

2021-22 Risk Assessment: Available Data

Last updated: March 22, 2022

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TRIGGERS REQUIRING MANAGEMENT ACTION

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

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

As of March 21, 2022 there have been a total of three confirmed humpback whale entanglements, 0 confirmed blue whale entanglements, and 0 confirmed leatherback sea turtle entanglements reported to the West Coast Region during 2022. Two of the confirmed humpback whale entanglements have been reported since the last risk assessment, and additional details are provided below.

On March 11, 2022 a confirmed humpback whale entanglement (20220311Mn) was reported off Moss Beach, just north of Half Moon Bay (Fishing Zone 3). The reporting party confirmed the entanglement occurred in California commercial Dungeness crab gear. On March 19, 2022 a confirmed humpback whale entanglement (20220319Mn) was reported in Monterey Bay (Fishing Zone 4). The whale was documented trailing one set of gear (one main buoy with tag, one trailer buoy, and an end line marker buoy). The response team was able to document the entanglement

but had to return to shore because of weather. The whale was seen the day before with no noticeable entanglement, so this is likely a very recent entanglement. Based on available photo documentation, NMFS has confirmed the entanglement occurred in California commercial Dungeness crab gear and is a distinct entanglement from 20220311Mn.

Additionally, NMFS received a report of an additional humpback whale entanglement (20220321Mn) off Santa Cruz (Fishing Zone 4). The report indicates a juvenile humpback whale entangled with thick yellow line near the fluke. This entanglement is currently considered unconfirmed, and therefore not included in Tables 1-3 below.

Table 1. Actionable Species Entanglements in 2022, prepared with information shared by West Coast Region.

Actionable Species	Number Confirmed Entanglements in California Commercial Dungeness Crab Gear	Number Confirmed Entanglements in Unknown Fishing Gear Reported off California
Humpback whales	2	1
Blue whales	0	0
Leatherback sea turtles	0	0

CDFW has assigned an Impact Score of 0.75 to each of the March 11, 2022 and March 19, 2022 humpback whale entanglements. As described in the [March 9, 2022 Available Data document](#), CDFW considers the humpback whale entanglement reported from Fishing Zone 4 on January 27, 2022 (20220127Mn) to be a confirmed entanglement in Unknown Fishing Gear, and has assigned an Impact Score of 0.38.

During 2021 and 2022, there were no confirmed entanglements of either blue whales or leatherback sea turtles in California commercial Dungeness crab gear (reported from any location) or Unknown Fishing Gear (reported from California). Therefore, the cumulative Impact Score for 2022 and the current fishing season is 0 for these two species.

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 (2021-22)	Current Calendar Year Impact Score (2022)
Humpback whales	1.88	1.88
Blue whales	0	0
Leatherback sea turtles	0	0

The total calendar year impact score for 2021, and current total calendar year impact score for 2022, is provided in Table 3. CDFW will also evaluate risk based on a 3-year rolling average impact score starting with the 2023 season.

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 underlying calculation of a 3-year rolling average.

Actionable Species	2021 Calendar Year Impact Score	2022 Calendar Year Impact Score	2023 Calendar Year Impact Score	3-Year Rolling Average
Humpback whales	1.89	1.88	NA	NA
Blue whales	0	0	NA	NA

Actionable Species	2021 Calendar Year Impact Score	2022 Calendar Year Impact Score	2023 Calendar Year Impact Score	3-Year Rolling Average
Leatherback sea turtles	0	0	NA	NA

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)

Table 44. 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	CDFW aerial survey	No
Zone 4	CDFW aerial survey, MBWW	No
Zone 5	NA	Yes – no data
Zone 6	NA	Yes – no data

CDFW Aerial Survey (Fishing Zones 1-4)

On March 18, 2022 CDFW flew a series of zig-zag transects between Trinidad and Half Moon Bay covering nearshore waters out to 50 fathoms/100 m (with the exception of the Gulf of the Farallones, where transects go out to 30 fathoms/60 m; Figures 1-2). No humpback or blue whales were observed. Two gray whales were observed in Fishing Zone 1, 18 gray whales and one unidentified whale were observed in Fishing Zone 2, and three gray whales were observed in Fishing Zone 3.

On March 22, 2022, CDFW flew a second aerial survey along east-west transect lines between Half Moon Bay and Point Pinos (Figure 3). Six humpback whales and one unidentified whale were observed in Fishing Zone 3, and five humpback whales and two gray whales were observed in Fishing Zone 4. The humpback whales in Fishing Zone 3 were all observed along a single transect line due west of Pescadero in waters between 50 and 100m depth. The humpback whales in Fishing Zone 4 were observed in waters between 50 and 200m depth off Davenport and between 50 and 100m depth in northern Monterey Bay.

