

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

Last updated: February 9, 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:

- Continue 50% Gear Reduction in Fishing Zones 3, 4, 5 and 6
- Continue Fleet Advisory for all Fishing Zones

Recreational Fishery:

- Continue Fleet Advisory for 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 | Fleet Advisory | Fleet Advisory | Fleet Advisory | Fleet Advisory |
| 2 | Fleet Advisory | Fleet Advisory | Fleet Advisory | Fleet Advisory |
| 3 | Season Open with 50% Gear Reduction; Fleet Advisory | 50% Gear Reduction; Fleet Advisory | Fleet Advisory | Fleet Advisory |
| 4 | Season Open with 50% Gear Reduction; Fleet Advisory | 50% Gear Reduction; Fleet Advisory | Fleet Advisory | Fleet Advisory |
| 5 | Season Open with 50% Gear Reduction; Fleet Advisory | 50% Gear Reduction; Fleet Advisory | Fleet Advisory | Fleet Advisory |
| 6 | Season Open with 50% Gear Reduction; Fleet Advisory | 50% Gear Reduction; Fleet Advisory | Fleet Advisory | Fleet Advisory |

I. Management Recommendation Summary Rationale

Entanglements: No new entanglements have been reported since the last Risk Assessment on January 11, 2024. Currently, 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: No Marine Life Concentration surveys were conducted since the last risk assessment due to severe weather. Monterey Bay Whale Watch documented no humpback whales during the last seven days (January 24-30, 2024). The semi-monthly average number of whales-per-half-day-trip in southern Monterey Bay in January 2024 is very low, similar to 2023 and the historical average for this time period. Recent leatherback turtle telemetry data documented a tagged female 500km southwest of Point Conception, CA heading in an ENE direction towards the coast of southern California or northern Baja California. Although the turtle is currently well outside Fishing Zones, the speed of travel has

been relatively rapid, indicating the turtle could move into southern California waters within the next 2-4 weeks.

Marine Region's preliminary recommendation is for the Director to continue the current Management Actions for both the commercial and recreational fisheries. This includes the continuation of the 50% Gear Reduction in Fishing Zones 3, 4, 5 and 6 for the commercial fishery and continuation of the Fleet Advisory for all Fishing Zones in both fisheries. No Marine Life Concentration triggers were met for Actionable Species under RAMP; humpback whale sightings are at seasonal lows as most whales have migrated to their southern breeding grounds. Research partners documented a tagged leatherback sea turtle traveling across the Pacific towards California waters, but it is currently well outside of the Fishing Zones. This turtle will continue to be closely monitored as it enters California ocean waters.

Since the commercial season opened statewide on January 18, 2024, fishing effort has primarily been concentrated in Fishing Zones 1 and 3. Biweekly reports in the Northern Management Area (NMA) (Fishing Zones 1-2) show that 106 active vessels deployed 33,493 traps during the February 1, 2024 reporting period, and 158 vessels deployed 22,737 traps in the Central Management Area (CMA) (Fishing Zones 3-6) while operating under a 50 percent Gear Reduction. For context, the 2022-23 fishing season opened statewide on December 31, 2022, with the CMA under a 50 percent Gear Reduction which was lifted on January 15, 2023. In 2023, the same biweekly reporting period (February 1) documented 189 vessels in the NMA deployed 54,933 traps and 120 vessels in the CMA deployed 23,762 traps. Biweekly compliance rates vary but they provide the best direct seasonal comparison and indicate more fishing effort is occurring in CMA than in 2023. Given the increased effort in the CMA and the current rolling average three-year Impact Score for both humpback whales and leatherback sea turtles, Marine Region recommends that the 50 percent Gear Reduction continue in Fishing Zones 3, 4, 5 and 6 to reduce the amount of gear in the water. This will have the overall effect of minimizing the potential for lost gear which was a significant contributor to reported entanglements in 2023 and the number of vertical lines encountered as the whale migration begins to California waters in the coming weeks.

