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DEPARTMENT OF FISH AND WILDLIFE
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
DECLARATION OF FLEET ADVISORY FOR
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 17, 2021, 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 12, 2021. Prior to this risk assessment and management response, I considered relevant information provided to my staff. The Working Group did not provide a management recommendation specific to this risk assessment.

II

NOAA-standardized data from commercial whale-watching trips in Fishing Zone 4 between March 2, 2021 and March 8, 2021 show a weekly running average of 5.7 Humpback whales in Monterey Bay. Pursuant to Section 132.8(c)(2)(B)(2)(a), I must implement a Fishing Zone closure or other protective management action.

III

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

IV

Upon evaluation of the management considerations pursuant to Section 132.8(d), I have determined that the management action listed below protects Humpback whales and Blue whales based on the best available science. Additional information on the relevant management considerations is provided in the attachment to this declaration.

V

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. A Fishing Advisory is issued for ocean waters statewide (Fishing Zones 1 - 6) for the California commercial Dungeness crab fleet. The Department encourages the fleet to implement fishing best practices (e.g. minimizing knots, line scope) and to immediately remove all gear when an operator no longer intends to fish. Vessels fishing in Zone 4 should pay particular attention to the location of set gear and foraging whales and minimize entanglement risk by adhering to the Best Practices Guide.

This management action is in effect until the next risk assessment, which is expected to occur on or around April 1, 2021.

Updates and material regarding future entanglement risk evaluations in the commercial Dungeness crab fishery will be made available on the Department's web page: www.wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries

Charlton H. Bonham, Director

3/17/21 3:25pm PST

Date/Time

ATTACHMENT TO DIRECTOR MARCH 17, 2021 DECLARATION OF FLEET ADVISORY FOR THE COMMERCIAL DUNGENESS CRAB FISHERY DUE TO RISK OF MARINE LIFE ENTANGLEMENT

Information referenced in this Attachment is further described in the Data Summary Compilation dated March 16, 2021, 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)

Marine Life Concentrations:

- **Fishing Zone 4:** Weekly running average of 5.7 animals and single day sighting of 30 Humpback whales based on Monterey Bay Whale Watch data, which exceeds the marine life concentration trigger under RAMP (c)(2)(B)(2).

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

Relevant Management Considerations Under Section 132.8(d)

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

   No Working Group Recommendation was provided for this risk assessment.

2. **Information from NOAA**

   No additional information was provided for this risk assessment.

3. **Effectiveness of Management Measures to Minimize Entanglement Risk**

   Given the low relative running average sightings of Humpback whales, a Fleet Advisory will be an effective Management Action due to anticipated declining fishing effort in Fishing Zone 4, and will provide additional precaution for all Zones.

4. **Total Economic Impact to the Fleet and Fishing Communities**

   A Fleet Advisory is not anticipated to have significant economic impact on the fleet or fishing communities as it allows for continued fishing opportunity.

5. **Data Availability Within and Across Fishing Zones**

Monterey Bay Whale Watch (MBWW) data was available for Fishing Zone 4. Additional Department aerial survey data were available for Zones 2, 3 and 4, Point Blue observation data for Zones 3, 4 and 6 and Blue whale habitat predictions are available for all Fishing Zones. The Habitat Compression Index and Whale Watch 2.0 habitat predictions are available for all Zones. The Department considers this comprehensive data set to adequately cover the full geographic extent of those Fishing Zones to inform the appropriate management response.

6. Known Historic Marine Life Migration Patterns

Low presence of Humpback whales across all but one of the Fishing Zones is consistent with average historical late winter patterns that show few or no Humpback whale sightings when whales are mostly at their breeding areas off Mexico and central America. Recent surveys at these breeding areas indicated lower numbers of Humpback whales than previously observed during mid-winter surveys, indicating some departures.

Continued absence of Blue whales from Zones 1-5 is consistent with their migration to breeding areas during the winter months.

7. Fishing Season Dynamics

Season price negotiations delayed the actual start of fishing following the December 23, 2020 statewide opener. Most vessels began setting gear on Monday January 11, 2021.