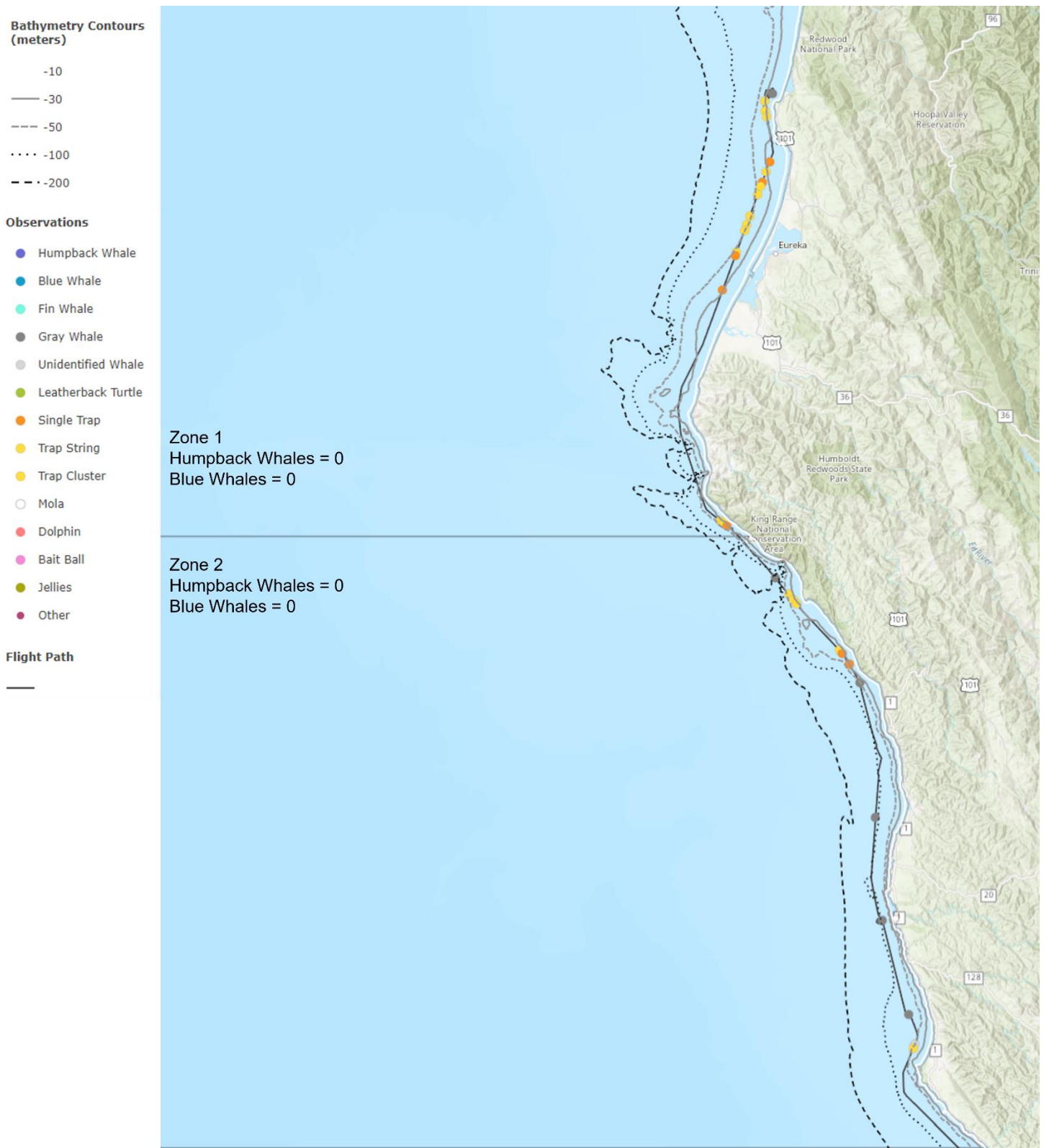


Figure 1. Map showing track lines and observations from CDFW aerial survey of Fishing Zones 1 and 2 on March 18, 2022. Survey information is overlaid onto contours showing the 10m, 30m, 50m, 100m, and 200m bathymetry lines.

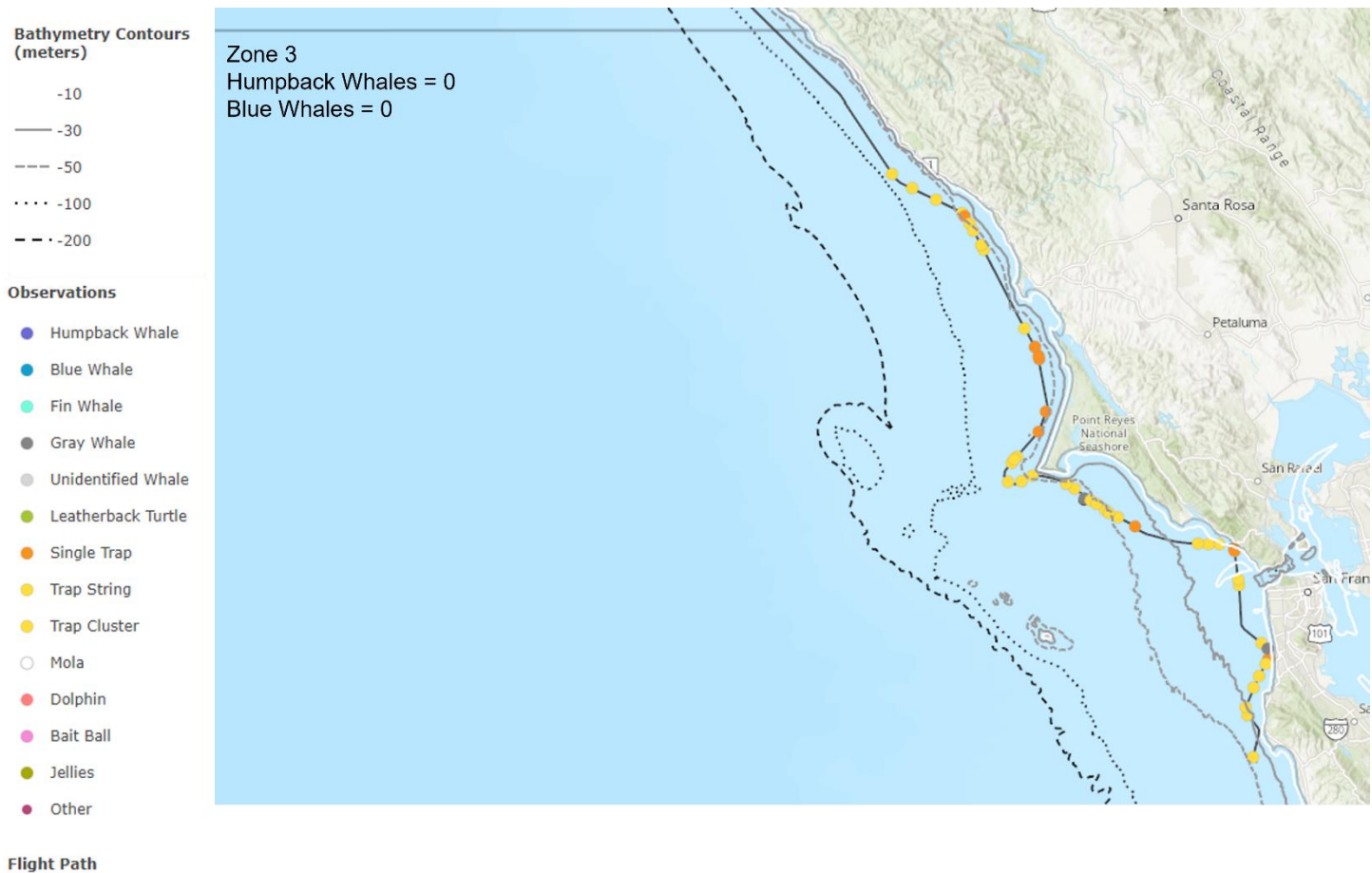


Figure 2. Map showing track lines and observations from CDFW aerial survey of Fishing Zone 3 on March 18, 2022. Survey information is overlaid onto contours showing the 10m, 30m, 50m, 100m, and 200m bathymetry lines.

