

2024-2025 Risk Assessment

Preliminary Assessment and Available Data for Risk Assessment Mitigation Program

Last updated: November 15, 2024

PRELIMINARY ASSESSMENT

This Preliminary Assessment and Management Recommendation has been developed by California Department of Fish and Wildlife (CDFW) Marine Region staff for consideration by the California Dungeness Crab Fishing Gear Working Group for the Risk Assessment Mitigation Program (RAMP; Section 132.8, Title 14, California Code of Regulations) regarding Management Actions to address marine life entanglement risk in the commercial and recreational Dungeness crab fishery. CDFW will prepare a Final Assessment and Management Recommendation after review of the Working Group Recommendation and other relevant data.

Recommended Management Actions

Commercial Fishery:

- Season Delay: All Fishing Zones (1, 2, 3, 4, 5, and 6) (continuation for 3-6)
 - Note: Fishing Zones 1 and 2 are expected to be delayed due to quality testing results (Fish and Game Code Section 8276.2) until at least December 16, 2024.

Recreational Fishery:

- Crab Trap Prohibition: 3 and 4 (continuation)
 - Note: Fishing Zone 1 (CA/OR border to Reading Rock) is currently closed due to [elevated domoic acid levels](#).
- Fleet Advisory: All Fishing Zones

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Table 1. Fishing Zones and current management status in the California commercial and recreational Dungeness crab fishery.

Fishing Zone	Commercial Fishery: Current Management Status	Commercial Fishery: Proposed Management Status	Recreational Fishery: Current Management Status	Recreational Fishery: Proposed Management Status
1	Closed	Season Delay	Closed due to Domoic Acid (CA/OR border to Reading Rock)*	Closed due to Domoic Acid (CA/OR border to Reading Rock)*
2	Closed	Season Delay	Fleet Advisory	Fleet Advisory
3	Season Delay	Season Delay	Crab Trap Prohibition; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory
4	Season Delay	Season Delay	Crab Trap Prohibition; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory
5	Season Delay	Season Delay	Fleet Advisory	Fleet Advisory
6	Season Delay	Season Delay	Fleet Advisory	Fleet Advisory

* Northern portion of Fishing Zone 1 is closed, from CA/OR border to the southern border of the Reading Rock State Marine Reserve (41° 17.6' N latitude). A Fleet Advisory would go into effect once the domoic acid closure is lifted.

I. Management Recommendation Summary Rationale

Entanglements: Numerous humpback whale entanglements have been reported since the close of the 2023-24 fishing season. Table 2 describes confirmed Actionable Species entanglements in 2024 that have been reported by the National Marine Fisheries Service (NMFS) as of Nov. 15, 2024. Humpback whale entanglements in California commercial Dungeness crab fishing gear and Unknown Fishing Gear bring the three-year rolling average Impact Score to 5.40 (subject to revision), which exceeds the trigger as defined in RAMP for the commercial Dungeness crab fishery.

Marine Life Concentrations: Based on recent Marine Life Concentration (MLC) surveys in Fishing Zones 1, 3, 4, 5, and 6, humpback whale and blue whale sightings remain high. Cascadia vessel surveys were conducted on Nov. 7-8, 2024, and observed up to 42 humpback whales in Fishing Zone 1, up to 56 humpback whales in Fishing Zone 3 and 81 humpback whales in Fishing Zone 4. A NOAA/SWFSC CalCurCEAS Marine Mammal survey conducted from Oct. 24 – Nov. 11, 2024, observed up to 155 humpback whales and 13 blue whales in Fishing Zone 3. In Fishing Zone 4, 25 humpback whales were observed. In Fishing Zone 5, 36 humpback whales and 16 blue whales were observed. Monterey Bay Whale Watch data indicated an average number of humpback whales-per-half-daytrip during the last seven days of 26.6, with a peak of 53 whales observed during a half-day

trip on Nov. 6, 2024. CDFW aerial surveys conducted on Nov. 8, 2024, observed elevated numbers of humpback whales in Fishing Zones 3 and 4, above MLC triggers, however data are unavailable due to a technical issue.

Marine Region's preliminary recommendation is for the Director to continue the delay for Fishing Zones 3-6 and delay Fishing Zones 1 and 2 for the commercial fishery. In addition, the commercial fishery opener in Fishing Zones 1 and 2 is expected to be further delayed pursuant to Fish and Game Code Section 8672.2 (due to quality testing results) until at least December 16, 2024. The Marine Region also recommends the continued prohibition of recreational crab traps in Fishing Zones 3 and 4 and to continue the Fleet Advisory for all Fishing Zones (1-6) until the next Risk Assessment. These recommendations are a result of the exceedance of Marine Life Concentration data triggers and known migration patterns for humpback whales in all Fishing Zones. The recommendation is also supported by the high number of entanglements that occurred during the current 2024 calendar year and 3-year average Impact Score for the commercial fishery. Additionally, the MBARI krill model forecasts higher than expected zooplankton concentrations between Point Arena and Point Sur (Fishing Zones 3 and 4) which may delay migration out of California waters due to foraging opportunities.

