



**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
DECLARATION OF FISHERY CLOSURE
IN THE COMMERCIAL DUNGENESS CRAB FISHERY
DUE TO RISK OF MARINE LIFE ENTANGLEMENT**

Pursuant to Fish and Game Code Section 8276.1(b) and California Code of Regulations, Title 14, Section 132.8 ("Section 132.8"), I find and declare that:

I

On March 25, 2022, I evaluated entanglement risk for the commercial Dungeness crab fishery pursuant to Section 132.8(b). I provided the California Dungeness Crab Fishing Gear Working Group (Working Group) and the Whale Safe Fisheries email listserv with notice of the risk assessment and all non-confidential data under consideration on March 22, 2022. Prior to this risk assessment and management response, I considered relevant information provided to my staff. The Working Group met on March 23, 2022 to discuss the risk assessment but did not provide a written recommendation.

II

On March 17, 2022, a Humpback whale was confirmed entangled in California commercial Dungeness crab gear in Fishing Zone 3, and on March 19, 2022, a second Humpback whale was confirmed entangled in California commercial Dungeness crab gear in Fishing Zone 4. Pursuant to Section 132.8(c)(1)(B) I must implement a Fishing Zone closure or other protective management action.

III

There are no Department approved marine life concentration survey data to inform the risk assessment in Fishing Zones 5 and 6. Pursuant to Section 132.8(c)(2)(B)(1), I must implement a protective management action.

IV

Pursuant to Fish & Game Code Section 9002.5(b)(1)(A)(ii) and implementing regulations in Section 132.7 of Title 14 of the California Code of Regulations, I may authorize retrieval operations under the Lost or Abandoned Dungeness Crab Trap Gear Retrieval Program when take of crab is restricted pursuant to Section 132.8.

V

Pursuant to Section 132.8(e)(5), I must allow use of any authorized Alternative Gear during a closure on April 1 or later.

VI

Upon evaluation of the management considerations pursuant to Section 132.8(d), I have determined that the management action listed below protects humpback whales based on the best available science. Additional information on the relevant management considerations is provided in the attachment to this declaration **THEREFORE**, under the authority granted by Fish and Game Code Section 8276.1(b) and Section 132.8 of Title 14 of the California Code of Regulations, I am implementing the following management action:

1. Fishery Closure for commercial Dungeness crab for the remainder of the 2021-2022 season in Fishing Zones 3, 4, 5, and 6 starting at 12:00PM (noon) on April 8, 2022, requiring all Dungeness crab traps be removed from ocean waters in those Fishing Zones by then. The take and possession of Dungeness crab is therefore prohibited after 12:00PM on April 8, 2022. This closure does not apply to fishing activity with authorized Alternative Gear types as stated below.
2. Fishing Zones 1 and 2 remain under a Fleet Advisory. Fishery participants are encouraged to report entangled whales to the United States Coast Guard or 1-877-SOS-WHALE and to review the Best Practice Guide when moving gear to new Fishing Grounds.
3. Retrieval operations under the Lost and Abandoned Dungeness Crab Trap Gear Retrieval Program may begin in Fishing Zones 3, 4, 5, and 6 on April 15, 2022, at 12:00PM.
4. Authorized Alternative Gear may be used in all closed Fishing Zones. Currently there are no authorized Alternative Gear types. If an Alternative Gear type is authorized before the statutory season closure dates, it may be used for take of Dungeness crab.

This management action is in effect until lifted or modified. The next risk assessment is expected to occur on or around April 15, 2022, and will evaluate marine life entanglement risk in the Fishing Zones that remain open and the recreational Dungeness crab fishery.

Updates and material regarding future entanglement risk evaluations in the commercial Dungeness crab fishery will be made available on the [Department's Whale Safe Fisheries web page](#).



Charlton H. Bonham, Director

3/25/22 10 Am PT
Date/Time

ATTACHMENT TO DIRECTOR MARCH 25, 2022, DECLARATION OF FISHERY CLOSURE IN THE COMMERCIAL DUNGENESS CRAB FISHERY DUE TO RISK OF MARINE LIFE ENTANGLEMENT

Information referenced in this Attachment is further described in the Available Data summary dated March 22, 2022, and located at the Department's Whale Safe Fisheries website (<https://wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries>), which to the Department's knowledge represents the best available science informing the management considerations in Section 132.8(d).

Information Supporting Trigger for Management Action Under Section 132.8(c)

Confirmed Entanglements:

- **Fishing Zone 3:** March 17, 2022 – Confirmed entanglement in California commercial Dungeness crab gear.
- **Fishing Zone 4:** March 19, 2022 – Confirmed entanglement in California commercial Dungeness crab gear.

Marine Life Concentrations:

- **Fishing Zones 5 and 6:** No current data available

Relevant Management Considerations Under Section 132.8(d)

1. Working Group Management Action Recommendation and Best Available Science Made Available to the Department

The Working Group met on March 23, 2022 to discuss the risk assessment, but did not provide a consensus recommendation. There was however support for the CDFW staff's preliminary recommendation by some members, with one member opposed. Working Group members expressed differing opinions regarding the appropriate amount of time between the Director's determination and the closure date, with some members wanting the closure to include a provision for weather delays and some wanting an earlier closure to minimize risk as quickly as feasible

2. Information from NOAA

No additional information was made available for this risk assessment.

3. Effectiveness of Management Measures to Minimize Entanglement Risk

Given the low abundance of humpback whales in the Fishing Grounds, it is not possible to identify an appropriate depth-based closure which would reduce co-occurrence risk. A vertical line reduction is not sufficiently responsive to the recent

humpback entanglements confirmed to the commercial crab fishery. Given those entanglements, a Fishery Closure in Zones 3-6 is the most protective of Actionable Species within the Fishing Grounds. While no Alternative Gear is currently authorized for use, should a gear become authorized it could be used in closed Zones.

While a Fleet Advisory is no longer sufficiently protective for Fishing Zones 3-6 given the recent entanglements, there is no indication of Actionable Species presence in Fishing Zones 1 and 2, supporting a determination of overall low entanglement risk. A Fleet Advisory is sufficiently protective of Actionable Species in those areas.

4. Total Economic Impact to the Fleet and Fishing Communities

Total economic costs are considered when deciding between management measures that equivalently reduce entanglement risk. A Fishery closure is the only effective management action in response to the current entanglement risk. Additionally, while a fishery closure will have economic costs to the commercial fishery, a closure in response to elevated entanglement risk can prevent longer term loss of fishing opportunity should additional entanglements occur.

5. Data Availability Within and Across Fishing Zones

CDFW aerial surveys were available for Fishing Zones 1 through 4. Monterey Bay Whale Watch (MBWW) data are available for Fishing Zone 4. No current data was available for Fishing Zones 5 and 6.

6. Known Historic Marine Life Migration Patterns

Currently, aerial surveys and MBWW data indicate relatively few humpback whales in the Fishing Grounds, which aligns with known historic migration patterns. MBWW data indicates humpback whale presence is similar to historic levels for this time of year. Based on historic migration patterns, the Department expects humpback whales to begin returning to California waters within the coming weeks.

7. Fishing Season Dynamics

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. Looking at landings by Zone, 69 active permits made landings in Zone 1, 19 active permits in Zone 2, 88 active permits in Zone 3, and 15 active permits in Zone 4. Zones 5 and 6 had fewer than 3 active permits. 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. Unit price (price per pound) has continued to trend upwards for Crescent City, Eureka, Bodega Bay, San Francisco, Half Moon Bay, and Monterey Bay. 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. Approximately 34,188 traps are estimated to be deployed statewide for the March 16 reporting period, which covers fishery participation from March 1-15, 2022. The majority of these (47%) are located within Fishing Zone 3 while 39% of these located within Fishing Zone 1.

8. Known Distribution and Abundance of Key Forage

Bait was observed during aerial surveys providing foraging opportunities humpbacks whales.

9. Ocean Conditions

As of February 10, 2022, La Niña conditions are expected to continue into the Northern Hemisphere spring (77% change during March-May) and then transition to ENSO-neutral (56% change during May-July). The most recent Habitat Compression Index values are for February 2022, during which there was moderate compression between 35.5 and 40°N. During the Working Group meeting, fleet members expressed concerns about the limited opportunity to safely remove gear due to spring ocean conditions. Spring conditions along the coast often bring long periods of gale force winds and large swell.

10. Current Impact Score Calculations

- a. Fishing Season – 1.88 for Humpback whales; 0 for blue whales and leatherback sea turtles.
- b. 2022 Calendar Year – 1.88 for Humpback whales; 0 for blue whales and leatherback sea turtles.
- c. 2021 Calendar Year – 1.89 for Humpback whales; 0 for blue whales and leatherback sea turtles.

