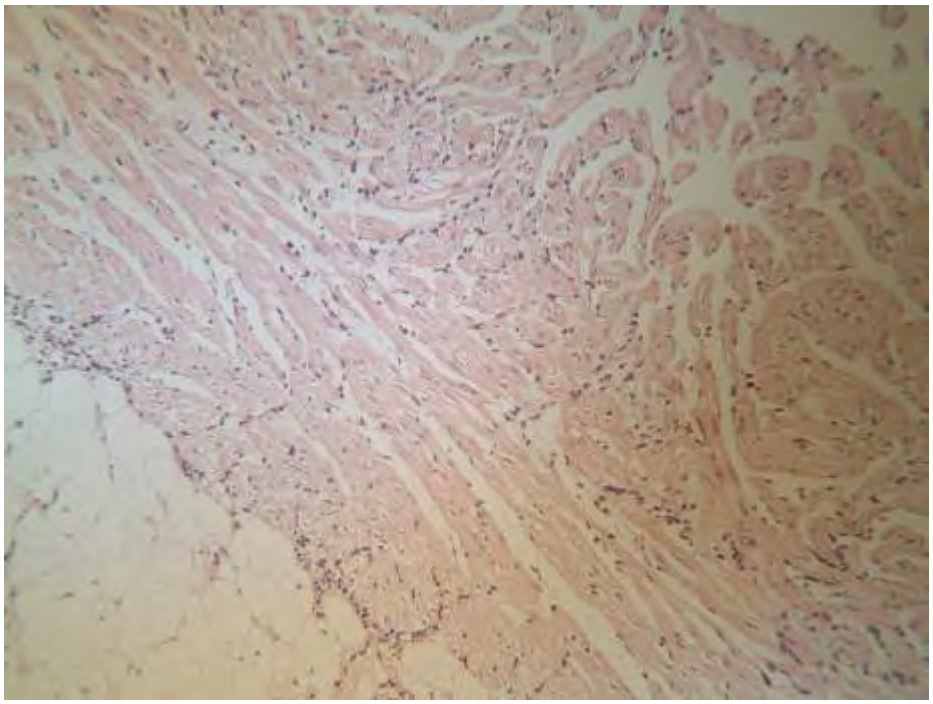

Fig. 10. Histological section of digestive tract.

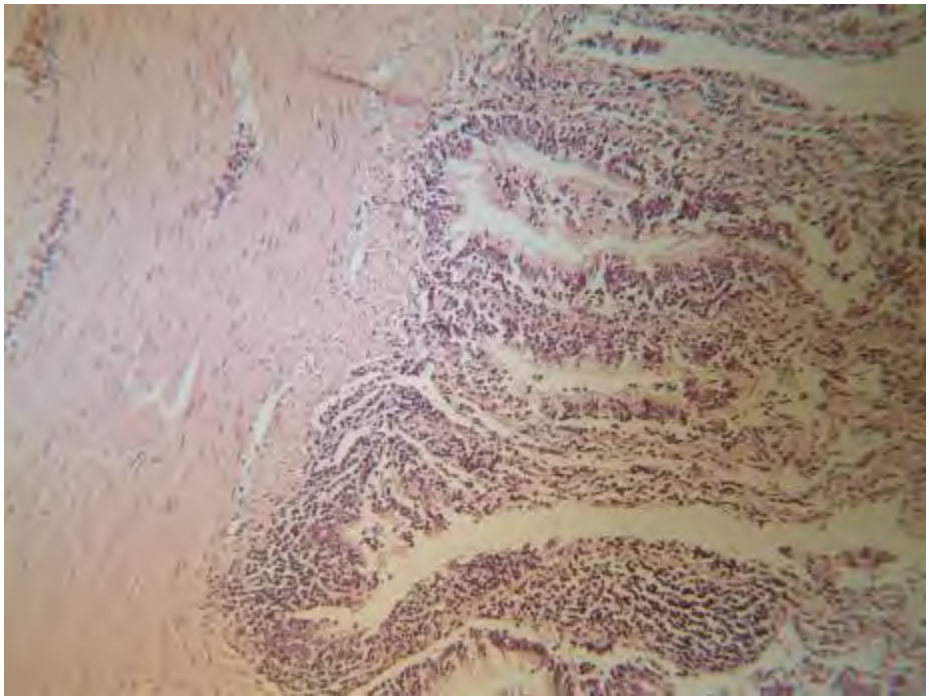

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Fig. 11. Histological section of liver.

