2021-22 Risk Assessment: Available Data

Last updated: October 29, 2021. See the RAMP Data Sources Overview for more information.

Contents

Items with updated information are followed by an *.

TRIGGERS REQUIRING MANAGEMENT ACTION

Confirmed Entanglements: §132.8(c)(1) *

Data provided by: Lauren Saez and Dan Lawson, NMFS

Table 1. Number of Confirmed Entanglements of Actionable Species between January 1 and October 20, 2021, prepared by West Coast Region.

Actionable Species	Confirmed Entanglements in CA commercial Dungeness crab gear	Confirmed Entanglements in unidentified fishing gear reported off CA
Humpback whales	1	4
Blue whales	0	0
Leatherback sea turtles	0	0

Between January 1 and October 20, 2021 there have been 11 confirmed humpback whale entanglements, 0 confirmed blue whale entanglements, and 0 confirmed leatherback sea turtle entanglements reported to NMFS West Coast Region (Table 1). Of the 11 confirmed humpback whale entanglements, eight were reported from California: seven in Fishing Zone 6 and one in Fishing Zone 5. Three of these eight entanglements were attributed to specific fisheries (one each to spot prawn, experimental box crab, and Washington commercial Dungeness crab), one has been provisionally attributed to commercial lobster, and four are classified as occurring in unidentified fishing gear. Of the other three confirmed humpback whale entanglements, one was reported from Mexico in California commercial Dungeness crab gear on June 9, and one entanglement each was reported from Oregon and Washington.

Table 2. Impact Score Calculations based on Confirmed Entanglements in California commercial Dungeness crab gear and confirmed entanglements in Unknown Fishing Gear reported off California, prepared by CDFW.

Actionable Species	Current Fishing Season	Current Calendar Year
Humpback whales	0	0.75 + 0.38 = 1.13 *Preliminary total; see below
Blue whales	0	0
Leatherback sea turtles	0	0

The fishing season has not yet started, so the cumulative Impact Score for the current fishing season is 0 for all three species (Table 2). There have been no confirmed entanglements of either blue whales or leatherback sea turtles in California commercial Dungeness crab gear (reported from any location) or unidentified fishing gear (reported from California) during the current calendar year, so the cumulative Impact Score for the current calendar year is 0 for these two species.

For humpback whales, there have been two confirmed entanglements during the current calendar year for which CDFW has assigned an Impact Score. One was confirmed in California commercial Dungeness crab gear and assigned an Impact Score of 0.75; one was from Unknown Fishing Gear (i.e., unidentified fishing gear which could not be ruled out as California commercial Dungeness crab gear) and was assigned an impact score of 0.38. See the April 13, 2021 Available Data document for additional information regarding the Unknown Fishing Gear entanglement. Three additional confirmed entanglements in unidentified fishing gear are pending review by CDFW.

Marine Life Concentrations: §132.8(c)(1) *

Data provided by: CDFW; Karin Forney and Scott Benson (NMFS), in collaboration with Upwell Turtles (Upwell.org); Cascadia Research and The Marine Mammal Center; Monterey Bay Whale Watch (processed by Karin Forney, NMFS)

Table 3. Summary of available CDFW-approved survey data for marine life concentrations for Fishing Zones 1-6, and whether the triggers established in Section 132.8(c)(2) have been met for any Fishing Zone.

Fishing Zone	CDFW-approved survey data	Triggers attained?
Zone 1	CDFW/USCG Aerial Survey	No
Zone 2	CDFW Aerial Survey	No
Zone 3	CDFW Aerial Survey, NOAA Aerial Survey, Cascadia/TMMC Vessel Survey	Yes – CDFW and NOAA Aerial Surveys, Cascadia/TMMC Vessel Survey
Zone 4	CDFW Aerial Survey, NOAA Aerial Survey, Cascadia/TMMC Vessel Survey, MBWW	Yes - MBWW
Zone 5	CDFW Aerial Survey, Cascadia/TMMC Vessel Survey	No
Zone 6	Cascadia/TMMC Vessel Survey	No

CDFW Aerial Surveys *(Fishing Zones 2-5)*

- CDFW aerial reconnaissance surveys were conducted on October 18 and 19, 2021 between Shelter Cove and Piedras Blancas (Figure 1). Sea conditions were generally calm with good visibility. Two flight lines were chosen to maximize airtime and coverage across Fishing Zones; an inshore flight line at approximately 1-2 miles offshore and an offshore flight line at approximately 5-6 miles offshore.
- Few humpback whales were observed between Shelter Cove and Bodega Bay (Fishing Zone 2 and the northern portion of Fishing Zone 3). Large aggregations of feeding humpback whales were observed in the area from Point Reyes down to Half Moon Bay and extending out to the Farallon Islands, with a total of 48 humpback whales observed in Fishing Zone 3. Few humpback whales were observed in Fishing Zones 4 and 5, with only a small aggregation observed in Fishing Zone 5 off the Big Sur coast.

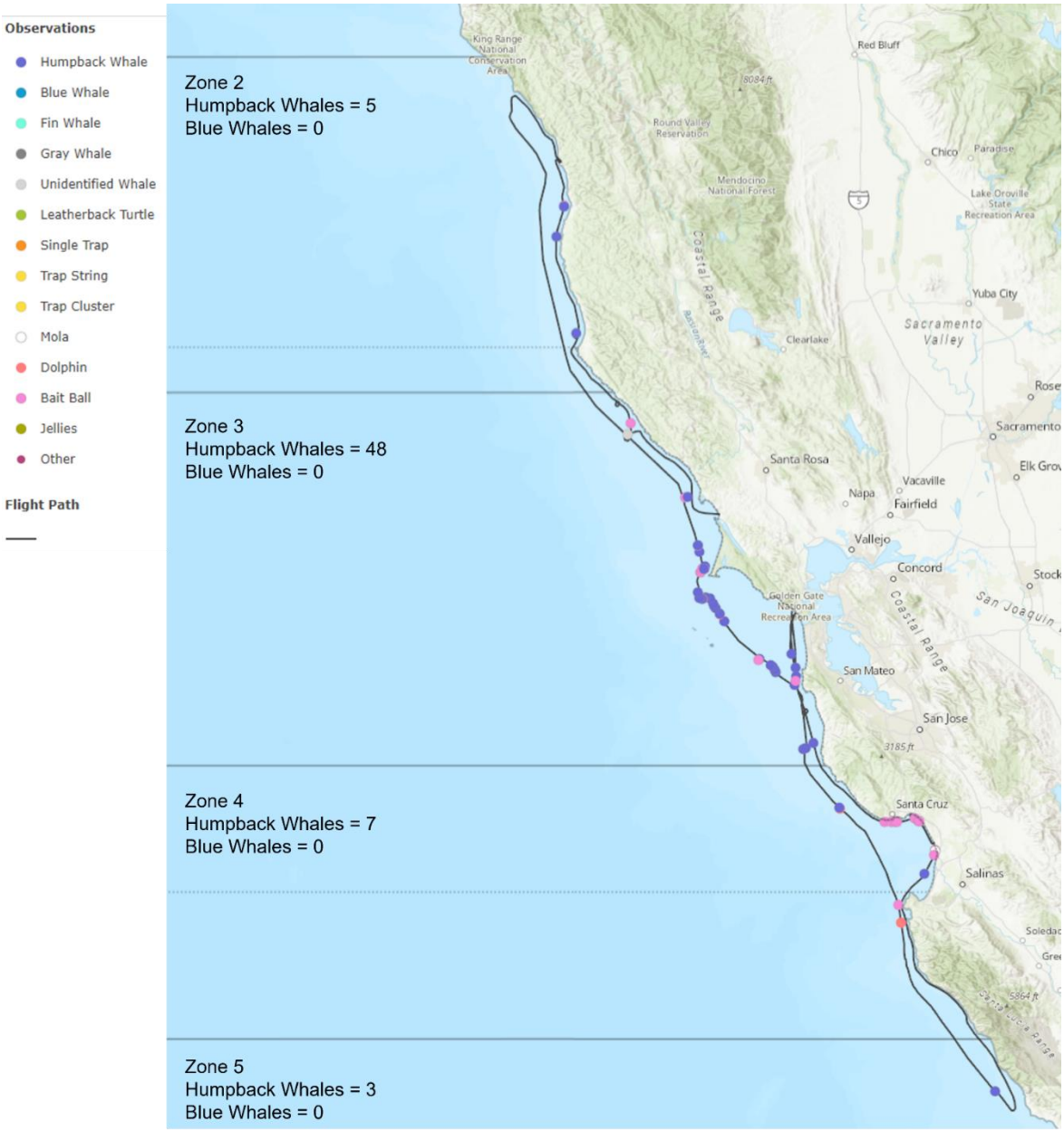

Figure 1. Track lines and observations from CDFW aerial survey on October 19 and 20, 2021. Survey covered Fishing Zones 2, 3, and 4, as well as the northern portion of Fishing Zone 5.

CDFW/USCG Aerial Surveys *(Fishing Zone 1)*

CDFW and the USCG conducted a previously planned rotary flight from Shelter Cove to the Oregon border over two legs on October 27, 2021. The first leg flew south from McKinleyville to Shelter Cove following the 200-foot contour. From Shelter Cove to the Oregon border, the air crew flew the 100-foot contour. On the return flight they flew the 200-foot contour south to McKinleyville. During both legs, a total of three humpback whales were observed between Eureka and Crescent City. Three additional unknown whales and a large group of dolphins were observed in the same area.

NOAA and Upwell Aerial Surveys *(Fishing Zones 3 and 4)*

- Aerial surveys in support of leatherback research were conducted on October 2, 3, 14, 15, 16, and 19 (Figures 2-7) by NOAA in collaboration with Upwell Turtles. Standard NOAA survey methods were used to record all observations of leatherbacks, humpback whales, blue whales, their respective prey if observed (jellies, schooling fish, and krill), as well as other ecosystem indicators such as large ocean sunfish (Mola mola; henceforth 'mola'), which are often found in the same habitat as leatherbacks and feed on the same jellyfish prey (i.e., brown sea nettles).
- Leatherback turtles were observed off the San Mateo County coast and in the Gulf of the Farallones (Fishing Zone 3) on 4 of the 5 survey days in this region.
- The five leatherback sightings included at least four distinct individuals, based on observed body size and shape, and animal coloration (which can vary based on diatom fouling and other factors). The fifth individual may also have been different, but this could not be ascertained with certainty. The leatherbacks were documented foraging in waters of about 20-40 fathoms depth, both north and south of the Golden Gate.
- Few humpback whales were seen on October 2, 2021 inside Monterey Bay (Fishing Zone 4). Humpback whales were very abundant off the San Mateo County coast and in the Gulf of the Farallones (Fishing Zone 3) and were observed feeding on abundant schooling fish (anchovies) within water depths of approximately 20 to 50 fathoms. Daily totals for surveys within Fishing Zone 3 were:
    - October 3, 2021: 34 humpback whales
    - October 14, 2021: 96 humpback whales
    - October 15, 2021: 48 humpback whales
    - October 16, 2021: 65 humpback whales
    - October 19, 2021: 32 humpback whales
- No blue whales were observed during these surveys.