Based on Department landings data, 351 vessels have participated in the fishery as of March 2, 2021. Week 5 had the highest number of potential traps deployed across all Fishing Zones, with an estimated total of 94,350 traps. Fishing Zone 3 had the highest total, followed by Zone 1. Based on the most recent landings data from week 10, participation and landings volume has decreased significantly. The estimated maximum number of traps is currently 45,625.

8. Known Distribution and Abundance of Key Forage

Krill abundance (higher offshore in the outer slope) is anticipated to be closer to average yearly values while anchovy is still considered to be above average, based on the historical record.

9. Ocean Conditions

La Niña conditions persisted in January with a 60% chance of a transition from this condition to ENSO-neutral in the northern hemisphere by the spring months of April, May and June.

The latest outlook of late winter/spring ocean ecosystem conditions shows that ocean conditions have cooled significantly over this past winter and conditions in spring are trending toward cool and productive conditions. It is anticipated that cool conditions will continue, with expanded upwelling habitat and no signs of impact of habitat compression that would otherwise result in increased concentrations and aggregations of whales and forage nearshore.

10. Current Impact Score Calculations

a. Fishing Season – 0

b. Calendar Year – 0

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

Based on Department aerial survey data, Monterey Bay Whale Watch data, and Point Blue Conservation Science observation data, significant migration into the Fishing Grounds has yet to occur. A single Humpback whale has been observed feeding inside San Francisco Bay. Humpbacks foraging for anchovies inside the bay are typically not observed until mid-April based on the previous 5-year sighting history. Additionally, two Humpback whales were observed outside and to the east of San Francisco Bay in Zone 3 on March 14, 2021. Three Humpback whales and one Blue whale were observed in Zone 6 but is considered outside of the Dungeness crab fishing grounds.

Chosen Management Action and Rationale

Based on the management considerations outlined above, the Director will implement a state-wide Fleet Advisory.

Fishing Zone 4 reached a marine life concentration trigger, leading to analysis of the management considerations under Section 132.8(d) and appropriate management response under Section 132.8(c). Those sections anticipate a broader analysis of the factors impacting entanglement risk statewide. A Fleet Advisory under section 132.8(e) is not necessarily limited to a single Fishing Zone, and compliance with best management practices throughout the state will ensure that entanglement risk remains low as we begin to approach a time of year when Humpback and Blue whales start migrating into the Fishing Grounds. The RAMP regulations indicate a Fleet Advisory is warranted if the level of risk is elevated and/or anticipated to increase but more restrictive management actions are not necessary at this time.

Although historic information indicates we are approaching the spring migration period, available data indicate the bulk of the migration has not started at this time. Department aerial survey data for Zones 2, 3, and 4 observed very few Actionable Species; it is reasonable to use this data as a proxy for whale presence in Fishing Zones 1 and 5.

Additionally, observation data from Point Blue Conservation Science supports low whale presence in the Fishing Grounds. In addition, based on oceanographic and forage condition data, cool conditions persist, and compression of available forage which could increase co-occurrence of trap gear and whales as they begin to arrive to the Fishing Grounds is not expected to occur. Additionally, fleet participation in low and decreasing compared to activity levels from previous years.

A Fleet Advisory provides notice to fishermen of possible whale presence, and encourages the to implement best fishing practices (e.g. minimizing knots, line scope) and to immediately remove all gear when an operator no longer intends to fish. Additionally, vessels fishing in Zone 4 should pay particular attention to the location of gear and foraging whales and further minimize entanglement risk by adhering to the Best Practices Guide. The Department will perform additional risk assessments throughout the spring and respond to changing entanglement risk as appropriate should new data indicate the increased presence of Humpback and Blue whales in the Fishing Grounds.

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

Date: March 17, 2021

An initial assessment and preliminary recommendation was 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 12, 2021 and finalized at the conclusion of the Working Group meeting on March 16, 2021 based on discussions with the group.

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

Confirmed Entanglements in California Commercial Dungeness Crab Gear

- During the current Fishing Season: 0
- During the current calendar year: 0

Confirmed Entanglements in Unknown Fishing Gear reported from California:

- During the current Fishing Season: 0
- During the current calendar year: 0

Marine Life Concentrations Surveys and/or Satellite Telemetry Observations:

- **Fishing Zone 4:** Weekly running average of 5.7 animals and single day sighting of 30 Humpback whales based on Monterey Bay Whale Watch data, which exceeds the marine life concentration trigger under RAMP (c)(2)(B)(2).
- **Fishing Zone 1, 5 and 6:** No current data are available for these Zones, which

triggers management response under RAMP (c)(2)(B)(1).