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 by Rejected

- 70% Gear Reduction in Fishing Zones 3, 4, 5 and 6 - In consideration of economic impacts to the commercial fleet, this was not provided as a recommended Management Action at this time.
- 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)

No entanglements have been reported in 2024. 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 2. 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 turtle | 0 | 0 | 0.33 |

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

Data provided by: Peter Waldie (The Nature Conservancy – Solomon Islands) via Scott Benson (NOAA-SWFSC) and Monterey Bay Whale Watch (processed by Karin Forney, NOAA SWFSC)

Table 31. 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 | None | NA |
| Zone 2 | None | NA |
| Zone 3 | None | NA |
| Zone 4 | None | NA |
| Zone 5 | None | NA |
| Zone 6 | None | NA |

A. Leatherback Turtle Telemetry

A post-nesting female leatherback turtle was tagged with a satellite-linked transmitter by Nature Conservancy colleagues at a beach in the Solomon Islands on June 7, 2023.

The transmitter remains active, and the turtle has nearly completed a trans-Pacific crossing. It is currently 500 km southwest of Point Conception, CA and heading in an

ENE direction toward the coast of southern California or northern Baja California, Mexico. Past telemetry data indicate that leatherback turtles often enter US West Coast waters off southern California before turning northward and moving up the coast to central California.

Although this turtle is currently well outside of Dungeness crab fishing zones, the speed of travel has been relatively rapid. Although it is unusual for leatherbacks to occupy coastal California waters prior to June/July, this turtle could move into southern California waters within the next 2-4 weeks. The turtle will continue to be monitored.

B. 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 January 24, 2024, to January 30, 2024. No humpback whales were observed during the last seven days. The most recent humpback whale sighting was on January 23, 2024, when two whales were observed during a half-day trip (Figure 1.) No blue whales have been observed since July 16, 2023.

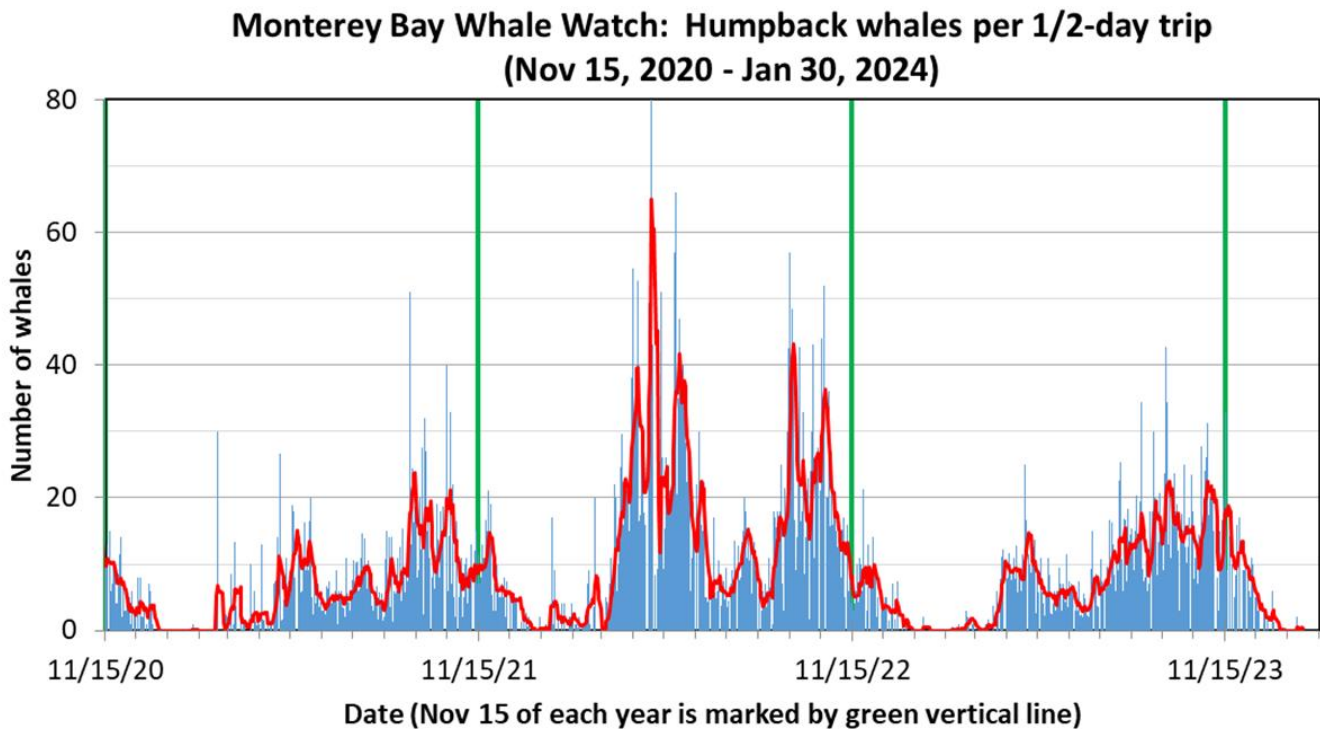


Figure 1. Standardized number of humpback whale sightings for Monterey Bay Whale Watch from 15 November 2020 – 30 January 2024. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns 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