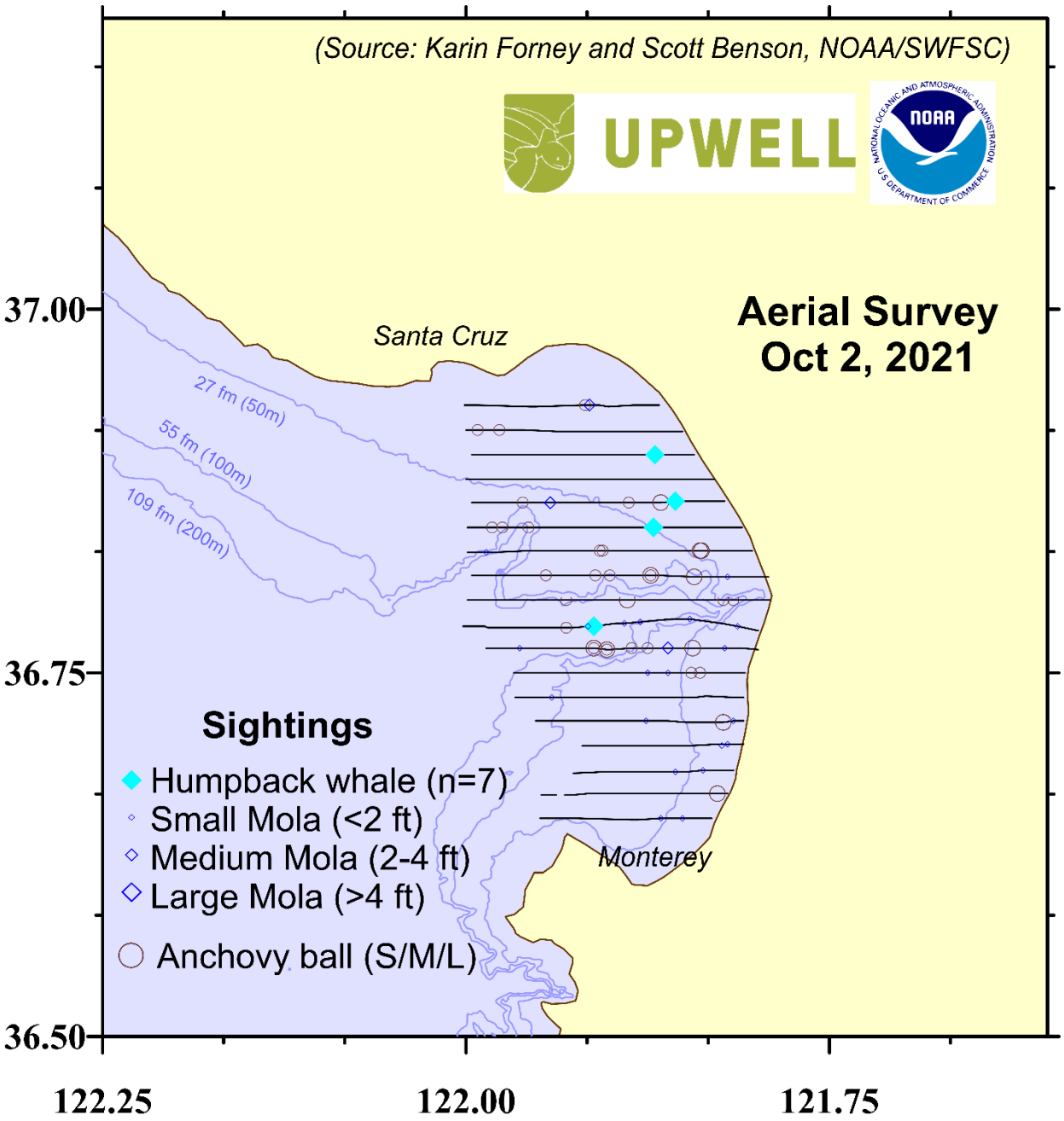

Figure 2. Aerial survey track lines and observations of humpback whales, molas (ocean sunfish), and anchovy balls in Monterey Bay (Fishing Zone 4) on October 2, 2021. Molas and anchovy balls are scored as small/medium/large based on estimated size; large molas tend to co-occur with leatherback turtles but were not observed during this flight. The number of individual whales observed (n=7) is indicated in parentheses.

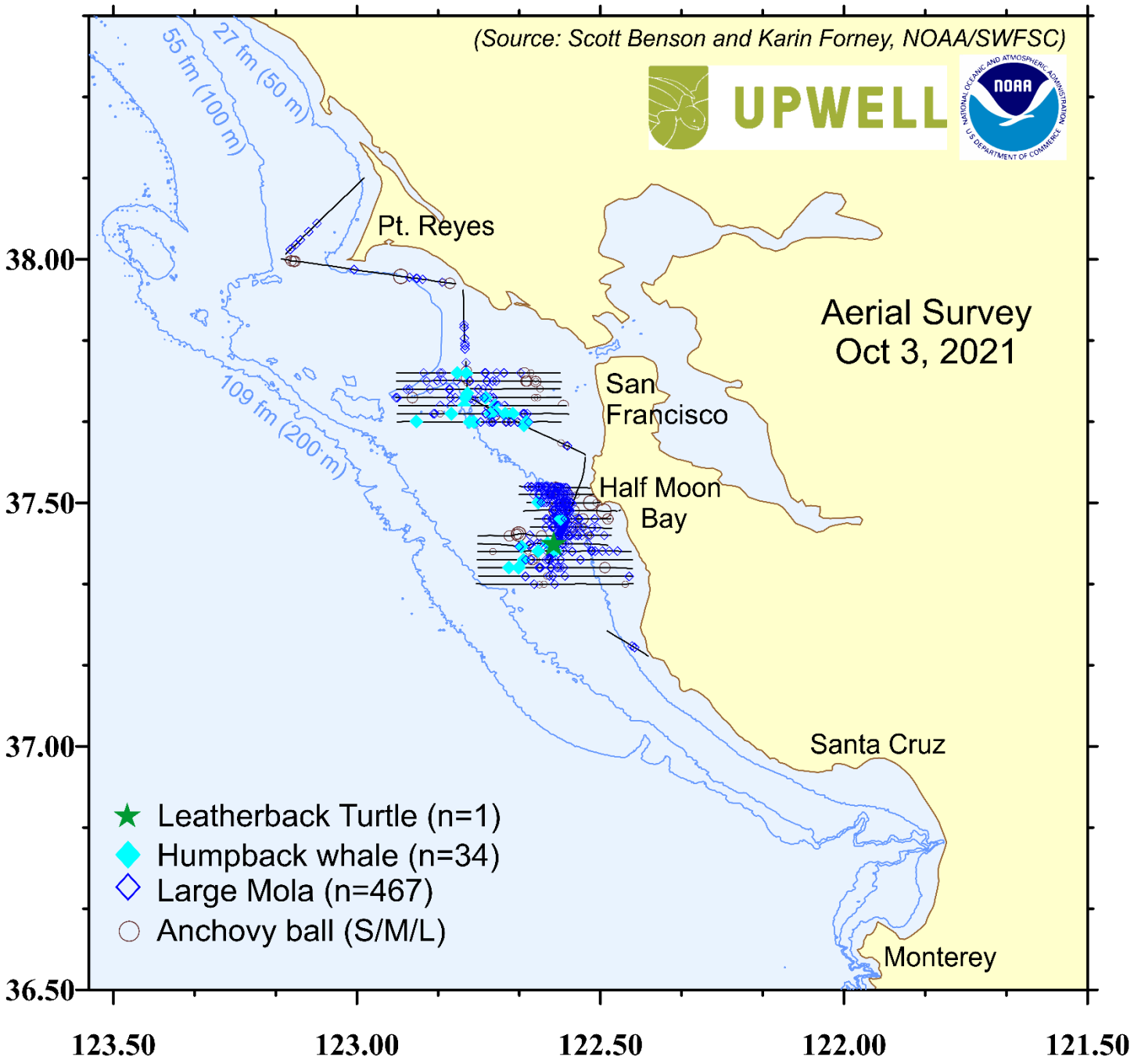

Figure 3. Aerial survey track lines and observations of humpback whales, leatherback turtles, large molas (ocean sunfish), and anchovy balls off San Mateo County and in the Gulf of the Farallones (Fishing Zone 3) on October 3, 2021. Survey coverage was limited by low clouds throughout the day. For clarity, this plot only includes large molas, which tend to co-occur with leatherback turtles. The number of individual whales, leatherbacks, and molas observed are indicated in parentheses (e.g., n=34 for humpback whale).

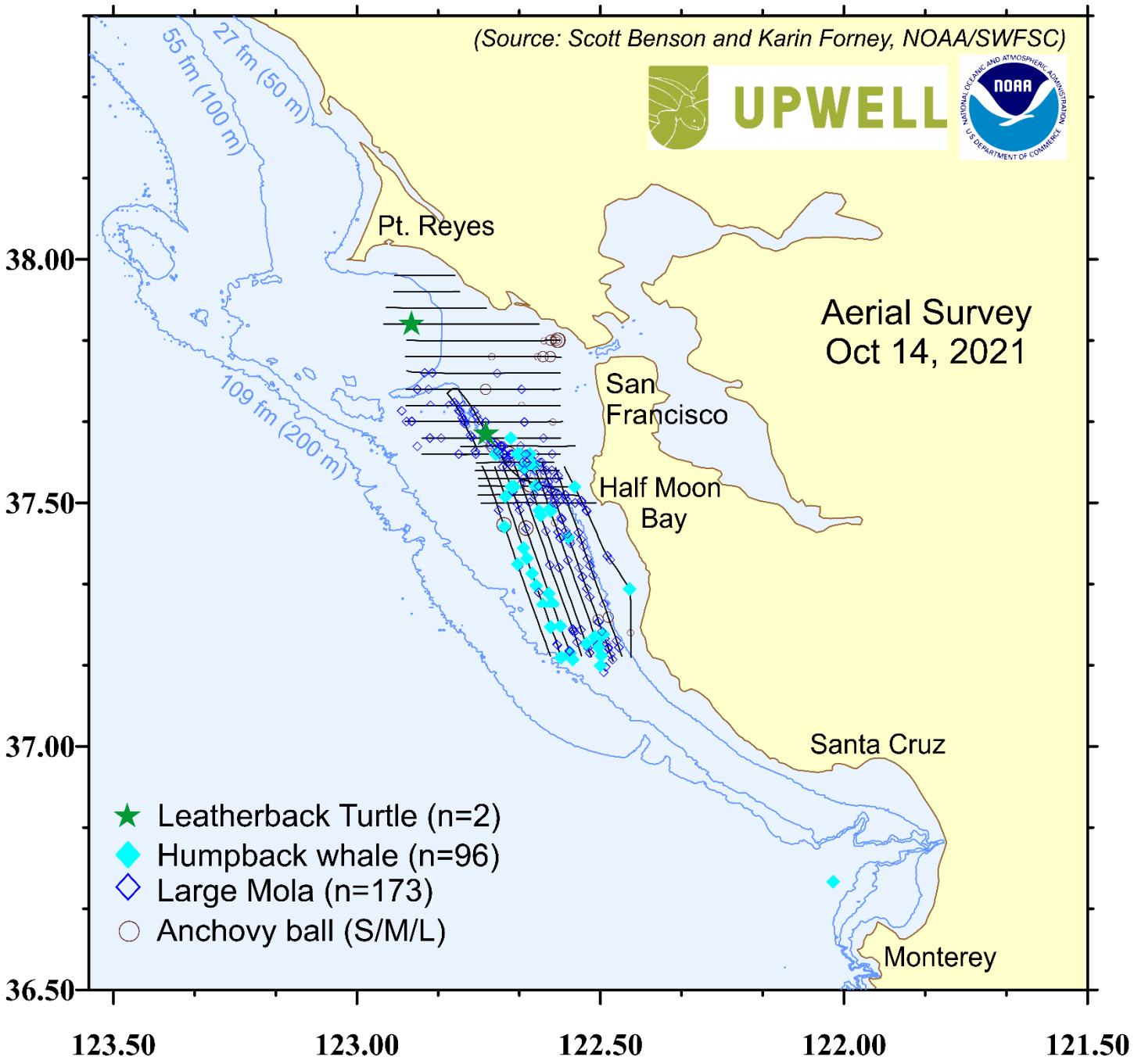

Figure 4. Aerial survey track lines and observations of humpback whales, leatherback turtles, large molas (ocean sunfish), and anchovy balls off San Mateo County and in the Gulf of the Farallones (Fishing Zone 3) on October 14, 2021. Survey coverage included east-west lines from Drakes Bay to Half Moon Bay, and NW/SE lines within the water depths where leatherback turtles have commonly been observed in the past between Half Moon Bay and Pigeon Point. Only large molas, which tend to co-occur with leatherback turtles, are included for simplicity. The number of individual whales, leatherbacks, and molas observed are indicated in parentheses (e.g., n=96 for humpback whale).