A Fleet Advisory for the recreational fishery in Fishing Zones 1- 6 is recommended based on survey data and known migration patterns of humpback whales. Under a trap prohibition, hoop nets will still be allowed, requiring increased precaution when setting gear to avoid entanglements in vertical lines. It should be noted that the northern portion of Fishing Zone 1 (CA/OR border to Reading Rock) is currently closed to the recreational fishery due to elevated domoic acid levels. In addition, a trap prohibition was not recommended for Fishing Zone 1 due to limited fishing overlap potential due to the depth ranges of observed whales for the recreational fishery. Recreational effort typically occurs inshore, and no whales were observed in those areas.

It is anticipated that the delay and trap prohibition for commercial and recreational fishery would be in place until at least the next Risk Assessment, which is expected to occur on or around December 20, 2024. That assessment will inform a potential commercial fishery opener on or around January 1, 2025, and/or a lifting of the trap restriction for the recreational fishery.

For additional details, see the Entanglement and Marine Life Concentration sections of this Available Data document.

II. Alternative Management Actions for the Commercial Fishery

Alternatives Considered but Rejected

- Gear Reduction - given the exceedance of the statewide entanglement Impact Score and elevated risk due to concentrations of humpback whales (Fishing Zones 1, 3 and 4), this was not the recommended Management Action.
- Depth Restriction - given the current exceedance of the statewide entanglement Impact Score and distribution of humpback whales across depths (particularly

inshore depth ranges within Zone 3 and 4), a depth restriction may inadvertently concentrate trap gear, thereby increasing entanglement risk.

- Alternative Gear - can only be authorized after April 1st.

AVAILABLE DATA

III. Triggers Requiring Management Action

I. Confirmed Entanglements: §132.8(c)(1)

Data provided by: Lauren Saez and Dan Lawson (National Marine Fisheries Service)

The table below outlines the confirmed entanglements under RAMP and their associated Impact Score for the year 2024. Many entanglements categorized as “Unknown Fishing Gear” are actively being reviewed by NMFS staff and are subject to revision as new data becomes available. CDFW staff and the Working Group have reviewed all entanglements listed below. Entanglements listed in **bold** have updated Impact Scores based on this review. See “[FAQ: Impact Scoring for the Risk Assessment and Mitigation Program](#)” for information about the RAMP Impact Scores.

Table 2. Actionable Species Entanglements during 2024 pursuant to RAMP regulations.

Entanglement ID	Date	Species	Fishery	Impact Score
20241022Mn	10/22/24	Humpback whale	Unknown Fishing Gear*	0.38
20241020Mn	10/20/24	Humpback whale	Unknown Fishing Gear*	0.38
20241019Mn	10/19/24	Humpback whale	Unknown Fishing Gear*	0.38
20241011Mn	10/11/24	Humpback whale	CA commercial Dungeness crab	0.75
20241009Mn	10/09/24	Humpback whale	Unknown Fishing Gear*	0.38
20240928Mn	09/28/24	Humpback whale	CA commercial Dungeness crab	0.75
20240927Mn_2	09/28/24	Humpback whale	CA commercial Dungeness crab	0.75
20240927Mn_1	09/27/24	Humpback whale	Unknown Fishing Gear*	NA
20240922Mn	09/22/24	Humpback whale	Unknown Fishing Gear*	NA
20240921Mn	09/21/24	Humpback whale	Unknown Fishing Gear*	0.38
20240905Mn	09/05/24	Humpback whale	Unknown Fishing Gear*	0.38
20240902Mn	09/02/24	Humpback whale	Unknown Fishing Gear*	0.38
20240713Mn	07/13/24	Humpback whale	Unknown Fishing Gear*	NA
20240517Mn2	05/17/24	Humpback whale	Unknown Fishing Gear*	0.38
20240517Mn1	05/17/24	Humpback whale	CA commercial Dungeness crab	0.75

Table 3. Impact Score Calculations based on Confirmed Entanglements in California commercial Dungeness crab gear and Confirmed Entanglements in Unknown Fishing Gear reported off California.

Actionable Species	Current Fishing Season Impact Score (2024-25)	Current Calendar Year Impact Score (2024)	3-Year Rolling Average
Humpback whales	0	6.04	5.40
Leatherback sea turtle	0	0	0.33

As of November 15, 2024, there have been zero Confirmed Entanglements of blue whales or leatherback sea turtles during the 2024-2025 period.

II. Marine Life Concentrations: §132.8(c)(2)

Data provided by: Scott Benson and Karin Forney (NOAA SWFSC and Upwell), John Calambokidis (Cascadia Research Collective, in collaboration with the Marine Mammal Center), Monterey Bay Whale Watch (processed by Karin Forney, NOAA SWFSC)

For the period of November 1 until the Fishing Season opens statewide a RAMP Marine Life Concentration trigger has been met when:

- The number of humpback whales is greater than or equal to 20, or there is a running average of five or more animals over a one-week period within a single Fishing Zone.
- The number of blue whales is greater than or equal to three, or there is a running average of three or more animals over a one-week period within a single Fishing Zone
- A Pacific leatherback sea turtle is seen in any Fishing Zone

Table 41. Summary of available CDFW-approved survey data for Marine Life Concentrations for each Fishing Zone, and whether the triggers established in Section 132.8(c)(2) have been met for any Fishing Zone. *CDFW aerial survey data was lost due to technical issues.