B. 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

- Given the low relative running average sightings of Humpback whales, a Fleet Advisory will be an effective Management Action due to anticipated declining fishing effort in Fishing Zone 4, and will provide additional precaution for all Zones.

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

- A Fleet Advisory is not anticipated to have significant economic impact on the fleet or fishing communities as it allows for continued fishing opportunity.

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

- Monterey Bay Whale Watch (MBWW) data was available for Fishing Zone 4. Additional CDFW aerial survey data were available for Zones 2, 3 and 4, Point Blue observation data for Zones 3, 4 and 6 and Blue whale habitat predictions are available for all Fishing Zones. The Habitat Compression Index and Whale Watch 2.0 habitat predictions are available for all Zones.

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

- Low presence of Humpback whales across all but one of the Fishing Zones is consistent with average historical late winter patterns that show few or no Humpback whale sightings when whales are mostly at their breeding areas off Mexico and central America.

- Recent surveys at these breeding areas (Central America and Mexico) resulted in lower numbers of Humpback whales than previously observed during mid-winter surveys indicating some departures.

- Continued absence of Blue whales from Zones 1-5 is consistent with their migration to breeding areas during the winter months.

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

- Season price negotiations delayed actual start of fishing following the December 23,

2020 statewide opener. Most vessels began setting gear on Monday January 11, 2021.

- Based on CDFW landings data, 351 vessels have participated in the fishery as of March 2, 2021. Week 5 had the highest number of potential traps deployed across all Fishing Zones, with an estimated total of 94,350 traps. Fishing Zone 3 had the highest total, followed by Zone 1. Based on the most recent landings data from week 10, participation and landings volume has decreased significantly. The estimated maximum number of traps is currently 45,625.

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

- Krill abundance (higher offshore in the outer slope) is also anticipated to be closer to average yearly values while anchovy is still considered to be above average, given the historical record.

Section 132.8(d)(9): Ocean conditions

- La Niña conditions persisted in January with a 60% chance of a transition from this condition to ENSO-neutral in the northern hemisphere by the spring months of April, May and June.

- The latest outlook of late winter/spring ocean ecosystem conditions shows that ocean conditions have cooled significantly over this past winter and conditions in spring are trending toward cool and productive conditions. It is anticipated that cool conditions will continue, with expanded upwelling habitat and no signs of impact of habitat compression that would otherwise result in increased concentrations and aggregations of whales and forage nearshore.

- See Available Data from March 16, 2021.

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

- Impact score calculation under RAMP began on January 1, 2021. Current impact score is 0 for all three Actionable Species.

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

- Based on Monterey Bay Whale Watch data, Cascadia Research, Point Blue

Conservation Science observation data and CDFW aerial survey data, significant migration into the Fishing Grounds has yet to occur.

- A single Humpback whale has been observed feeding inside San Francisco Bay. Humpbacks foraging for anchovies inside the bay are typically not observed until mid-April based on the previous 5-year sighting history.

- Additionally, two Humpback whales were observed outside and to the east of San Francisco Bay in Zone 3 on March 14, 2021.

- Three Humpback whales (Point Blue) and one Blue whale (Cascadia) were observed in Zone 6 but is considered outside of the Dungeness crab fishing grounds.

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

Fishing Zones 1-6: CDFW Marine Region staff's final recommendation is to issue a state-wide Fleet Advisory based on the weekly running average of Humpback whales observed in Zone 4 and the lack of recent survey data for Zones 1, 5 and 6. Based on the CDFW aerial survey data for the adjacent Zones 2, 3 and 4, very few Actionable Species were observed, which serves as a proxy for anticipated observations in Fishing Zones 1 and 5. Although migration is expected to increase into Zone 4 and adjacent Zones based on known historic migration patterns, available data indicate the bulk of the migration has not started at this time. In addition, based on oceanographic and forage condition data, cool conditions persist and compression of available forage is not expected to occur which could increase co-occurrence of trap gear and whales as they begin to arrive to the Fishing Grounds. Currently, there are no confirmed entanglements this season of Actionable Species, ocean and forage conditions do not warrant concern, and fleet participation is low and decreasing compared to activity levels from previous years. Given the above, paired with low or nonexistent presence of Humpback whales and Blues whales respectively, risk is low across all management considerations at this time.