III. 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.

No entanglements have been reported since the last Risk Assessment on January 11, 2024. For more entanglement information please see the CDFW [RAMP Entanglement History](#) document.

IV. 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 4. 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 February 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 January 2024 is similar to the 2023 value and the historical average for this time period (Figure 2).

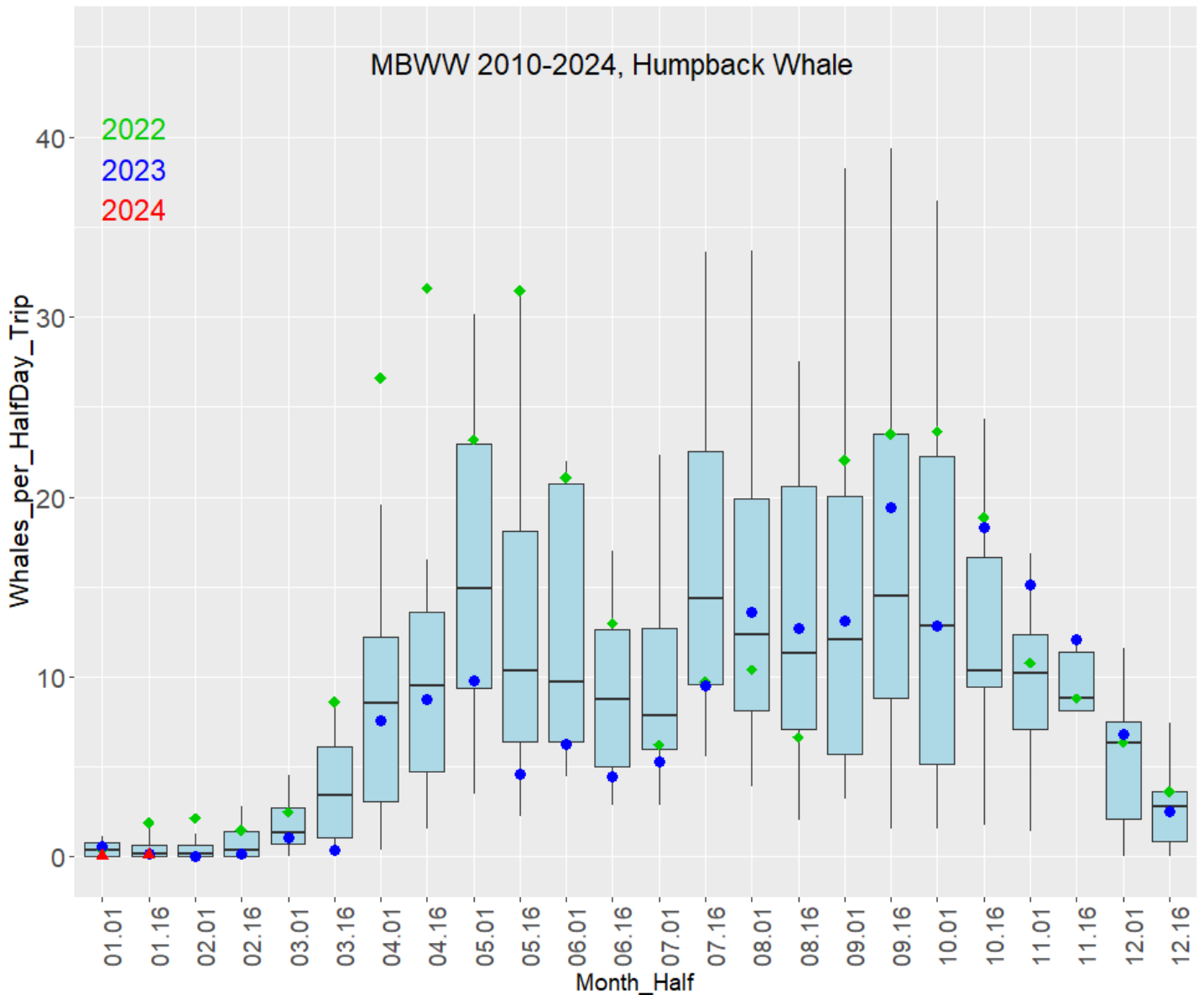


Figure 2. Historical Monterey Bay Whale Watch data for 2010-2024, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th-end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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) 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 February 3, 2024, show low habitat suitability in Fishing Zones 1-5, and small offshore portions of moderate suitable habitat within Fishing Zone 6. For current data can be accessed at [NOAA CoastWatch Habitat Suitability Map](#).

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

Data provided by: California Department of Fish and Wildlife. *CDFW data presented in this section is preliminary and subject to revision.

D. Marine Landings Data System (All Fishing Zones)

All Fishing Zones are open as of January 18, 2024, and a summary of landings from all Fishing Zones is provided below (Table 5).

Table 5. Summary of fleet dynamics information, as of February 8, 2024

| Metric | Value | Additional Info |
|---|--------------|--|
| Season status | Open | Fishing Zones 3-6 open under 50% Gear Reduction |
| Number of daily landings | 2,062 | NA |
| Total volume (pounds) | 9,157,857 | NA |
| Total Ex-Vessel Value | \$29,704,806 | NA |
| Average unit price | \$3.24 | NA |
| Total number of active vessels | 331 | NA |
| Maximum potential traps (based on active permits) | 78,200 | Estimates are also provided in the Bi-Weekly Fishing Activity Reports Subsection |

Fishing Zone 3 shows the highest number of active vessels throughout the fishing season to date with a high of 168 vessels, followed by Fishing Zone 1 with a high of 116 vessels. The number of active vessels peaked during the week of January 26, 2024, and has been decreasing.

