

Monthly Pile Driving Summary Underwater Noise Monitoring Results

Pile Driving Period: January 18, 2014 - February 17, 2014



Summary:

No sturgeon were observed to have been severely injured or killed as a result of underwater noise from pile driving during this reporting period. This conclusion was reached based on the results of sturgeon monitoring by observers on the barge and on a monitoring vessel downstream of the pile being driven.

Recoverable injuries caused by exposure to sub-lethal levels of underwater noise could not have been sustained by more than one sturgeon during this reporting period. This conclusion was reached by considering:

- the time required to drive each pile;
- the area that experienced noise levels higher than the level that could potentially result in recoverable injury to the sturgeon (206 dB); and
- the possible number of sturgeon that could have been in that area (number of gill nets x sturgeon encounter rate).

The potential number of sturgeon likely to have experienced recoverable injuries (described as “sturgeon take”) is reported as the probability of a fish being affected, as shown in the table below. If the sturgeon take is listed as 1, then 1 sturgeon was potentially exposed to recoverable noise levels. If sturgeon take is less than 1, then it is less likely that 1 sturgeon was affected. As shown at the bottom right of the table below, the cumulative sturgeon take was 0.04 sturgeon (that is, less than 1 sturgeon) for this reporting period, which is less than the 0.48 sturgeon that was anticipated.

Introduction:

As required under the NMFS Biological Opinion, dated April 2013, (NMFS BO) Reasonable & Prudent Measure #4 and Term & Condition #9, the following is a summary of the installation and underwater noise monitoring of permanent piles, [REDACTED] for the time period beginning January 18, 2014 through February 17, 2014.

As required under this condition, an estimate of sturgeon take for production piles driven during the most recent 30-day monitoring period is included. The sturgeon take estimate has been calculated using the times required to drive each pile (impact hammer only) and an estimate of the diameter of the 206 dB peak SPL isopleth. Because there were no underwater noise measurements made during this reporting period, the size of the isopleth was conservatively assumed to be equivalent to the maximum isopleth measured to date for a [REDACTED] production pile (i.e., 60 feet). This take estimate has been compared to that derived for the same piles listed in Table 9 of the NMFS BO to ensure that sturgeon take is not being exceeded.

Pile Installation and Underwater Noise Monitoring:

During the 30-day period from January 18 through February 17, 2014, [REDACTED] production piles were driven at Pier [REDACTED]. These piles correspond to the first two rows of 2013 in Table 9 of the NMFS BO, which indicates that [REDACTED] piles will be driven at Pier [REDACTED] at Pier [REDACTED] during the first few weeks of production pile driving; [REDACTED] in this group remain to be driven. In Table 9, the anticipated incidental take of sturgeon for these 100 piles is 6 sturgeon (rounded up from 5.28 sturgeon), which was calculated as the product of the number of piles, number of hours to drive a pile, number of gill nets to span the 206 dB peak SPL isopleth, and the sturgeon encounter rate of 0.033 sturgeon per net per hour.

To calculate anticipated sturgeon take per pile from Table 9, the anticipated take of 6 sturgeon was divided by the 100 piles in this grouping, which resulted in an estimate of 0.06 sturgeon per pile. Based on this value:

- the anticipated take from Table 9 for the [REDACTED] production piles driven from January 18 through February 17 would be 0.48 sturgeon (i.e., 0.06 sturgeon per pile multiplied by 8 piles),
- the cumulative take associated with the [REDACTED] production piles driven to date (as anticipated in Table 9 of the NMFS BO) is the sum of the anticipated take values for all [REDACTED] piles, or 2.16 sturgeon.

Following the same method used to estimate incidental sturgeon take for Table 9, the product of pile driving time, number of gill nets to span the width of the 206 dB isopleth, and sturgeon encounter rate of 0.033 sturgeon per net per hour was used to calculate sturgeon take for the [REDACTED] piles driven at Piers [REDACTED] during this reporting period. For previous piles that have been monitored for underwater noise, the diameter of the 206 dB peak SPL isopleth was measured based on the maximum peak SPL recorded during pile driving. For the unmonitored piles, the maximum recorded isopleth diameter was assumed (i.e., 60 feet for piles at Pier [REDACTED]). Actual pile driving times for each of the [REDACTED] piles were used in the calculations.

During this reporting period, none of the piles exceeded the maximum allowable pile driving time of 1 hour per pile. Although there was no underwater noise monitoring for the production piles driven during this reporting period, the size of the 206 dB peak SPL isopleths for piles measured previously have not exceeded the 200 foot maximum width. Therefore, it is not likely that the maximum allowable isopleth width was exceeded during this reporting period.

Based on the recorded pile-driving times and isopleth widths:

- the incidental sturgeon take for the [REDACTED] piles driven during the 30-day period from January 18 through February 17 was calculated as 0.04 sturgeon, which is less than the estimate of 0.48 sturgeon for the same [REDACTED] piles listed in Table 9,
- the cumulative incidental take for the [REDACTED] production piles driven to date was calculated as 0.71 sturgeon, which is less than the anticipated take of 2.16 sturgeon for the same [REDACTED] piles in Table 9.

Therefore, incidental take was not exceeded during the most recent 30-day reporting period for production pile driving, nor has the cumulative sturgeon take been exceeded for all production

piles driven to date. The monthly sturgeon take estimated for this reporting period was lower than anticipated because of the shorter than expected drive times for piles driven during this time period (i.e., 0.25 to 0.35 hours per pile vs. 1.00 hours per pile as anticipated in the NMFS BO).

Report Period: 01/18/2014 to 02/17/2014

Date	Year	Week		Net Impact Pile Driving Duration (hrs/pile)	Pile Driving Time from Table 9 of the NMFS BO (hrs/pile)	Average width of isopleth for 206-dB peak SPL (feet)	Maximum width of isopleth for 206-dB peak SPL (feet)	Number of gill nets to span the 206-dB peak SPL isopleth	Sturgeon encounter rate (fish/net/hour)	Sturgeon take
1/18/2014	2014	3		0.35	1.00	Not measured	60	0.5	0.033	0.006
1/18/2014	2014	3		0.30	1.00	Not measured	60	0.5	0.033	0.005
1/18/2014	2014	3		0.35	1.00	Not measured	60	0.5	0.033	0.006
1/18/2014	2014	3		0.30	1.00	Not measured	60	0.5	0.033	0.005
1/20/2014	2014	4		0.33	1.00	Not measured	60	0.5	0.033	0.005
1/20/2014	2014	4		0.27	1.00	Not measured	60	0.5	0.033	0.004
1/20/2014	2014	4		0.25	1.00	Not measured	60	0.5	0.033	0.004
1/20/2014	2014	4		0.25	1.00	Not measured	60	0.5	0.033	0.004
Monthly sturgeon take (Calculated based on pile-driving data/Anticipated from Table 9 of the NMFS BO)										0.04/0.48
Cumulative sturgeon take to date (Calculated based on pile-driving data/Anticipated from Table 9 of the NMFS BO)										0.71/2.16