Fishing Zone	CDFW-approved survey data	Triggers attained?
Zone 1	Cascadia Vessel Surveys	Yes
Zone 2	None	Yes
Zone 3	Cascadia Vessel Surveys, CDFW Aerial Survey*, NOAA/NMFS CalCurCEAS Marine Mammal Survey	Yes
Zone 4	Cascadia Vessel Surveys, CDFW Aerial Survey*, MBWW, NOAA/NMFS CalCurCEAS Marine Mammal Survey	Yes
Zone 5	NOAA/NMFS CalCurCEAS Marine Mammal Survey	Yes
Zone 6	NOAA/NMFS CalCurCEAS Marine Mammal Survey	Yes

A. CDFW Surveys (Fishing Zones 3-4)

CDFW conducted an aerial survey on November 8, 2024, covering Fishing Zones 3 and 4. CDFW conducted east-west transects between Tomales Bay and Monterey with a survey altitude between 700-1000 ft. Conditions in both Fishing Zones were good with clear, sunny skies, and a Beaufort state of less than one. It should be noted that technical difficulties occurred with data transmission, so maps depicting transect lines and observations are not currently available. Observers noted that large aggregations of humpback whales were observed in both Fishing Zones, well over the MLC trigger.

B. Cascadia Research Survey (Fishing Zones 1, 3 and 4)

Four surveys were conducted by Cascadia in Fishing Zones 1, 3, and 4 on November 7-8, 2024, and are summarized in Table 5 and Figures 1-2. In Fishing Zone 1, both surveys revealed significant concentrations of humpback, blue, and fin whales almost exclusively near the shelf edge (near the 200 m depth contour compared to the inshore areas of 100m or less water depth). In Fishing Zones 3 and 4, large numbers of humpback whales were encountered on both inshore and offshore survey legs. The highest concentrations were noted in the partial day of effort in the northern portion of Fishing Zone 4.

Despite the high number of sightings on recent surveys, data from six humpback whales UCSC satellite tagged in Monterey Bay in early October show the southern migration of humpback whales is well underway (Figure 3). Of the six, at least three are confirmed now in Mexico, and a fourth was in S California Bight getting close to Mexico. That left only two still potentially in central California; one of those was still transmitting and in the Gulf of the Farallones and the second not heard from for over a week but last located in the same area.

Cascadia also conducted extensive surveys in the latter half of October with much of that effort concentrated in the Monterey Bay area, helping to respond to the high number of entanglements reported in that area in late September and October. Those efforts were successful in identifying several new entangled whales and important data was gathered on these entanglements and in one case some progress made in disentangling a whale. These surveys were not successful in relocating some of the entangled whales reported prior to our arrival. One insight into the high number of reports these surveys provided was that it appeared during this period there was influx of whales into the Monterey Bay area (a region with a lot of whale watching and high chance of entanglements being reported) likely from other nearby regions where entanglements would be less likely to be reported.

Table 5. Summary of Cascadia Research vessel surveys in Fishing Zones 1, 3 and 4 between November 7-8, 2024.

Date	Fishing Zone	Humpback whale sightings	# of humpback whales sighted	Blue whale sightings	# of blue whales sighted	Unidentified whale sightings	# of unidentified whales sighted
11/7	1	8	14	5	10	1	1
11/8	1	14	42	5	7	4	8
11/7	3	21	56	1	1	1	1
11/8	3	16	38	0	0	0	0
11/8	4	33	81	0	0	0	0