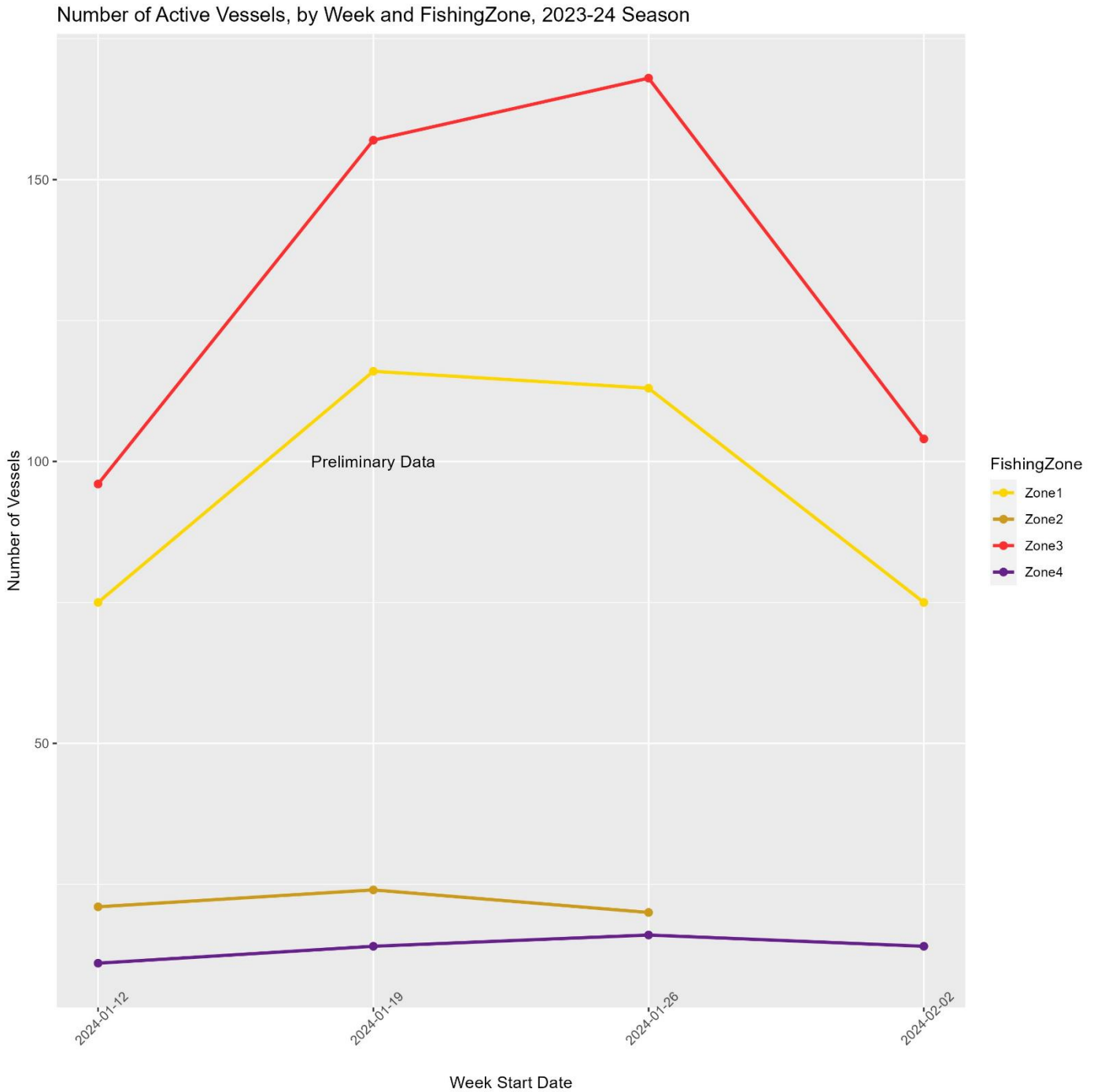


Figure 3. Number of active vessels by week and Fishing Zone. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, January 5, 2024. All data are preliminary and subject to change. Some week*port complex combinations are withheld due to confidentiality constraints.

Total volume (pounds) peaked during the week of January 19, 2024, at just over 4 million pounds and has since been decreasing. Fishing Zone 3 shows the highest landings over the course of the season at about 6 million pounds, followed by Fishing Zone 1 at 2.7 million pounds.

