

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

Last updated: June 11, 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 1 and 2: Continue Depth Constraint (30-Fathom) and Fleet Advisory through the end of the statutory season (July 15, 2024).

#### Recreational Fishery:

- Fishing Zones 3, 4, and 5: Continue Crab Trap Prohibition through the end of the statutory season (June 30, 2024).
- All Fishing Zones: Continue Fleet Advisory through the end of the statutory season.

## Contents

PRELIMINARY ASSESSMENT .....	- 1 -
I. Management Recommendation Summary Rationale .....	- 2 -
II. Alternative Management Actions for the Commercial Fishery .....	- 3 -
AVAILABLE DATA.....	- 5 -
III. Triggers Requiring Management Action .....	- 5 -
IV. Management Considerations.....	- 8 -

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

<b>Fishing Zone</b>	<b>Commercial Fishery: Current Management Status</b>	<b>Commercial Fishery: Proposed Management Status</b>	<b>Recreational Fishery: Current Management Status</b>	<b>Recreational Fishery: Proposed Management Status</b>
1	30-Fathom Depth Constraint; Fleet Advisory	30-Fathom Depth Constraint; Fleet Advisory	Fleet Advisory	Fleet Advisory
2	30-Fathom Depth Constraint; Fleet Advisory	30-Fathom Depth Constraint; Fleet Advisory	Fleet Advisory	Fleet Advisory
3	Season Closure	Season Closure	Crab Trap Prohibition; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory
4	Season Closure	Season Closure	Crab Trap Prohibition; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory
5	Season Closure	Season Closure	Crab Trap Prohibition; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory
6	Season Closure	Season Closure	Fleet Advisory	Fleet Advisory

## I. Management Recommendation Summary Rationale

*Entanglements:* Two entanglements with humpback whales were reported on May 17, 2024, in the Monterey Bay area (Fishing Zone 4), near Soquel Canyon. NMFS has reviewed the entanglements and confirmed one entanglement (20240517Mn1) involved CA commercial Dungeness crab gear. The confirmed entanglement involves a blue/green line wrapped around the peduncle with two buoys, one with an orange/red CDFW buoy tag, trailing 30 to 50 feet behind the whale. The whale was documented earlier in the day without gear, so it is believed that this was a very recent entanglement. The second entanglement (20240517Mn2) had a similar blue/green line wrap around the peduncle/fluke. However, the injuries to the caudal peduncle were more severe, confirming this to be a different whale. No buoys were seen in the two photos taken of this whale and this gear type is currently considered unidentified (line only). Both humpback whale entanglements were documented in the same area in a group of over 35 humpback whales. These entanglements bring the 2023-2024 Current Fishing Season Impact Score to 1.13, and the 3-year rolling average to 3.77. For more information, please see the [RAMP Entanglement History](#) document.

*Marine Life Concentrations:* CDFW conducted an aerial survey in Fishing Zones 1-2 on June 3, 2024, and observed zero Actionable Species. NOAA National Marine Fisheries Service (NMFS) Rockfish Recruitment and Ecosystem Assessment Survey (RREAS) transited through Fishing Zone 1 and observed 73 humpback whales and two unidentified large baleen whales in deeper, offshore waters (deeper than 200m) from May 30 through June 3, 2024. Industry-led vessel surveys occurred on June 4, 2024, in Fishing Zone 1 and observed 16 humpback whales and two unidentified whales along the Crescent City (South Zone 1) transect in depths from 59 to 94 fathoms.

Marine Region's preliminary recommendation is for the Director to continue the Management Actions currently in place for both the commercial and recreational fisheries, including the 30-fathom Depth Constraint in Fishing Zones 1-2 for the commercial fishery and the Crab Trap Prohibition in Fishing Zones 3, 4 and 5 for the recreational fishery. These management actions would be in place until the end of the statutory season for both the commercial and recreational fisheries. A Fleet Advisory would also be maintained for all open Fishing Zones for both the commercial and recreational fisheries.

