Whale Entanglement Working Group (WG)
Aerial Survey of Crab Pot Gear and Whales

Summary of Dec 8, 2017 survey
(Prepared by Karin Forney, NOAA/SWFSC; scientific advisor to the WG

Survey Design:

The aerial survey was planned to be conducted as soon after season opening as weather permits (on or after Nov 15), within the Southern Management Area (south of Sonoma/Mendocino County line). The available funding was sufficient to contract a total 10 flight hours in a twin-engine, high-wing aircraft (Partenavia P-68 Observer model). Based on an expected aircraft transit time of 3.5 hrs round trip between Oxnard and Monterey, this provided 6.5 hrs of aerial survey time, which was expected to be sufficient to complete a set of parallel east-west transects, spaced 4 nmi apart, from the coast to about 150-m (82-fm) water depth between Pt. Pinos and Pt. Reyes (Figure 1). This region is where humpback whale densities tend to be highest (compared to areas north of Pt. Reyes).

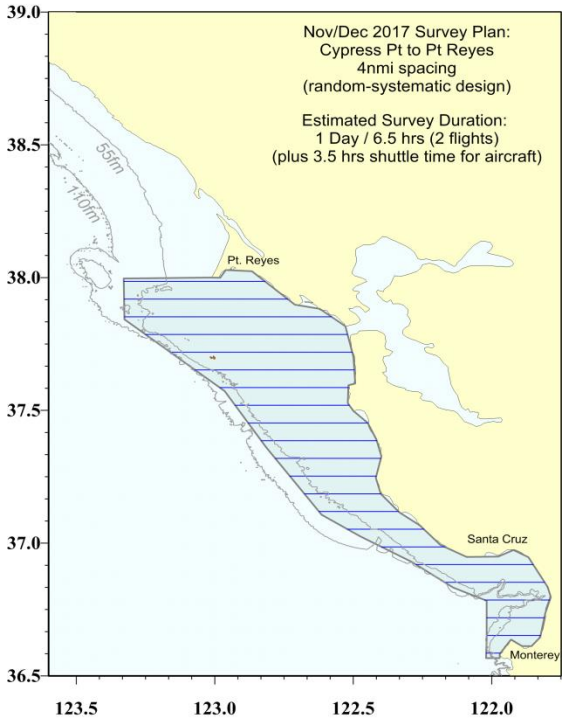

Figure 1 Planned aerial survey transects, covering area from the coast to about 150-m (82-fm) water depth between Pt. Pinos and Pt Reyes. This was the level of coverage we expected to be able to achieve given the available funding .

Survey Logistics:

The earliest opportunity to conduct the aerial survey under suitable weather conditions occurred during the week of December 4-8, and Friday Dec 8 was forecast to provide the most favorable weather conditions. Karin Forney conducted the survey with two other experienced aerial observers from the Monterey Bay area, Scott Benson (NOAA/SWFSC) and Katherine Whitaker. Data collection protocols were modeled after those used during NOAA/SWFSC's standard marine wildlife surveys, but they were modified for the anticipated high densities of crab pots in some areas. The most significant change was that the survey was a one-sided strip transect survey, recording crab pots only within a defined survey strip from directly below the aircraft to a distance of 435 m (0.24 nmi) on the non-glare side of the aircraft. This allowed a high probability of detecting gear and ensured that all information could be reliably recorded (with time and position) using a laptop computer and custom software.

Dec 8, 2017 Aerial Survey Results:

Completed transects (gray lines), sightings of whales, and locations of crab pot gear are shown in Figure 2. Winds were mostly light with excellent viewing conditions from northern Monterey Bay to Half Moon Bay and north of the Golden Gate. Winds were greater with poor-to-fair viewing conditions in the southern portion of Monterey Bay and between Half Moon Bay and the Golden Gate. Whale numbers recorded during the survey represent a minimum, because animals that are diving when the plane passes overhead cannot be detected.