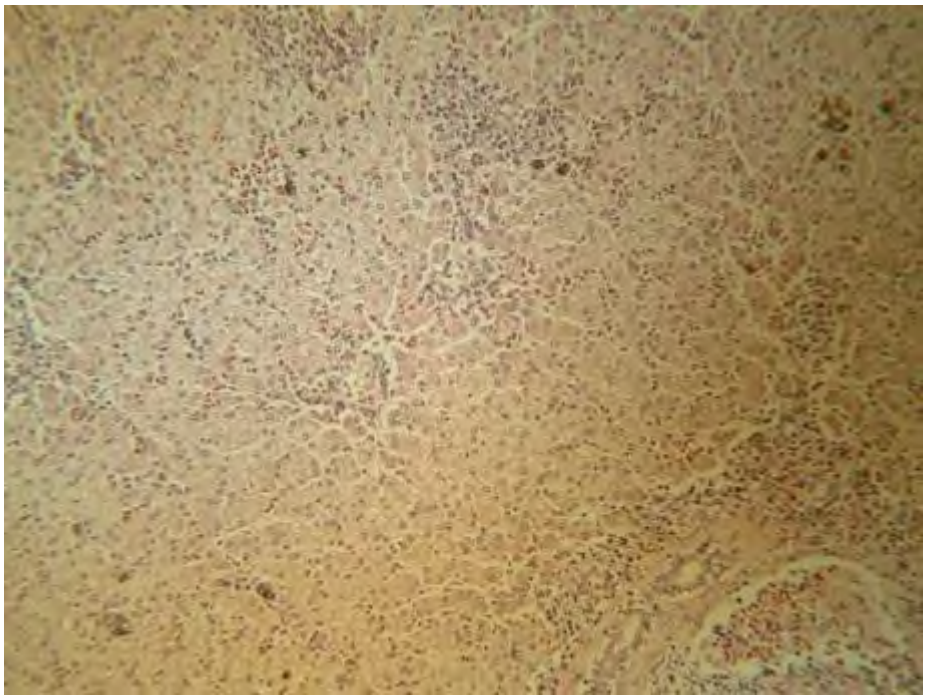

Fig. 12. Histological section of ovary.

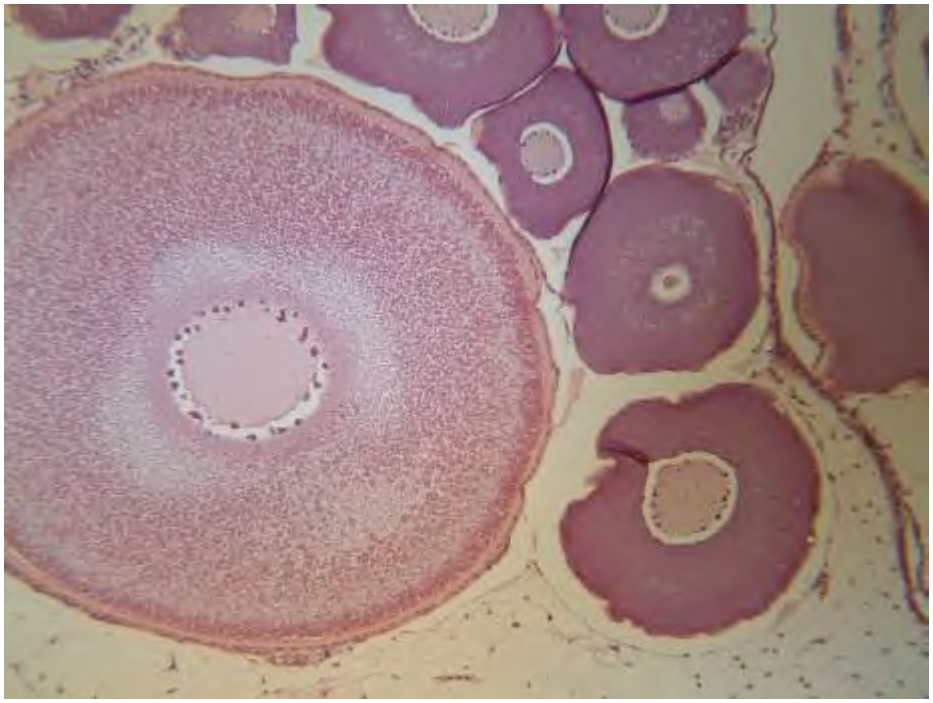

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Fig. 13. Histological view of the inner surface of the operculum and gills.