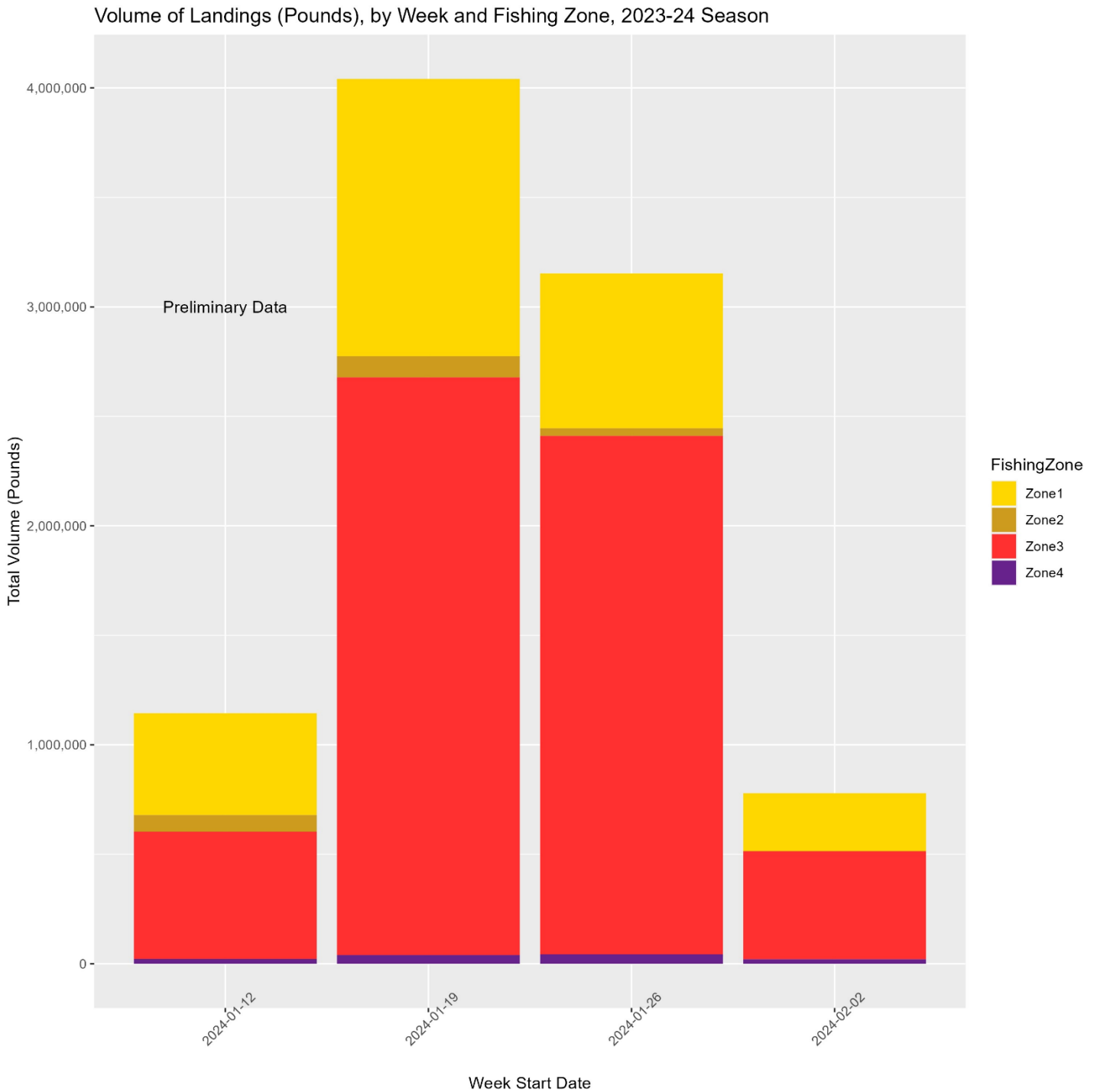


Figure 4. Cumulative volume (pounds) landed by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, January 5, 2024. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality constraints.

E. Bi-Weekly Fishing Activity Reports (All Fishing Zones)

CDFW has received bi-weekly reports since the first reporting period on January 16, 2024, through the most recent reporting period of February 1, 2024. A summary of reports received for January 16, 2024, is provided in Table 6 and those received for February 1, 2024, are provided in Table 7; note this summary may not reflect all permitted vessels participating in the fishery due to ongoing compliance issues.

Table 6. Summary of information provided for the January 16, 2024, bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on February 7, 2024. All data are preliminary and subject to change.

| Fishing Zone | Permits Reporting | Avg. Trap Number | Total Traps | Avg. Min. Depth (fa.) | Avg. Max. Depth (fa.) | Max. Depth (fa.) | Final Report | Number of Lost Traps |
|--------------|-------------------|------------------|-------------|-----------------------|-----------------------|------------------|--------------|----------------------|
| Zone 1 | 59 | 338 | 19,962 | 14 | 31 | 65 | 0 | NA |
| Zone 2 | 15 | 190 | 2,857 | 13 | 25 | 38 | 0 | NA |
| Zone 3 | 110 | 159 | 17,524 | 20 | 34 | 80 | 0 | NA |
| Zone 4 | 13 | 103 | 1,344 | 21 | 46 | 70 | 0 | NA |
