Near-Field Sturgeon Monitoring for the New NY Bridge at Tappan Zee

Quarterly Report
January 1 – March 31, 2015

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for

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1.0 SUMMARY

During the monitoring period from January 1 through March 31, 2015, there were no acoustic-tagged fish, sturgeon or otherwise, detected within the near-field array in the vicinity of the Tappan Zee Bridge.

2.0 INTRODUCTION

This quarterly report for the Near-Field Sturgeon Monitoring program summarizes all available information collected via the near-field array of acoustic receivers deployed in the vicinity of Authorized Activities at the Tappan Zee Bridge during the time period from January 1 through March 31, 2015. The purpose of the near-field sturgeon monitoring is to detect the presence, residence time, and movement of acoustic-tagged Atlantic and shortnose sturgeon within the vicinity of the Tappan Zee Bridge during construction of the New NY Bridge at Tappan Zee ("Project"). The information presented herein is reported as required by the National Marine Fisheries Service ("NMFS") and New York State Department of Environmental Conservation ("DEC").

2.1 PERMIT REQUIREMENTS

On September 23, 2014, NMFS issued a Biological Opinion ("NMFS BO") for the Tappan Zee Bridge Replacement Project (NER-2013-9592) in accordance with Section 7 of the Endangered Species Act of 1973, as amended. The NMFS BO assessed the potential impacts of the Project on ESA-listed Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) and shortnose sturgeon (*Acipenser brevirostrum*). This quarterly report has been developed in compliance with Reasonable and Prudent Measure ("RPM") #6 of the NMFS BO, which states that:

> *FHWA must continue to implement a program to monitor impacts to sturgeon resulting from pile installation for permanent piles* [redacted] *throughout the duration of pile driving operations.*

Term and Condition #11 of the BO further requires that:

> *To implement RPM#6, FHWA must ensure acoustic telemetry equipment continues to be utilized to monitor for the presence, residence time and movement of tagged Atlantic and shortnose sturgeon in the project area during installation of permanent piles,* [redacted]*. FHWA must design a monitoring plan that would ensure the detection of any acoustically tagged shortnose or Atlantic sturgeon in the action area. FHWA must ensure all occurrences of tagged sturgeon in the project area are recorded and reported to NMFS to the extent that detected tags can be identified as shortnose or Atlantic sturgeon. Information collected from any stationary receivers must be downloaded at least every 60 days, unless there are weather or safety concerns in which*

> *case downloads must be made as soon as practicable after the relief of the weather or safety concern. Preliminary reports containing information on the number of tagged sturgeon detected must be provided to NMFS on a regular basis, but no less frequently than every 60 days. If reports cannot be provided on that frequency, FHWA must provide an explanation to NMFS within the 60-day period and provide the report as soon as possible. On a quarterly basis, FHWA must provide NMFS a report that summarizes the presence, residence time, and movement of tagged Atlantic and shortnose sturgeon for the 90 day period. The quarterly report must be provided within 30 days of the end of the 90 day period. The report must also include the number of tags that could not be identified to species and document the steps that FHWA took to attempt to identify the species identification (e.g., contact the tag manufacturer). This term and condition does not require FHWA to tag any sturgeon with telemetry tags.*

Similar sturgeon monitoring requirements are outlined in Condition 40 of the Final DEC Permit (DEC ID 3-9903-00043/00012) issued on March 25, 2013, which states:

> *As soon as possible, but no more than 60 days after the effective date of this Permit, and before starting installation of permanent piles* [redacted] *the Permittee must submit to the Department a plan for monitoring the movement of shortnose and Atlantic sturgeon in the vicinity of the Tappan Zee Bridge.*