Humpback whale observations remain low in nearshore waters that are open to fishing throughout Fishing Zones 1 and 2. At this time, Marine Region staff do not recommend additional Management Actions for Fishing Zones 1 and 2 for the commercial or recreational fisheries. The 30-fathom Depth Constraint for the commercial fishery will continue to minimize overlap with foraging humpback whales observed offshore and limited recreational trap fishing in Fishing Zones 1 and 2 does not present an elevated risk at this time. The total number of commercial traps in Fishing Zones 1 and 2 continues to decrease as the season progresses. Since the last Risk Assessment, Fishing Zones 1 and 2 reported 15,566 traps on May 16, 2024, which decreased to 6,615 traps as of the last bi-weekly reporting period on June 1, 2024. The number of reporting permits also decreased from 76 active permits on May 16, 2024, to 43 permits as of the last bi-weekly reporting period. In addition, the Depth Constraint will also help reduce entanglement risk from high habitat compression, as modeled by the Habitat Compression Index, by limiting fishing activity to nearshore, shallower depths.

Extending the current Management Actions will allow for continued fishing opportunities in Fishing Zones 1 and 2 while minimizing entanglement risk through the end of the statutory season. This preliminary recommendation is based on the historical migration patterns, current Entanglement Impact Score and observed Marine Life Concentrations.

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**

- Fishery Closure - most protective, but in consideration of lowered risk and continued minimal Actionable Species sightings, it was not the recommended management option.
- Gear Reduction – considered for Fishing Zones 1 and 2 but not recommended at this time due to declining fishing effort (based on bi-weekly reporting).

- Alternative Gear- can be authorized after April 1st, but no gear is currently authorized for the commercial Dungeness crab fishery.

# AVAILABLE DATA

## III. Triggers Requiring Management Action

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

Data provided by: Lauren Saez and Dan Lawson (NOAA NMFS)

The table below outlines the confirmed entanglements under RAMP and their associated Impact Score for the year 2024. See "[FAQ: Impact Scoring for the Risk Assessment and Mitigation Program](#)" for information about the RAMP Impact Score. For more information and definitions, please see the [RAMP Entanglement History](#) document.

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

Entanglement ID	Date	Species	Fishery	Impact Score
20240517Mn1	05/17/24	Humpback whale	CA commercial Dungeness crab	0.75
20240517Mn2	05/17/24	Humpback whale	Unknown Fishing Gear	0.38

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 (2023-24)	Current Calendar Year Impact Score (2024)	3-Year Rolling Average
Humpback whales	1.13	1.13	3.77
Leatherback sea turtle	0	0	0.33

As of June 11, 2024, there have been zero Confirmed Entanglements of blue whales or leatherback sea turtles during the 2024 calendar year.

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

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

Aerial and vessel survey data from May 30 to June 4, 2024 are available online with the [Arc Map Viewer](#). Past Risk Assessment survey data have been combined in a [2023-2024 Season RAMP Survey Map](#).

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

Under the RAMP regulations for the period of March 1 until the Fishing Season closes statewide a trigger has been met when:

- The number of humpback whales is greater than or equal to 10, 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
- The number of Pacific leatherback sea turtles is greater than or equal to one within 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.

Fishing Zone	CDFW-approved survey data	Triggers attained?
Zone 1	CDFW Aerial Survey	No
Zone 2	CDFW Aerial Survey	No
Zone 3*	None	Season closed
Zone 4*	MBWW	Season closed
Zone 5*	None	Season closed
Zone 6*	None	Season closed

\*Fishing Zone is closed for the commercial fishery for the remainder of the statutory season

### A. CDFW Surveys (Fishing Zones 1-2)

CDFW conducted an aerial survey on June 3, 2024, covering Fishing Zones 1 and 2. CDFW flew between the coast and the 100-fathom line between Point Arena and the Oregon border. Between Shelter Cove and Newport, the aircraft stayed offshore due to low lying cloud cover along the coastline. From this section of the survey and south to Point Arena, the survey continued offshore outside cloud cover. The survey ended at Point Arena as larger clouds obscured the remaining portion of the coastline. Conditions in both Fishing Zones were generally good, with a survey altitude between 700-1000' and Beaufort states of 1 and 2 north of Cape Mendocino. The wind greatly increased (Beaufort state 4) around Cape Mendocino and improved by the Shelter Cove area south (Beaufort state 3).

CDFW aerial survey data is available online with the [Arc Map Viewer](#). For assistance with using Arc Map Viewer, please see the [How to Guide](#).

Table 5. Counts of Actionable Species seen by CDFW aerial survey conducted on June 3, 2024.