| Zone 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zone 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 197 | NA | 41,687 | NA | NA | NA | 0 | 0 |

Table 7. Summary of information provided for the February 1, 2024, bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on February 7, 2024. All data are preliminary and subject to change.

| Fishing Zone | Permits Reporting | Avg. Trap Number | Total Traps | Avg. Min. Depth (fa.) | Avg. Max. Depth (fa.) | Max. Depth (fa.) | Final Report | Number of Lost Traps |
|--------------|-------------------|------------------|-------------|-----------------------|-----------------------|------------------|--------------|----------------------|
| Zone 1 | 90 | 339 | 30,179 | 13 | 31 | 65 | 0 | NA |
| Zone 2 | 16 | 207 | 3,314 | 13 | 23 | 38 | 0 | NA |
| Zone 3 | 137 | 149 | 20,428 | 23 | 39 | 80 | 1 | 0 |
| Zone 4 | 21 | 109 | 2,309 | 21 | 42 | 70 | 0 | NA |
| Zone 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zone 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Totals | 264 | NA | 56,230 | NA | NA | NA | 1 | 0 |

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

A. MBARI Krill Model

Modeled zooplankton conditions for January 2024, indicate areas of slightly higher than average conditions near the Cape of Mendocino and from Point Sur to south of Point Conception. Average to lower-than-average concentrations are present everywhere else on the coast. Current data can be accessed from the [MBARI website](#).