The RAMP regulations indicate a Fleet Advisory is warranted if the level of risk is elevated and/or anticipated to increase but more restrictive management actions are not necessary at this time. The Director may issue an advisory notice to the Fleet to employ voluntary efforts and/or measures to reduce the risk of entanglements (i.e., fishing best practices) and to avoid

triggering additional management actions. As a result, CDFW encourages the fleet to implement fishing best practices (e.g. minimizing knots, line scope) and to immediately remove all gear when an operator no longer intends to fish. Vessels fishing in Zone 4 should pay particular attention to the location of set gear and foraging whales and minimize entanglement risk by adhering to the Best Practices Guide.

CDFW Marine Region shared the Initial assessment with Working Group representatives and advisors on March 12, 2021. There was no opposition to the recommendation by Marine Region staff and no alternative recommendation was provided by the Working Group.

CDFW will continue to monitor all available data to inform the next risk assessment (expected to occur on or around April 1, 2021).

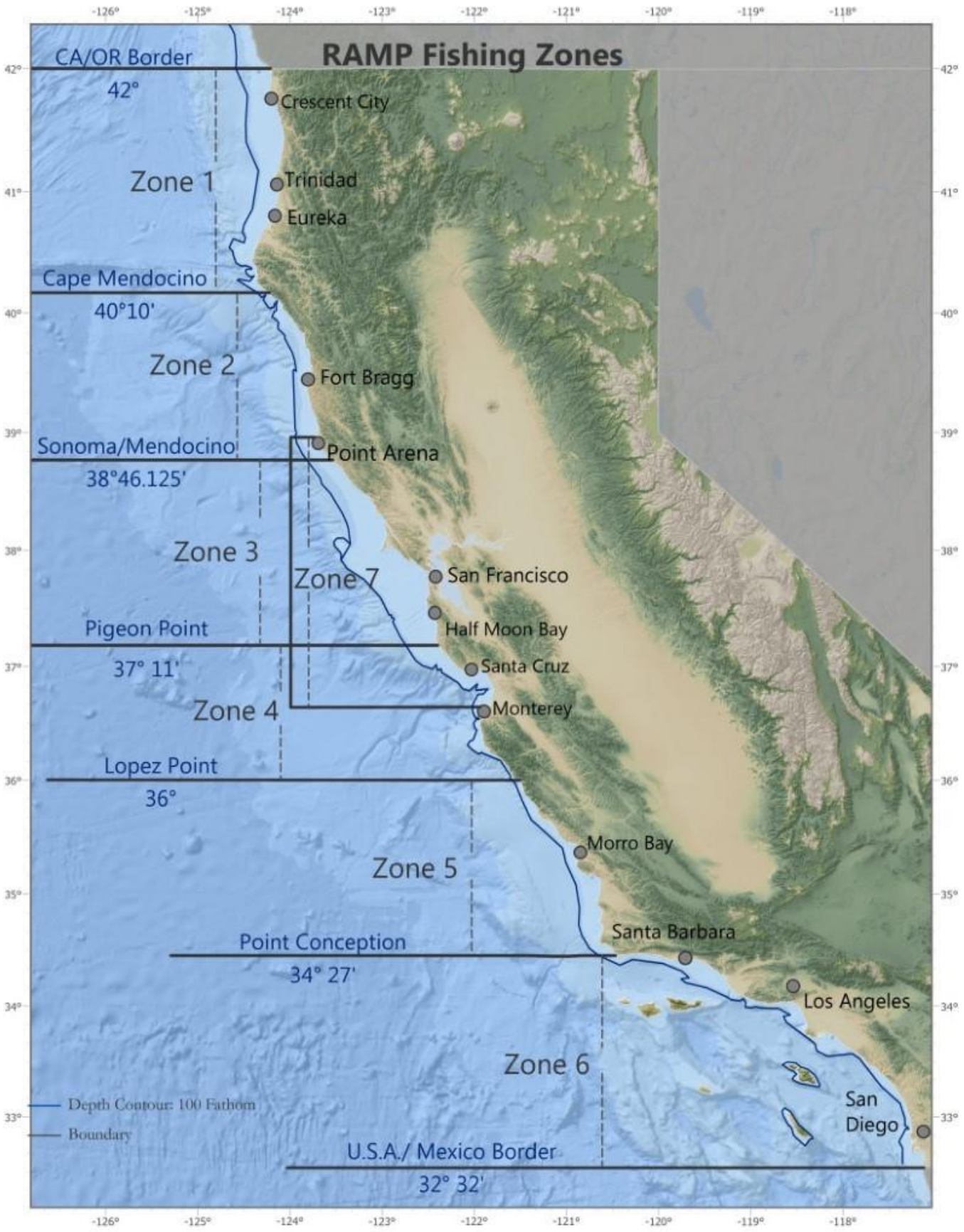

Figure 1. RAMP Fishing Zone boundaries.

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

Date: March 12, 2021

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. Marine life entanglement risk, based on triggers in subsection (c)

Confirmed Entanglements in California Commercial Dungeness Crab Gear:

- During the current Fishing Season: 0
- During the current calendar year: 0

Confirmed Entanglements in Unknown Fishing Gear reported from California:

- During the current Fishing Season: 0
- During the current calendar year: 0

Marine Life Concentrations Surveys and/or Satellite Telemetry Observations:

- **Fishing Zone 4:** Weekly running average of 5.7 animals and single day sighting of 30 Humpback whales based on Monterey Bay Whale Watch data, which exceeds the marine life concentration trigger under RAMP (c)(2)(B)(2).
- **Fishing Zone 1 and 5:** No current data are available for these Zones, which triggers management response under RAMP (c)(2)(B)(1).

B. Scope of 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

- Given the low relative running average sightings of Humpback whales, a Fleet Advisory will be an effective Management Action due to anticipated declining fishing effort in Fishing Zone 4, and will provide additional precaution for all Zones.

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

- No additional information was made available for this risk assessment.