11. Marine Life Concentrations and Distribution During the Current Fishing Season

Based on aerial survey data and MBWW data, most humpback whales appear to be outside the Fishing Grounds, and overall whale presence is low. However, based on the time of year, migration is likely underway and arrivals can be anticipated in the coming weeks.

Chosen Management Action and Rationale

Based on the management considerations outlined above, the Director will implement a Fishery Closure in Fishing Zones 3, 4, 5, and 6, and maintain the Fleet Advisory in Fishing Zones 1 and 2. Any authorized Alternative Gear will be allowed to be used in the closed Fishing Zones.

The confirmed entanglements of humpback whales in California commercial Dungeness crab fishing gear in Fishing Zones 3 and 4 require the Department to evaluate risk and take an appropriate management response. Based on available data, a Fishery Closure is appropriate protective management response. Two recent entanglements show a clear indication of co-occurrence of fishing gear and humpback whales. Additionally, although fishing effort has decreased statewide and is anticipated to continue to decrease into the spring months, the arrival of migrating humpback and blue whales in the next few weeks is expected and the Department anticipates that numbers of Actionable Species will increase, thereby also increase entanglement risk. The two-week period for gear removal in advance of the closure will help the fleet accommodate safe removal and work when ocean conditions allow.

Under Section 132.8(d)(10), the Director may consider current Impact Score calculations when evaluating an appropriate management response. The Impact Score for the current fishing season is 1.88 for Humpback whales. The potential for additional entanglements this Fishing Season begins to raise concerns of meeting the mandatory season closure Impact Score of 3, as well as the possibility of reaching the running average score trigger at the end of this calendar year pursuant to Section 132.8(c)(1)(C). This concern is warranted as there have been entanglements occur during the fishing season and not detected until after the season closes. A Fishery Closure will mitigate that risk.

There was no available Marine Life Concentration data for Fishing Zones 5 and 6, requiring the Director to implement a management action pursuant to Section 132.8(c)(2)(B)(1). Given that northward migrating whales will first reach those southern Fishing Zones, and the entanglements that have occurred in the season to date, a closure in that area is the appropriate protective measure for those Zones.

For Fishing Zones 1 and 2, based on the available data continuing the Fleet Advisory is protective of humpback whales in those Zones. Aerial surveys in Fishing Zones 1 and 2 show low numbers of humpback whales in the Fishing Grounds, which is consistent with historic migration patterns. Furthermore, fishery participation is decreasing, and it is anticipated that fishing effort will continue to decline into the spring months, reducing the likelihood of co-occurrence between commercial crab traps and Actionable Species. All confirmed entanglements to-date are from Fishing Zones 3 and 4 either in or near Monterey Bay. However, fishery participants in Fishing Zones 1 and 2 should be prepared for a Fishery Closure within those Zones should another entanglement occur or be detected. A Fleet Advisory will also alert fishery participants and other mariners to increase

entanglement detection and the potential for an entanglement response team to disentangle the animal.



California Department of Fish and Wildlife Final Assessment of Marine Life Entanglement Risk and Management Recommendation

Date: March 25, 2022

An initial assessment and preliminary recommendation were developed by California Department of Fish and Wildlife (CDFW) Marine Region staff for consideration by the California Dungeness Crab Fishing Gear Working Group (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 Dungeness crab fishery. The initial assessment was shared with the Working Group on March 22, 2022, and finalized at the conclusion of the Working Group meeting on March 23, 2022, based on discussions with the group.

A. Recommended Management Action from options identified in subsection (e)

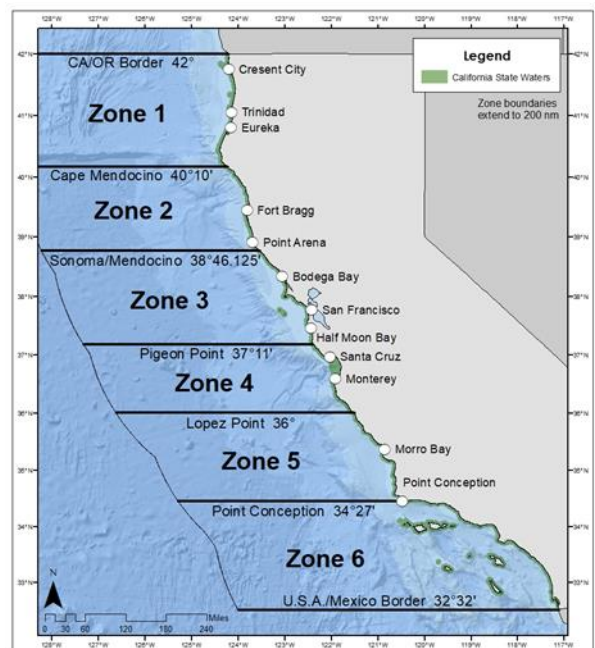
Commercial Fishery:

- **Fishery Closure: Fishing Zones 3, 4, 5 and 6 – effective April 8, 2022 12:00pm**
- **Fleet Advisory (continuation): Fishing Zones 1 and 2**

Recreational Fishery:

- **No Management Action**

CDFW Marine Region staff's final recommendation is to implement a Fishery Closure for Fishing Zones 3 and 4 triggered by two confirmed humpback entanglements in California commercial Dungeness crab fishing gear and lack of available survey data for Fishing Zones 5 and 6. To reduce risk of entanglement, staff's recommendation is to implement a Fishery Closure for Fishing Zones 3, 4, 5, and 6 beginning April 8, 2022 at 12:00pm (noon). In addition to the Fishery Closure, staff recommend the Director authorize the Lost or Abandoned Commercial Dungeness Crab Trap Gear Retrieval Program to begin on April 15, 2022 at 12:00pm (noon) for Fishing Zones 3, 4, 5 and 6. Authorization of this program will further reduce entanglement risk by removing lost or abandoned gear. Staff's final recommendation is to continue the Fleet Advisory for Fishing Zones 1 and 2 due to low abundance of Actionable Species in those Zones. The Fleet should, however, be prepared for a Fishery Closure within those Zones should another entanglement occur or if Marine Life Concentrations exceed management triggers.



Rationale: One humpback entanglement in Fishing Zone 3 was first reported on March 11, 2022, and confirmed in California commercial Dungeness crab gear on March 17, 2022, and a second entanglement confirmed in California commercial Dungeness crab gear was reported in Fishing Zone 4 on March 19, 2022. In addition, a management action is triggered by lack of recent RAMP approved survey data for Fishing Zones 5 and 6. A third humpback whale entanglement reported on March 21, 2022, is currently being reviewed by NMFS, but is currently considered an unconfirmed report, and therefore does not trigger action under RAMP. Due to RAMP entanglement triggers being reached and in anticipation of increasing risk due to migrating humpback and blue whales, a closure will help minimize additional entanglement risk in Fishing Zones 3, 4, 5 and 6.

By recommending a closure date of 12:00pm on April 8, 2022, CDFW is providing additional notice to the fleet (72 hours is the minimum required under the RAMP regulations). The two-week period between the Director's anticipated determination and the closure date is intended to accommodate spring weather conditions which may constrain the ability of some vessels to remove trap gear. While the Working Group declined to provide a formal management action recommendation for the Director's consideration, during their March 23, 2022 meeting, some members supported and one member opposed CDFW's Initial Recommendation. Working Group members expressed differing opinions regarding the appropriate amount of time between the Director's determination and the closure date, with some members wanting the closure to include a provision for weather delays and some wanting an earlier closure to minimize risk as quickly as feasible.

It is anticipated that fishing effort will continue to decline into the spring months, however arrivals of humpback and blue whales will increase, and the Fleet should be prepared to modify fishing operations to minimize risk of entanglement in Fishing Zones 1 and 2. CDFW anticipates that humpback whale migrations to California waters will increase over the coming weeks and reminds fisherman to use [best fishing practices](#) to minimize risk of entanglement as whales begin to arrive in Zones that remain open to fishing. The recreational crab fishery is not subject to a restriction at this time because Marine Life Concentration triggers have not been reached. The recreational fleet should however implement best practices and remove all gear promptly once they no longer intend to fish for crab to further minimize risk of entanglement. If Marine Life Concentration triggers are reached during a future risk assessment, the Director may implement a trap restriction for the recreational fishery either by Zone or statewide.

CDFW will continue to monitor all available data to inform the next risk assessment (expected to occur on or around April 15, 2022).

