

2023-2024 Risk Assessment Preliminary Assessment and Available Data for Risk Assessment Mitigation Program

Last updated: January 8, 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:

- Fishing Zones 3, 4, 5 and 6: Season Opener with 70% Gear Reduction (trap reduction, vessels allowed to fish 30% of trap tier allotment) on January 18, 2024, at 12:01am (gear setting period to begin on Jan. 15, 2024, at 8:00 am)
- All Fishing Zones (1, 2, 3, 4, 5 and 6): Fleet Advisory

Recreational Fishery:

- Fishing Zones 3 and 4: Lift Crab Trap Prohibition
- All Fishing Zones (1, 2, 3, 4, 5 and 6): Continue Fleet Advisory

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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	Season Open; Fleet Advisory	Fleet Advisory	Fleet Advisory	Fleet Advisory
2	Season Open; Fleet Advisory	Fleet Advisory	Fleet Advisory	Fleet Advisory
3	Season Delay	Season Open with 70% Gear Reduction; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory	Fleet Advisory
4	Season Delay	Season Open with 70% Gear Reduction; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory	Fleet Advisory
5	Season Delay	Season Open with 70% Gear Reduction; Fleet Advisory	Fleet Advisory	Fleet Advisory
6	Season Delay	Season Open with 70% Gear Reduction; Fleet Advisory	Fleet Advisory	Fleet Advisory

I. Management Recommendation Summary Rationale

Entanglements: Two confirmed humpback whale entanglements were reported since the last risk assessment. The first entanglement was reported on December 17, 2023, off Dana Point, CA. The whale was reported to have a line and single buoy wrapped around the right pectoral flipper and peduncle. An unmarked bullet buoy was observed with no other identifying information; this is determined to be an entanglement with Unidentified Fishing Gear. A second humpback whale was reported entangled off Banderas Bay, Mexico on December 20, 2023, and confirmed to be CA commercial Dungeness crab fishing gear. Confirmed humpback whale entanglements in California commercial Dungeness crab fishing gear and Unknown Fishing Gear bring the three-year rolling average Impact Score to 3.39. Additionally, the three-year rolling average Impact Score for leatherback sea turtles is 0.33. For more information, please see the [RAMP Entanglement History](#) document.

Marine Life Concentrations: Based on the January 5, 2024, CDFW aerial survey in Fishing Zones 3 and 4, humpback whale sightings remain low and are expected to continue to decline through the winter months. Monterey Bay Whale Watch data also show a decline in humpback whale observations, with a weekly average of 2.4 whales per half-day trip.

Marine Region's preliminary recommendation is for the Director to open the commercial season in Fishing Zones 3, 4, 5 and 6 on January 18, 2024, at 12:01am (gear setting period to begin on Jan. 15, 2024, at 8:00 am) with a 70% Gear Reduction and under a Fleet Advisory. Trap allotments by Tier under the 70% Gear Reduction are listed below in Table 2. This is the recommended management approach due to the number of entanglements reported during the past three seasons and resulting Impact Scores as well as the potential for a significant effort shift from the Northern Management Area (Fishing Zones 1-2) into the Central Management Area (Fishing Zones 3-6). As of January 8, 2024, no landings have been reported in Fishing Zones 1 and 2. The lack of landings in those Fishing Zones and the resulting uncertainty regarding the number of vessels expected to fish during an opener in Fishing Zones 3 and 4 requires a conservative approach to reduce overall risk of entanglement due to trap loss. Based on bi-weekly reporting from the past three seasons, an estimated 41,000 traps are fished in Fishing Zones 3 and 4 during a season opener and an estimated 64,000 traps are fished in Fishing Zones 1 and 2. Given the high probability of effort shift as reported by the commercial fleet, a Vertical Line/Gear Reduction must be considered to minimize the number of vertical lines/traps, thereby reducing the amount of potential lost gear which was a significant contributor to reported entanglements during the 2023 calendar year. This 70% Gear Reduction is anticipated to remain in effect throughout the Fishing Season to minimize entanglement risk and provide stability for business planning.

Marine Region also recommends lifting the temporary crab trap prohibition for the recreational fishery in Fishing Zones 3 and 4 and continuing the Fleet Advisory in all Fishing Zones for both the commercial and recreational fishery. These recommendations are based on confirmed entanglements for humpback whales and a leatherback sea turtle and the resulting Impact Scores and known migration patterns for humpback whales.