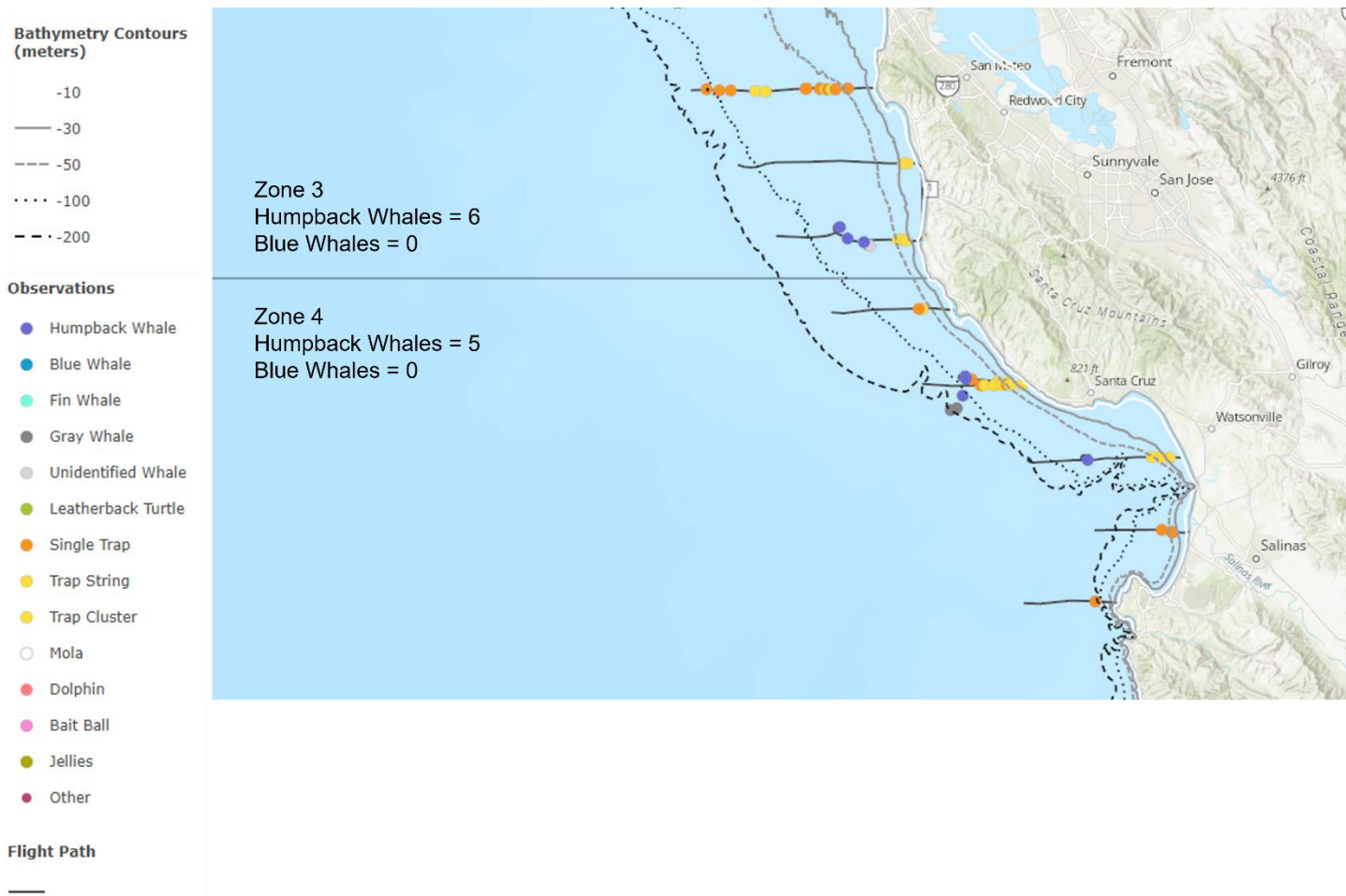


Figure 3. Map showing track lines and observations from CDFW aerial survey of Fishing Zones 3 and 4 on March 22, 2022. Survey information is overlaid onto contours showing the 10m, 30m, 50m, 100m, and 200m bathymetry lines.

Monterey Bay Whale Watch (Fishing Zone 4)

MBWW conducted whale-watching trips in southern Monterey Bay on all seven days during the week of March 13 - 19, 2022. The average number of humpback whales-per-trip during the last seven days (March 13 - 19) was 1.3, with a peak of 10 whales observed on a single all-day trip on March 19, 2022. The previous peak number was 20 whales on March 8, 2022, followed by multiple days without any humpback whales observed. This may suggest that humpback whales are moving around to find foraging patches (versus staying in a single area for days/weeks).

No blue whales have been observed by MBWW since November 13, 2021, when one whale was documented.

MANAGEMENT CONSIDERATIONS

Information from NOAA: §132.8(d)(2)

No additional information was shared.

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) will be provided in the March 22, 2022 Initial Assessment.

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. CDFW will provide this evaluation in the March 22, 2022 Initial Assessment.

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

Data provided by: Monterey Bay Whale Watch, processed by Karin Forney (NOAA)

Monterey Bay Whale Watch (Fishing Zone 4)

The semi-monthly average number of whales-per-half-day-trip is similar to historical patterns for this time of the year (Figure 4). The lack of blue whale sightings since mid-November is consistent with their historical seasonal migration patterns to lower latitudes during winter.

