Relocation of a Harbor Seal Haul-out Site in Alameda

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Background:
Harbor seals (*Phoca vitulina*) occur throughout the northern hemisphere, and there are five different subspecies. One of the subspecies, the Pacific harbor seal (*Phoca vitulina richardii*), occurs from Baja California north through the Pribilof Islands, Alaska. There are about 30,000 harbor seals in California (NMFS 2011), and about 600 harbor seals using San Francisco Bay (Lowry et al. 2008). Harbor seals usually spend most of their lives in nearshore waters, and as their name imply, they often inhabit bays, harbors, and estuaries. They come ashore (i.e. haul-out) to rest on mudflats, sandy shores, rocky shorelines, and human-made structures mostly during low tides but also at some sites that exposed during high tides. Adults can be 1.7 to 1.9 m total length and weigh 155 kg, males tend to be slightly larger than females.

Mating occurs underwater soon after the pupping season, which in SF Bay is mostly in March through May. Males will vocalize underwater that broadcasts their size and position within a complex hierarchy (Nicholson 2000) that helps maintain underwater territories (Hayes et al. 2004). It is suspected that those males that defend territories near haul-out sites used by females may produce more pups (Hayes et al. 2006). The 20 to 25 pound pups are able to swim immediately after birth, and are weaned within three to five weeks of birth. Molt occurs in June and July, when they typically spend more time on haul-out sites. They forage at all times of the day, but often during nighttime when they eat benthic (i.e. bottom dwelling) species like flatfish, sculpin, and octopus and pelagic (i.e. living in the water column) species like anchovies, herring, and squid. In San Francisco Bay, one of the most prevalent prey is yellowfin goby that is an introduced species from China (Gibble and Harvey in press).

Harbor species rest onshore at sites that generally have some specific characteristics:

1. The site has access to deep water nearby.
2. It is accessible at low tide (or at some sites at high tide).
3. It has minimal disturbance (although seals can become habituated to sites with human activity if it does not cause the seals to repeatedly vacate the site).
4. It is reasonably close to foraging sites.
5. Sites typically have a gentle slope to allow seals to crawl out of the water mainly using their front flippers.

Submitted by Staff
Re: 6-C
7-7-15

The Issue:
Harbor seals have recently been using various haul-out sites in the vicinity of Alameda, including an abandoned wooden dock at the location of a proposed berthing and mooring facility for ferry vessels (Fig. 1). The Water Emergency Transportation Authority (WETA) and City of Alameda have received permits and approvals to remove the old wooden dock used by the seals and then dredge and construct a berthing facility for up to 12 ferries. The removal of the old wooden dock and the construction activity will displace the harbor seals from the location they are presently using, therefore, WETA and the City of Alameda have agreed to establish an alternative location where the seals can rest ashore that is safe for the seals, affordable to build, and viewable by the public (see Memorandum of Understanding between WETA and the City of Alameda dated March 2015). Marine mammals also are protected under a federal law (The Marine Mammal Protection Act [MMPA] of 1972), thus WETA and the City of Alameda must comply with federal laws. Developing a long-term plan for the seals in this area should be done in such a manner as to decrease inadvertent violations of the MMPA, which restricts harassment of marine mammals.