During the previous risk assessment, humpback whale aggregations remained in Fishing Zones 3 and 4, primarily in waters off Point Reyes and Half Moon Bay in water depths of 27-38 fathoms (50-70m). Aerial surveys conducted by CDFW on January 5, 2024, recorded a decline in humpback whale numbers, observing four humpback whales in Fishing Zone 3 and no whales in Fishing Zone 4. Monterey Bay Whale Watch in Fishing Zone 4 also indicated a decline in the average number of humpback whales per half-day trip, decreasing from eight humpback whales in mid-December to 2.4 humpback whales as of this risk assessment. A peak of six whales were observed during a half-day trip on December 30, 2023. All previously available data showed a continued decline of humpback whales across all Fishing Zones and based on this trend and historical migration patterns, CDFW anticipates risk of entanglement has abated sufficiently to allow the season opener for Fishing Zones 3, 4, 5, and 6 under a 70% Gear Reduction and the lifting of the trap restrictions for the recreational fishery in Fishing Zones 3 and 4.

Table 2. Trap allotment under a 70% Gear Reduction by Tier.

Tier	Maximum Trap Allotment under 70% Gear Reduction
Tier 1	150
Tier 2	135
Tier 3	120
Tier 4	105
Tier 5	90
Tier 6	75
Tier 7	53

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

II. Alternative Management Actions for the Commercial Fishery

Alternative Recommendations

- 50% Gear Reduction in Fishing Zones 3, 4, 5 and 6: Considered as a recommendation but due to the significant likelihood of effort shift and potential increase in the number of vertical lines/traps it was not the preferred Management Action. In addition, the Marine Region anticipates that a further gear reduction would be needed in the upcoming two to four weeks as whales begin their migration back on to the fishing grounds, thereby increasing entanglement risk.

Alternatives Considered but Rejected

- Fishery Closure in Fishing Zones 3, 4, 5 and 6 – most protective but in consideration of not attaining marine life concentration triggers and economic impacts to the fleet this action was not a recommended management option.
- Depth Restriction by Fishing Zone – not considered for this assessment because it would not reduce overall risk from vertical lines.
- 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 2023. For recent entanglement information please see the CDFW [RAMP Entanglement History](#) document. See “[FAQ: Impact Scoring for the Risk Assessment and Mitigation Program](#)” for information about the RAMP Impact Score.

Table 3. Actionable Species Entanglements during 2023 pursuant to RAMP regulations.

Entanglement ID	Date	Species	Fishery	Impact Score
20230417Mn	04/17/23	Humpback whale	Unknown Fishing Gear	0.38
20230420Mn	04/20/23	Humpback whale	Unknown Fishing Gear	0.38
20230611Mn	06/11/23	Humpback whale	CA commercial Dungeness crab	0.75
20230719Mn	07/19/23	Humpback whale	CA commercial Dungeness crab	0.75
20230819Mn	08/19/23	Humpback whale	CA commercial Dungeness crab	0.75
20231111Mn	11/11/23	Humpback whale	CA commercial Dungeness crab	0.75
20231124Dc	11/24/23	Leatherback sea turtle	CA commercial Dungeness crab	1.0
20231217Mn	12/17/23	Humpback whale	Unknown Fishing Gear	0.38
20231220Mn	12/20/23	Humpback whale	CA commercial Dungeness crab	0.75

Table 4. 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 (2023-24)	Current Calendar Year Impact Score (2024)	3-Year Rolling Average
Humpback whales	0	0	3.39
Leatherback sea turtles	0	0	0.33

As of January 8, 2024, there have been zero Confirmed Entanglements of blue whales during the 2023-2024 period.

II. Marine Life Concentrations: §132.8(c)(1)

Data provided by: California Department of Fish and Wildlife, Monterey Bay Whale Watch (processed by Karin Forney, NOAA SWFSC)

CDFW Survey Data Map Viewer

CDFW aerial survey data are available as an interactive web map through ESRI Map Viewer for the [January 8, 2024, Risk Assessment](#). Past Risk Assessment survey data have been combined in a [2023-2024 Season RAMP survey map](#).

For assistance with using ESRI Map Viewer, please see the [How to Guide](#).

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 51. 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.

Fishing Zone	CDFW-approved survey data	Triggers attained?
Zone 1	N/A (season opened)	N/A
Zone 2	N/A (season opened)	N/A
Zone 3	CDFW Aerial Survey	No
Zone 4	CDFW Aerial Survey, MBWW	No
Zone 5	None	N/A
Zone 6	None	N/A

A. CDFW Surveys (Fishing Zones 3-4)

On January 5, 2024, CDFW conducted an aerial survey from Monterey Bay to Point Arena covering Fishing Zones 3 and 4. The survey followed east-west transect lines from Monterey Bay to Bodega Bay and followed a zig-zag pattern between the 30 and 100 fathom (55-183m) contour lines from Bodega Bay to Point Arena. Conditions were mostly favorable with a Beaufort state of less than 2. Four humpback whales and two unidentified whales were recorded in Fishing Zone 3. No whales were recorded in Fishing Zone 4.