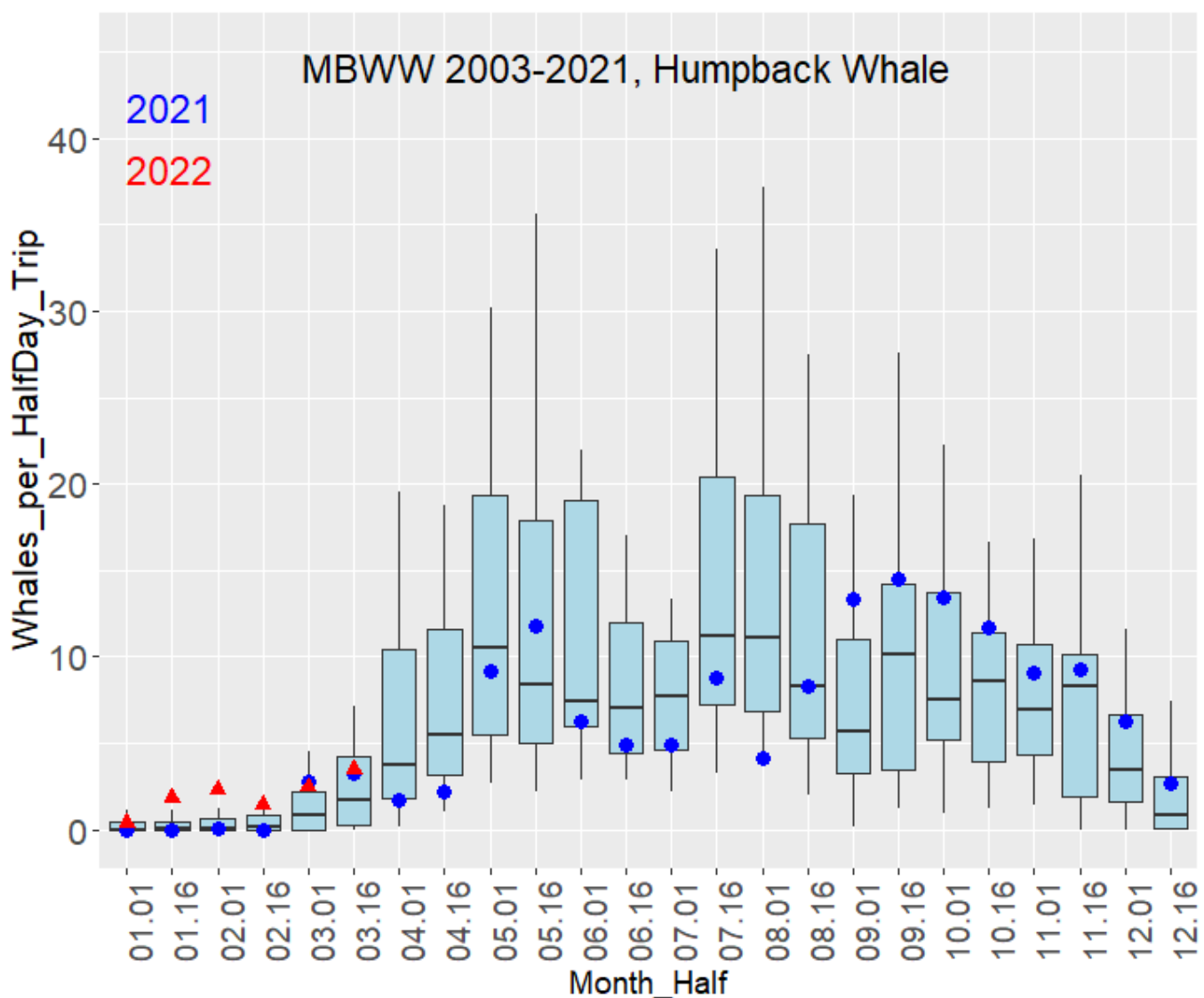


Figure 4. Historical Monterey Bay Whale Watch data for 2003-2022, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2021 (large blue dots) and 2022 (red triangles) are provided for reference, placing recent whale numbers in a historical context.

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.

Marine Landings Data System (All Fishing Zones)

Weekly total landing volume has continued to decrease since late December. In recent weeks, landed volume has primarily been harvested from Fishing Zones 1 and 3. Overall, 66% of the total volume harvested this season has been from Fishing Zone 1, 31% from Fishing Zone 3, and less than 5% each from the other Fishing Zones. To date, 42% of harvested volume has been landed into Crescent City, 20% into Eureka, 11% each into San Francisco and Half Moon Bay, and less than 10% each from the other port complexes (Figure 5).

Looking at vessel activity by port over the course of the season (Figure 6), the highest activity has been in Crescent City (87 vessel) and Eureka (69 vessels), followed by San Francisco (57 vessels), Half Moon Bay (56 vessels), and Bodega Bay (54 vessels). Vessels have also made landings into Fort Bragg (31 vessels), Monterey (25 vessels), Trinidad (14 vessels), and Morro Bay (3 vessels). Vessel activity has recently increased in Crescent City, however the general trend of decreasing activity continues for all ports.

Overall, the number of weekly Dungeness crab landings reflects the port-specific trends in vessel activity, including the recent uptick in Crescent City vessel activity (Figure 7).

Unit price (price per pound) has continued to trend upwards for Crescent City, Eureka, Bodega Bay, San Francisco, Half Moon Bay, and Monterey Bay (Figure 7). While the overall trends in Trinidad and Eureka reflect increased prices relative to those at the start of the season, prices have remained stable for these ports during the last few weeks. The most recent landings have fetched prices under \$10/lb. for all ports other than Half Moon Bay.

CDFW introduced two new, multi-season figures in the [March 9, 2022 Available Data document](#). In general, recent trends in vessel activity and maximum potential traps for the 2021-22 season are similar to those seen at this time during the 2019-20 and 2020-21 seasons, with high (and declining) levels of vessel activity and potential trap estimates in Fishing Zone 3, followed by Fishing Zone 1 (Figures 8-9).

Table 5. Summary of fleet dynamics information, as of March 21, 2022.

Metric	Value	Additional Info
Season status	Open statewide	Fleet Advisory is in place for all Fishing Zones
Number of daily landings	4,929	NA
Total volume (pounds)	9,991,419	NA
Total Ex-Vessel Value	\$51,955,036	NA
Average unit price	\$5.57	NA
Total number of active vessels	364	NA
Maximum potential traps (based on active permits)	120,075	Estimates are also provided in the Bi-Weekly Fishing Activity Reports subsection.