Fishing Zone	Humpback whales	Unidentified whales
Zone 1	0	0
Zone 2	0	0

### 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 May 27 – June 2, 2024. The 7-day average number of humpback whales-per-half-day-trip during May 27 – June 2, 2024, was 9.0 (Figure 1), with a peak of 14 humpback whales observed on a half-day trip on June 2, 2024. This represents a marked drop in whale numbers

compared to mid-May (when the whales-per-half-day trip averaged 29.4 and a peak of 75 whales was observed on an all-day trip on May 20, 2024).

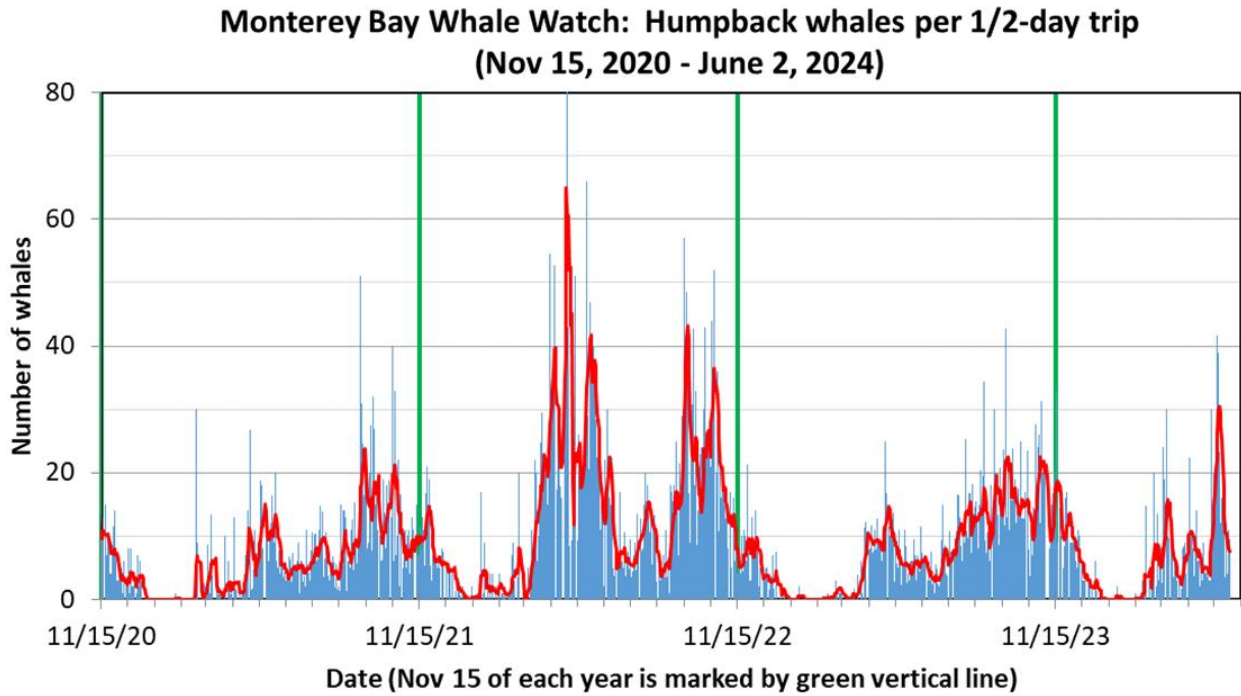


Figure 1. Standardized number of humpback whale sightings for Monterey Bay Whale Watch from November 15, 2020 - June 2, 2024. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns 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)

Two entanglements with humpback whales were reported on May 17, 2024, in the Monterey Bay area (Fishing Zone 4). NMFS has reviewed the entanglements and confirmed one entanglement (20240517Mn1) as involving CA commercial Dungeness crab gear. The second entanglement (20240517Mn2) is currently considered unidentified. Both humpback whale entanglements were documented in the same area in a group of over 35 humpback whales. For more detail, please refer to the Management Recommendation Summary Rationale on page 2.