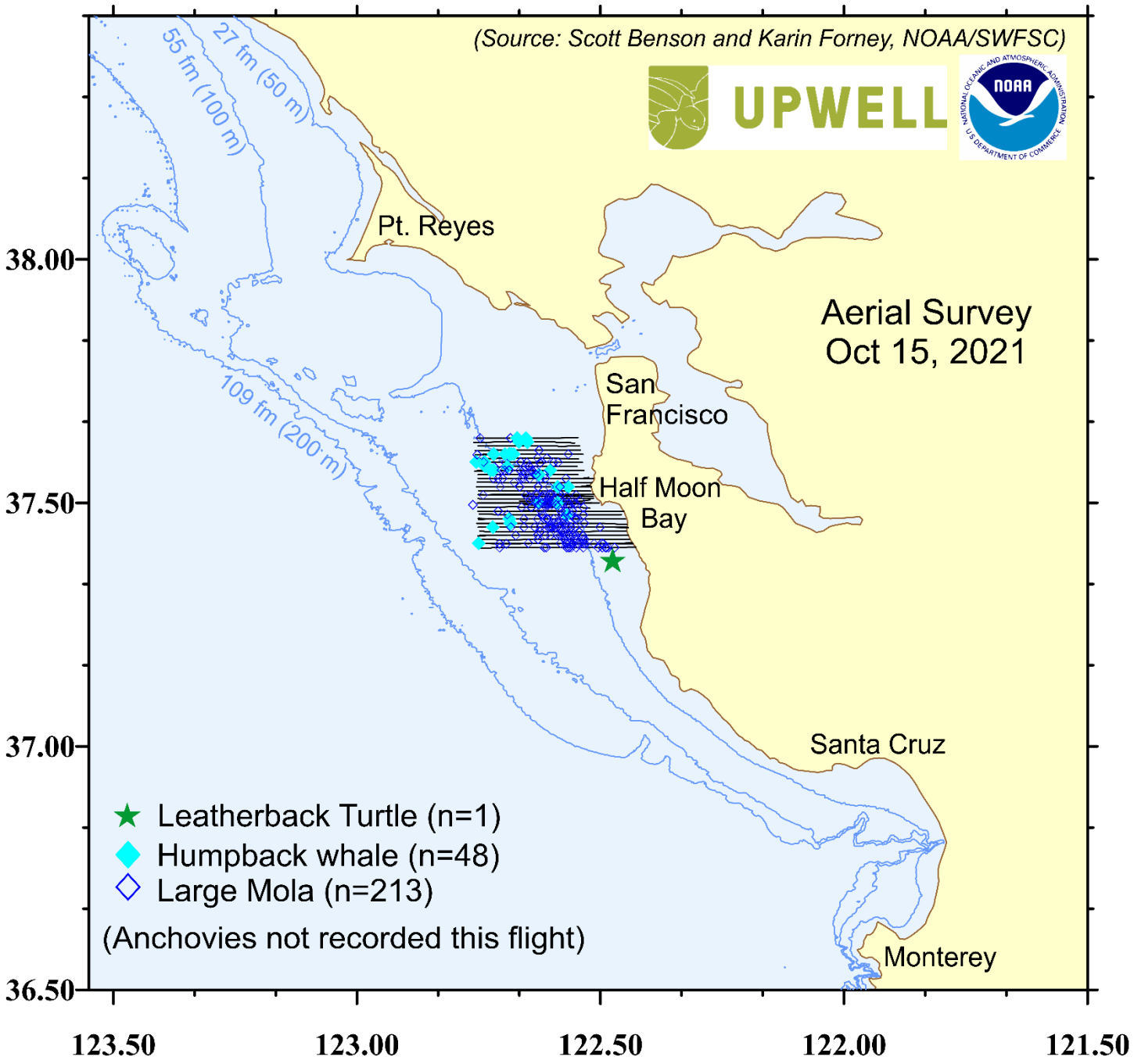

Figure 5. Aerial survey track lines and observations of humpback whales, leatherback turtles, and large molas (ocean sunfish) off San Mateo County and in the Gulf of the Farallones (Fishing Zone 3) on October 15, 2021. These surveys were specifically conducted to search for leatherback turtles near Half Moon Bay for capture/tagging operations. Anchovies were not recorded during this flight to allow the team to focus on searching for leatherbacks. One leatherback turtle was sighted at the end of the day, as the aerial team headed south back to Monterey. Only large molas, which tend to co-occur with leatherback turtles, are included for simplicity. The number of individual whales, leatherbacks, and molas observed are indicated in parentheses (e.g., n=48 for humpback whale). Given the fine-scale nature of the transects (0.5 nautical mile spacing), some of the humpback whale sightings likely represented re-sightings of the same individuals.

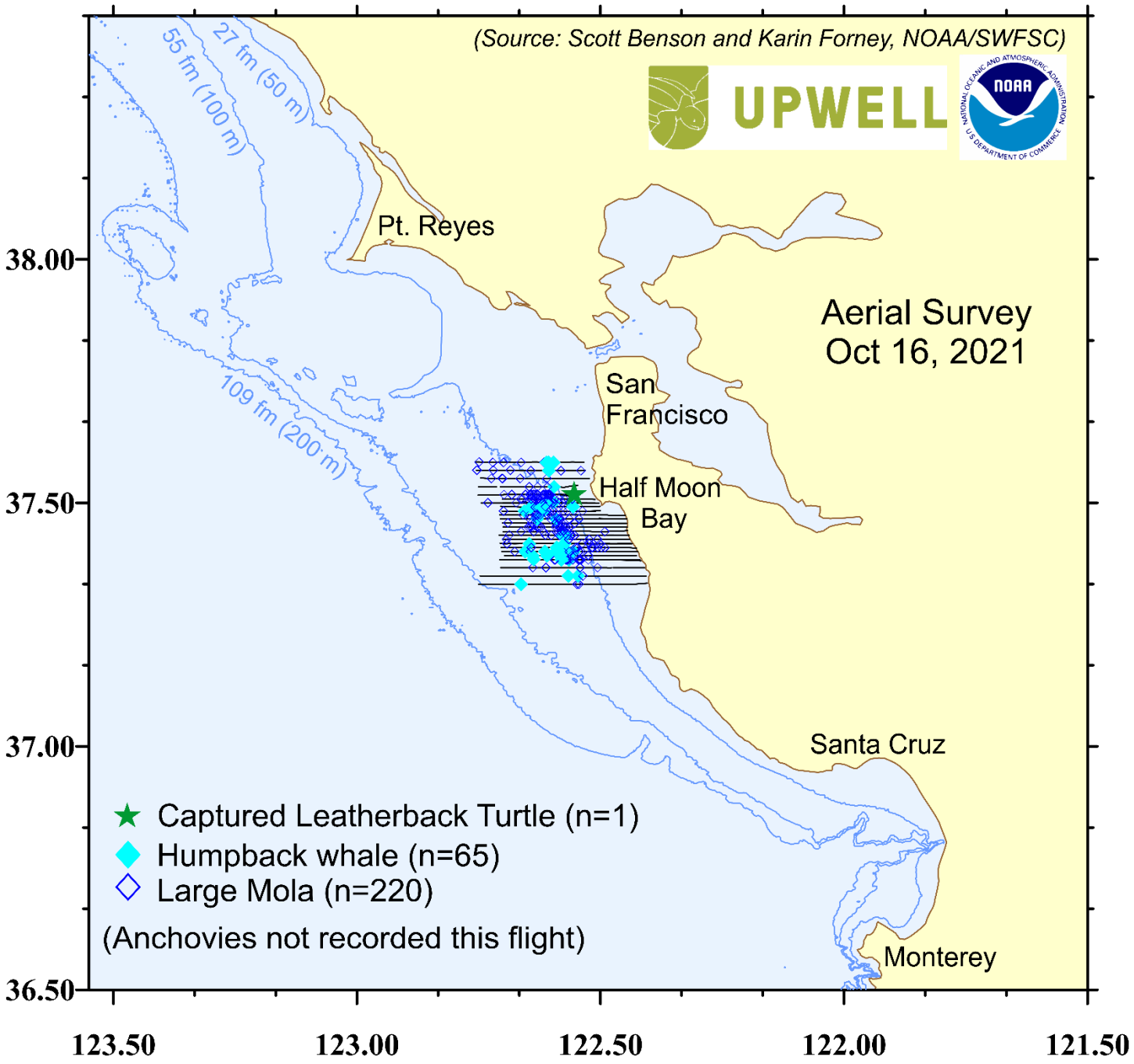

Figure 6. Aerial survey track lines and observations of humpback whales, leatherback turtles, and large molas (ocean sunfish) off San Mateo County and in the Gulf of the Farallones (Fishing Zone 3) on October 16, 2021. These surveys were specifically conducted to search for leatherback turtles near Half Moon Bay for capture/tagging operations. Anchovies were not recorded during this flight to allow the team to focus on searching for leatherbacks. One leatherback turtle was sighted and subsequently captured, tagged with a satellite-linked transmitter, and released (see separate telemetry data contribution). Only large molas, which tend to co-occur with leatherback turtles, are included for simplicity. The number of individual whales, leatherbacks, and molas observed are indicated in parentheses (e.g., n=65 for humpback whale). Given the fine-scale nature of some of the transects (0.5 nautical mile spacing), some of the humpback whale sightings likely represented re-sightings of the same individuals.