B. Marine life entanglement risk, relative to the triggers in subsection (c)

Confirmed Entanglements in California Commercial Dungeness Crab Gear

- During the current Fishing Season: 2 humpback whales
- During the current calendar year: 2 humpback whales
- During the 2021 calendar year: 1 humpback whale

Confirmed Entanglements in Unknown Fishing Gear reported from California:

- During the current Fishing Season: 1 humpback whale

- During the current calendar year: 1 humpback whale
- During the 2021 calendar year: 3 humpback whales

Marine Life Concentrations Surveys and/or Satellite Telemetry Observations:

- **Fishing Zone 1, 2, 3 and 4:** No Management Action triggers reached
- **Fishing Zone 5 and 6:** No current data are available for these Zones, which triggers management response under RAMP (c)(2)(B)(1).

C. Scope of elevated risk based on Management Considerations in subsection (d)

Section 132.8(d)(2): Information from NOAA

- No additional information was made available for this risk assessment

Section 132.8(d)(3): Effectiveness of management measures to reduce entanglement risk

- **Fleet Advisory:** given the confirmed gear types (CA commercial Dungeness crab) involved in the entanglements, a Fleet Advisory will not sufficiently protect the Actionable Species within the Fishing Grounds.
- **Fishing Depth Constraint:** given the low abundance of humpback whales in the Fishing Grounds, it is not possible to identify an appropriate depth-based closure which would reduce co-occurrence between humpback whales and commercial Dungeness crab fishing gear. Therefore, implementing a depth constraint would not be an effective management measure.
- **Fishery Closures or Vertical Line Reductions:** given the recent entanglements in CA commercial Dungeness crab fishing gear, a Fishery closure is likely to provide the most protection for Actionable Species within the Fishing Grounds.
- **Alternative Gear:** No gear is currently authorized for use and one request is currently under evaluation.

Section 132.8(d)(4): Total economic impact to the fleet and fishing communities

- A fishery closure will have economic costs to the commercial fishery but given the elevated entanglement risk, a closure is warranted to prevent longer term loss of fishing opportunity.

Section 132.8(d)(5): Data availability within and across Fishing Zones

- CDFW aerial survey data are available for Fishing Zones 1, 2, 3 and 4. MBWW data are available for Fishing Zone 4.

Section 132.8(d)(6): Known historic marine life migration patterns

- Aerial surveys and MBWW indicate relatively few humpback whales, which

aligns with known historic migration patterns.

Section 132.8(d)(7): Fishing Season dynamics

- 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.
- Looking at landings by Zone, 69 active permits made landings in Zone 1, 19 active permits in Zone 2, 88 active permits in Zone 3, 15 active permits in Zone 4. Zones 5 and 6 had active permits fewer than 3.
- 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.
- Unit price (price per pound) has continued to trend upwards for Crescent City, Eureka, Bodega Bay, San Francisco, Half Moon Bay, and Monterey Bay. 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.
- Approximately 34,188 traps are estimated to be deployed statewide for the March 16 reporting period, which covers fishery participation from March 1-15, 2022. The majority of these (47%) are located within Fishing Zone 3 while 39% of these located within Fishing Zone 1.

Section 132.8(d)(8): Known distribution and abundance of key forage

- See [Available Data document dated March 9, 2022](#)

Section 132.8(d)(9): Ocean conditions

- See [Available Data document dated March 9, 2022](#)

Section 132.8(d)(10): Current Impact Score Calculation

- Impact score calculation under RAMP began on January 1, 2021. The 2021 calendar year impact score is 1.89 for humpback whales and 0 for blue whales and leatherback sea turtles. The current impact scores for 2022 are 1.88 for humpback whales and 0 for blue whales and leatherback sea turtles.

Section 132.8(d)(11): Actionable Species migration into or out of Fishing Grounds and across Fishing Zones

- Based on aerial survey data and MBWW data, most humpback whales appear to be outside the Fishing Grounds. Based on the time of year, migration is likely underway, and arrivals can be anticipated over the coming weeks.



California Department of Fish and Wildlife Initial Assessment of Marine Life Entanglement Risk and Preliminary Management Recommendation

Date: March 22, 2022

CDFW will prepare a Final Assessment and Management Recommendation after review of the Working Group Recommendation and any other relevant information.

This assessment and preliminary recommendation have 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 Dungeness crab fishery.

A. Recommended Management Action from options identified in subsection (e)

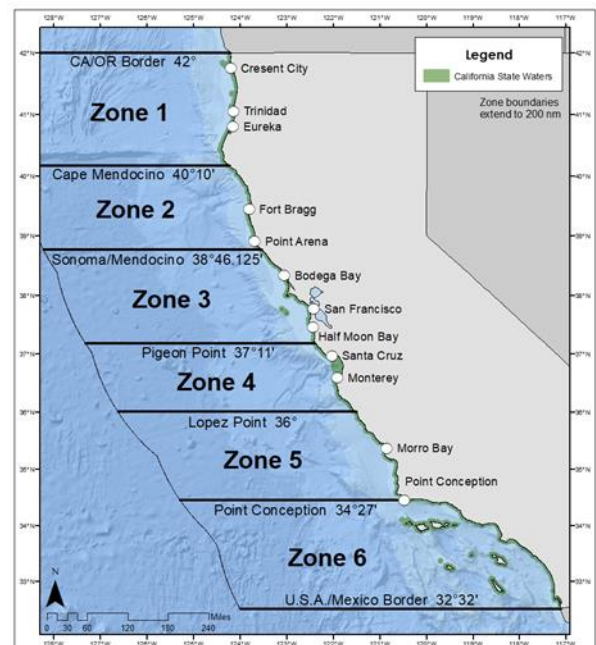
Commercial Fishery:

- **Fishery Closure: Fishing Zones 3, 4, 5 and 6 – effective April 8, 2022 12:00pm**
- **Fleet Advisory (continuation): Fishing Zones 1 and 2**

Recreational Fishery:

- **No Management Action**

CDFW Marine Region staff's preliminary recommendation is to implement a Fishery Closure for Fishing Zones 3 and 4 triggered by two confirmed humpback entanglements in California commercial Dungeness crab fishing gear and lack of available survey data for Fishing Zones 5 and 6. To reduce risk of entanglement, staff's recommendation is to implement a Fishery Closure for Fishing Zones 3, 4, 5, 6 beginning April 8, 2022 at 12:00pm (noon). In addition to the Fishery Closure, staff recommend the Director authorize the Lost or Abandoned Commercial Dungeness Crab Trap Gear Retrieval Program to begin on April 15, 2022 at 12:00pm (noon) for Fishing Zones 3, 4, 5 and 6. Authorization of this program will further reduce entanglement risk by removing lost or abandoned gear. Staff's preliminary recommendation is to continue the Fleet Advisory for Fishing Zones 1 and 2 due to low abundance of Actionable Species in those Zones. The Fleet should however be prepared for a Fishery Closure within those Zones should another entanglement occur.



Rationale: One humpback entanglement in California commercial Dungeness crab gear was confirmed in Fishing Zone 3 on March 17, 2022, and a second entanglement was confirmed in Fishing Zone 4 on March 19, 2022. In addition, a management action is triggered by lack of recent RAMP approved survey data for Fishing Zones 5 and 6. Due to RAMP entanglement triggers being reached and in anticipation of increasing risk due to migrating humpback and blue whales, a closure will help minimize additional entanglement risk in Fishing Zones 3, 4, 5 and 6. It is anticipated that fishing effort will continue to decline into the spring months, however arrivals of humpback and blue whales will increase, and the Fleet should be prepared to modify fishing operations to minimize risk of entanglement in Fishing Zones 1 and 2. CDFW anticipates that humpback whale migrations to California waters will increase over the coming weeks and reminds fisherman to use [best fishing practices](#) to minimize risk of entanglement as whales begin to arrive in Zones that remain open to fishing. The recreational crab fishery is not subject to a restriction at this time because Marine Life Concentration triggers have not been reached. The recreational fleet should however implement best practices and remove all gear promptly once they no longer intend to fish for crab to further minimize risk of entanglement. If Marine Life Concentration triggers are reached during a future risk assessment, the Director may implement a trap restriction for the recreational fishery either by Zone or statewide.

CDFW will continue to monitor all available data to inform the next risk assessment (expected to occur on or around April 15, 2022).

B. Marine life entanglement risk, relative to the triggers in subsection (c)

Confirmed Entanglements in California Commercial Dungeness Crab Gear

- During the current Fishing Season: 2 humpback whales
- During the current calendar year: 2 humpback whales
- During the 2021 calendar year: 1 humpback whale

Confirmed Entanglements in Unknown Fishing Gear reported from California:

- During the current Fishing Season: 1 humpback whale
- During the current calendar year: 1 humpback whale
- During the 2021 calendar year: 3 humpback whales

Marine Life Concentrations Surveys and/or Satellite Telemetry Observations:

- **Fishing Zone 1, 2, 3 and 4:** No Management Action triggers reached
- **Fishing Zone 5 and 6:** No current data are available for these Zones, which triggers management response under RAMP (c)(2)(B)(1).

