

to January 1999. Mean monthly counts for the same period range from approximately 15 in September 1998 to 107 in June 1999 (San Francisco State University, unpublished records 1998–1999). The abundance of harbor seals at this site during the winter months likely coincides with the presence of spawning Pacific herring near the island.

Angel Island is a small haul-out site located approximately 7.4 km (4.6 mi) from the project site. A maximum count of 15 seals was observed in the 1980s and most recently, six harbor seals were seen in 1989. No pupping has been observed at the site.

The next closest haul-out site in the Bay is approximately 14 km (8.7 mi) away at Castro Rocks, near the Richmond end of the Richmond-San Rafael Bridge. The Castro Rocks haul-out site is a recognized pupping site. A maximum of 176 harbor seals were observed at Castro Rocks in October 1999 (San Francisco State University unpublished records, 1998–9).

#### *Gray Whales*

The vast majority of all gray whales are found in the Pacific Ocean along the western coastline of North America. Here, they spend their winters in the waters off Baja California and migrate more than 9,000 kilometers (5,600 miles) north to spend their summers north of Alaska. They are typically seen off the California coastline from December through May as they migrate northward to the Bering and Chukchi Seas, and again in the return trip to Baja California.

Gray whales have been sighted more frequently in recent years in San Francisco Bay. Reduced food supply in the Bering Sea has been suspected as the most probable cause. Gray whales have been sighted in the Bay in areas off Sausalito in Richardson Bay and the tip of the Tiburon Peninsula (approximately 11 km or 7 mi northwest of the project area) and as far south as the San Bruno Shoals area (approximately 23 km or 14 mi southwest of the project area). Gray whales have been observed foraging in these areas. Sightings in the Bay have typically been made from December through May, during the whales' coastal migration. Calves may be expected during the migration north with mothers in March and May. Most recently, in February 2001, a pod of gray whales was observed near the Dumbarton Bridge in the South Bay.

Gray whales heading to the San Bruno Shoals area would pass beneath the SF-OB. It is likely that some of the whales that enter the Bay would swim through

the two deep-water shipping channels beneath the West Spans of the bridge. Though the number of sightings of gray whales to the east of YBI and in the immediate vicinity of the SF-OB is low, they are not precluded from swimming there to reach the San Bruno Shoals area or foraging near or in these areas.

#### **Potential Effects on Marine Mammals and Their Habitat**

At this time, NMFS considers that underwater SPLs above 190 dB re 1 micro-Pa RMS (impulse) could cause hearing injury to harbor seals and sea lions and SPLs above 180 dB re 1 micro-Pa RMS (impulse) could cause hearing injury to whales. In addition, the effects of elevated SPLs on marine mammals have the potential to cause annoyance, disruption of echolocation, masking, avoidance of an area, habitat abandonment, aggression, pup/calf abandonment, tissue rupture and hearing loss. Therefore, CALTRANS has determined that in-water pile driving outlined in the project description has the potential to harass California sea lions, Pacific harbor seals, and gray whales that may be swimming, foraging, or resting in the project vicinity.

As indicated by monitoring elsewhere, the use of vibratory hammers for installing sheet-pile sections for the dam and the vibratory driver/extractor used to install and remove temporary piles are not expected to produce noise levels sufficient to result in a significant behavioral response in pinnipeds.

During the 2-month PIDP construction period, sound measurements were taken during pile driving of three piles, and marine mammals were monitored at the project site and at the harbor seal haul-out site on YBI. Results of observable effects of the PIDP on marine mammals have been summarized previously in this document and also provided in the Marine Mammal Impact Assessment Report prepared by CALTRANS in August 2001 (CALTRANS 2001). More specifically, the demonstration provided CALTRANS an opportunity to measure resulting SPLs both in air and under water, record impacts to marine mammals and experiment with measures to reduce harm to marine mammals. Sixty-eight pinnipeds (55 harbor seals and 13 sea lions) were sighted during monitoring activities. Of this total, 57 pinnipeds (47 harbor seals and 10 sea lions) were seen during non-pile driving activities. Only eight harbor seals and three sea lions were observed near the PIDP site during actual pile driving, which totaled 12 hours and 51 minutes. In addition, up to 85 harbor

seals per monitoring period hauled out at the semi-protected cove on the southwestern side of YBI, approximately 1,500 m (4,920 ft) from the pile-driving area. No gray whales were observed.

The East Span Project is not expected to result in any significant impacts to marine mammal habitat. Short-term impacts will include the minimal disturbance of the sediment where the channels are dredged for barge access and where individual bridge piers are constructed. Long-term impacts to marine mammal habitat will be limited to the footprint of the piles and the obstruction they will create following installation. However, this impact is not considered significant as the marine mammals can easily swim around the piles of the new bridge, as they currently swim around the existing bridge piers.

#### *California Sea Lions*

Of the 13 total sea lions observed during the PIDP construction period, three individual sea lions were observed in the PIDP construction site within and beyond the 500-m (1,640-ft) safety zone during the actual driving of piles. The three sea lions rapidly swam and porpoised out of the area when pile driving began, indicating possibly: (1) increased sensitivity to the pile driving noise in air and/or water, (2) less conditioning to anthropogenic noise, or (3) a difference of the level of sound received by the sea lions resulting from varying human, environmental (ambient) and hammer magnitude or conditions at the time of pile driving. Alternatively, since the three sea lions were present at the start of pile driving, their response could indicate that they were startled by the noise (SRS Technologies, 2001). The frequency and duration of the noise and whether underwater or airborne sounds start suddenly or gradually, creating a ramping effect (as usually performed for the PIDP), may also influence the behavior of these mammals. However, none of these factors could be explored in detail within the scope of the demonstration project.

Noise levels from the East Span project are not expected to result in harassment of the sea lions hauled out at Pier 39 as airborne and waterborne SPLs would attenuate to below harassment levels by the time they reach the haul-out site, 5.7 kilometers (3.5 miles) from the project site.

#### *Pacific Harbor Seals*

The Richmond Bridge Harbor Seal Survey continues to gather data on harbor seals at the Castro Rocks and YBI