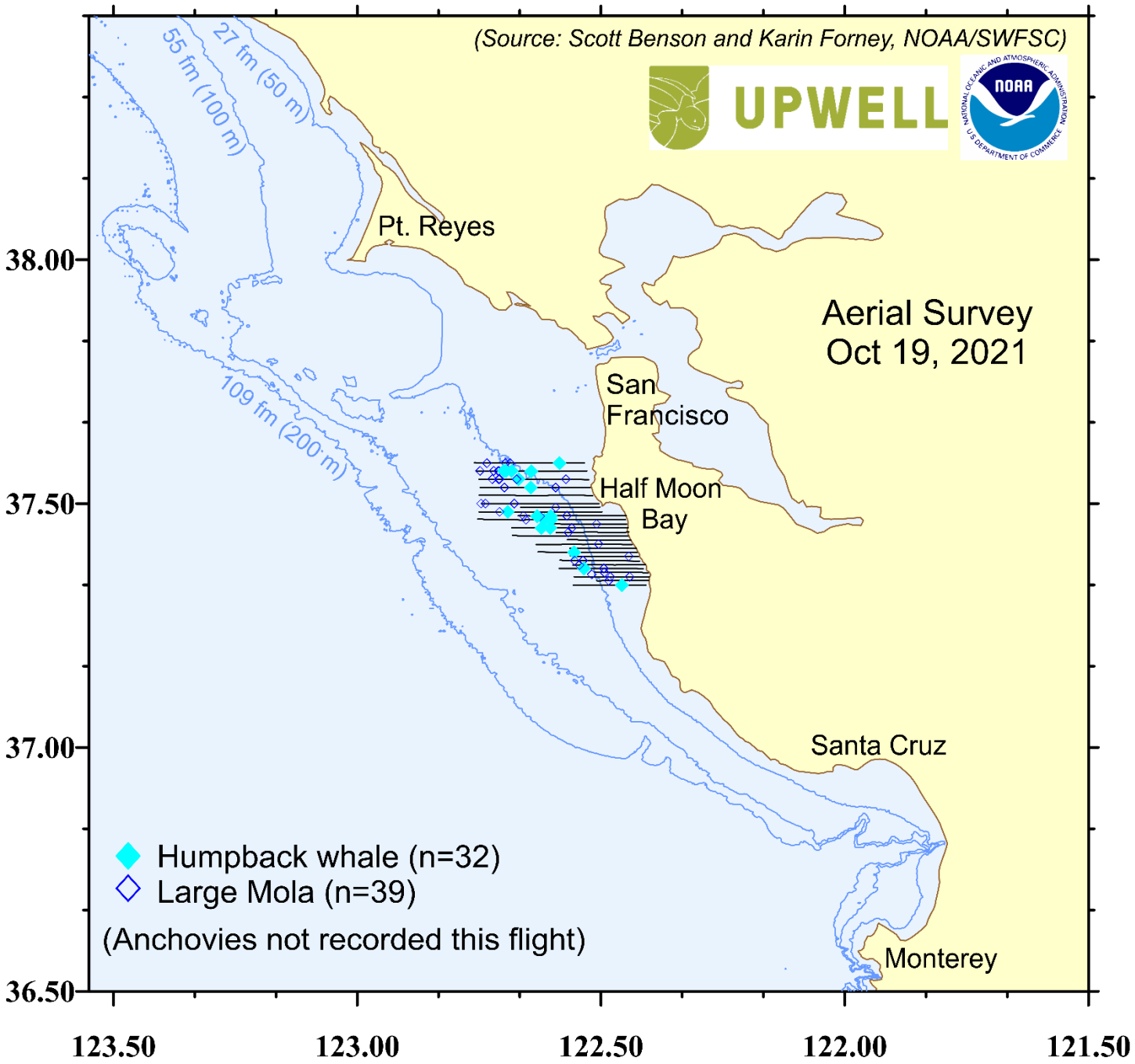

Figure 7. Aerial survey track lines and observations of humpback whales and large molas (ocean sunfish) off San Mateo County and in the Gulf of the Farallones (Fishing Zone 3) on October 19, 2021. Viewing conditions were suboptimal (with extensive clouds that limited the ability to see subsurface animals and moderately high winds creating whitecaps), and no leatherback turtles were seen. These surveys were specifically conducted to search for leatherback turtles near Half Moon Bay for capture/tagging operations. Anchovies were not recorded during this flight to allow the team to focus on searching for leatherbacks. Only large molas, which tend to co-occur with leatherback turtles, are included for simplicity. The number of individual whales, leatherbacks, and molas observed are indicated in parentheses (e.g., n=32 for humpback whale). Given the fine-scale nature of some of the transects (0.5 nautical mile spacing), some of the humpback whale sightings likely represented re-sightings of the same individuals.

Leatherback Sea Turtle Telemetry *(Fishing Zone 3)*

- An adult male leatherback turtle was captured at about 37° 31.3" N, 122° 33.9" W, roughly 3 miles northwest of Pillar Point (Half Moon Bay, CA) and tagged with a satellite-linked transmitter on October 16, 2021. This individual (aka "Bumpy") was previously captured

and tagged in the same area during September 2016. The turtle was in superb body condition and weighed 645 kg (1419 lbs, Figure 8).

- Following release, the turtle spent approximately 10 hours in shelf waters within about 5-15 miles off Half Moon Bay and subsequently moved off the shelf and southward (Figure 9). The most recent position was received on October 20, 2021, when the leatherback was over deep offshore waters west of Pt. Lobos in Monterey County. It should become evident during the next 1-2 weeks whether the turtle returns to nearshore waters for additional foraging or continues southwestward to tropical overwintering grounds or Western Pacific nesting beaches for breeding activities.

Figure 8. Adult male leatherback turtle captured and tagged with a satellite-linked transmitter by the NOAA/Upwell team about 3 miles northwest of Pillar Point (Half Moon Bay, CA) on October 16, 2021. The turtle was in superb body condition and weighed 645kg (1419 lbs).

Figure 9. Telemetry track for the period October 16 – 20, 2021 of an adult male leatherback turtle tagged on October 15, 2021 off Half Moon Bay. The transmitter reported frequently immediately after release of the turtle, and it is now reporting approximately every 24 hrs.

Cascadia Research and TMMC Small Vessel Surveys *(Fishing Zones 3-6)*

Eight surveys conducted in September 2021 in Fishing Zone 3 revealed high concentrations of humpback whales (more than 70 sighted on each of three different days) in inshore waters especially between Point Reyes and Half Moon Bay (Table 4 and Figure 10). Most of these humpback whales were feeding on fish with the seven largest groups (eight or more whales) all occurring between 50 and 70m of water inshore of the Farallon Islands.

During these surveys, blue whales were only seen near the shelf edge (around 200m water depth) most concentrated west of Cordell Bank. Tag deployments also confirmed that blue whales were feeding on krill layers near the shelf edge but they were sometimes moving into slightly more inshore waters and calling at night (Figure 11). Deployments on three humpback whales feeding in between the Farallon Islands and San Francisco Bay confirmed they were feeding close to the surface on fish but were also moving more widely through the Gulf of the Farallones.

Table 4. Summary of surveys and sightings in Fishing Zone 3 from surveys conducted in September 2021.

Date	Vessel	Locality	Hours	NMi	Blue	Humpback	UnLgCet
02-Sep-21	ROB	Bodega – Cordell	9.4	91	18	21	1
03-Sep-21	ROB	Bodega – Cordell	8.5	98	11	31	0

Date	Vessel	Locality	Hours	NMi	Blue	Humpback	UnLgCet
03-Sep-21	TMMC	Gulf of the Farallones	5.9	84	0	75	0
04-Sep-21	ROB	Gulf of the Farallones	9.7	93	4	72	0
11-Sep-21	MUS	Gulf of the Farallones	7.0	101	0	77	0
15-Sep-21	ROB	Half Moon Bay	10.0	94	4	22	1
16-Sep-21	ROB	Gulf of the Farallones	9.8	123	0	31	1
17-Sep-21	ROB	Gulf of the Farallones	7.8	88	0	17	2

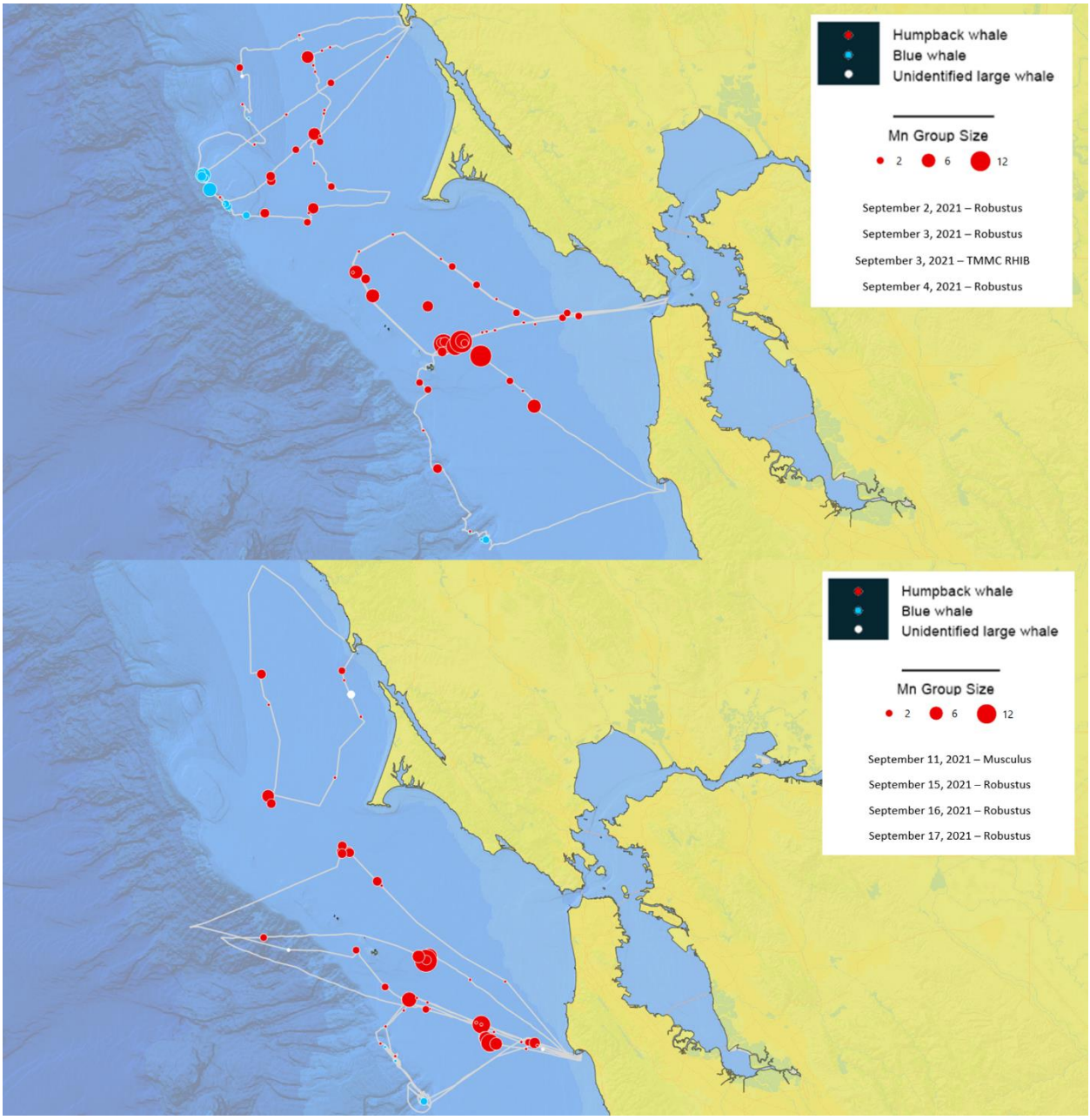

Figure 10. Small boat surveys (gray lines) and whale sightings in early (top) and mid-September (bottom) in the Gulf of the Farallones region (N of Bodega Bay to just S of Half-Moon Bay).