C. Scope of elevated risk based on Management Considerations in subsection (d)

Section 132.8(d)(2): Information from NOAA

- No additional information was made available for this risk assessment

Section 132.8(d)(3): Effectiveness of management measures to reduce entanglement risk

- Fleet Advisory: given the confirmed gear types (CA commercial Dungeness crab) involved in the entanglements, a Fleet Advisory will not sufficiently protect the Actionable Species within the Fishing Grounds.
- Fishing Depth Constraint: given the low abundance of humpback whales in the Fishing Grounds, it is not possible to identify an appropriate depth-based closure which would reduce co-occurrence between humpback whales and commercial Dungeness crab fishing gear. Therefore, implementing a depth constraint would not be an effective management measure.
- Fishery Closures or Vertical Line Reductions: given the recent entanglements in CA commercial Dungeness crab fishing gear, a Fishery closure is likely to provide the most protection for Actionable Species within the Fishing Grounds.
- Alternative Gear: No gear is currently authorized for use and one request is currently under evaluation.

Section 132.8(d)(4): Total economic impact to the fleet and fishing communities

- A fishery closure will have economic costs to the commercial fishery but given the elevated entanglement risk, a closure is warranted to prevent longer term loss of fishing opportunity.

Section 132.8(d)(5): Data availability within and across Fishing Zones

- CDFW aerial survey data are available for Fishing Zones 1, 2, 3 and 4. MBWW data are available for Fishing Zone 4.

Section 132.8(d)(6): Known historic marine life migration patterns

- Aerial surveys and MBWW indicate relatively few humpback whales, which aligns with known historic migration patterns.

Section 132.8(d)(7): Fishing Season dynamics

- 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.
- Looking at landings by Zone, 69 active permits made landings in Zone 1, 19 active permits in Zone 2, 88 active permits in Zone 3, 15 active permits in Zone 4. Zones 5 and 6 had active permits fewer than 3.

- 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.
- Unit price (price per pound) has continued to trend upwards for Crescent City, Eureka, Bodega Bay, San Francisco, Half Moon Bay, and Monterey Bay. 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.
- Approximately 34,188 traps are estimated to be deployed statewide for the March 16 reporting period, which covers fishery participation from March 1-15, 2022. The majority of these (47%) are located within Fishing Zone 3 while 39% of these located within Fishing Zone 1.

Section 132.8(d)(8): Known distribution and abundance of key forage

- See [Available Data document dated March 9, 2022](#)

Section 132.8(d)(9): Ocean conditions

- See [Available Data document dated March 9, 2022](#)

Section 132.8(d)(10): Current Impact Score Calculation

- Impact score calculation under RAMP began on January 1, 2021. The 2021 calendar year impact score is 1.89 for humpback whales and 0 for blue whales and leatherback sea turtles. The current impact scores for 2022 are 1.88 for humpback whales and 0 for blue whales and leatherback sea turtles.

Section 132.8(d)(11): Actionable Species migration into or out of Fishing Grounds and across Fishing Zones

- Based on aerial survey data and MBWW data, most humpback whales appear to be outside the Fishing Grounds. Based on the time of year, migration is likely underway, and arrivals can be anticipated over the coming weeks.

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.

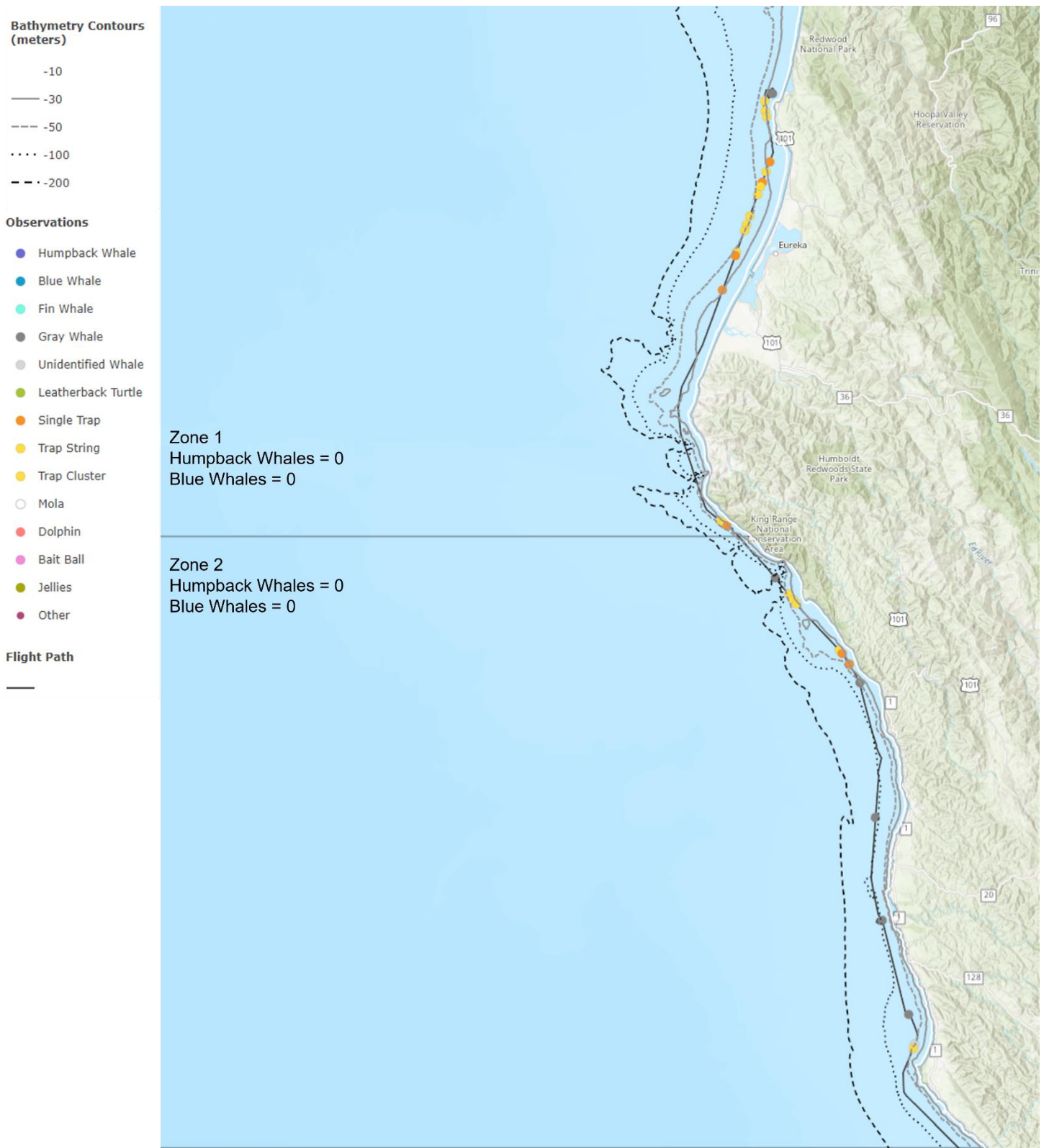


Figure 1. Map showing track lines and observations from CDFW aerial survey of Fishing Zones 1 and 2 on March 18, 2022. Survey information is overlaid onto contours showing the 10m, 30m, 50m, 100m, and 200m bathymetry lines.