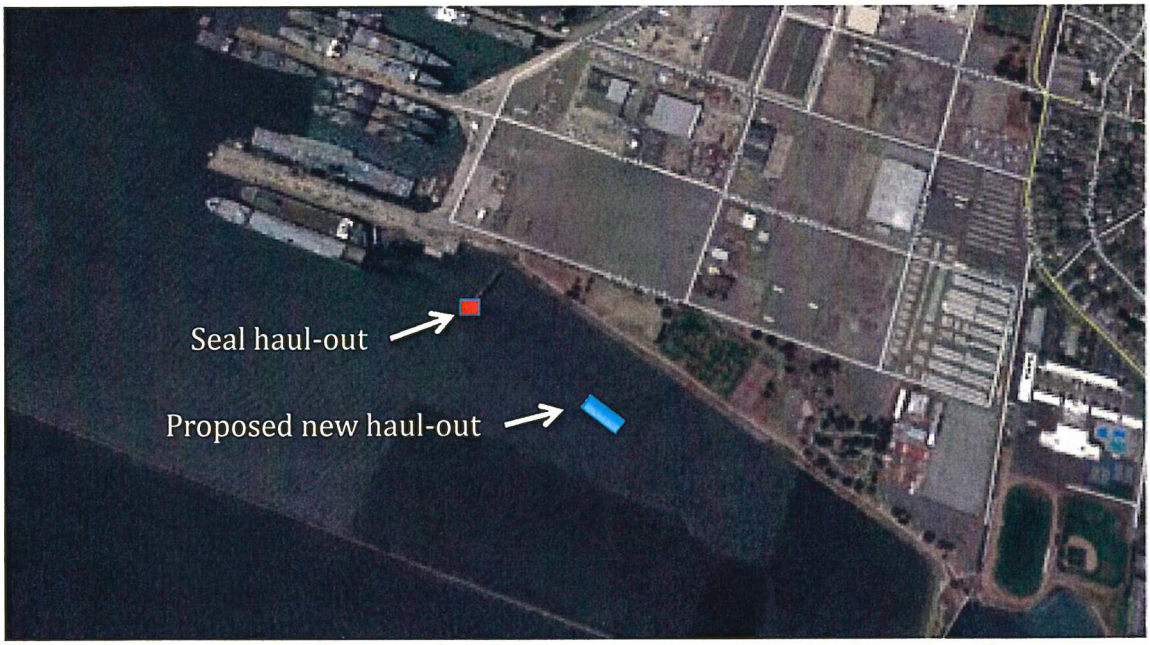

Figure 1. Location of current haul-out site of harbor seals at the end of an abandoned wooden dock in Alameda (red square) and the approximate proposed location of a new haul-out site (blue rectangle). The proposed new site should be >100 m offshore and at least 250 m southeast of the new ferry maintenance facility.

Counts of harbor seals during surveys of birds within the Alameda Wildlife Reserve have produced estimates of 6 – 46 seals in the area (Feeney 2015). Although this is not considered a major haul-out location for seals in SFB, the number of animal using the area is not inconsequential, there is public concern regarding the

disposition of the seals, and WETA and the City of Alameda also want to accommodate the use of the area by harbor seals. Therefore, it was decided that to initiate a plan to identify a location and concept design for a replacement haul-out site.

Proposed Plan and Biological Considerations:
To establish a new haul-out site that would likely be used by the seals will require careful consideration of the haul-out needs of the seals, biology and behavior of the seals, and design and location of the new haul-out. Because harbor seals cannot climb vertical surfaces easily, the new structure needs to have a gentle slope. Harbor seals seek haul-out sites that are free from terrestrial predators or sources of disturbance, so the new haul-out site should not be connected to land, and should be greater than 100m from shore. Although the seals will tolerate some movement of their haul-out site, they seem to use more stable sites (e.g. rocks, sandflats or mudflats, or well-secured docks.

The proposed design for the new haul-out site would be constructed of a wood or concrete float that could be secured to the bottom using a chain and weight or with pilings (Fig. 2). One potential design of a haul-out site would be a rectangular floating structure with a flat surface (8-10' X 20-25') approximately 1.5' above the water's surface secured in place by two pilings at each end and a sloping surface (10' X 20'), with the sloping side facing the nearest shore (a design variant under consideration would include a second sloping side). Sloping the surface towards the shore would increase the visibility of seals using the haul-out site, especially because most seals will likely rest on the sloped surface and not on the flat upper surface. The surface of the sloped sides should be somewhat rough to allow easy access by the seals, possibly constructed of a water-resistant but non-slippery material. The new haul-out site would be located at least 250 m to the east of the current dock site used by the seals, and at least 100 m from shore (Fig. 1). The overall size of the float would be more than sufficient to accommodate the current number of harbor seals typically observed at the current haul-out location near the WETA project site.