Volume of Landings (Pounds), by Week and Port Complex, 2021-22 Season

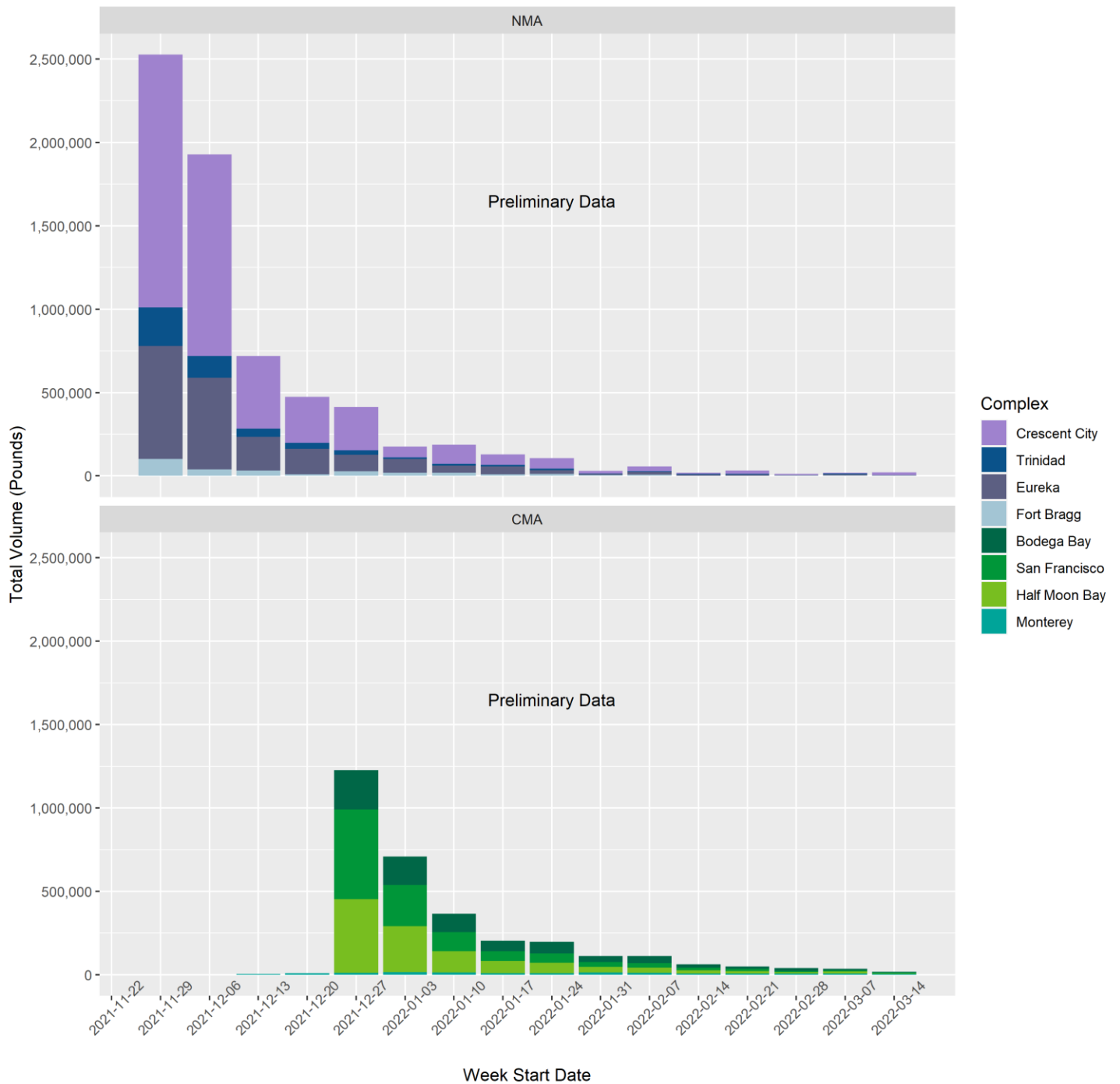


Figure 5. Cumulative volume (pounds) landed by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, November 15, 2021. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality constraints.

Number of Active Vessels, by Week and Port Complex, 2021-22 Season

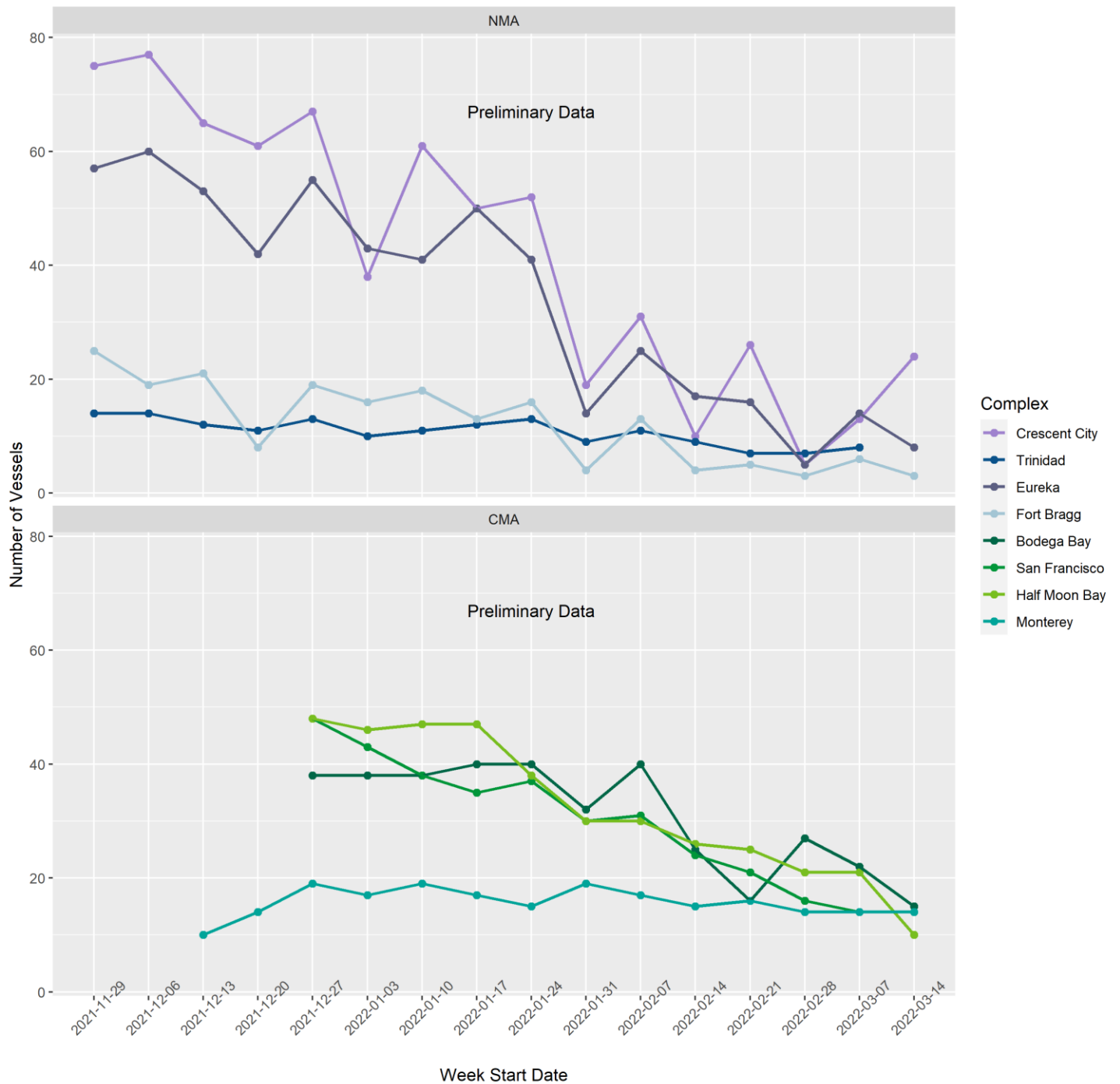


Figure 6. Number of active vessels by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, November 15, 2021. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality constraints.