Table 6. Counts of Actionable Species seen by CDFW aerial survey conducted on January 5, 2024.

Fishing Zone	Humpback whales	Unidentified whales
Zone 3	4	2
Zone 4	0	0

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

Monterey Bay Whale Watch conducted whale watching trips in southern Monterey Bay on three of seven days during the week of December 26, 2023-January 1, 2024. The average number of humpback whales per half day trip during the last seven days was 2.4, with a peak of 6 whales observed during a half day trip on December 30, 2023 (Figure 1).

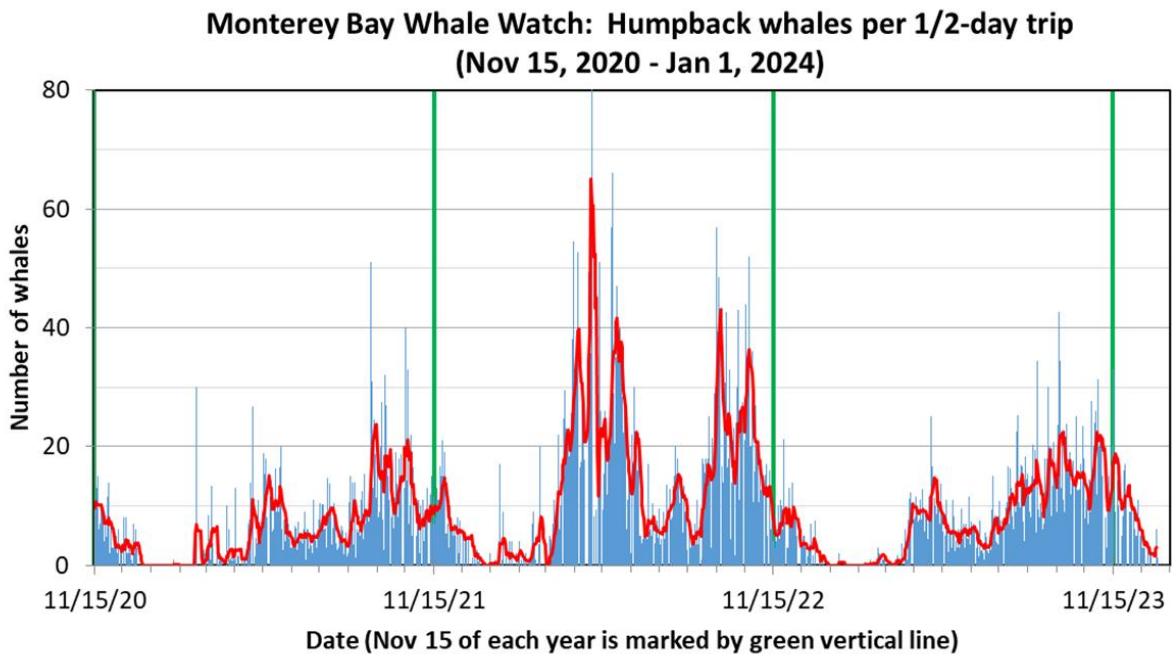


Figure 1. Standardized number of humpback whale sightings for Monterey Bay Whale Watch from 15 November 2020 – 1 January 2024. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns 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.

Since the last risk assessment, two humpback whale entanglements were reported. The first was reported on December 17, 2023, and confirmed to be in Unknown Fishing Gear. The second was reported on December 20, 2023, and confirmed to be entangled with CA commercial Dungeness crab gear. The whale was partially disentangled off Banderas Bay, Mexico. The gear was originally set in northern California.

During NOAA's annual review, staff determined that a gray whale entanglement reported off Shelter Cove on April 16, 2023, had a Dungeness crab tag consistent with CA shape. This entanglement has been updated from "commercial Dungeness crab, state unknown" to "California commercial Dungeness crab".

For the 2023 calendar year, total entanglements with the California commercial Dungeness crab include five humpback whales, two gray whales and one leatherback turtle. For more entanglement information please see the CDFW [RAMP Entanglement History](#) document.

II. Historic patterns and current Actional 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 7. Summary of available humpback and blue whale recorded by observers and reported on via Point Blue Conservation in Fishing Zones 3, 4, and 6 during the seven-day period ending January 8, 2024.

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

B. Monterey Bay Whale Watch (Fishing Zone 4)

The semi-monthly average number of whales per half-day trip in southern Monterey Bay for late December 2023 and early January 2024 is slightly lower than the historical average for this time period.