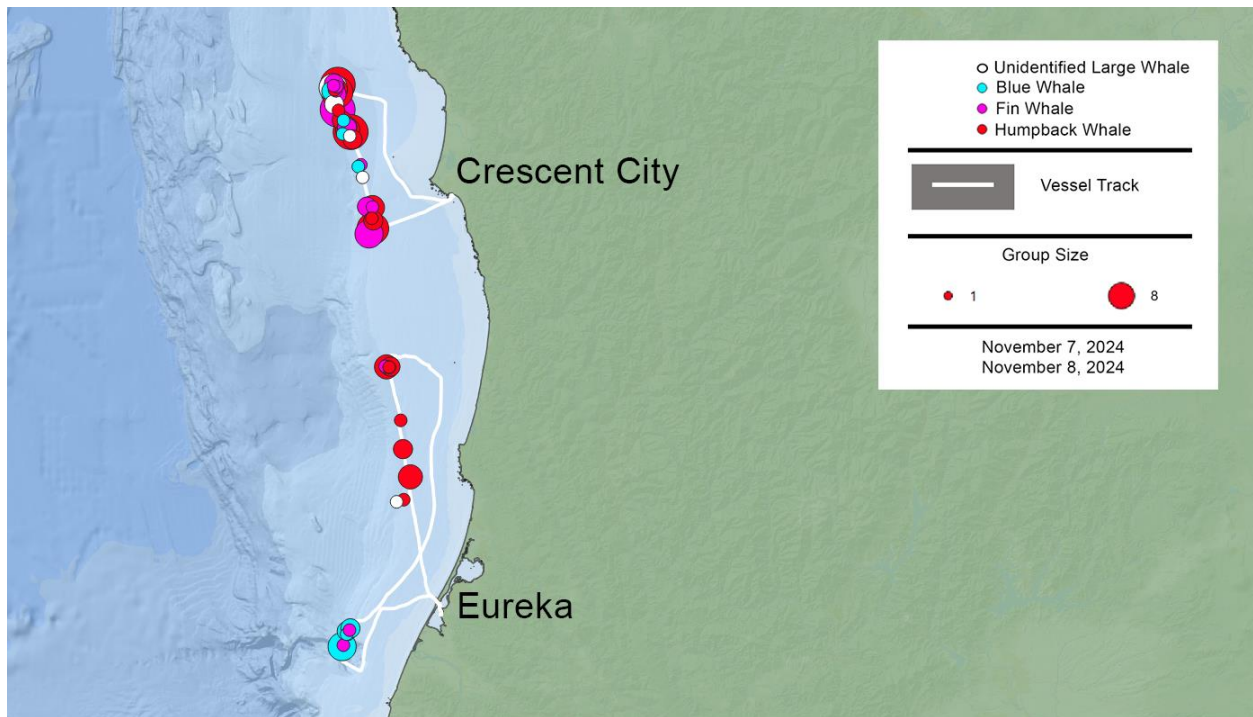


Figure 1. Survey effort and whale sightings during small boat surveys by TMMC/CRC in Fishing Zone 4 searching for reported entangled whales in Monterey Bay.

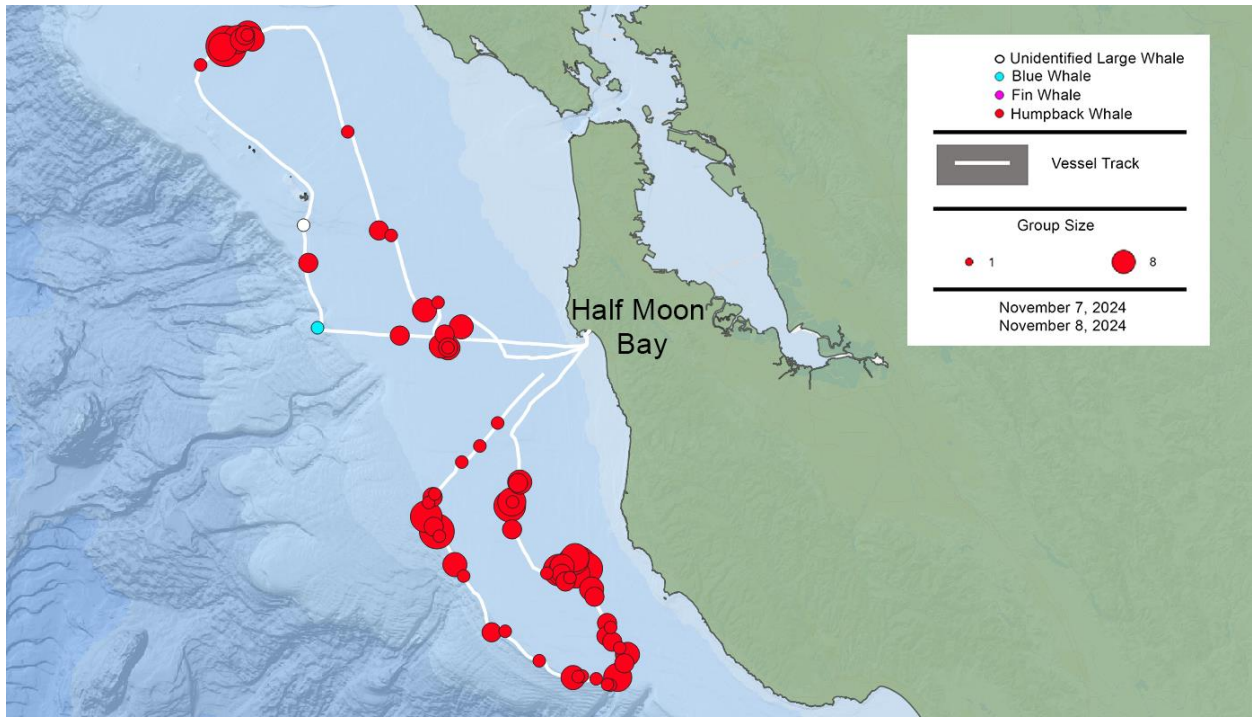


Figure 2. Survey effort and sightings from small boat survey by Cascadia in Fishing Zone 3 on 11 October 2024 through the Gulf of the Farallones.