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

Data provided by: Point Blue Conservation Science, Jarrod Santora (NOAA NMFS), California Coast Crab Association, Monterey Bay Whale Watch (processed by Karin Forney NOAA SWFSC)

#### C. 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 June 7, 2024.

Fishing Zone	Number of humpback whales sighted	Number of blue whales sighted
Zone 3	1	11
Zone 4	13	0
Zone 6	30	0

#### D. NOAA NMFS (Fishing Zone 1)

The NOAA NMFS Rockfish Recruitment and Ecosystem Assessment Survey (RREAS), run by the Southwest Fisheries Science Center and partners at the Farallon Institute, transited through Fishing Zone 1 and documented large baleen whales. The cruise departed San Francisco on May 30, 2024, and headed directly to northern California to conduct trawling operations and acoustic and visual surveys, which occurred within the Northern Management Area through June 3, 2024. A sawtooth pattern covered the cross-shelf domain to ensure adequate sampling on the shelf and outer slope. Gaps in the transect lines indicate portions where visibility was reduced due to foggy conditions, but overall, the sea state was very calm, allowing for excellent coverage and visual survey effort. There were 54 sightings for a total of 73 whales, all being humpback whales except for two unidentified large baleen whales. The RREAS encountered dense concentrations of krill in trawls and in



acoustic records; it appears that whales are feeding on krill patches and distributed further offshore (as they were in the Greater Gulf of the Farallones last month too). Data from the NOAA RREAS survey can be found on the CDFW [Arc Map Viewer](#).

### E. California Coast Crab Association (Fishing Zone 1)

Three vessels completed four surveys on June 4, 2024. One industry vessel departed from Crescent City (F/V Miss Heidi) and two vessels departed out of Eureka (F/V Seaila, F/V Sally Kay). All three vessels had independent observers (F/V Miss Heidi, F/V Seaila, and F/V Sally Kay). Visibility was 6-10 nmi, with clear skies, and the swell shifting between 4-8 ft. A total of 18 whales, including 16 humpback whales and two unidentified whales were observed along the Crescent City (South Zone 1) transect (Table 7). The 16 humpback whales were sighted along the Crescent City (South Zone 1) transect at 59-94 fathoms, and 2 unknown/unidentified whales were sighted along the Crescent City (South Zone 1) transect at 48 fathoms. No whales were sighted off Eureka (North and South Zone 1) and Crescent City (North Zone 1) transects. Other notable marine mammals observed were 2 harbor porpoises sighted off Eureka (North Zone 1). Four crab pots were recovered by F/V Sally Kay during the Eureka (North Zone 1) transect survey. Data from the industry-led vessel surveys can be found on the CDFW [Arc Map Viewer](#).

Table 7. Summary counts of Actionable Species seen on CCCA vessel surveys conducted on June 3, 2024.

<b>Fishing Zone</b>	<b>Transect</b>	<b>Humpback whales</b>	<b>Unidentified whales</b>
Zone 1	Crescent City (South Zone 1)	16	2
Zone 1	Crescent City (North Zone 1)	0	0
Zone 1	Eureka (North Zone 1)	0	0
Zone 1	Eureka (South Zone 1)	0	0

## F. Monterey Bay Whale Watch (Fishing Zone 4)

The semi-monthly average number of humpback whales-per-half-day-trip in southern Monterey Bay is similar to the historical average for this time of year (Figure 2).