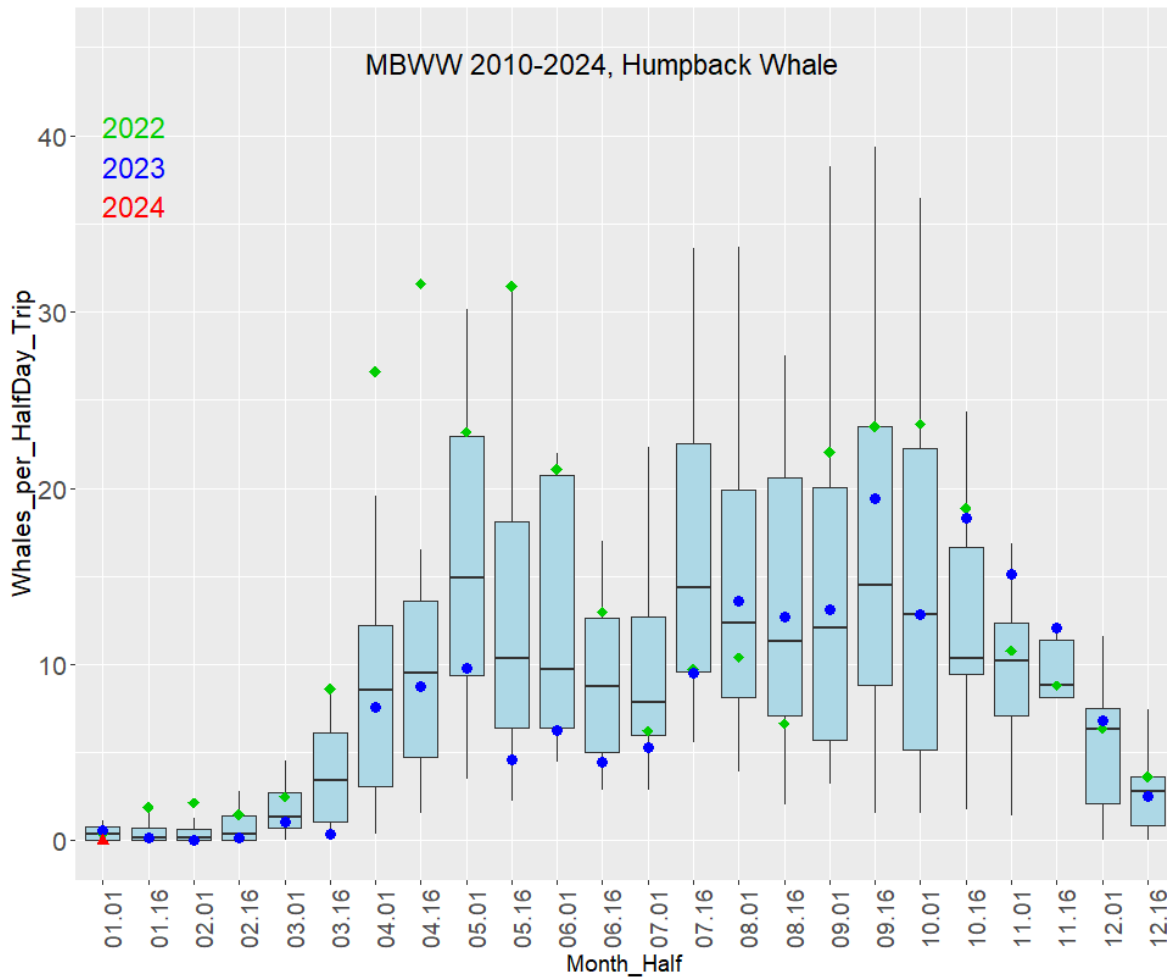


Figure 2. Historical Monterey Bay Whale Watch data for 2022-2024, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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) 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 January 1, 2024, show low habitat suitability in Fishing Zones 1-5, with some suitable habitat remaining within Fishing Zone 6, and high suitability in Mexico. For current habitat suitability check the [NOAA Coastwatch Habitat Suitability Map](#).

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

No reported landings as of January 8, 2024.

IV. Ocean conditions: §132.8(d)(9)

A. El Nino/Southern Oscillation (ENSO) Diagnostic

El Niño is expected to continue through the Northern Hemisphere winter, with a transition to ENSO-neutral favored during April-June 2024 (60% chance). Please visit the [NOAA ENSO Diagnostic webpage](#) for more information.

B. Large Marine Heatwave Tracker

The marine heatwave which formed in mid-May 2023 has decreased in area and receded from much of the coast during October. The heatwave is currently forecasted to persist through the winter, with an increased risk of coastal warming in the spring of 2024. Please visit the [NOAA Marine Heatwave Tracker webpage](#) for more information.

C. Habitat Compression Index

Regions 2 and 3, which include the north and central coast of California, show high habitat compression. Please see the [NOAA Habitat Compression Index webpage](#) for more information.

V. 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.

VI. 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.

VII. 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](#).