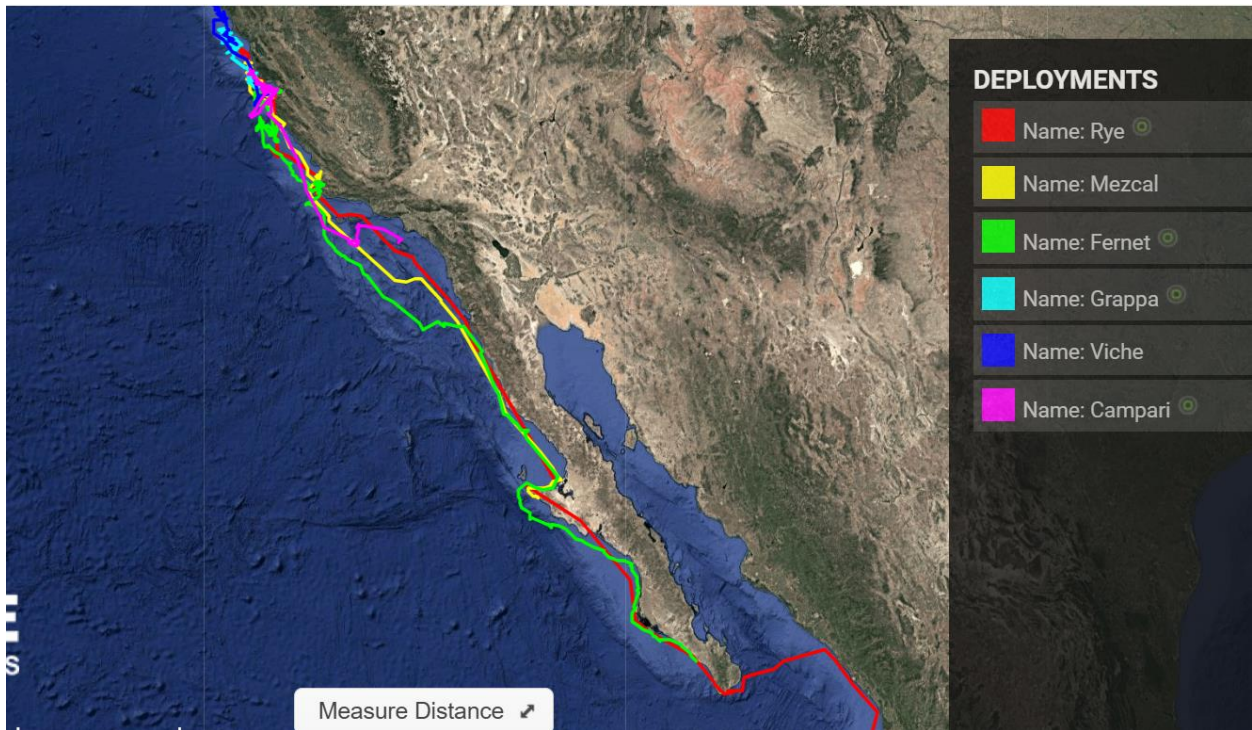


Figure 3. Tracks of six humpback whales satellite tagged by UCSC in October in Monterey Bay.

C. NOAA/SWFC CalCurCEAS Marine Mammal Survey (Fishing Zones 3-6)

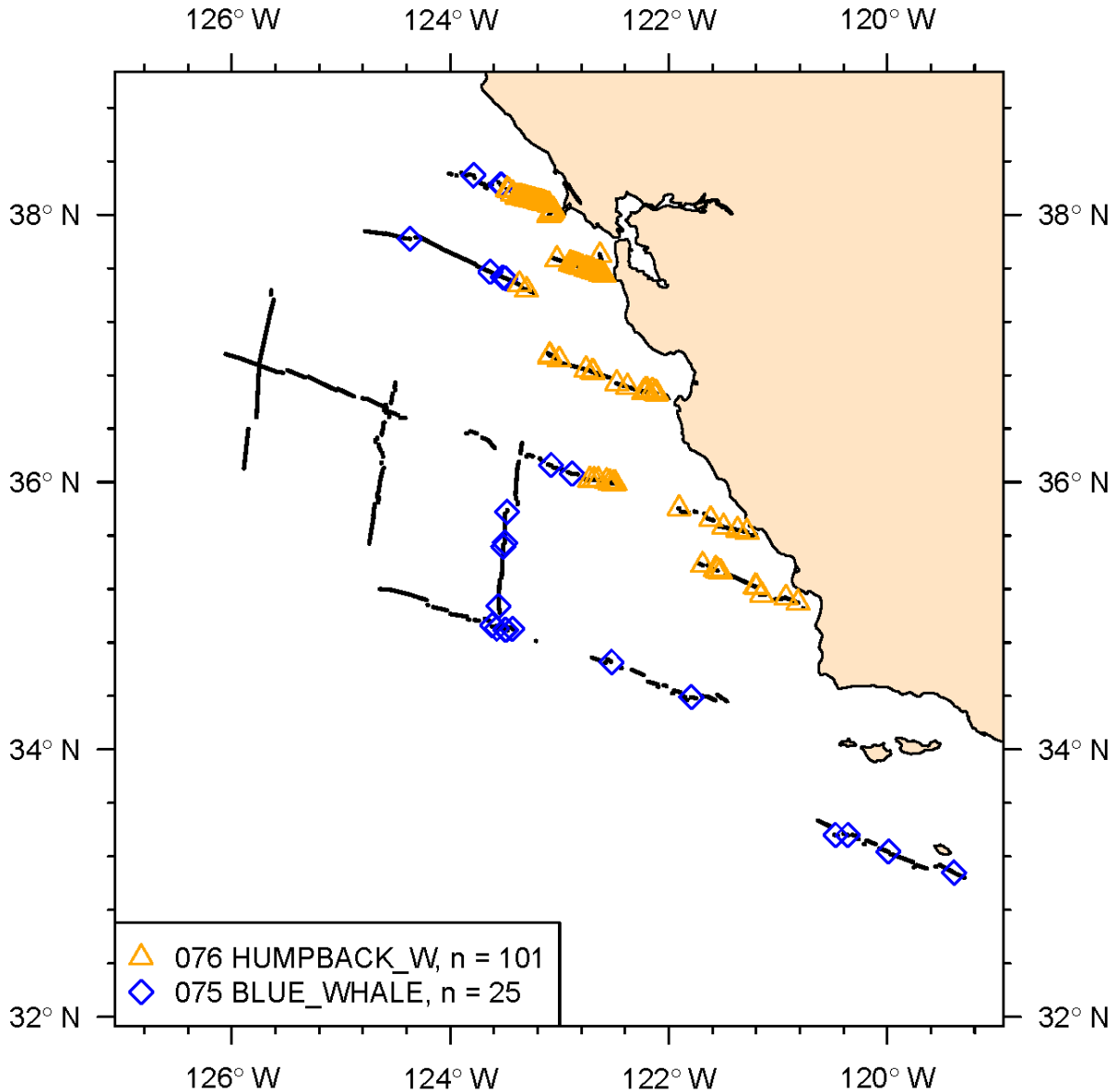
As part of a 4-month U.S. West Coast wide shipboard marine mammal survey aboard the R/V Bold Horizon, a 3-week survey leg covered waters from just north of Point Reyes south to San Nicolas Island off southern California, ranging from the coast to about 200 nautical miles offshore. The vessel generally worked from north