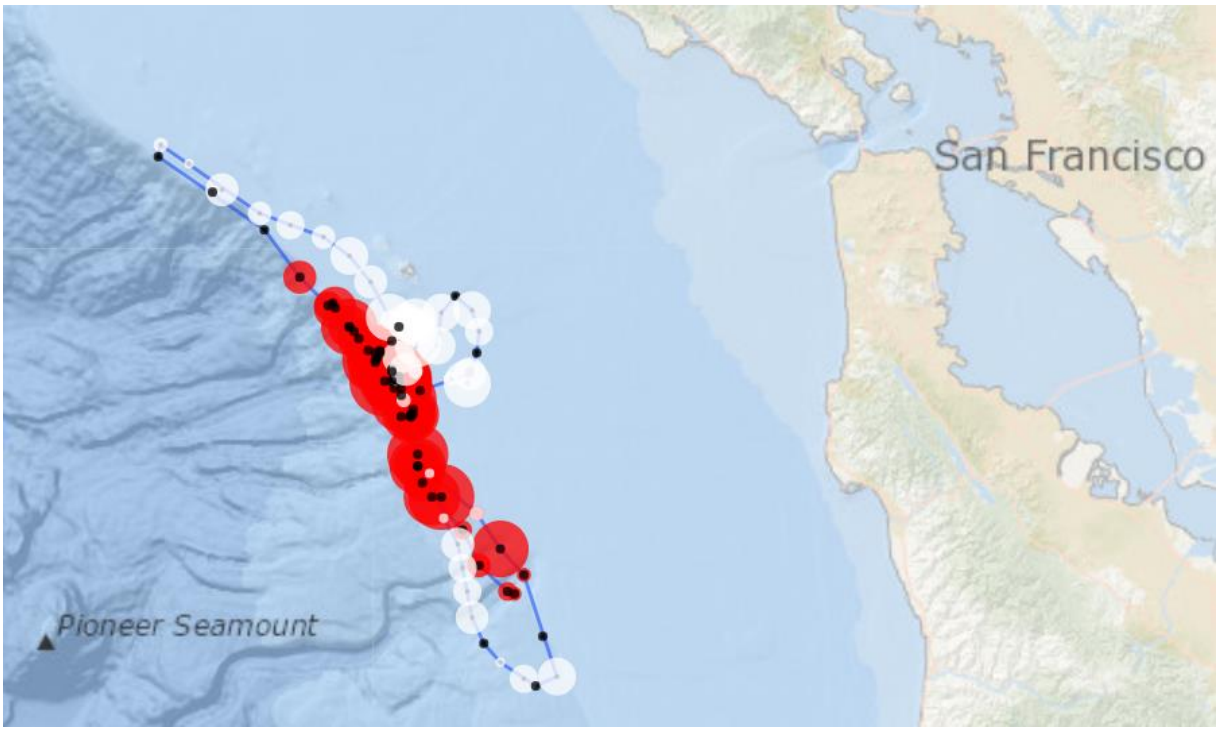

Figure 11. Movements of one of two blue whales tagged on September 4, 2021 showing feeding locations (red circles) along shelf edge and calling locations (white circles).

Surveys conducted primarily in the Monterey Bay region in September revealed generally low concentrations of whales with a maximum of 13 seen in one day (Table 5). The humpback whales that were seen were generally scattered in the southern half of the bay (Figure 12).

Table 5. Summary of surveys and sightings in Fishing Zone 4 from surveys conducted in September 2021.

Date	Vessel	Locality	Hours	NMi	Humpback	UnLgCet
13-Sep-21	MUS	Monterey Bay	3.8	40	8	0
13-Sep-21	ROB	Monterey Bay	3.3	26	9	0
14-Sep-21	MUS	Monterey Bay	6.4	90	13	0
14-Sep-21	RAD	Monterey Bay	8.0	69	0	0
14-Sep-21	ROB	Monterey Bay	5.5	73	0	0
15-Sep-21	MUS	Monterey Bay	3.5	32	7	0
16-Sep-21	MUS	Monterey Bay	3.9	29.4	6	0
17-Sep-21	MUS	Monterey Bay	2.5	13.4	1	0
18-Sep-21	MUS	Monterey Bay	1.0	19	4	0

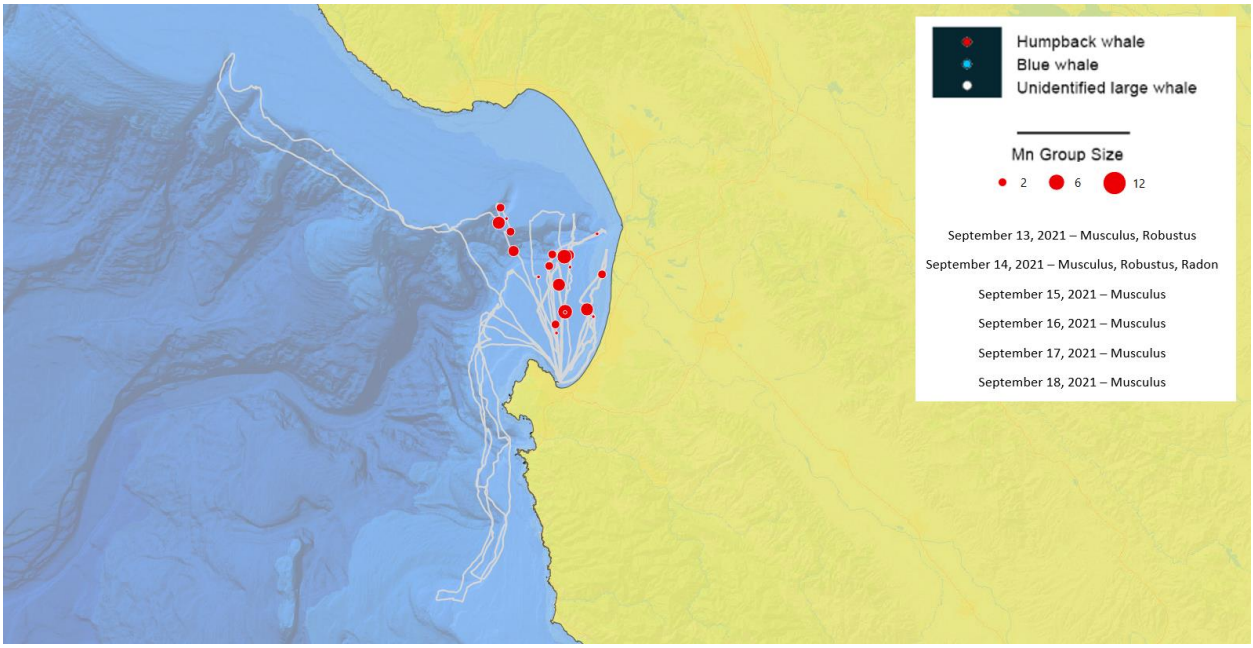

Figure 12. Survey tracks (faint white lines) and sighting locations of humpback whales in the Monterey Bay region (Fishing Zone 4) during surveys by Cascadia (on collaboration with Stanford University) in September 2021.

Surveys conducted in Zones 5 and 6 generally found lower concentrations of humpback whales in the areas surveyed (Table 6, Figure 13). Additional surveys conducted for a different project in early to mid-October revealed humpback whales feeding on fish off Palos Verdes Peninsula and near Catalina Island and photo-identification of these whales revealed they were primarily whales that were typically seen in the Southern California Bight and not humpback whales migrating south from feeding areas to the north. To date seven of 11 different whales identified had known winter breeding areas.

Table 6. Surveys and sightings in Fishing Zones 5 & 6 from surveys conducted in September 2021.

Date	Vessel	Locality	Hours	NMi	Humpback	UnLgCet
18-Sep-21	ROB	Morro Bay (Zone 5)	3.3	34	6	0
19-Sep-21	ROB	Santa Barbara Ch. (Zone 6)	8.8	108	6	1
20-Sep-21	ROB	Santa Barbara Ch. (Zone 6)	9.2	117	5	0
21-Sep-21	ROB	Morro Bay (Zone 5)	9.1	109	6	0

Figure 13. Survey tracks (faint white lines) and sighting locations of humpback whales in Fishing Zones 5 & 6 during surveys by Cascadia in September 2021.

Monterey Bay Whale Watch *(Fishing Zone 4)*

- MBWW has regularly conducted whale-watching trips in southern Monterey Bay throughout the summer and fall. The average number of humpback whales-per-trip during the last 7-day period (October 12-18) was 18.9 whales per half-day trip, with a peak of 40 whales observed on October 14, 2021.
- No blue whales have been observed by MBWW since late August.

MANAGEMENT CONSIDERATIONS

Information from NOAA: §132.8(d)(2)

No additional information was shared.

Total economic impact to the fleet: §132.8(d)(4)

Economic analysis beyond landings data submitted to CDFW is not currently available. See management consideration (d)(7) for available information on fishing activity to date during the 2020-21 fishing season.

Historic patterns and current Actionable Species migration: §132.8(d)(6) and (11) *

Data provided by: Monterey Bay Whale Watch (processed by Karin Forney, NMFS); Karen Grimmer (Monterey Bay National Marine Sanctuary) and Jaime Jahncke (Point Blue Conservation Science); Briana Abrahms (University of Washington)

Monterey Bay Whale Watch *(Fishing Zone 4)*

- The semi-monthly average number of whales-per-half-day-trip during the last 14 days (October 5-18) was 16.6 (Figure 14). This is above average for this time of year compared to the overall 2003-2020 record, and slightly higher than for the same period in 2020.
- No blue whales have been observed by MBWW since late August. This is largely consistent with their historical seasonal migration patterns during late summer and fall (Figure 15).

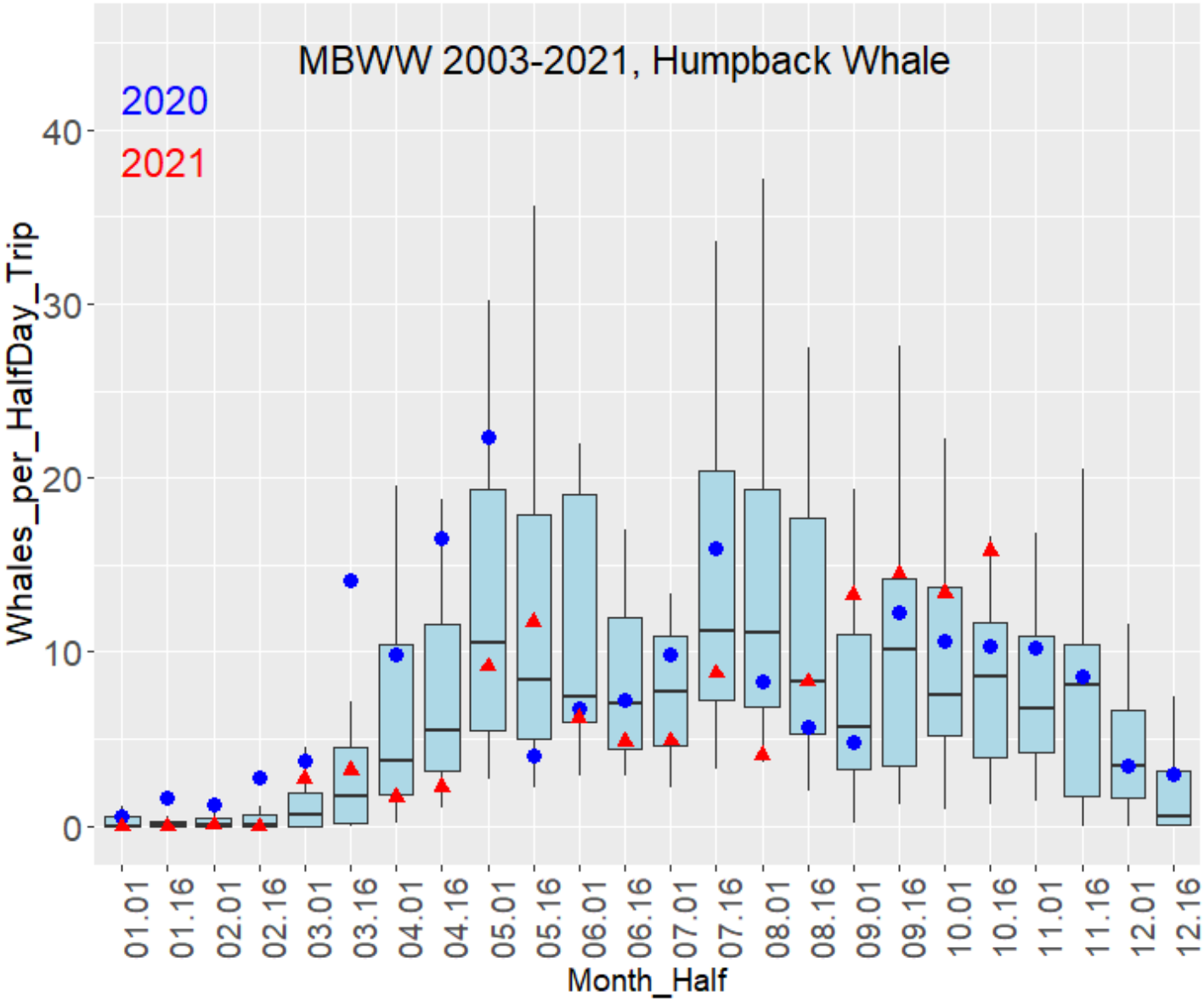

Figure 14. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average number of whales; the blue box shows the 25th-75th percentiles (i.e., half of all past whale numbers are within the blue box); the vertical lines show the range of whale numbers excluding outliers, and outliers are shown as small black dots. Values for 2020 (large blue dots) and 2021 (red triangles) and are provided for reference, placing recent whale numbers in a historical context.