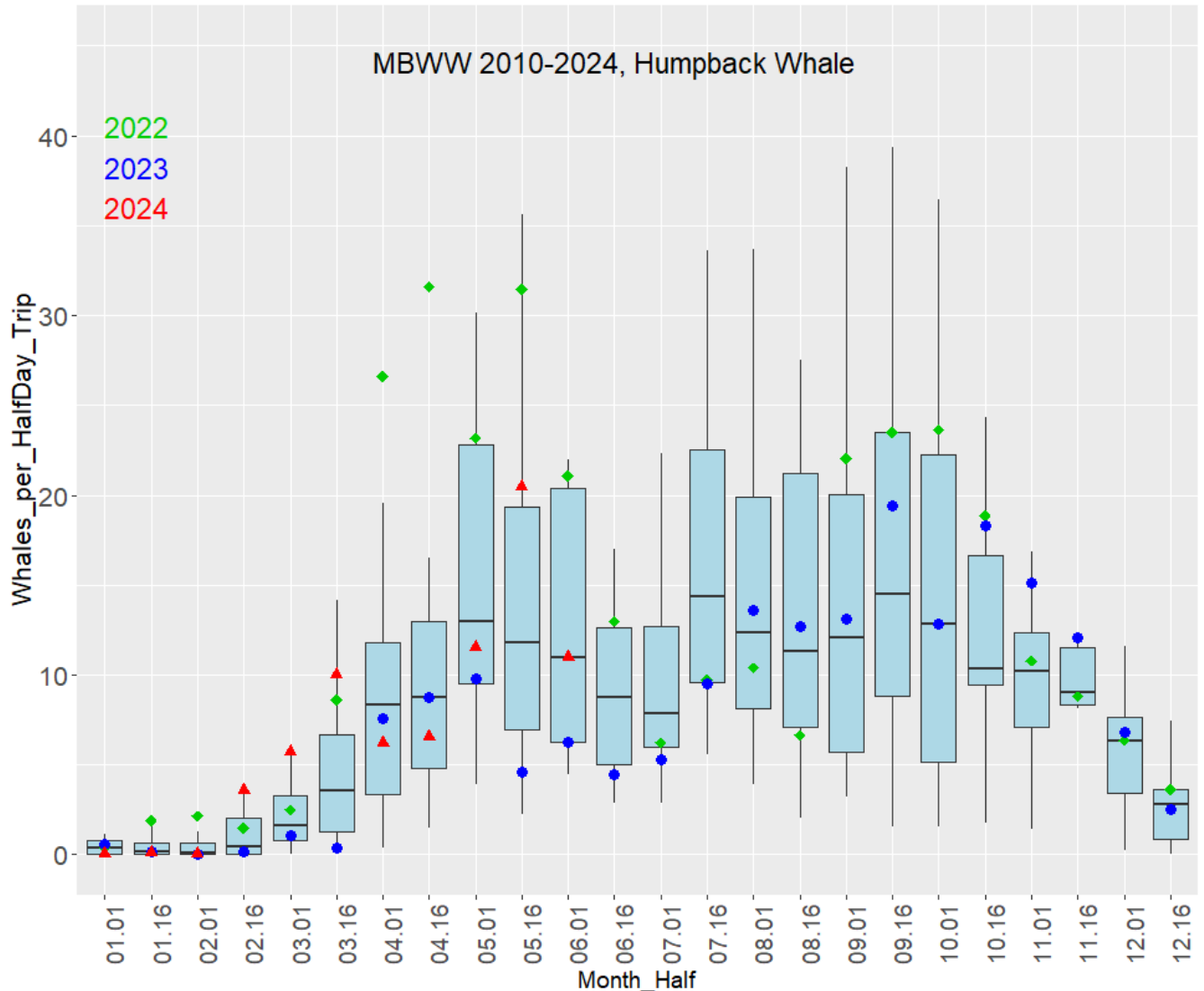


Figure 2. Historical Monterey Bay Whale Watch data for 2010-2024, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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) and are provided for reference, placing recent whale numbers in a historical context.

## G. Whale Watch 2.0 (All Fishing Zones)

Blue whale habitat predictions for June 1, 2024, show high habitat suitability in Fishing Zone 6 and a small pocket of suitable habitat in Monterey Bay. Habitat suitability remains low throughout the rest of the state. Current habitat suitability can be accessed online at [NOAA Coastwatch Habitat Suitability Map](#).

### III. 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.

#### A. Marine Landings Data System (All Fishing Zones)

The commercial fishery is currently open in Fishing Zones 1 and 2 under a 30-Fathom Depth Constraint and all other Fishing Zones are closed. A summary of landings from all Fishing Zones is provided below (Table 8).

Table 8. Summary of fishing season dynamics information for the commercial fishery, as of June 6, 2024.

<b>Metric</b>	<b>Value</b>	<b>Additional Info</b>
Season status	NA	Fishing Zones 3-6 are closed, excluding Experimental Fishing Permit (EFP) activity
Number of daily landings	5,877	NA
Total volume (pounds)	13,929,362	NA
Total Ex-Vessel Value	\$48,527,915	NA
Average unit price	\$3.87	NA
Maximum number of active permits to date	350	NA
Maximum potential traps (based on maximum active permits to date)	82,950 <i>*Note: estimated maximum potential traps reflects the 50% Gear Reduction in Fishing Zones 3-6</i>	Estimates are also provided in the Bi-Weekly Fishing Activity Reports Subsection

Total volume (pounds) peaked during the week of January 19, 2024, at just over 4 million pounds and has since been decreasing (Figure 3). Fishing Zone 3 shows the highest landings over the course of the season at 8.4 million pounds, followed by Fishing Zone 1 at 4.7 million pounds.