to south, with Fishing Zone 3 surveyed Oct. 24-26, 2024, Fishing Zone 4 surveyed on Nov. 2, 2024, Fishing Zone 5 surveyed Nov. 4-10, 2024, and Fishing Zone 6 surveyed on Nov. 10-11, 2024. Standard NOAA line-transect methods were used by a team of three experienced observers who searched through pedestal-mounted 25x binoculars and with handheld 7x binoculars. The team systematically identified and recorded all whales observed during the surveys.

Humpback whales were observed mostly in shelf/slope waters <150fm deep, although some sightings were made in deeper waters (Figure 4). Surveys conducted within Fishing Zone 3 during Oct. 24-26, 2024, documented 66 sightings of 155 humpback whales, mostly in shelf waters. Fishing Zone 4 was surveyed on Nov. 2, 2024, resulting in 18 sightings of 25 humpback whales. Fishing Zone 5 was surveyed on Nov. 4-10, 2024, resulting in 17 sightings of 36 humpback whales.

Blue whales were observed exclusively in deeper offshore waters (>150fm water depth and/or > 50 nmi from shore; Figure 4). Surveys conducted within Fishing Zone 3 during Oct. 24-26, 2024, documented eight sightings of 13 blue whales. Fishing Zone 4 was surveyed on Nov. 2, 2024, resulting in two sightings of two blue whales. Fishing Zone 5 was surveyed on Nov. 4-10, 2024, resulting in 10 sightings of 16 blue whales. Five additional sightings of seven blue whales were made on Nov. 11, 2024, off southern California in Fishing Zone 6.

CalCurCEAS Survey, Oct 24 – Nov 11, 2024



(NOAA/SWFSC, data provided by Karin Forney and Scott Benson)

Figure 4. NOAA/SWFSC ship-survey transects (black lines) and observations of humpback whales (orange triangles) and blue whales (blue diamonds) from Oct 24 – Nov 11, 2024. See text for timing of surveys within each RAMP Zone. The number of sightings of each species is indicated in the legend as 'n = '.

D. Monterey Bay Whale Watch Surveys (Fishing Zone 4)

Monterey Bay Whale Watch conducted whale-watching trips in southern Monterey Bay on six of seven days during the week of November 5-11, 2024. The 7-day average number of humpback whales-per-half-day-trip during November 5-11, 2024 was 26.6, with a peak of 53 humpback whales observed on a half-day trip on 6 November 2024 (Figure 5). Two blue whales were documented on October 16, 2024, but none have been observed since.