On December 9, 2013, FHWA finalized the Sturgeon Acoustic Telemetry Monitoring Plan ("Plan") through consultation with DEC and NMFS. The area of the Hudson River to be monitored was referenced in the DEC Permit as "the vicinity of the Tappan Zee Bridge" and "the vicinity of any Authorized Activities" and in the Plan as "the vicinity of the Authorized Activity." In the Plan, this area ("the vicinity of the Tappan Zee Bridge") was defined as being within 1,000 feet of pile driving in waters deeper than 6 feet (mean low water). This area encompasses the zone in which behavioral effects from pile driving are anticipated for sturgeon based on the NMFS 2013 Biological Opinion (i.e., the 150 dB rms SPL isopleth) and extends 61 meters (m; 200 feet [ft]) beyond this isopleth. It is important to note that the detection range of the near-field array exceeds the vicinity of the Authorized Activity. Therefore, some of the detection data presented in this quarterly report are from sturgeon occurring just outside of the monitoring array.

The Plan[1] defines the monitoring objectives, extent of the survey area, details of the monitoring array, results of range testing, and data-collection methods used to conduct the near-field sturgeon monitoring summarized in this quarterly report. The measures established by the Plan

[1] AKRF, Inc. Sturgeon Acoustic Telemetry Monitoring Plan for the Tappan Zee Hudson River Crossing, Revision 4. Submitted to NMFS on November 17, 2014.

were utilized during monitoring to determine 1) sturgeon presence, 2) residence time, 3) position within the array, and 4) movement within the array. The 29 Vemco receivers that currently comprise the near-field array were configured to allow the two dimensional (2-D) positioning of acoustic-tagged sturgeon within the vicinity of the Authorized Activity defined by DEC.

As required by Term and Condition #11 of the NMFS BO, and outlined in the Plan, this quarterly report should summarize the presence, residence time, and movement of acoustic-tagged sturgeon detected in the near-field receiver array during the most recent 90-day monitoring period. The approved configuration of the monitoring stations that comprise the near-field array (Figure 1 in the Plan) was in place in October 2013.

To improve monitoring coverage in the northern area of the array and west of the navigation channel, two new stations (Stations 33 and 34) were deployed in December as discussed with DEC staff in New Paltz on November 6, 2014 (see Figure 1 below). The possible placement locations for the two new stations was constrained to the south by the presence of steel piles along the alignment of the new bridge and to the north by the swing radius of the moorings for construction barges. Despite those limitations, the current placement of the new stations is expected to increase the number of detections of acoustic-tagged fish in this part of the array. Based on estimates from the Thruway Authority's range testing analysis (see Attachment C of the Plan), the detection range of the new stations should be approximately 600-1,000 m.

3.0 METHODS

3.1 DATA DOWNLOADS

During this quarter, receivers deployed at 23 of the 29 monitoring stations were downloaded; several stations were not able to be retrieved during the most recent download event (Figure 1 below). Locations of receiver stations at the beginning of this quarter's monitoring period and other relevant information is shown in Table 1 and Figure 1.

All monitoring stations contain Vemco sync tags, and one station contains a temperature tag for use in the Vemco Positioning System ("VPS") analysis. Sync tags were used to maintain internal clock synchrony among Vemco receivers within the array, which is necessary to accurately position sturgeon.

Data downloads for this quarter were performed beginning on March 31, 2015 and ending on April 6, 2015.

4.0 RESULTS

4.1 STURGEON PRESENCE

Presence is defined for the purpose of this monitoring effort as the detection of an individual acoustic-tagged sturgeon within the near-field array independent of the time that the sturgeon spends in the array. Consistent with the manufacturer-recommended use of the Vemco receiver technology, the False Detection Analysis (FDA) tool was used in Vemco's VUE software to remove likely false detections prior to reporting.

During the monitoring period from January 1 through March 31, 2015, there were no acoustic-tagged fish, sturgeon or otherwise, detected within the near-field array in the vicinity of the Tappan Zee Bridge.