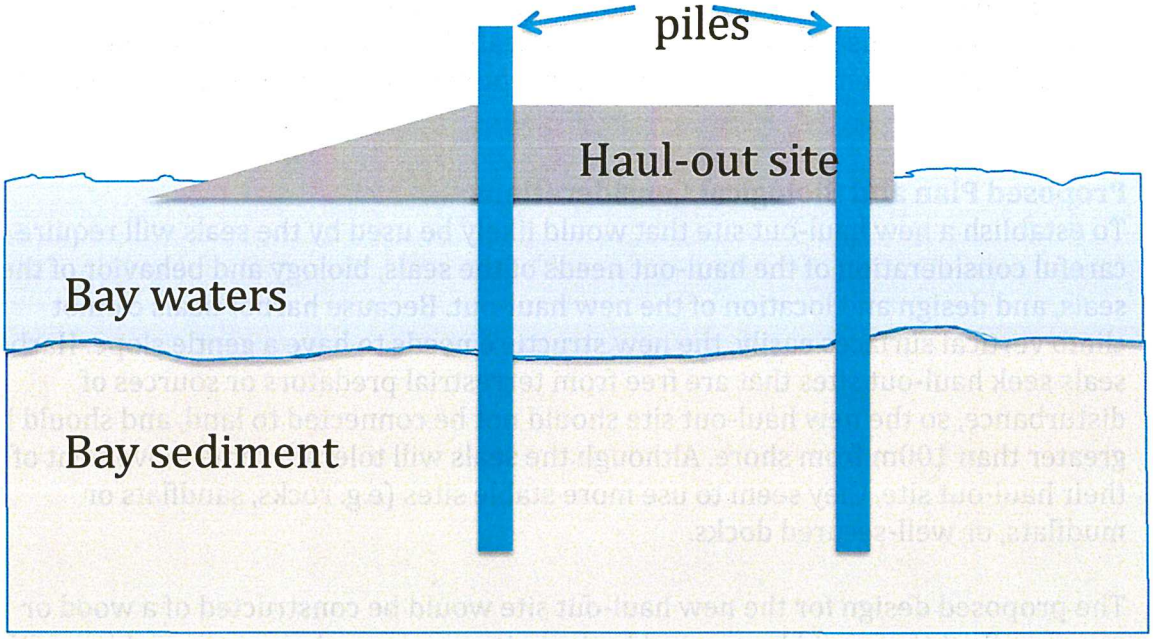

Figure 2. One potential design of a floating haul-out site that would be secured using four pilings, two at each end.

To encourage the seals to use the new haul-out site, the new haul-out would be secured with chain and weight about 10 m away from the current haul-out site. Hopefully within weeks the seals will begin to use the new site. If they continue to use the old site, some sort of barrier (e.g. fencing) could be placed around the old site so the seals were forced to use the new haul-out site or sloped portion of the dock currently used by the seals could be removed. Once the seals have become habituated to the new haul-out and are using it regularly, for instance for a week or two, then the new haul-out site would be sequentially moved over the period of a few weeks, to the new permanent location to the east and secured. This process would gradually present the new location to the seals, allow them to become accustomed to the new structure, then would slowly introduce them to the new location by a few short movements of the new haul-out site.

The new construction (e.g. removal of the old dock, dredging, dock and landing construction, and eventual use of the facility by ferries and personnel would likely cause some disturbance to the seals now using the new haul-out site. To minimize the chance that the seals would vacate the new site, the new haul-out site should be placed at least 250 m distance from construction and operations of the new ferry maintenance facility.

I also recommend that signage be placed at the beach at the eastern edge of the enclosed area where kayaks are launched. The signage should state that people should remain at least 100 m from seals on the haul-out site, and that seals are protected from disturbance by federal law. A sign attached to the pilings also could warn people to remain at least 100 m from the new haul-out site to minimize

disturbance to the seals. Additional signage with information about the biology of harbor seals, with warnings about minimizing disturbance, could be placed on land directly onshore of the location of the new haul-out site.

Schedule:
Assuming that the required permits and approvals can be obtained in a reasonable timeframe, the following would represent an optimal schedule for ensuring that the new haul-out is implemented before the August 1, 2016 in-water construction start of the new WETA facility (schedule developed in consultation with WETA and the City of Alameda):

Milestone	Duration	Start
Finalize design and project specifications	2 months	15 Jul. 2015
Fabricate float and pile/anchoring mechanisms	3 months	15 Sep. 2015
In-water deployment of float	1 week	15 Dec. 2015
Transition of float to permanent location	1-2 months	01 Jan. 2016
Secure float in permanent location	1 week	01 Mar. 2016

This schedule allows float placement and transition to occur during winter a time when seals are not as dependent on a haul-out site as they are during pupping and molt (March – August).

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