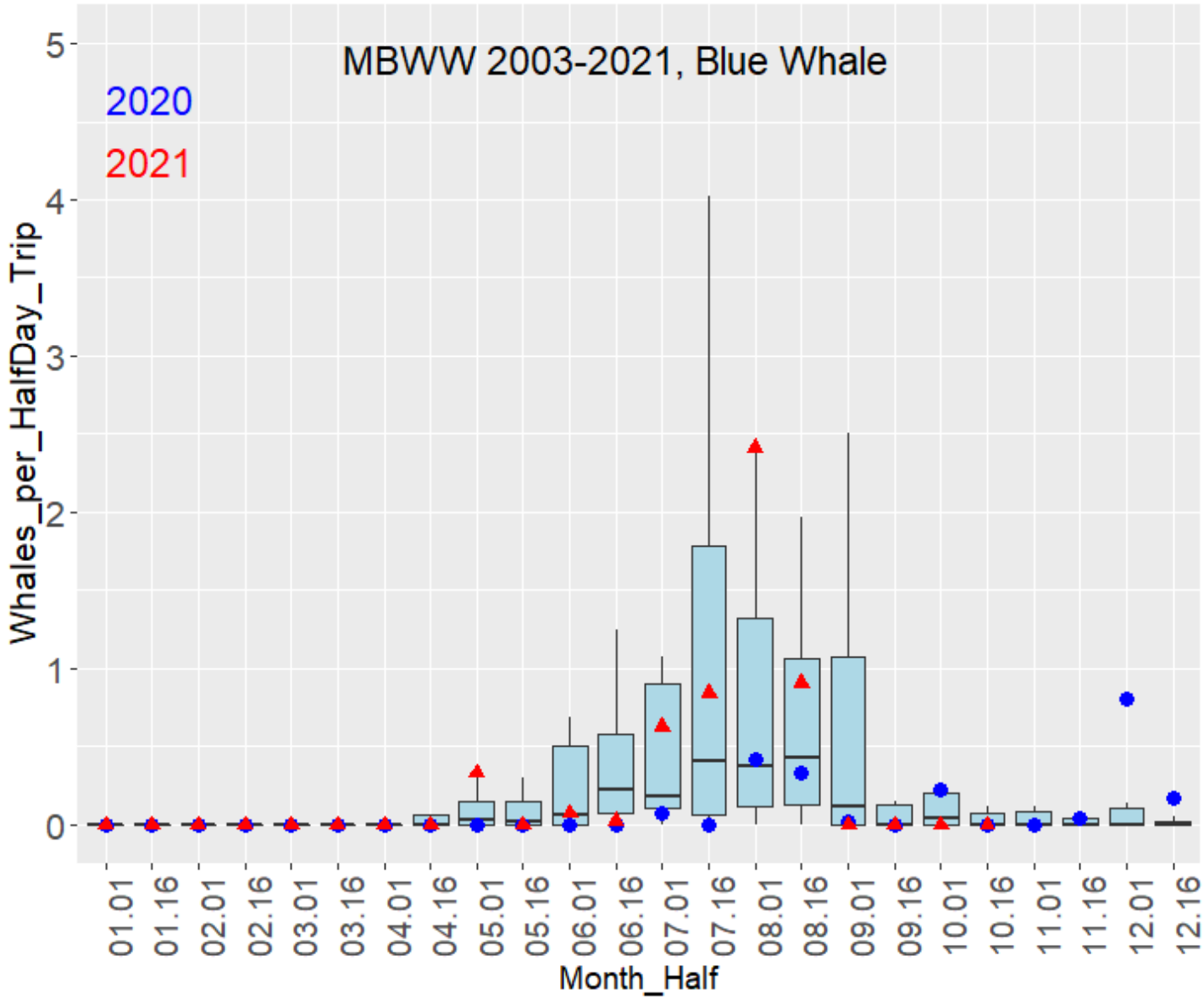

Figure 15. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of blue whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average number of whales; the blue box shows the 25th-75th percentiles (i.e., half of all past whale numbers are within the blue box); the vertical lines show the range of whale numbers excluding outliers, and outliers are shown as small black dots. Values for 2020 (large blue dots) and 2021 (red triangles) and are provided for reference, placing recent whale numbers in a historical context.

Point Blue Conservation Science Data Portal *(Fishing Zones 3, 4 and 6)*

- 126 humpback whale sightings were reported for the Greater Farallones National Marine Sanctuary (Zone 3) over the past seven days (October 13 – 20, 2021; Figure 16). No blue whales were sighted during this period. Observations were recorded by trained observers on the Farallon Islands and reported through the Spotter/Whale Alert app.
- 54 humpback whale sightings were reported for Monterey Bay National Marine Sanctuary (Zone 4) over the past seven days (Figure 17). No blue whales were sighted during this

period. Observations were reported by trained naturalists aboard Monterey Bay Whale Watch and Marine Life Studies.

- 100 humpbacks whale sightings were reported for Channel Islands National Marine Sanctuary (Zone 6) over the past seven days (Figure 18). No blue whales were sighted during this period. Observations were reported by trained naturalists from the Channel Islands National Marine Sanctuary and National Park Service.

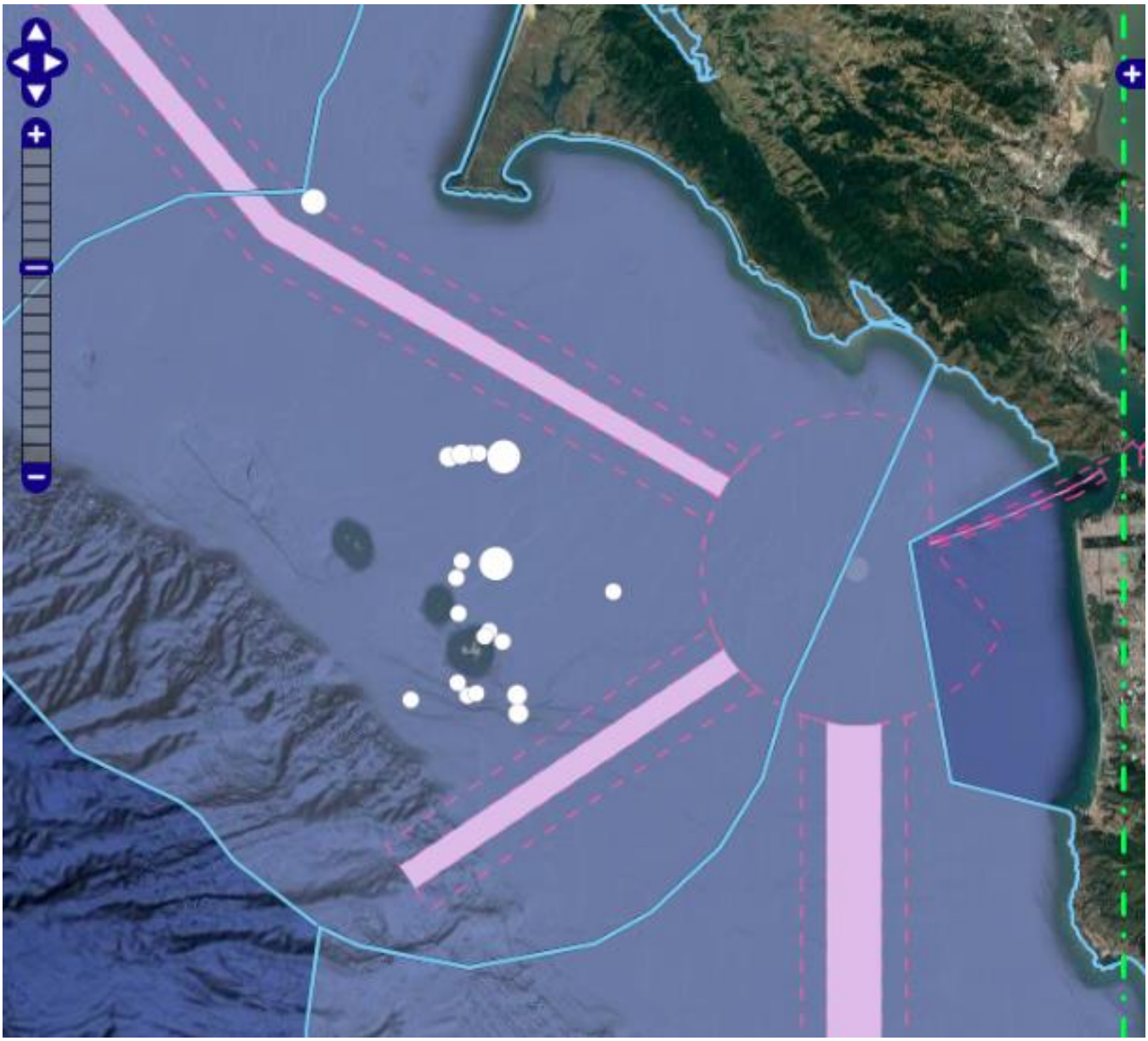

Figure 16. Location of 126 Humpback whale sightings in Fishing Zone 3. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals. View updated information.