**Monterey Bay Whale Watch: Humpback whales per 1/2-day trip
(Nov 15, 2020 - Nov 11, 2024)**

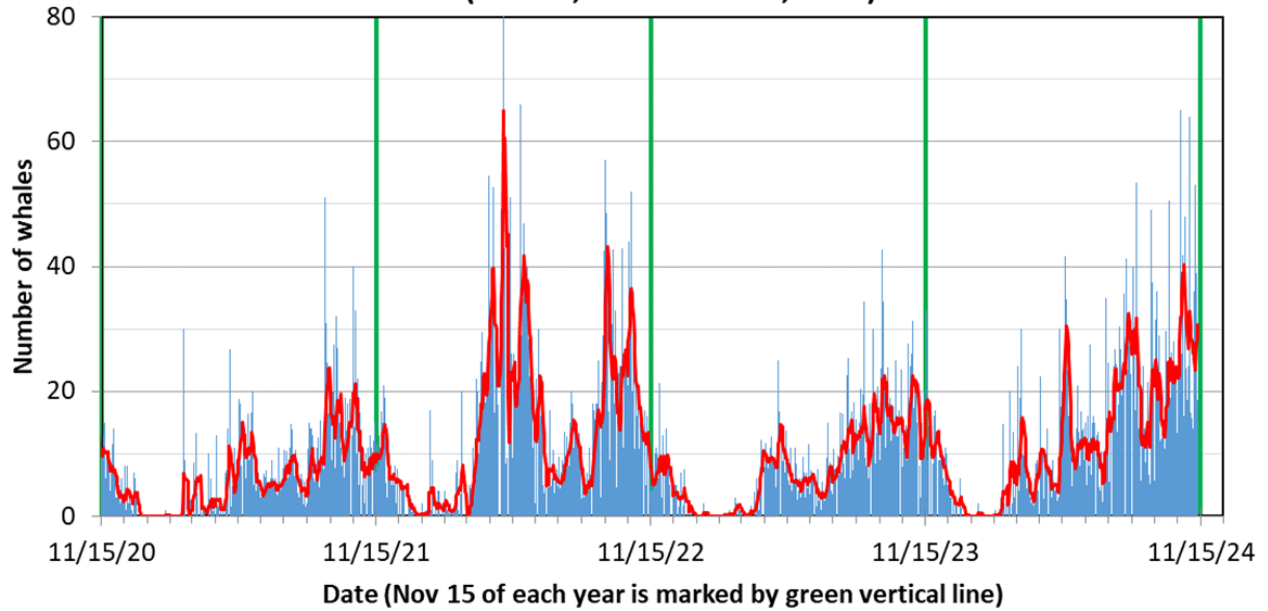


Figure 5. Standardized number of humpback whale sightings for Monterey Bay Whale Watch from 15 November 2020 – 18 March 2024. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns a bit easier to see. A vertical green line has been added at November 15 of each year for reference. Each tick mark is one month.

IV. Management Considerations

I. Information from NOAA: § 132.8(d)(2)

Data provided by: Lauren Saez and Dan Lawson, National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife.

As of November 15, 2024, NMFS has reported four confirmed CA commercial Dungeness crab gear entanglements and 11 Unknown Fishing Gear entanglements for the 2024 calendar year. Many entanglements categorized as “Unknown Fishing Gear” are actively being reviewed by NMFS staff and are subject to revision as new data becomes available. For more entanglement information please see the CDFW [Recent Entanglement History document](#).

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

Data provided by: Point Blue Conservation Science and Monterey Bay Whale Watch (processed by Karin Forney NOAA SWFSC)

A. Point Blue Conservation Science (Fishing Zones 3, 4, and 6)

For current observation data please see the [Point Blue Whale Alert map](#).

Table 6. Summary of available humpback and blue whale recorded reported via Point Blue Conservation Science in Fishing Zones 3, 4, and 6 during the seven-day period ending November 14, 2024.

Fishing Zone	Number of humpback whales sighted	Number of blue whales sighted
Zone 3	65	0
Zone 4	4	0
Zone 6	92	5

B. Monterey Bay Whale Watch (Fishing Zone 4)

The semi-monthly average number of humpback whales-per-half-day-trip in southern Monterey Bay is greater than the historical average for this time of year (Figure 6).