Table 1
Locations and deployment times for acoustic receivers within the near-field monitoring array at the Tappan Zee Bridge

Station	Deployment Location		Deployment Date and Time		Equipment Information			
	Latitude	Longitude	Date	Time	Vemco Receiver	Sync Tag[e]	Temp Tag	Lotek Receiver
St01	41.0744293	-73.9096939	19-Dec-14	1:23:59 PM	122371	65006	--	--
St02[a]	41.0751381	-73.8988418	03-Jul-14	5:44:52 PM	123574	65011	--	--
St03	41.0664566	-73.9110519	16-Dec-14	2:54:32 PM	122373	65008	--	--
St04	41.0668751	-73.8998226	16-Dec-14	2:29:57 PM	122888	65010	--	--
St05	41.0704223	-73.8938403	15-Dec-14	12:18:39 PM	123573	26740	--	--
St06	Decommissioned				122892	65014	--	265126
St07[b]	Decommissioned				122887	65012	--	265127
St08[c]	41.0724297	-73.8733492	22-Aug-14	3:01:12 PM	122890	65013	--	--
St09	41.0698298	-73.8923686	15-Dec-14	12:00:46 PM	123571	26742	--	--
St10[b]	Decommissioned				122894	65003	--	265121
St11	41.0667981	-73.8733434	16-Dec-14	1:26:53 PM	122889	65015	--	265119
St12	41.0768302	-73.8846246	19-Dec-14	2:30:00 PM	122884	65016	--	--
St13[c]	41.0759160	-73.8807816	22-Aug-14	10:36:55 PM	122885	65017	--	--
St14	Decommissioned				122886	65019	13339	--
St15	41.0736063	-73.8824976	16-Dec-14	12:36:47 PM	122883	65018	--	--
St16	41.0733176	-73.8793007	22-Dec-14	11:47:23 AM	122879	65020	--	--
St17	41.0689492	-73.8876821	22-Dec-14	1:29:06 PM	122881	65021	--	--
St18	41.0690660	-73.8837919	22-Aug-14	12:26:45 PM	122880	65022	--	--
St19	41.0686479	-73.8781151	16-Dec-14	12:56:02 PM	122735	65023	--	--
St20[c]	41.0661133	-73.8802760	25-Aug-14	12:01:25 PM	123572	65009	13338[f]	--
St21	41.0668805	-73.8849937	19-Dec-14	11:46:48 AM	122877	65004	--	--
St22	41.0660589	-73.8764188	04-Nov-14	11:25:32 AM	122878	65007	--	--
St23[c]	41.0745703	-73.9131982	21-Aug-14	12:38:57 PM	122871	65024	--	--
St24	41.0735687	-73.9048365	19-Dec-14	1:04:43 PM	124817	26744	--	--
St25	41.0690448	-73.9055207	16-Dec-14	2:38:50 PM	122875	65026	--	--
St26	41.0683297	-73.8960651	16-Dec-14	2:19:13 PM	122718	65025	--	--
St27	41.0756836	-73.9122181	29-Oct-14	11:27:10 AM	123565	26747	--	--
St28	41.0706298	-73.9136809	15-Dec-14	12:50:01 PM	123568	26738	--	--
St29	41.0702580	-73.9092860	15-Dec-14	12:30:55 PM	123566	26746	--	--
St30	41.0703343	-73.9138134	15-Dec-14	12:41:33 PM	123567	26741	--	--
St31	41.0699375	-73.9096412	15-Dec-14	12:21:31 PM	123569	26739	--	--
St32[b]	Decommissioned				123570	26745	--	--
St33[d]	41.0723320	-73.8909040	15-Dec-14	11:52:00 AM	122731	65037	--	--
St34[d]	41.0722890	-73.8981480	15-Dec-14	11:36:00 AM	122732	65039	--	--

[a]Station 2 was not recovered, has not been detected by adjacent stations, and is now presumed lost.
[b]Stations 7, 10, and 32 were determined to be unnecessary for sturgeon positioning based on stationary range testing using sync-tag detections and were decommissioned as discussed with DEC.
[c]Stations 8,13, 20, and 23 were not recovered.
[d]Stations were deployed to improve coverage in the vicinity of Stations 02, 05, and 06.
[e]The prefix for sync tag codes is "A69-1601-" and the prefix for temperature tags is "A69-9002-"
[f]The temperature tag at Station 20 was lost on October 20, 2013 and has not been replaced.