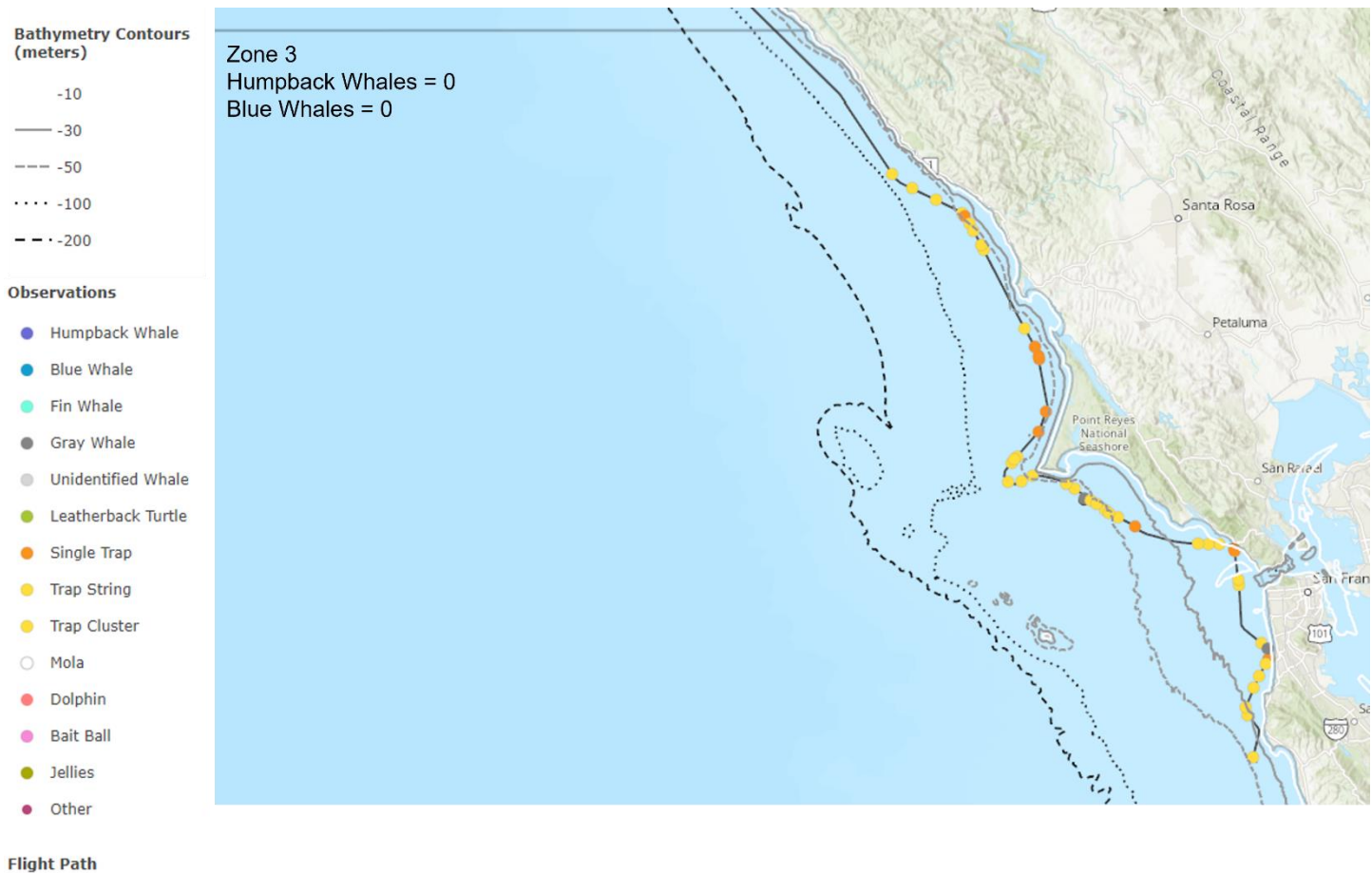


Figure 2. Map showing track lines and observations from CDFW aerial survey of Fishing Zone 3 on March 18, 2022. Survey information is overlaid onto contours showing the 10m, 30m, 50m, 100m, and 200m bathymetry lines.

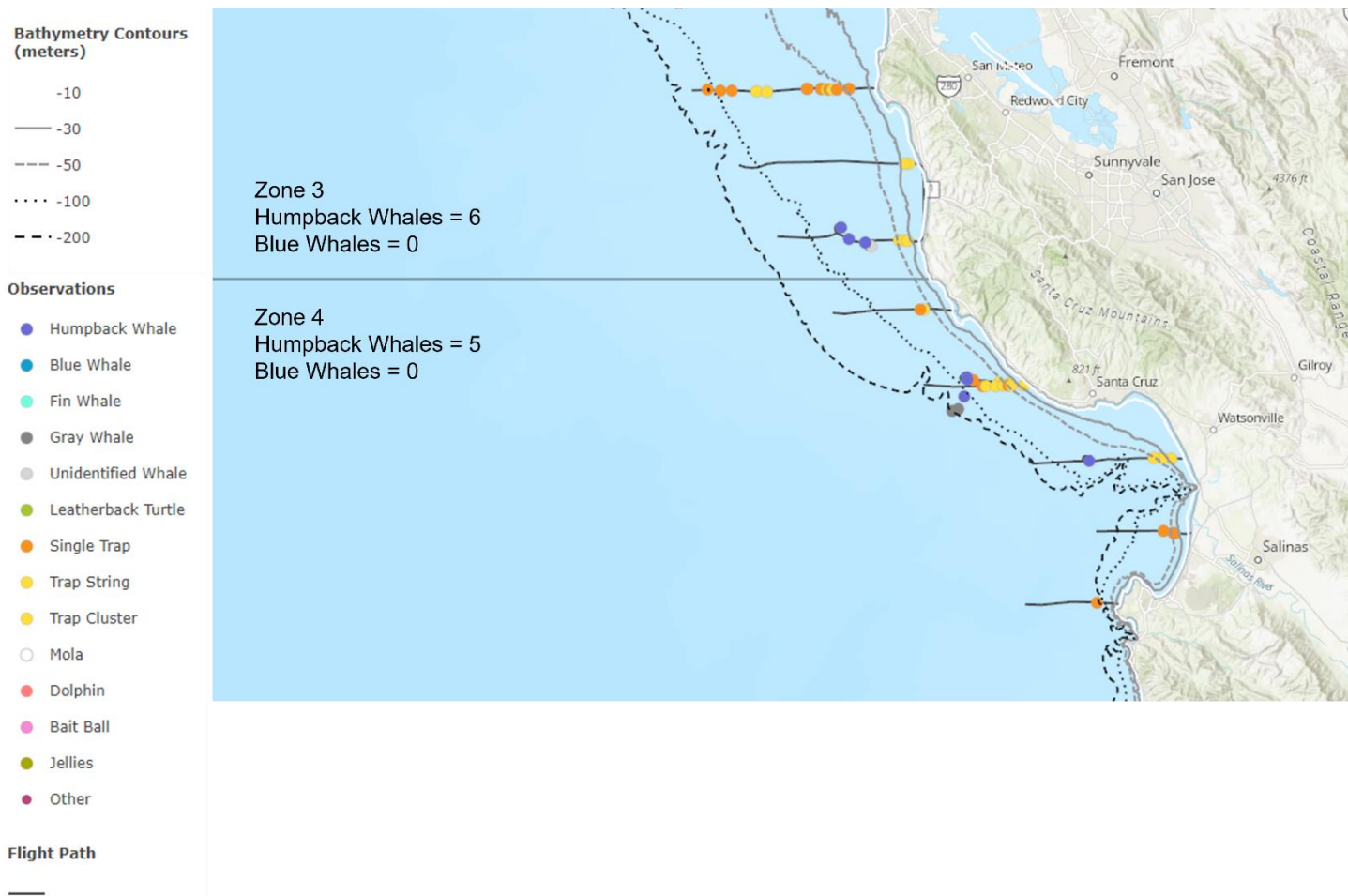


Figure 3. Map showing track lines and observations from CDFW aerial survey of Fishing Zones 3 and 4 on March 22, 2022. Survey information is overlaid onto contours showing the 10m, 30m, 50m, 100m, and 200m bathymetry lines.

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.