Volume of Landings (Pounds), by Week and Fishing Zone, 2023-24 Season

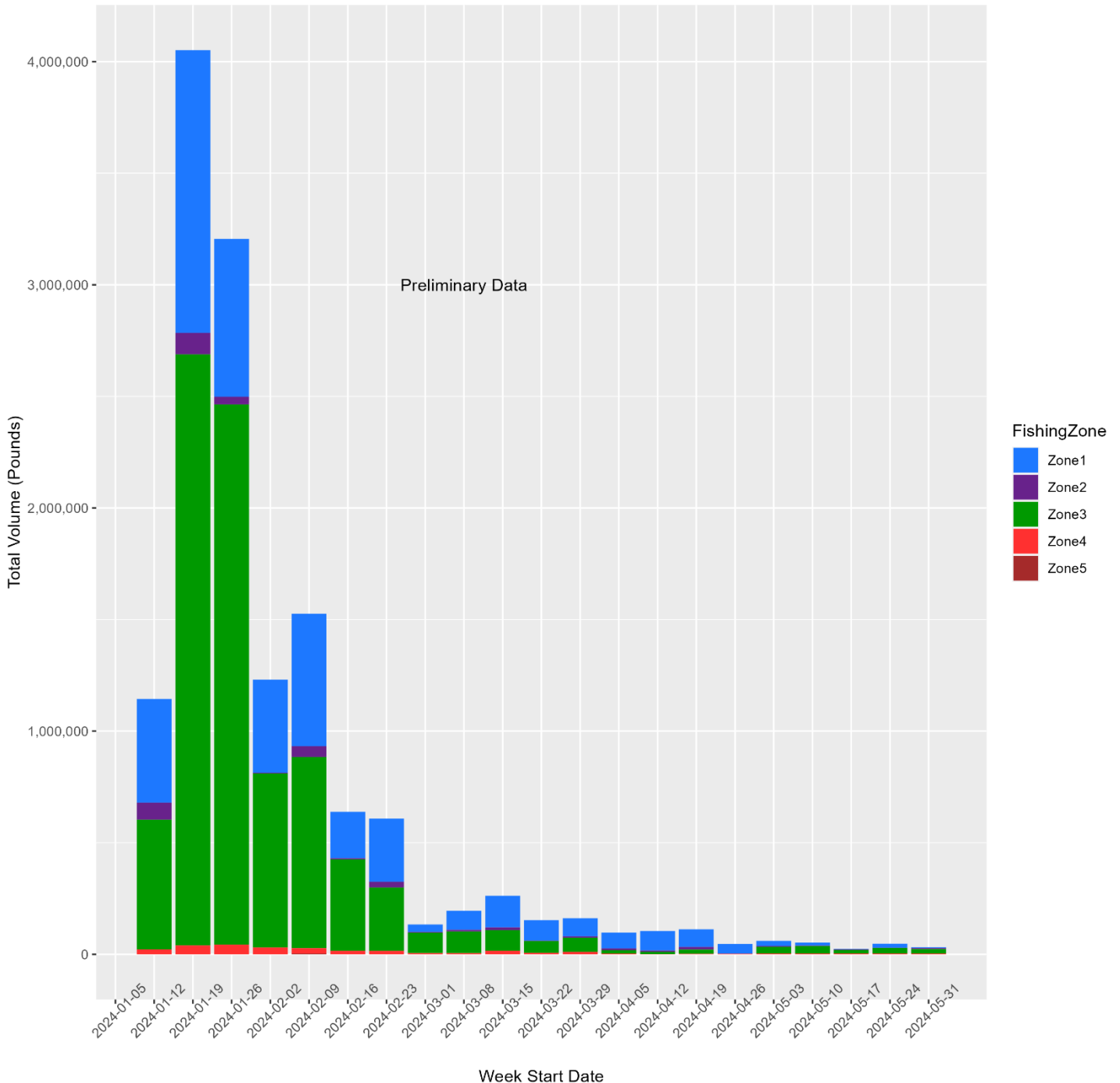


Figure 3. Cumulative volume (pounds) landed by week and Fishing Zone. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, January 5, 2024. All data are preliminary and subject to change. Certain week-Fishing Zone combinations are withheld due to confidentiality constraints.