Number of Landings, by Week and Port Complex, 2021-22 Season

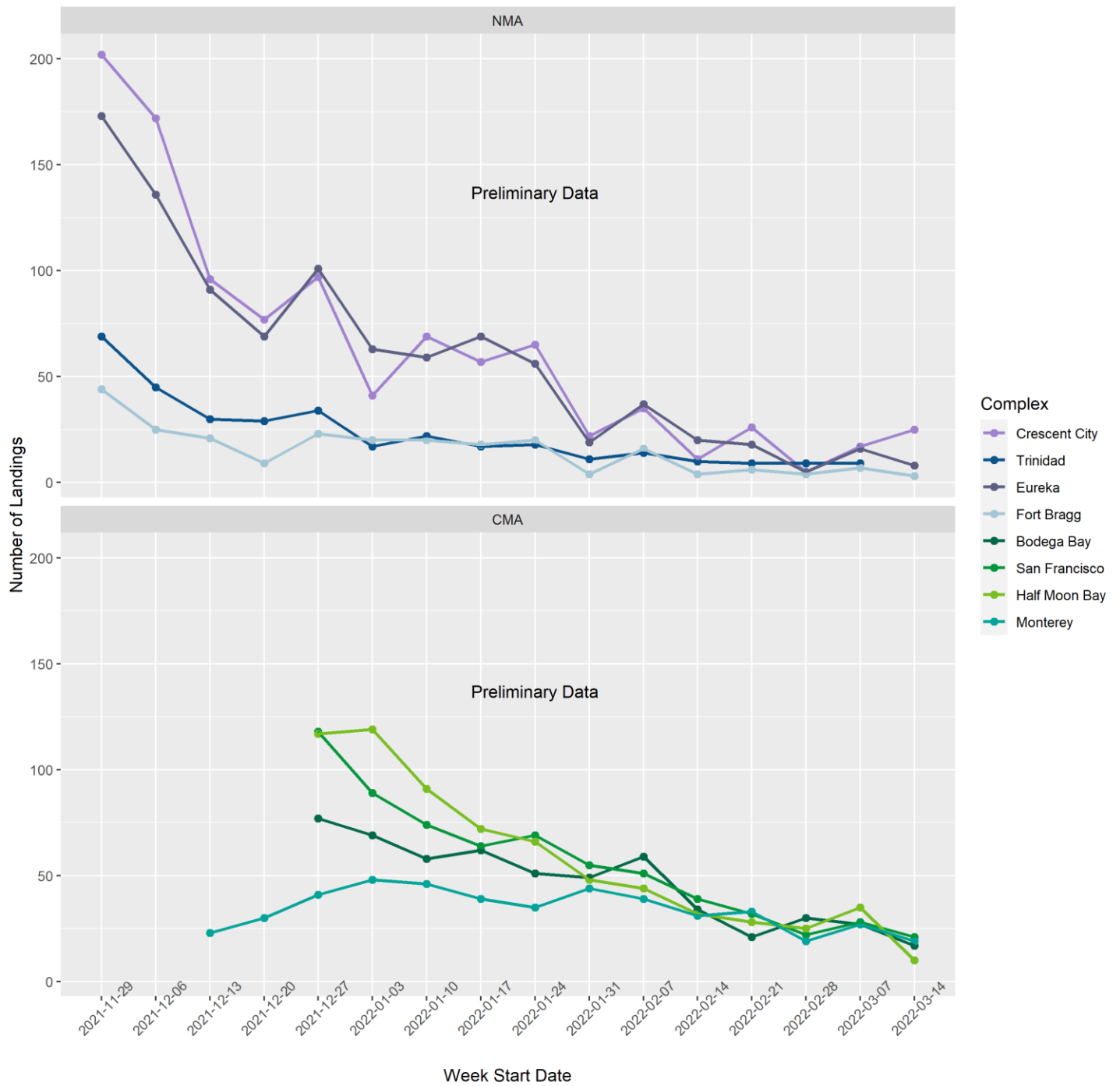


Figure 7. Number of unique landings by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, November 15, 2021. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality constraints.

Average Unit Price, Excluding Personal Use, By Week and Complex, 2021-22 Season

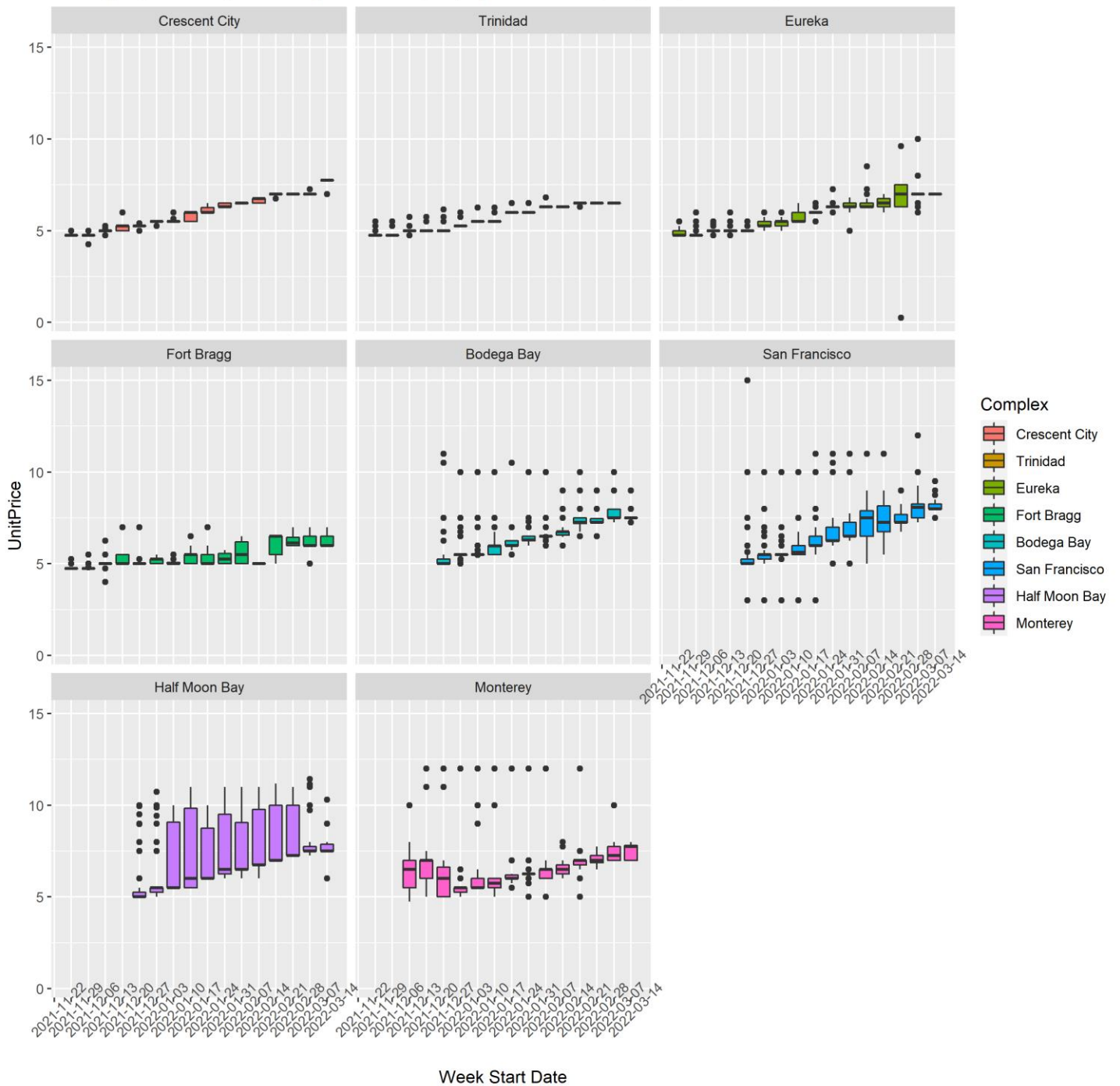


Figure 8. Mean unit price by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, November 15, 2021. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality constraints.