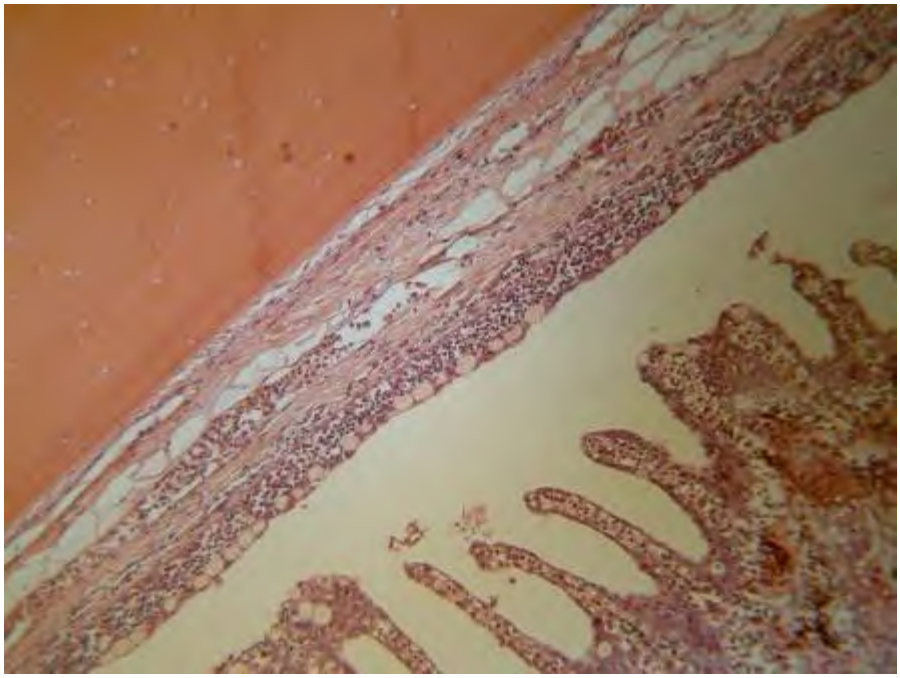

Fig. 14. Histological view of the gill lamellae.

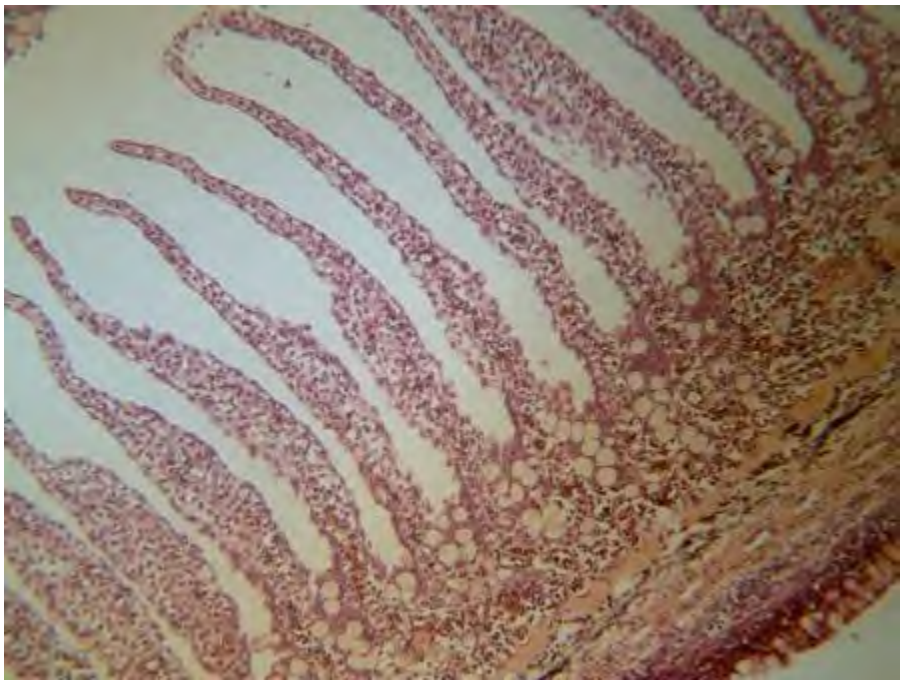

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Fig. 15. Histological view of the skeletal muscle tissue.

