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**To:** Stefan Galvez, California Department of Transportation

**From:** Jason Minton

**Date:** October 23, 2009

**RE:** San Francisco-Oakland Bay Bridge East Span Seismic Safety Project – Self Anchored Suspension Span, T1 Temporary Access Trestle Pile Driving  
Preliminary Results of Daily Bird Predation Monitoring for 10/23/2009

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This memorandum provides preliminary results of bird predation monitoring conducted on October 23, 2009 during pile driving for the T1 temporary access trestle. The monitoring was conducted in compliance with the requirements outlined in the Final Hydroacoustic Monitoring Plan for Driving of Temporary Access Trestle Piles for the Self-Anchored Suspension Span (October 2009).

Monitoring during pile driving has several goals:

- monitoring to confirm the presence or absence of bird predation as an indicator of fish mortality;
- observing the level of bird predation by quantifying the number of bird strikes per minute and the duration of the event; and
- identifying the species of fish affected.

## **Methods**

The bird predation monitor was located on a boat in the immediate vicinity [within 200 meters (660 feet)] of the temporary access trestle pile driving located between Yerba Buena Island and Pier T1 (Figure 1). The monitor recorded birds' feeding activity on standardized data sheets throughout the monitoring period, including during the pile driving events and during the intervals between piles. If feeding was observed, one-minute counts of bird strikes were initiated. Those counts were repeated throughout the duration of the pile driving activity, as needed.

The monitor was prepared to identify the species and sizes of any impacted fish either through observation with binoculars, or by collecting specimens with a dip-net. The survey protocol required the observer to collect any green sturgeon or salmonids observed for transfer to NOAA-Fisheries. In addition, general bird activity and behavior during pile driving and throughout the day were noted and recorded.

## Results

### *Pile Data*

On October 23, 2009, a total of one (1) steel pipe pile of 36-inch diameter was driven with the Delmag D 32-30 diesel impact hammer. The entire duration (3 minutes) of the driving was monitored, and the pile was identified from Figure 1 as pile number 17. Pile driving occurred along the relatively shallow shoreline of Yerba Buena Island. An air bubble curtain sound attenuation system was used to reduce sound pressure and exposure levels during impact driving.

### *Driving Data*

The monitors were on-site from 1305 to 1414 hours. The piles were driven from 1350 to 1352 hours and 1353 to 1354 hours. Table 1 shows the approximate period of the impact pile driving, and the occurrence of bird feeding/activity/predation when observed.

### *Bird Predation Data*

There was no observation of any bird predation events during the monitoring period.

A single western gull (*Larus occidentalis*) was observed to occasionally perch on Pier T1 before and after the pile driving period. No gulls were observed circling the pile driving activity.

### *Fish Observations*

No dead or injured fish were observed. Observations did not indicate that pile driving had impact to fish.

**Table 1. Pile driving periods for the SAS temporary access trestle on October 23, 2009. Bird strikes are recorded per one-minute interval during impact pile driving, the interval between piles, and at least 20 minutes following the end of driving.**

Pile #*	Pile Driving Duration		Air Bubble Curtain (Y/N)	Bird Predation Observed (Y/N)	Strikes per Count Interval	General Bird Activity/Behavior (Gull Numbers)
	Start Time	End Time				
<i>October 23, 2009</i>						
17	1350	1352	N	N	0	None
17	1353	1354	N	N	0	None

\* Intervals between piles are recorded on separate rows if bird predation was observed.

**Figure 1.**