Fishing Zone 3 shows the highest number of active vessels throughout the majority of the fishing season to date with a high of 170 active vessels, followed by Fishing Zone 1 with a high of 116 vessels (Figure 4). The number of active vessels peaked in late January and has been trending downward since the opening. Note that fishing activity in Fishing Zones 3-6 that occurred after the closure on April 8, 2024, is due to Experimental Fishing Permit landings.

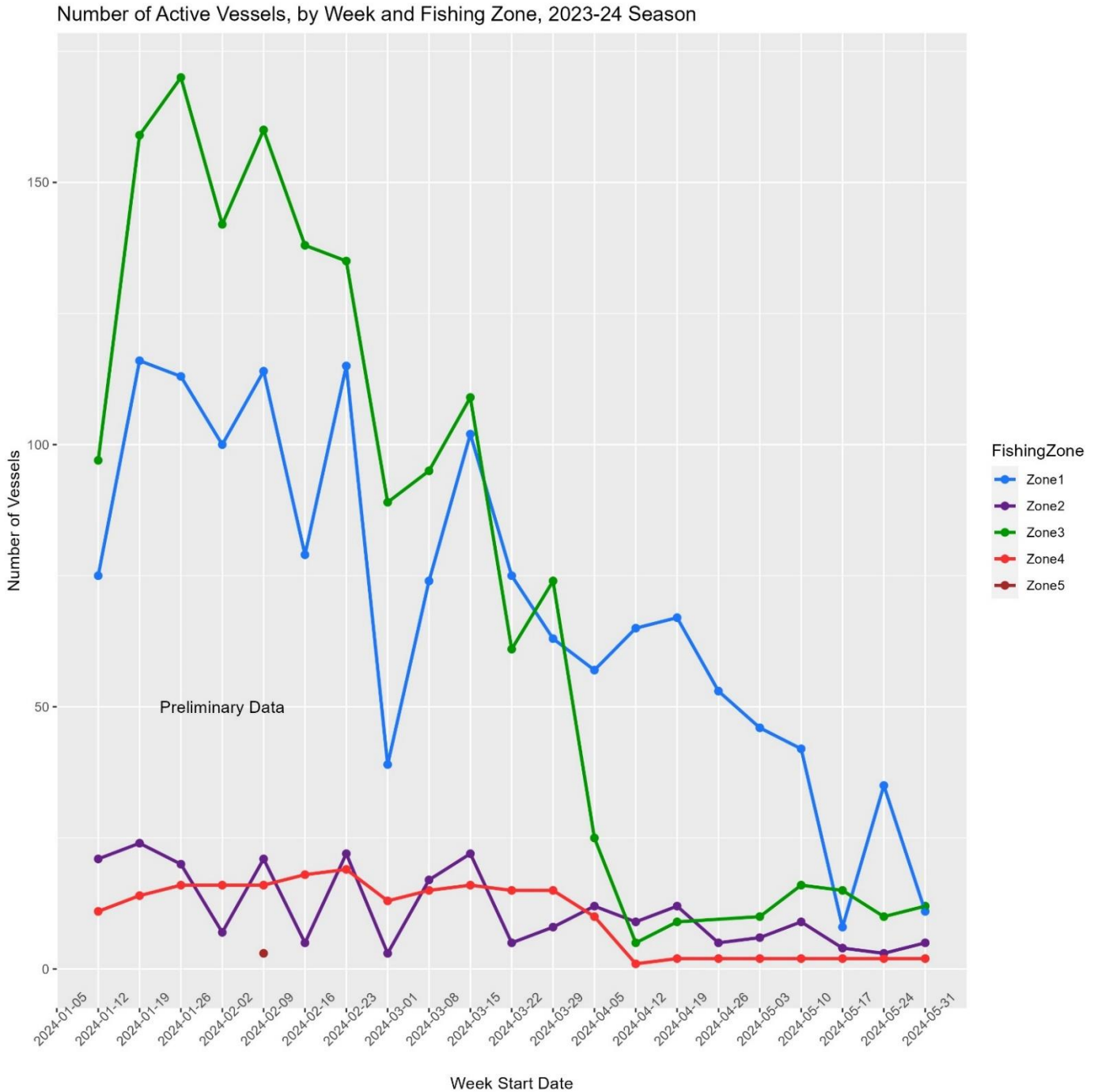


Figure 4. Number of active vessels by week and Fishing Zone. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, January 5, 2024. All data are preliminary and subject to change. Some week-Fishing Zone combinations are withheld due to confidentiality constraints. Note that fishing activity in Fishing Zones 3-6 that occurred after the closure on April 8, 2024, is due to Experimental Fishing Permit landings.

## B. Bi-Weekly Fishing Activity Reports (All Fishing Zones)

CDFW has received bi-weekly reports from the first reporting period on January 16, 2024, through the most recent reporting period of June 1, 2024. A summary of reports received for May 16, 2024, is provided in Table 9 and those received for June 1, 2024, are provided in Table 10; note this summary may not reflect all permitted vessels participating in the fishery due to compliance issues. In addition, Table 11 shows the summary of total traps by Fishing Zone for the six most recent reporting periods.

Table 9. Summary of information provided for the May 16, 2024, bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on June 6, 2024.

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	62	254	14,018	10	21	30	19	179
Zone 2	14	119	1,548	11	23	30	3	6
Zone 3	0	0	0	0	0	0	0	0
Zone 4	0	0	0	0	0	0	0	0
Zone 5	0	0	0	0	0	0	0	0
Zone 6	0	0	0	0	0	0	0	0
Totals	76		15,566				22	185

Table 10. Summary of information provided for the June 1, 2024, bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on June 6, 2024. NR-C refers to data withheld due to confidentiality and 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	34	221	5,548	11	20	30	14	31
Zone 2	9	133	1,067	13	22	28	3	2
Zone 3	0	0	0	0	0	0	0	0
Zone 4	0	0	0	0	0	0	0	0
Zone 5	0	0	0	0	0	0	0	0