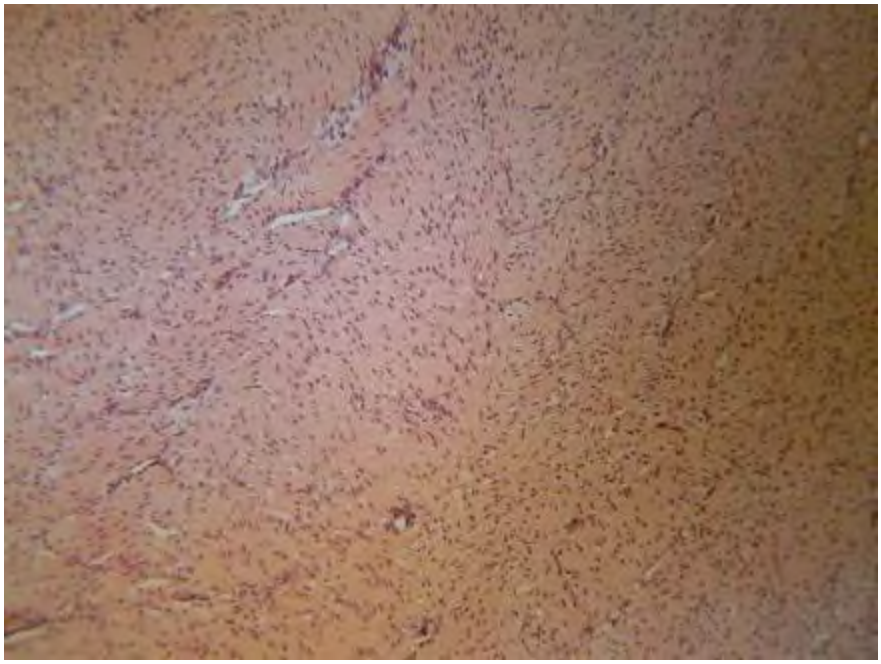
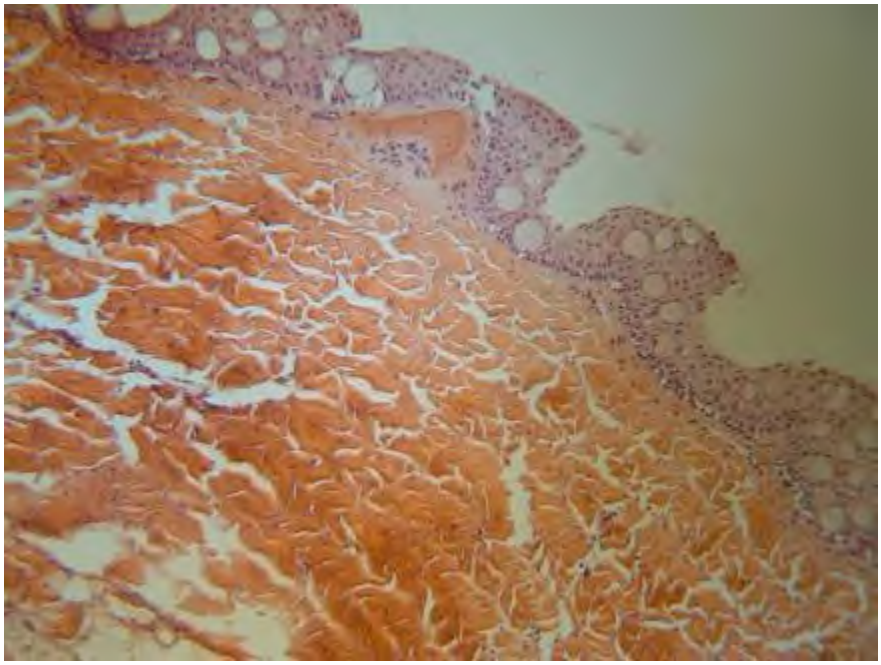


Fig. 16. Histological view of the skin and underlying muscle layer.



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