VII. Ocean conditions: §132.8(d)(9)

A. El Nino/Southern Oscillation (ENSO) Diagnostic

Current analyses indicate the ocean-atmosphere system is in a weakened El Niño state with a likely transition to ENSO-neutral in April to June of 2024 and increasing odds of La Niña developing in June to August of 2024. Please visit the [NOAA ENSO Diagnostic webpage](#) for more information.

B. Large Marine Heatwave Tracker

The marine heatwave that formed in mid-May, receded from the coast in October 2023. The second heatwave which developed in October 2023, has merged with recent coastal warming related to the ongoing El Niño. There is a high probability that these conditions will persist through the next few months. Please visit the [NOAA Marine Heatwave Tracker webpage](#) for more information.

C. Habitat Compression Index

Regions 2, 3, and 4, which includes part of Northern California down to Southern California, show high habitat compression. Please visit the [NOAA Habitat Compression Index webpage](#) for more information.

D. North Pacific High

The North Pacific High (NPH) Area Index monitors the area and intensity of the NPH atmospheric pressure cell off the west coast and acts an indicator of what potential spring upwelling and in turn, krill abundance may look like within California coastal waters.

The NPH Area index in January (Figure 5) is much below average, indicating likely weaker spring upwelling and lower krill abundance.

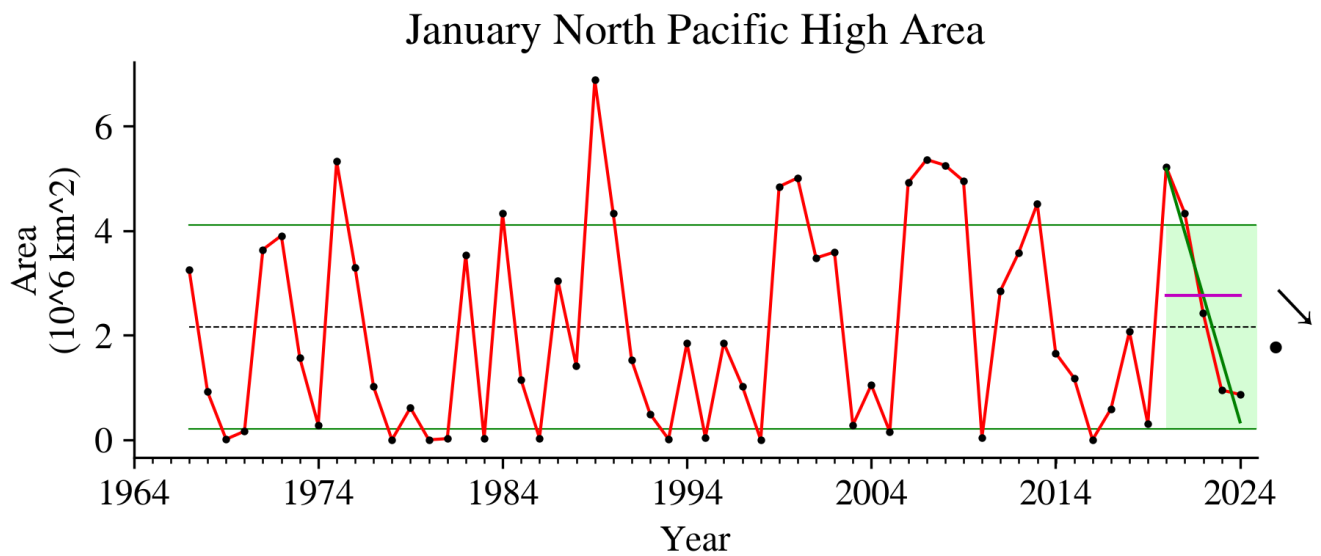


Figure 5. The North Pacific High (NPH) index from January from 1964 to 2024. Data provided by: Jarrod Santora (NMFS SWSFC).

VIII. 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.

IX. 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.

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

Data provided by: California Department of Fish and Wildlife

See Table 2 for the current fishing season and calendar year Impact Score. For more information about Impact scoring, please review the [Impact Score FAQ](#).