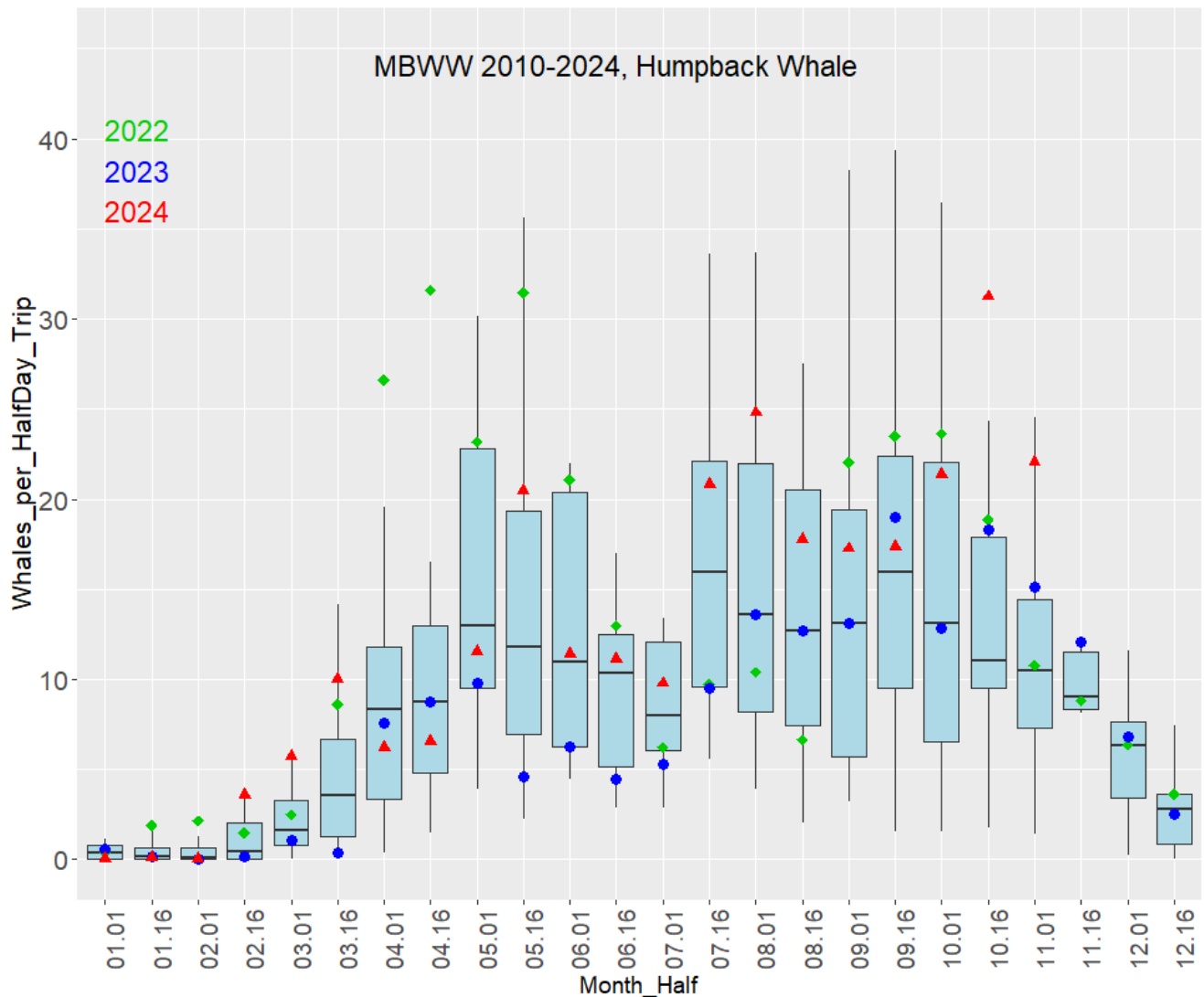


Figure 6. Historical Monterey Bay Whale Watch data for 2010-2024, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2022 (green diamonds), 2023 (blue dots) and 2024 (red triangles) and are provided for reference, placing recent whale numbers in a historical context.

C. Whale Watch 2.0 (All Fishing Zones)

Blue whale habitat predictions for November 12, 2024, show low habitat suitability in Fishing Zones 1-5 and high habitat suitability in Fishing Zone 6. Current habitat suitability can be accessed at [NOAA Coastwatch Habitat Suitability Map](#).

III. Fishing Season dynamics: §132.8(d)(7)

A. Domoic Acid and Quality Testing (Fishing Zones 1, 3, 4, and 5)

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

Domoic Acid

- Samples from collection sites in Fishing Zones 1, 3, 4, 5 have been collected and submitted to the California Department of Public Health (CDPH) with [results through November 7, 2024](#), posted on the [CDPH domoic acid website](#) where it will be updated. The results indicate that two locations in northern Fishing Zone 1 require additional testing. The [recreational Dungeness crab fishery was closed](#) in this area based on crab collected on 10/12/2024. Test results from crab collected on 11/8/2024 indicate that one of the two locations requires at least two more retests.
 - The closure of the recreational fishery is from the southern boundary of Reading Rock State Marine Reserve (41° 17.600' N. lat.) north to the California and Oregon border (42° 0.000' N. lat.).
- Based on prior results, [CDPH has issued a health advisory](#) for the following two areas, but these are likely to be lifted based on updated test results:
 - Northern Zone 3: Point Reyes (38° 0.000' N. lat.) north to the Sonoma/Mendocino County line (38° 46.125' N. lat.) and,
 - Southern Zone 1: Cape Mendocino (40° 10.000' N. lat.) north to the southern boundary of the Reading Rock State Marine Reserve (41° 17.600' N. Lat.).
- A sample collection is still being coordinated at one remaining site in Mendocino County.

Quality

- Domoic testing has postponed a quality test in November and will likely result in a delay for Fishing Zones 1 and 2 (Northern Management Area), pursuant to Fish and Game Code Section 8276.2.
- Quality test logistics are currently on hold pending domoic test results from Fishing Zone 1 and may be scheduled for the week of December 1 and/or December 15.

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

A. MBARI Krill Model

Modeled zooplankton conditions for October 2024 indicate low zooplankton conditions throughout the coast, with higher than expected concentrations between Point Arena and Point Sur (Fishing Zones 3 and 4). Current data can be accessed from the [MBARI Website](#).

V. Ocean conditions: §132.8(d)(9)

A. El Niño/Southern Oscillation (ENSO) Diagnostic

As of October 10, 2024, La Niña is favored to emerge in September-November (60% chance) and is expected to persist through January-March 2025. Please visit the [NOAA ENSO Diagnostic webpage](#) for more information.

B. Large Marine Heatwave Tracker

As of October 24, 2024, the heatwave conditions have decreased in the nearshore environment, while the main body of the heatwave has remained offshore. The current forecast suggests the heatwave will start to decline in size and strength over the fall. Please visit the [NOAA Marine Heatwave Tracker webpage](#) for more information.

C. Habitat Compression Index

No new data available. Please see the [October 22nd Preliminary Assessment and Available Data](#) document for the most recent update and the [NOAA Habitat Compression Index webpage](#) for more information.

VI. Effectiveness of management measures: §132.8(d)(3)

Data provided by: California Department of Fish and Wildlife

CDFW's effectiveness evaluation for the Management Actions specified in §132.8(e) are provided above in the Initial Assessment.

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

Data provided by: California Department of Fish and Wildlife

The RAMP regulations specify that, when deciding amongst multiple management measures which would equivalently reduce entanglement risk, CDFW shall consider total economic impact to the fleet and fishing communities.

VIII. Current Impact Score Calculation: §132.8(d)(10)

Data provided by: California Department of Fish and Wildlife

See Table 3 for the current fishing season and calendar year Impact Score. For more information about Impact scoring, please review the [Impact Score FAQ](#).