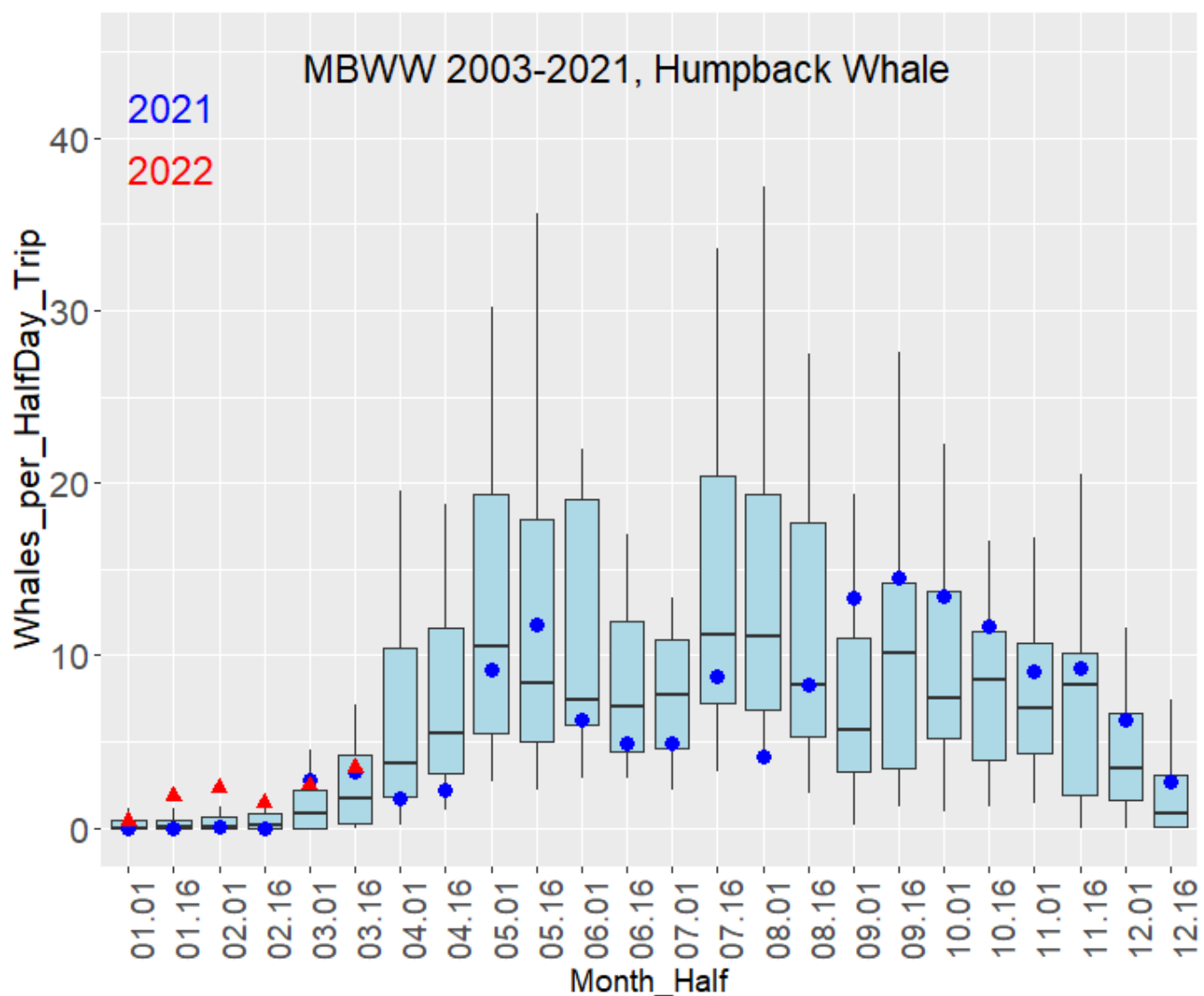


Figure 4. Historical Monterey Bay Whale Watch data for 2003-2022, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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

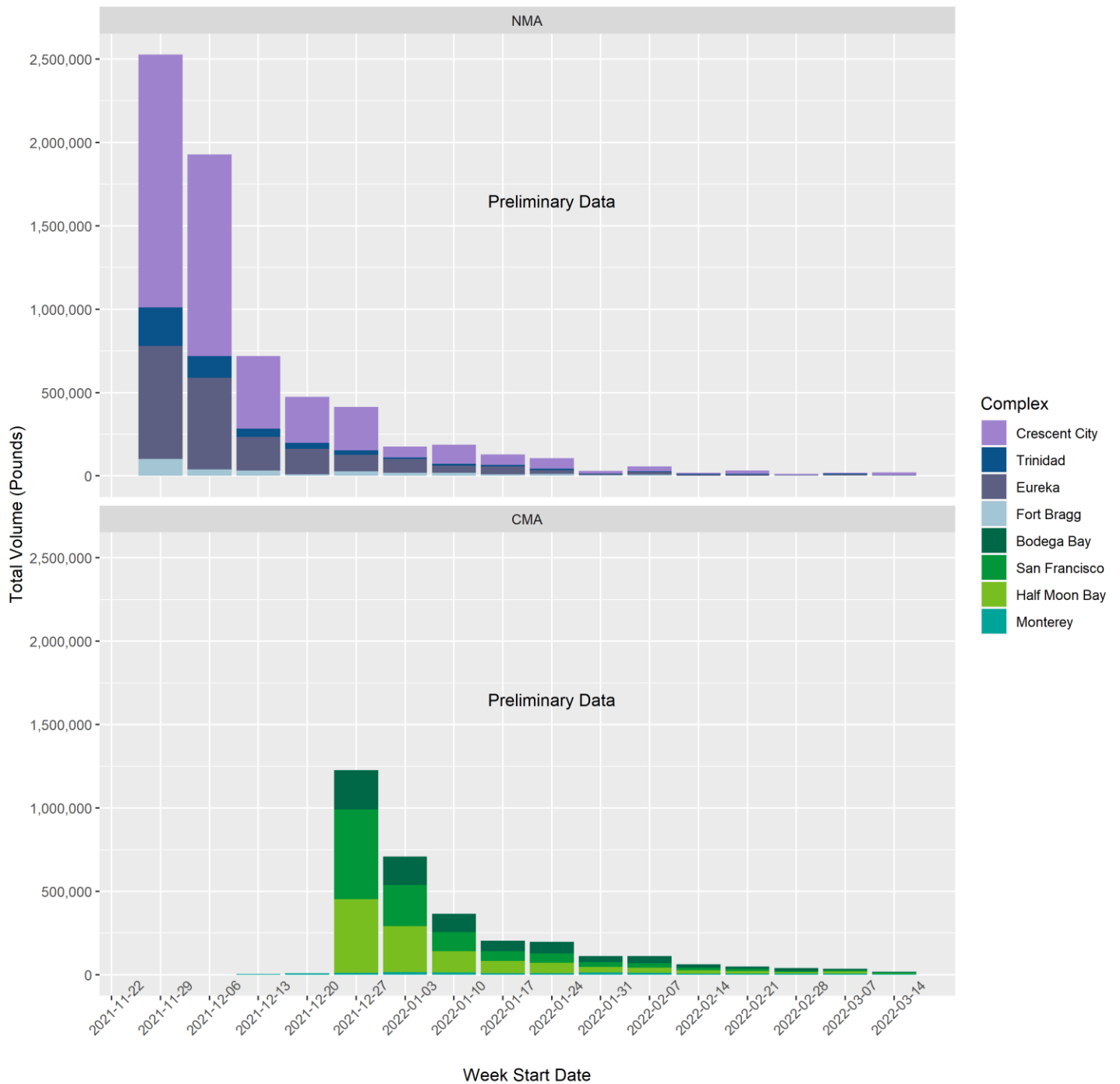


Figure 5. Cumulative volume (pounds) landed by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, November 15, 2021. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality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

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

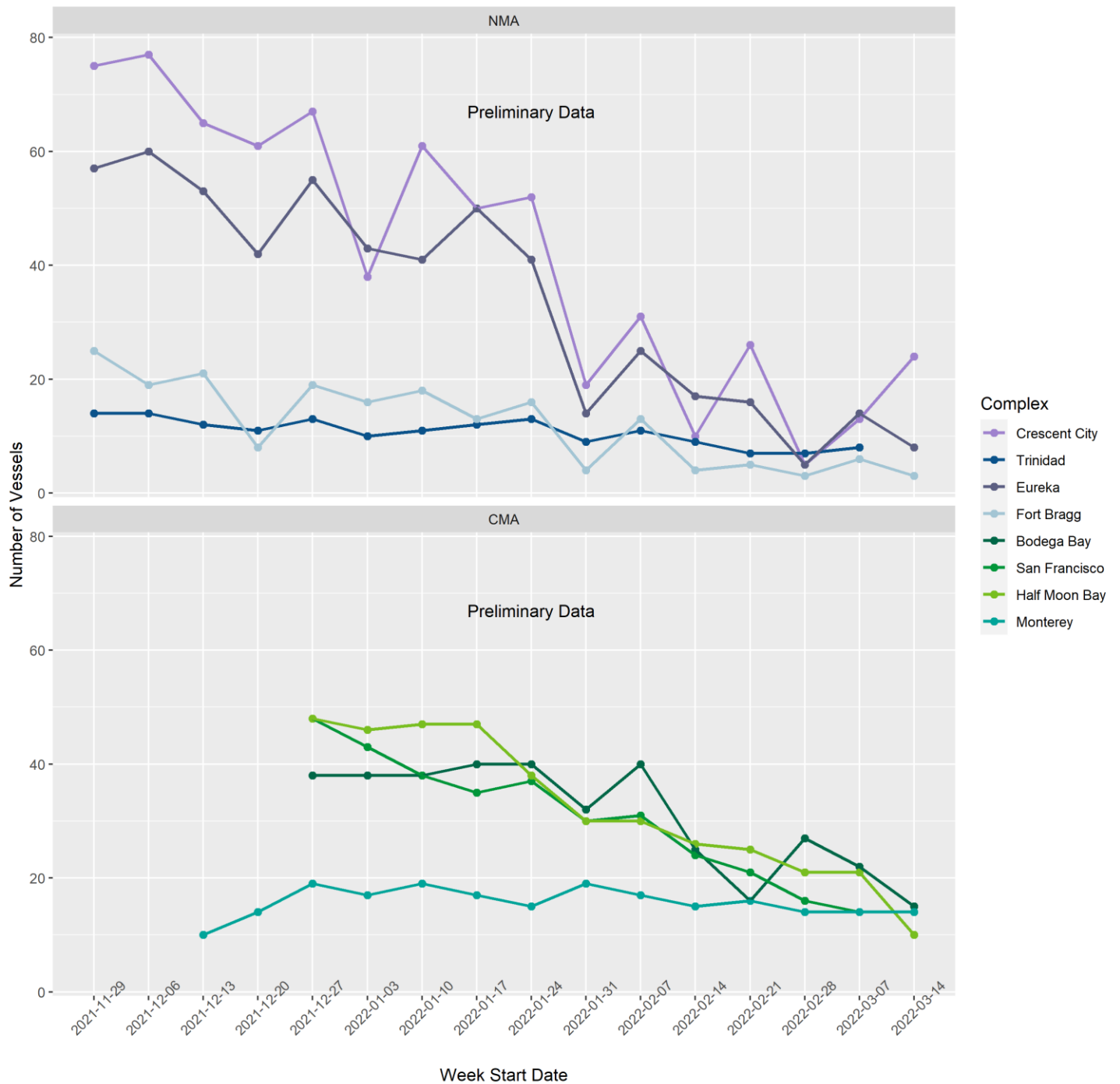


Figure 6. Number of active vessels by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, November 15, 2021. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality constraints.