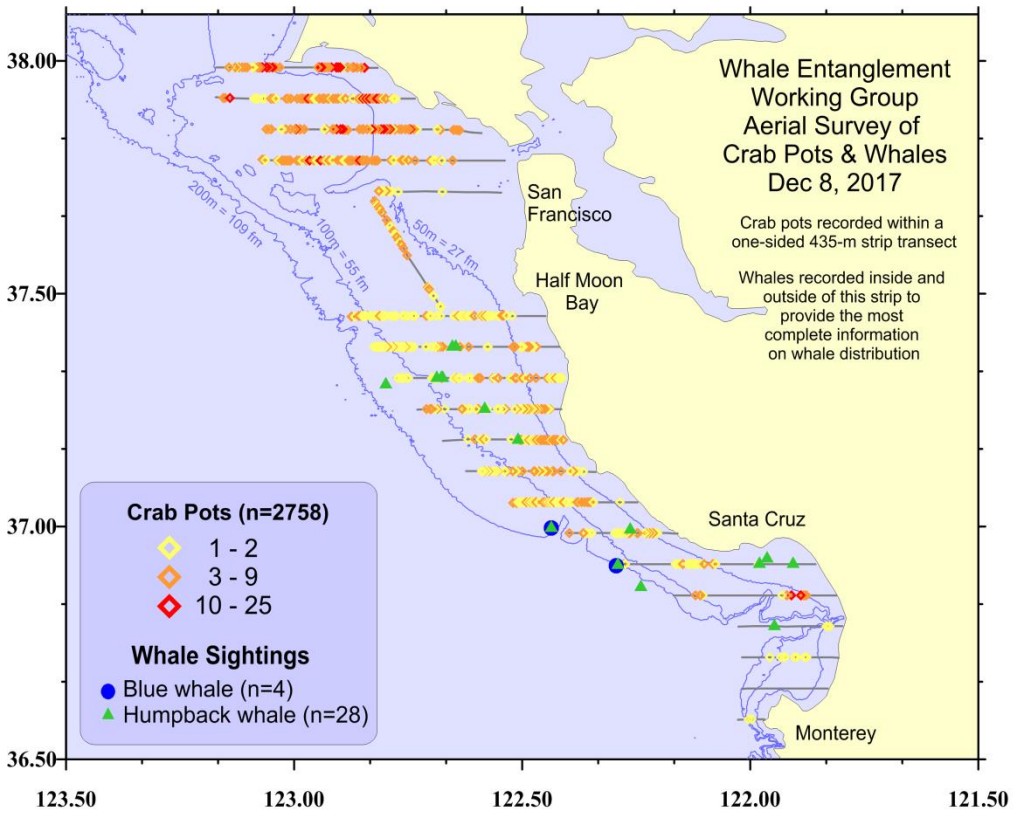

Figure 2. Flight transects, crab pot gear, and whales during the 8 December 2017 aerial survey.

Note: Some of the transect lines had to be truncated or skipped to avoid exceeding the available 10 flight hours, because the pilot unexpectedly had to take a much longer route from Oxnard to Monterey to avoid intense smoke caused by the 'Thomas Fire' in Ventura County. Therefore, we ended up short about 45-60 minutes for the survey and could not complete the full set of lines.

The survey revealed a few patterns of potential relevance to the RAMP:

1) Crab pot gear densities were greatest north of the Golden Gate and lowest in Monterey Bay. Within Monterey Bay, there appeared to be less gear than during a similar June 2016 aerial survey, even after taking into account the higher winds and less favorable viewing conditions during the Dec 8 flight.
2) Humpback whales were documented in groups of 1-3 animals in both shallow and deeper waters from Monterey Bay to Half Moon Bay. Sighting locations included areas without nearby pot gear and areas of low-to-moderate gear densities.
3) Two pairs of blue whales were seen (in one case feeding on krill) in water depths of about 200-m (109-fm), and crab pots were observed near both sightings.
4) Although most gear was marked by two typical crab pot buoys, a variety of other buoy configurations were observed, including surface gear with one, two, three or four buoys, and buoys of varying sizes and colors.
5) Crab pot gear extended out the offshore end of some of the transect lines, suggesting that any future surveys might need to include areas beyond 150-m (82-fm) water depth, particularly because whales are commonly found there.

Additional summaries and analyses, including depth distribution of crab pots and whales, are planned. Working group input is welcome! ---Karin