Number of Active Vessels Per BiWeekly Period, 2013-14 to 2021-22 Seasons

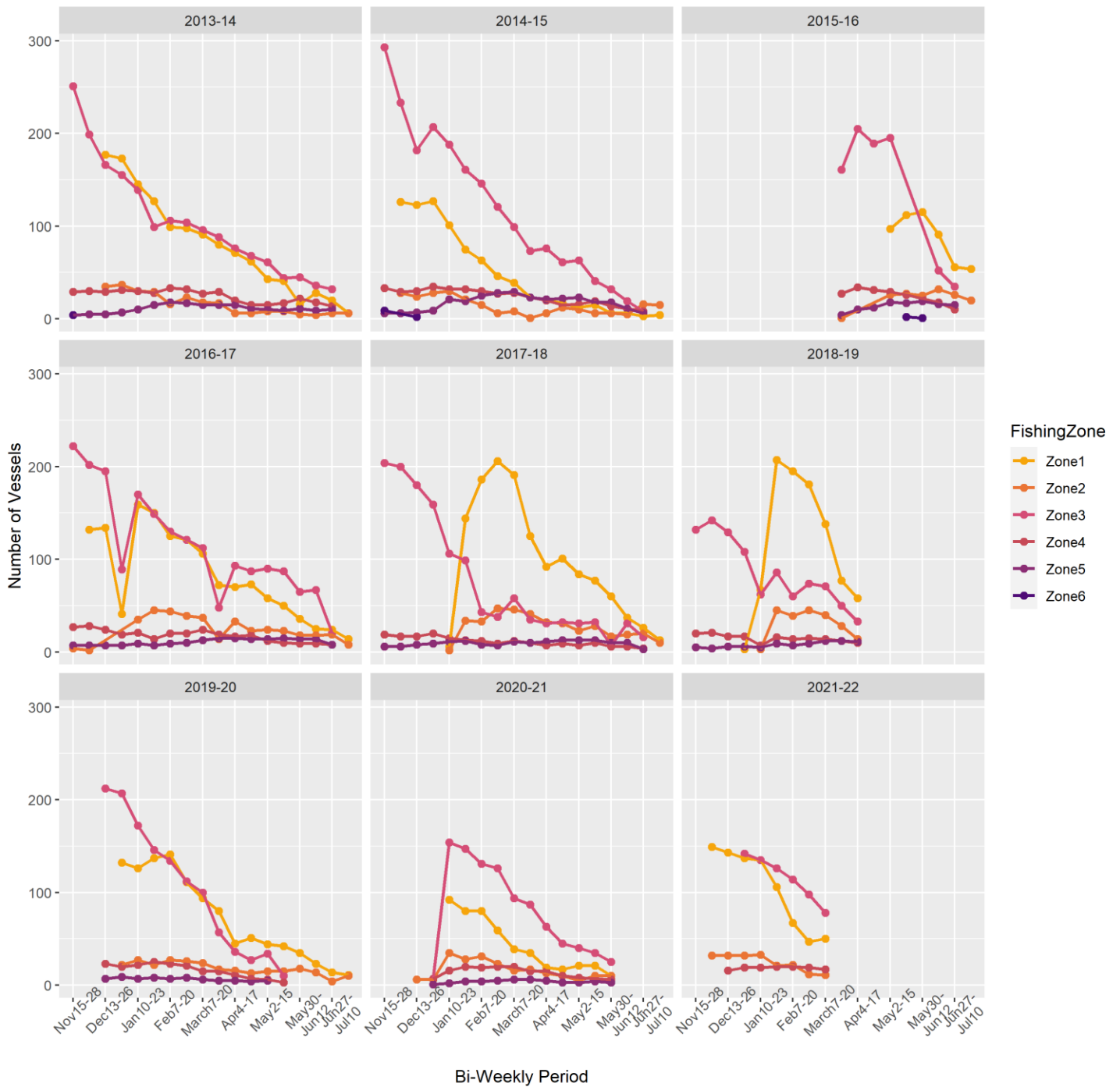


Figure 9. Number of active vessels during the 2013-14 to 2021-22 fishing seasons. Values are plotted over two-week intervals which begin with November 15 and continue through mid-July. All data are preliminary and subject to change. Certain week*Fishing Zone combinations are withheld due to confidentiality constraints.