Zone 6	0	0	0	0	0	0	0	0
Totals	43		6,615				17	33

Table 11. Total reported traps deployed in each Fishing Zone for the most recent six bi-weekly reporting periods. All data is preliminary and subject to change.

<b>Fishing Zone</b>	<b>Mar 16 – Total Traps</b>	<b>Apr 1 – Total Traps</b>	<b>Apr 16 - Total Traps</b>	<b>May 1 - Total Traps</b>	<b>May 16 - Total Traps</b>	<b>Jun 1 - Total Traps</b>
Zone 1	30,578	27,708	26,313	16,935	14,018	5,548
Zone 2	4,102	3,435	2,988	1,591	1,548	1,067
Zone 3	16,786	11,706	5,478	0	0	0
Zone 4	2,523	1,513	540	0	0	0
Zone 5	NR-C	NR-C	0	0	0	0
Zone 6	0	0	0	0	0	0
Totals	53,989	44,362	35,319	18,526	15,566	6,615

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

##### A. MBARI Krill Model

Modeled zooplankton conditions for May 2024 show pockets of higher than expected concentrations between Point Conception and Point Arena and expected concentrations to slightly below average concentrations between Point Arena and the CA/OR Border. Current data can be accessed from the [MBARI website](#).

#### V. Ocean conditions: §132.8(d)(9)

##### B. El Niño/Southern Oscillation (ENSO) Diagnostic

No new data, see the [May 13<sup>th</sup> Available Data and Preliminary Assessment document](#) for latest data or please visit [the NOAA ENSO Diagnostic webpage](#) for more information.

##### C. Large Marine Heatwave Tracker

As of May 28, 2024, the current heatwave forecast suggests that there will be minimal, if any, warming along the coast during the summer, with likely continued warming in the far offshore region. In late April, a large marine heatwave developed in the far offshore region of the study area, consistent with the same timing as other marine heatwaves over the previous five years. If the current pattern follows, we expect the marine heatwave to slowly grow in size and possibly impact coastal waters during the fall. Please visit the [NOAA Marine Heatwave Tracker webpage](#) for more information.

##### D. Habitat Compression Index

Regions 2 and 3, which include the north and central coast of California, show moderate habitat compression. Please visit [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 Preliminary 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](#).