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

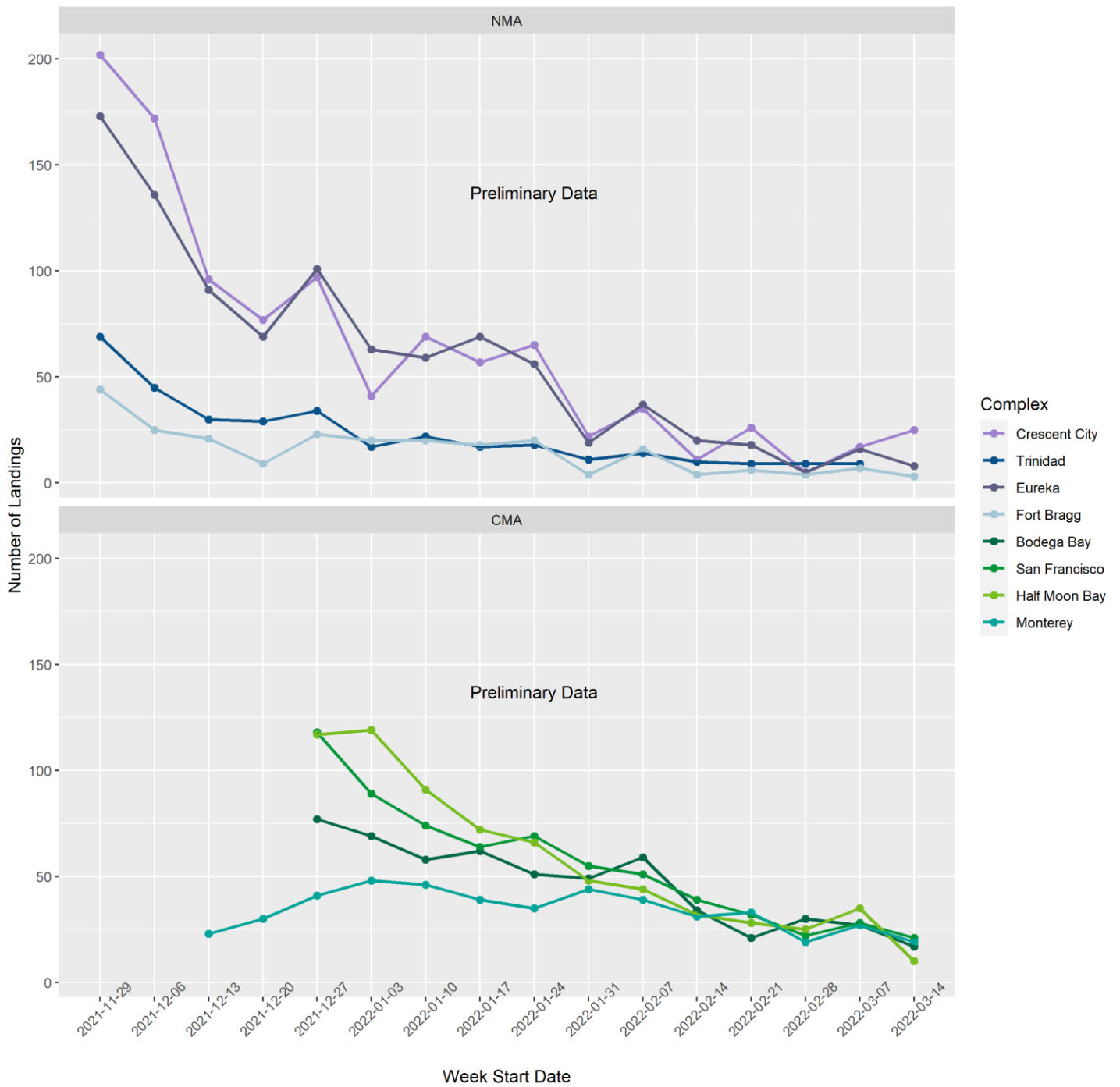


Figure 7. Number of unique landings by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, November 15, 2021. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality constraints.

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

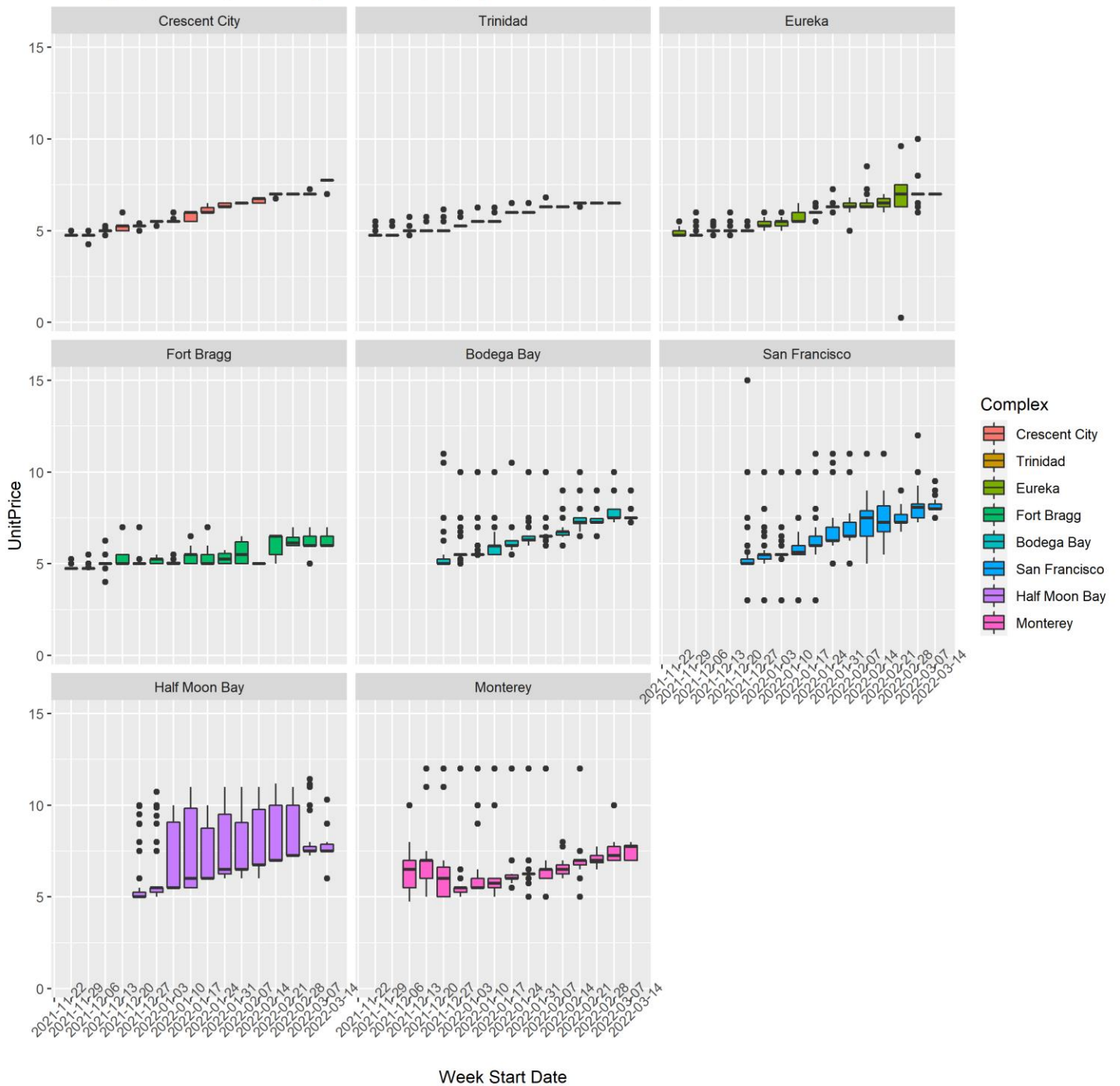


Figure 8. Mean unit price by week and port complex. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, November 15, 2021. All data are preliminary and subject to change. Certain week*port complex combinations are withheld due to confidentiality constraints.