Maximum Potential Traps Per BiWeekly Period, 2013-14 to 2021-22 Seasons

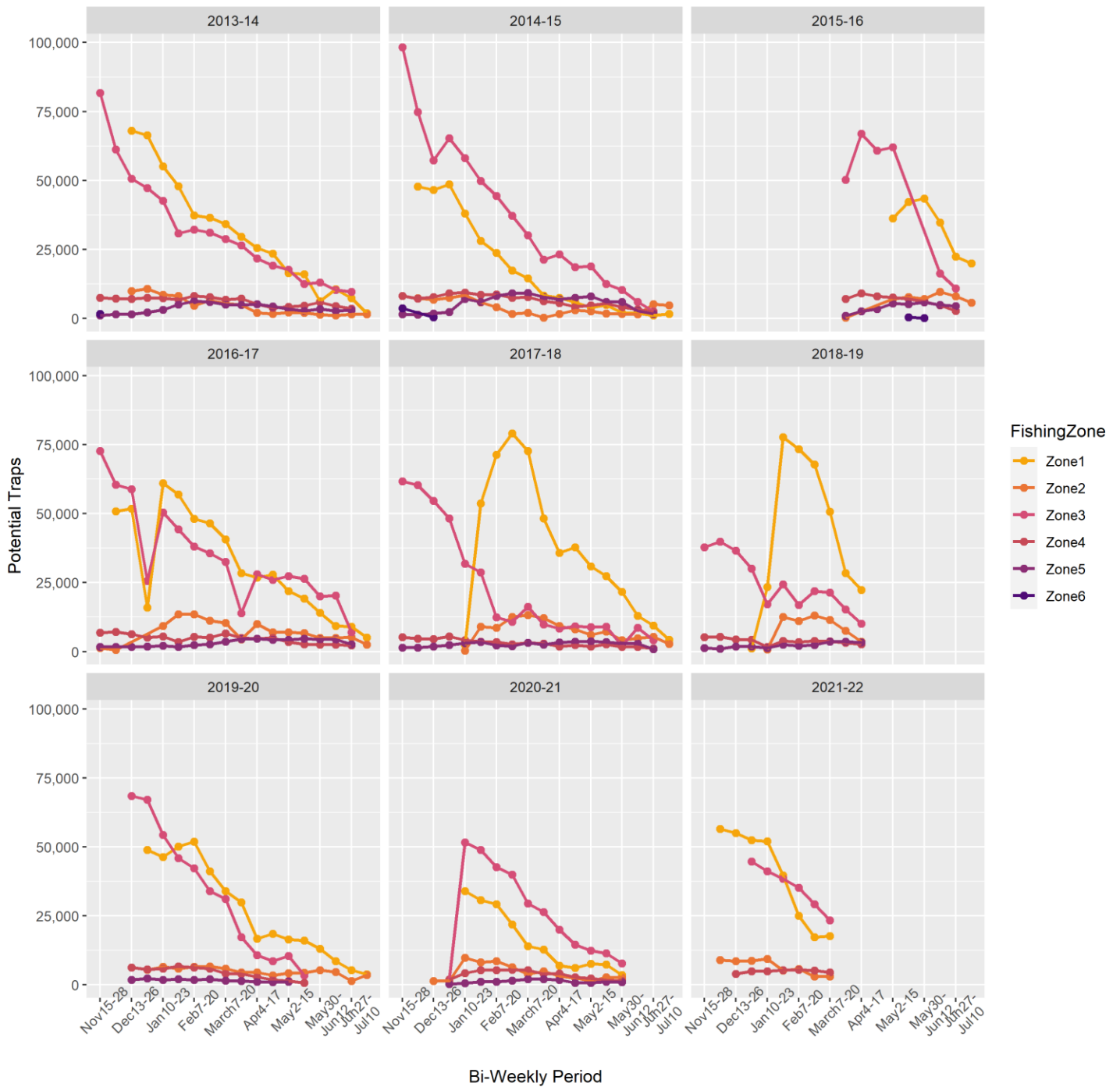


Figure 10. Estimated maximum number of deployed traps, based on vessel activity and permit tier level, during the 2013-14 to 2021-22 fishing seasons. Values are plotted over two-week intervals which begin with November 15 and continue through mid-July. All data are preliminary and subject to change. Certain week*Fishing Zone combinations are withheld due to confidentiality constraints.

Bi-Weekly Fishing Activity Reports (All Fishing Zones)

- CDFW has received bi-weekly reports since the first reporting period of November 16, 2021 through the most recent reporting period of March 16, 2022. A summary of reports received for March 16, 2022 is provided in Table 6; note this summary may not reflect all permitted vessels participating in the fishery. In addition, a summary of traps by RAMP Zone over the six most recent reporting periods is provided in Table 7.

- About 34,188 traps are estimated to be deployed statewide for the March 16 reporting period, which covers fishery participation from March 1-15. The majority of these (47%) are located within Fishing Zone 3 while 39% of these located within Fishing Zone 1 (Table 6).
- The total traps reported during the March 16, 2022 report period has declined by about 65% from the season high that occurred during the January 16, 2022 reporting period. Of the 62,902 traps that have been removed between the January 16, 2022 and March 16, 2022 reporting periods, 59% were removed from Fishing Zone 1, followed by 32% from Fishing Zone 3 (Table 8)

Table 6. Summary of information provided for the March 16, 2022 bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on March 23, 2022. CONFID 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	49	284	13,368	12	28	50	4	21
Zone 2	16	168	2,514	15	27	50	2	3
Zone 3	79	226	16,033	20	39	70	16	137
Zone 4	16	142	2,273	24	34	60	3	26
Zone 5	CONFID	CONFID	CONFID	CONFID	CONFID	CONFID	CONFID	CONFID
Zone 6	0	0	0	0	0	0	0	0
Totals	160	NA	34,188	NA	NA	NA	25	187

Table 7. Total reported traps deployed in each Fishing Zone for the most recent 6 bi-weekly reporting periods. All data is preliminary and subject to change.

Fishing Zone	Jan 1 - Total Traps	Jan 16 - Total Traps	Feb 1 - Total Traps	Feb 16 - Total Traps	Mar 1 - Total Traps	Mar 16 - Total Traps
Zone 1	51,026	50,218	37,855	24,696	18,610	13,368
Zone 2	7,326	7,126	5,490	3,841	4,637	2,514
Zone 3	34,539	35,918	35,924	30,685	23,780	16,033
Zone 4	3,529	3,828	3,455	3,612	3,400	2,273
Zone 5	0	0	CONFID	CONFID	CONFID	CONFID
Zone 6	0	0	CONFID	0	CONFID	0
Totals	96,420	97,090	82,724	62,834	50,427	34,188

CDFW Aerial Survey (Fishing Zones 1-4)

Note: Information presented in this section is not an estimate of total traps deployed, only an observation of areas of high trap deployment. Furthermore, it is not possible to determine how many of the observed traps are from the Dungeness crab fishery.

During the March 18, 2022 survey a total of 419 traps were observed throughout the survey area (Figures 1-2), with 91 traps observed in Fishing Zone 1, 31 traps observed in Fishing Zone 2, and 297 traps observed in Fishing Zone 3. Areas of high deployment included Eureka/Trinidad and the area between Fort Ross and Half Moon Bay. Within Fishing Zone 3, most gear was observed inshore of the 100m depth contour. Within Fishing Zones 1 and 2, most gear was observed inshore of the 50m depth contour.

During the March 22, 2022 survey a total of 64 traps were observed throughout the survey area (Figure 3), with 64 traps observed in Fishing Zone 3 and 94 traps observed in Fishing Zone 4. Areas of high deployment included Half Moon Bay and Davenport. Within both Fishing Zones, most gear was observed inshore of the 100m depth contour.

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

Updated information was not requested for this management consideration; please see the [March 9, 2022 Available Data document](#).

Ocean conditions: §132.8(d)(9)

Updated information was not requested for this management consideration; please see the [March 9, 2022 Available Data document](#).

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

Data provided by: California Department of Fish and Wildlife

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 (2022) are provided in Table 2 above. Impact Score totals for calendar year 2021 are provided in Table 3 above.