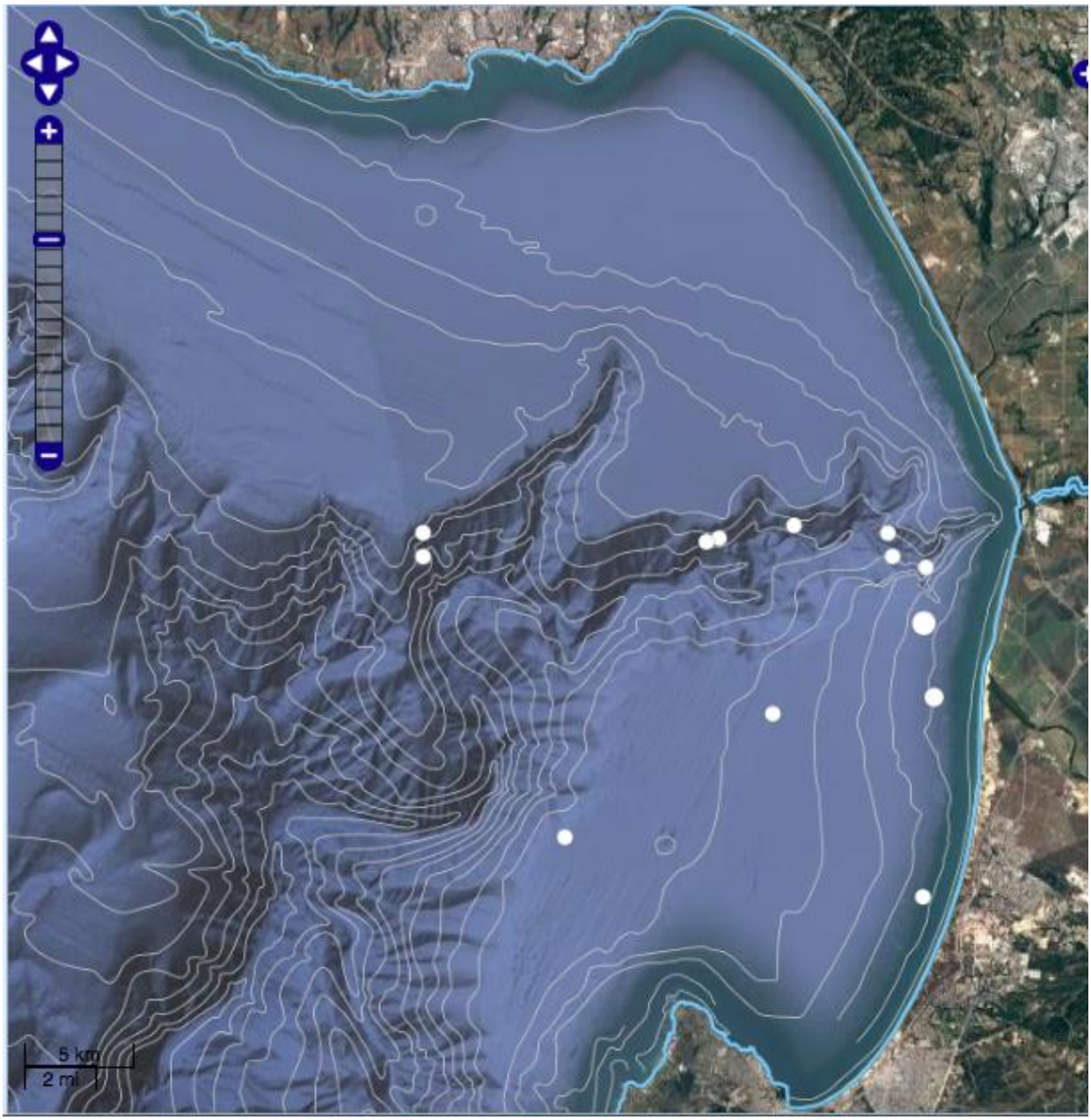

Figure 17. Location of 54 Humpback whale sightings in Fishing Zone 4. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals. View updated information.

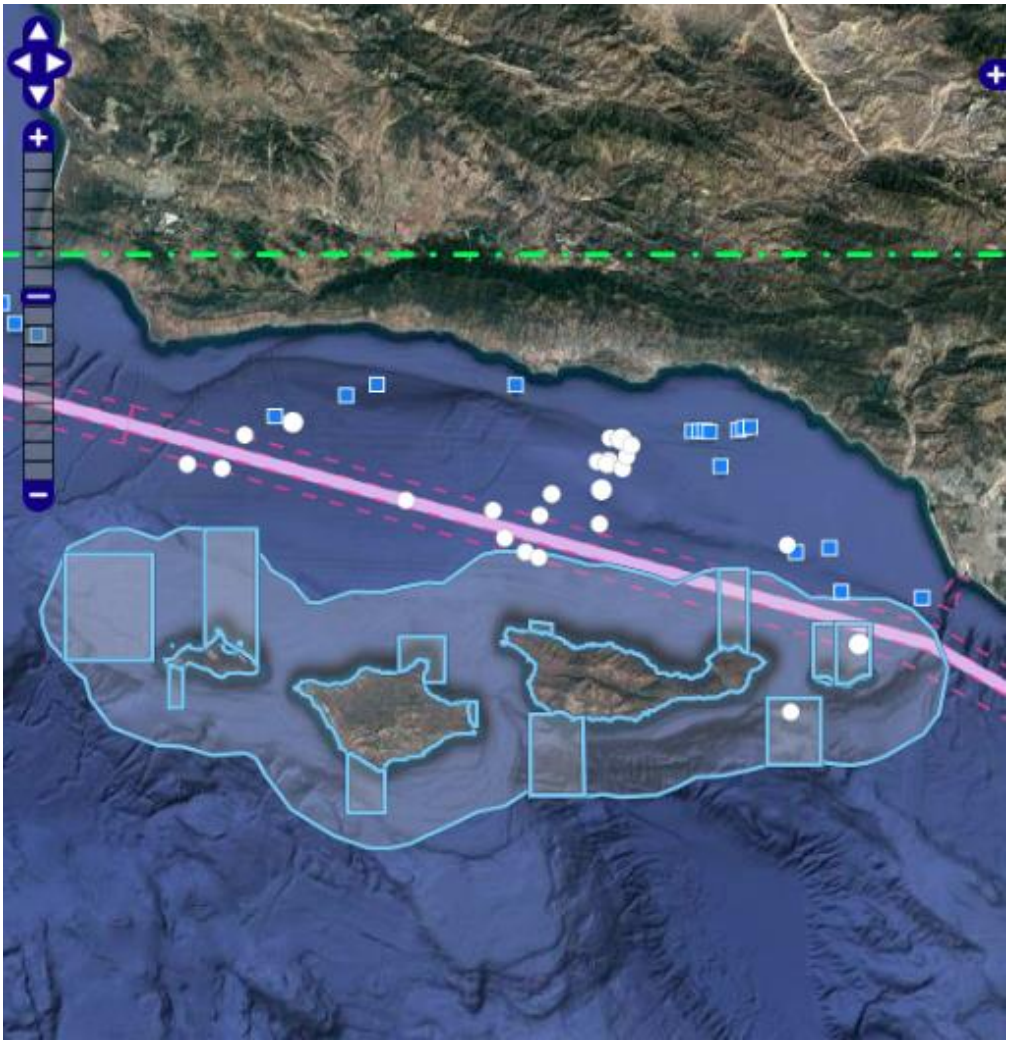

Figure 18. Location of 100 Humpback whale sightings in Fishing Zone 6. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals. View updated information.

WhaleWatch 2.0 – *All Fishing Zones*

Blue whale habitat predictions for October 19, 2021 (Figure 19) indicate the probability of blue whale presence is moderate-to-high nearshore between Oregon and Monterey Bay; low in the southern portion of Fishing Zone 4 (south of Monterey Bay); and high in the nearshore portion of Fishing Zone 5 and throughout the Southern California Bight (Fishing Zone 6).

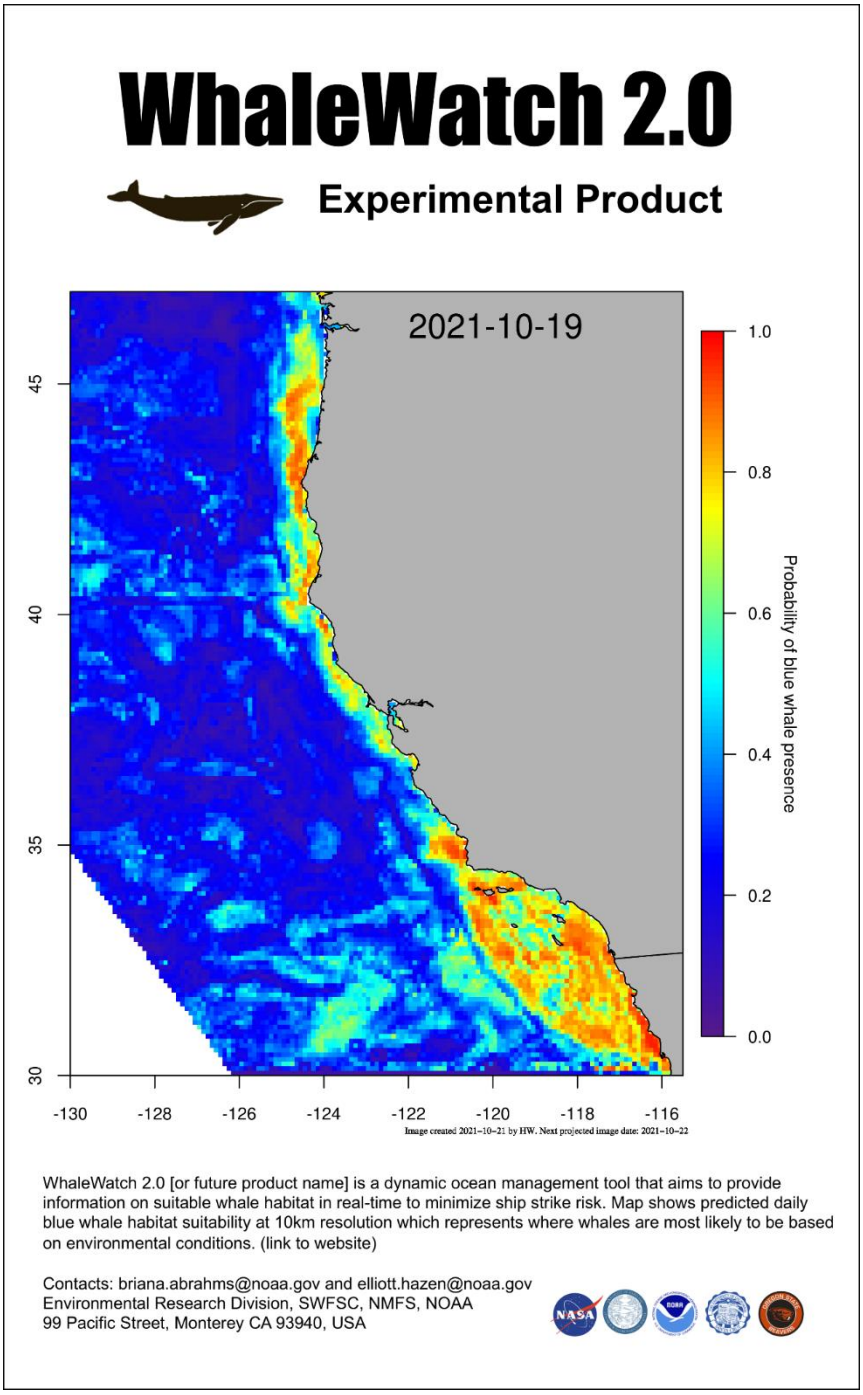

Figure 19. WhaleWatch 2.0 map for October 19, 2021. View a current map.

Fishing Season dynamics: §132.8(d)(7) *

Data provided by: California Department of Public Health, California Department of Fish and Wildlife

Domoic Acid and Quality Testing

- Although many sites tested below the action level during the first round of domoic acid sampling (Figure 20), two sites (Russian River and Monterey) within the Central Management Area had samples above the action level. Both sites now need to be retested,

with two consecutive samples taken at least one week apart with all testing below the action level.

- Two locations from the first round of testing are still pending results; one is in the Northern Management Area and one is in the Central Management Area. The latest information can be found on the CDPH website.
- Quality testing results are anticipated to be available the week of November 1. Low crab quality only affects the Northern Management Area.

CDPH SUMMARY OF DOMOIC ACID LEVELS IN CRABS **JULY 1, 2021 - OCTOBER 22, 2021**

AREA	COLLECTION SITE	PORT	SAMPLE COLLECTION DATE	CRAB TYPE VISCERA	INDIVIDUAL SAMPLE RESULTS (FDA ACTION LEVEL >30 PPM)						AVERAGE LEVEL (Information Only)	PERCENT OF SAMPLES EXCEEDING ACTION LEVEL
A	George Reef	Crescent City	9/29/2021	Dungeness	<2.5	<2.5	<2.5	2.6	<2.5	<2.5	0.4	0%
A	Klamath River	Crescent City	9/29/2021	Dungeness	5.1	<2.5	<2.5	7.7	<2.5	3.1	2.7	0%
B	Lagoons	Trinidad	9/21/2021	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	NA	Non-Detect	0%
B	Lagoons	Trinidad	10/7/2021	Dungeness	3.1	3.4	<2.5	2.5	3.2	<2.5	2.0	0%
B	Trinidad Head	Trinidad	9/21/2021	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
B	LP Eureka	Eureka	9/30/2021	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	7.8	1.3	0%
B	Eel River	Eureka	9/30/2021	Dungeness	3.4	<2.5	<2.5	<2.5	<2.5	2.6	1.0	0%
C	Usal	Fort Bragg		Dungeness								
D	Manchester Beach	Fort Bragg	10/9/2021	Dungeness	<2.5	<2.5	4.0	<2.5	<2.5	<2.5	0.7	0%
E	Salt Point	Bodega Bay	10/2/2021	Dungeness	<2.5	5.0	<2.5	<2.5	<2.5	5.4	1.7	0%
E	Russian River	Bodega Bay	10/2/2021	Dungeness	<2.5	<2.5	<2.5	36	<2.5	2.5	6.4	17%
E	Bodega Head	Bodega Bay	10/2/2021	Dungeness	12	6.3	9.6	<2.5	<2.5	<2.5	4.7	0%
E	Point Reyes	Bodega Bay	10/2/2021	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
F	Duxbury Reef	Half Moon Bay/ San Francisco	10/5/2021	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
F	Pillar Point	Half Moon Bay/ San Francisco	9/27/2021	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
F	Pigeon Point	Half Moon Bay/ San Francisco	9/27/2021	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
G	Monterey Bay	Monterey	9/21/2021	Dungeness	37	<2.5	21	<2.5	<2.5	<2.5	9.7	17%
G	Monterey Bay	Monterey	9/18/2021	Rock	7.4	9.7	<2.5	<2.5	<2.5	<2.5	2.9	0%
H	Avila Beach	Morro Bay		Dungeness								

Figure 20. California Department of Public Health Domoic Acid Test Results for Crab, Updated October 22, 2021.