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

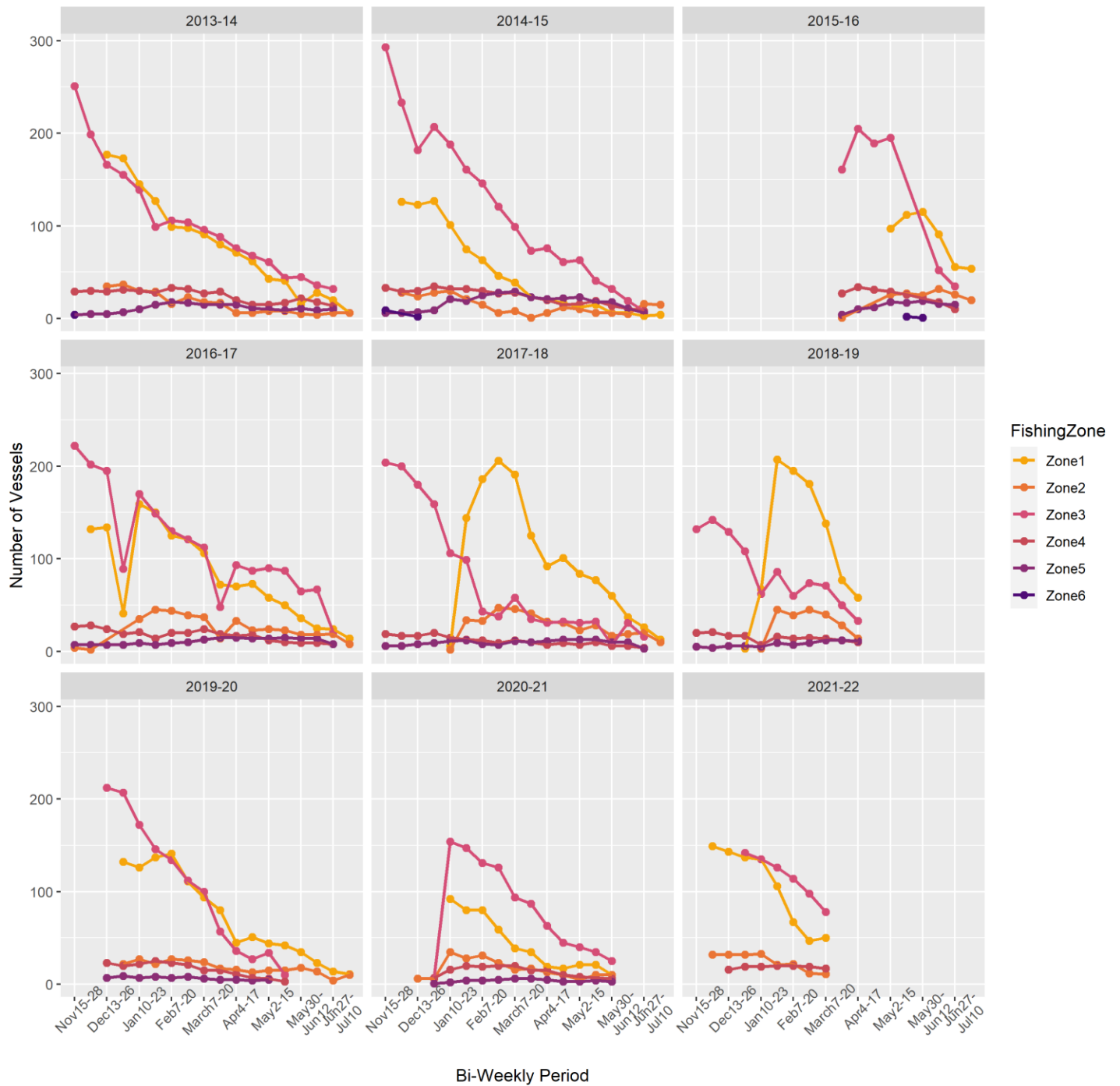


Figure 9. Number of active vessels during the 2013-14 to 2021-22 fishing seasons. Values are plotted over two-week intervals which begin with November 15 and continue through mid-July. All data are preliminary and subject to change. Certain week*Fishing Zone combinations are withheld due to confidentiality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

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

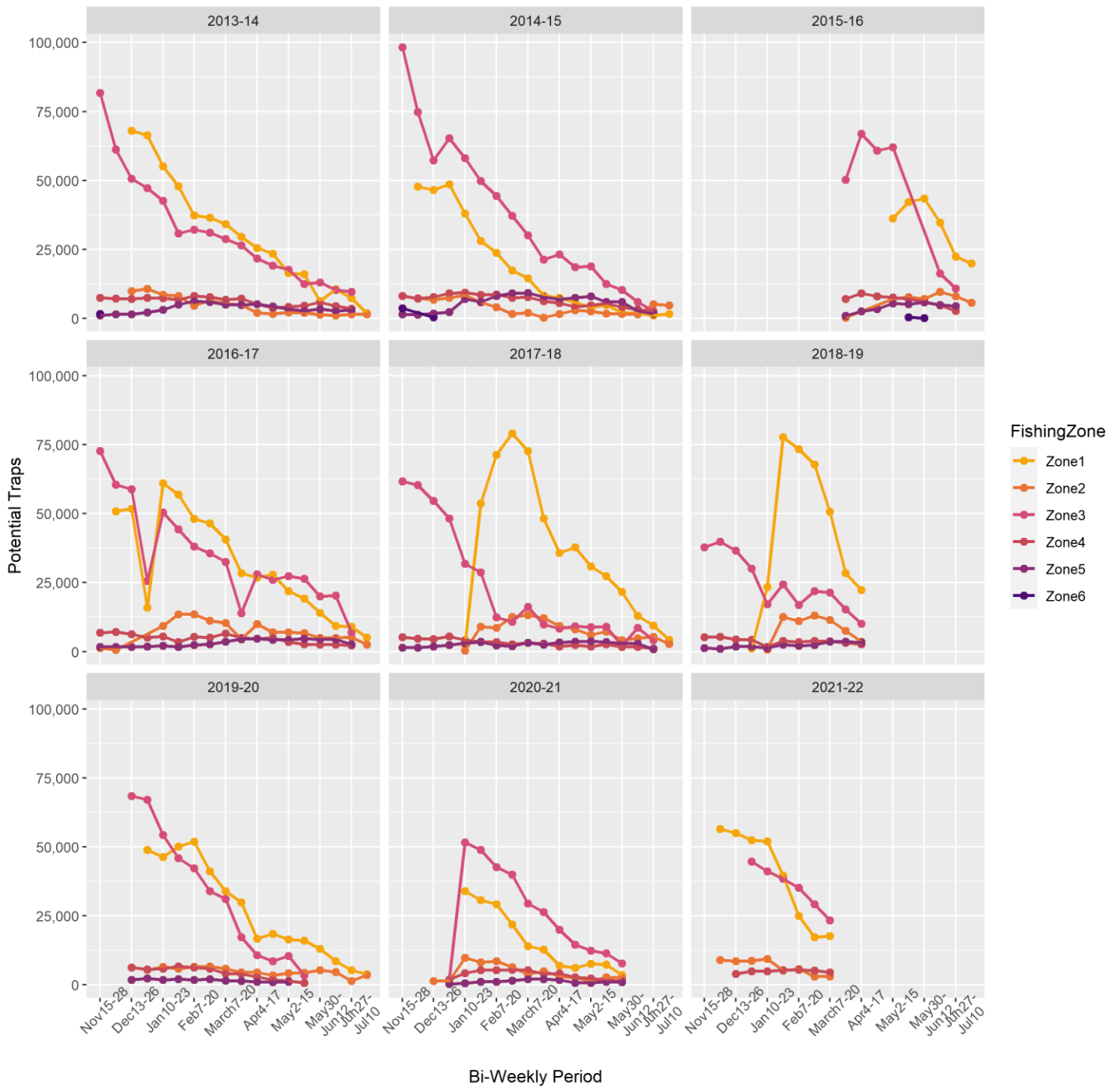


Figure 10. Estimated maximum number of deployed traps, based on vessel activity and permit tier level, during the 2013-14 to 2021-22 fishing seasons. Values are plotted over two-week intervals which begin with November 15 and continue through mid-July. All data are preliminary and subject to change.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