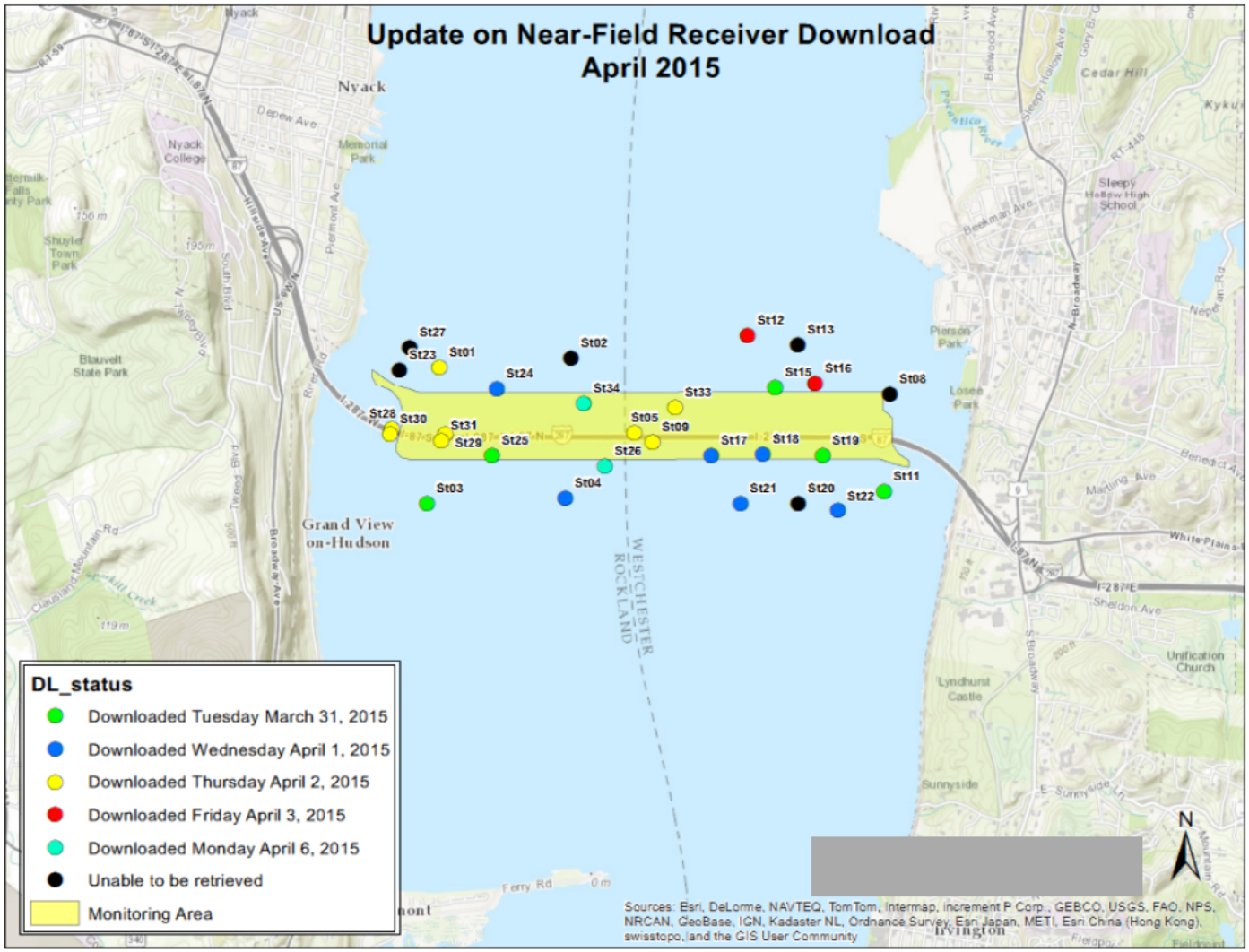

Figure 1. Configuration of the near-field receiver array during the first quarter 2015 monitoring period.✷