Distribution and abundance of key forage: §132.8(d)(8) *

Data provided by: CDFW; Karin Forney and Scott Benson (NMFS), in collaboration with Upwell Turtles (Upwell.org)

CDFW Aerial Surveys *(Fishing Zones 2-5)*

- Multiple bait balls were observed in Fishing Zones 3 and 4, particularly near Point Reyes and nearshore along the northern portion of Monterey Bay (Figure 1).

NOAA and Upwell Aerial Surveys *(Fishing Zones 3 -4)*

- Abundant schooling fish were documented off the San Mateo County coast and the Gulf of the Farallones, often associated with humpback whales and/or very dense aggregations of piscivorous (fish-eating) seabirds, including brown pelicans, common murres, and a variety of gulls (Figures 3-7).

- Leatherback foraging habitat was evident from about Point Reyes to Pigeon Point within water depths of about 20-40 fathoms, as indicated by dense aggregations of brown sea nettles (leatherback prey) and abundant large molas (ocean sunfish, another brown sea nettle predator that often is found in the same areas as leatherbacks). During transit, abundant sea nettles were also seen between Davenport and Año Nuevo (Fishing Zone 4), around 1-2 miles offshore (Figures 3-7).
- No krill (blue whale prey) were observed on any of the October 2-19, 2021 aerial surveys.

Ocean conditions: §132.8(d)(9) *

Data provided by: National Weather Service Climate Prediction Center, California Current Integrated Ecosystem Assessment Program

El Niño/Southern Oscillation Diagnostic Discussion

As of October 14, 2021, La Niña conditions have developed and are expected to continue, with an 87% chance of La Niña in December 2021-February 2022.

Marine Heatwave Tracker

The NEP21A large marine heatwave began in late April 2021 and as of October 12, 2021 has remained fairly strong in offshore waters (Figure 21). Waters in the Southern California Bight (Fishing Zone 6) remain warmer than normal, however this is a separate feature from the main NEP21A large marine heatwave. Within Fishing Zones 1-5, nearshore waters are cooler than usual for this time of year.

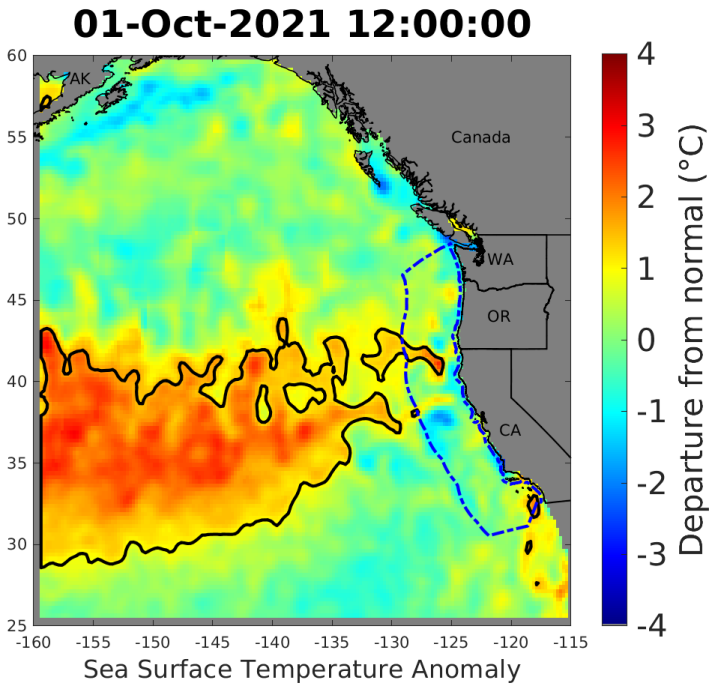

Figure 21. Science-quality (delayed 3-weeks), daily interpolated standardized sea surface temperature anomalies (SSTa) in the California Current ecosystem available for analysis of MHW presence. Dark outline shows the current extent of MHW conditions, as delineated by values of the normalized SST + 1.29 SD from normal. Blue dashed line represents the US West Coast EEZ. SST data from NOAA's Optimum interpolation Sea Surface Temperature analysis (OISST), with the SST anomaly calculated using climatology from NOAA's AVHRR-only OISST dataset.

Habitat Compression Index

The most recent Habitat Compression Index values available are for June 2021 (Figure 22). At that time, there was high compression, with limited available cool water habitat. Compression is typically moderate or high during October (Figure 23).

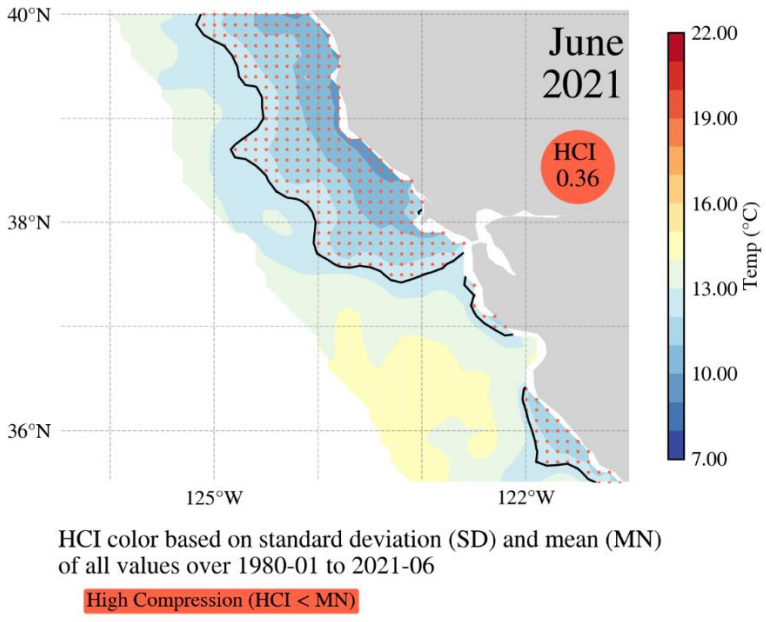

Figure 22. Map of June 2021 sea surface temperature and location of the Habitat Compression Index (HCI) boundary (think black line).

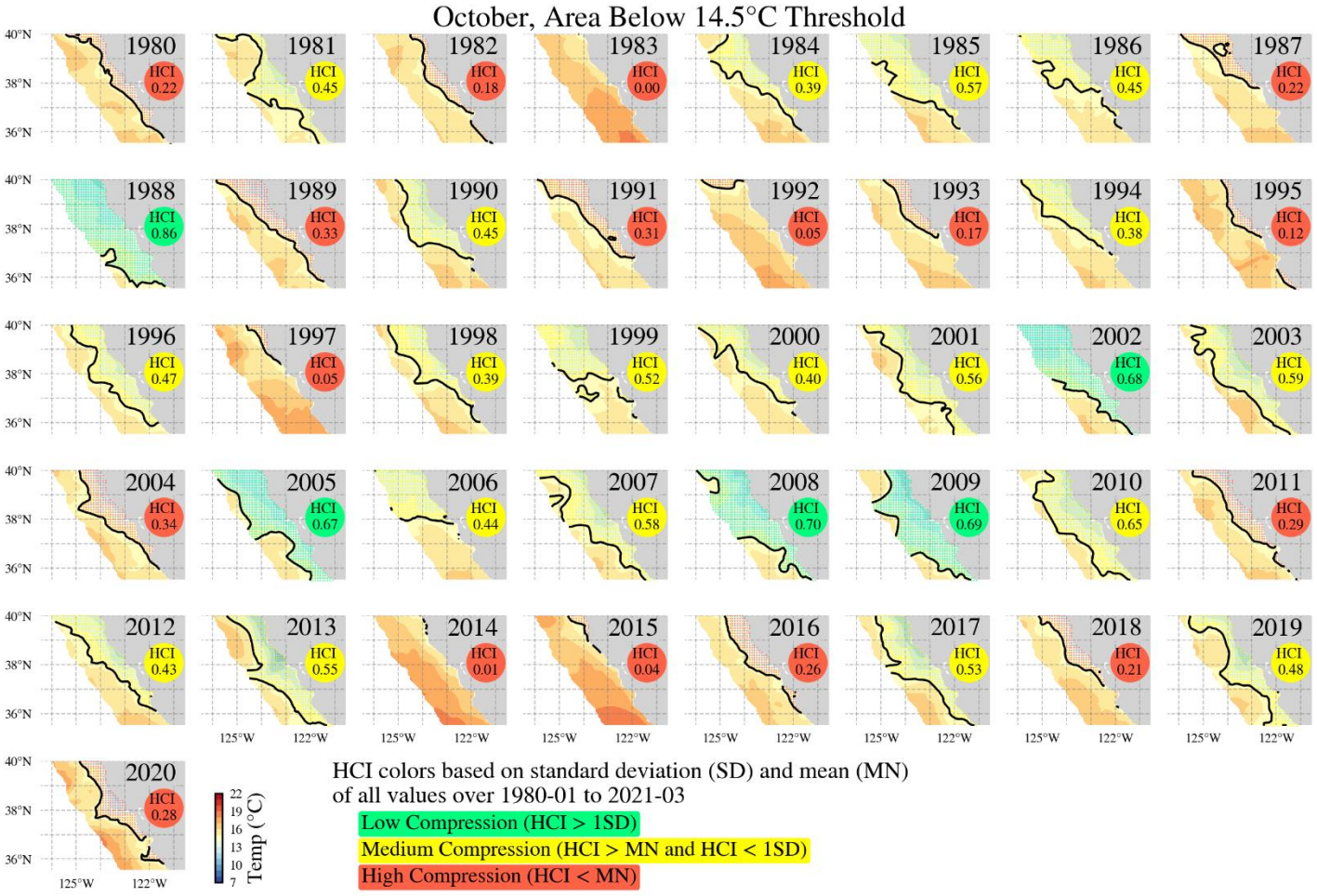

Figure 23. Maps of historical October sea surface temperatures and location of the Habitat Compression Index (HCI) boundary (think black line) between 1980 and 2020.

Current Impact Score Calculation: §132.8(d)(10) *

Data provided by: CDFW

Pursuant to the Risk Assessment and Mitigation Program (Section 132.8, Title 14, CCR), Impact Score Calculations will be assigned beginning with the 2021 calendar year based on confirmed entanglements of Actionable Species (humpback whales, blue whales, or leatherback sea turtles) reported to CDFW by NOAA. Impact Score totals for the current fishing season (2021-22) and calendar year (2021) are provided in Table 2 (see above).