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

- Monterey Bay Whale Watch (MBWW) data was available for Fishing Zone 4. Additional CDFW aerial survey data were available for Zones 2, 3 and 4, Point Blue observation data for Zones 3, 4 and 6 and Blue whale habitat predictions are available for all Fishing Zones.

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

- Low presence of Humpback whales across all but one of the Fishing Zones is consistent with average historical late winter patterns that show few or no Humpback whale sightings when whales are mostly at their breeding areas off Mexico and central America.

- Absence of Blue whales is consistent with their known southward migration to breeding areas during winter.

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

- Season price negotiations delayed actual start of fishing following the December 23, 2020 statewide opener. Most vessels began setting gear on Monday January 11, 2021.

- Based on CDFW landings data, 351 vessels have participated in the fishery as of March 2, 2021. Week 5 had the highest number of potential traps deployed across all Fishing Zones, with an estimated total of 94,350 traps. Fishing Zone 3 had the highest total, followed by Zone 1. Based on the most recent landings data from week 10, vessel participation and landings volume has decreased significantly. The estimated maximum number of traps is currently 45,625.

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

- No additional data was made available for this risk assessment.

Section 132.8(d)(9): Ocean conditions

- La Niña conditions persisted in January with a 60% chance of a transition from this condition to ENSO-neutral in the northern hemisphere by the spring months of April, May and June.

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

- Impact score calculation under RAMP began on January 1, 2021. Current impact score is 0 for all three Actionable Species.

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

- Based on Monterey Bay Whale Watch data, Point Blue Conservation Science observation data and CDFW aerial survey data, significant migration into the Fishing Grounds has yet to occur.

- A single Humpback whale has been observed feeding inside San Francisco Bay. Humpbacks foraging for anchovies inside the bay are typically not observed until mid-April based on the previous 5-year sighting history.

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

- **Fishing Zones 1-6:** CDFW Marine Region staff's preliminary recommendation is to issue a state-wide Fleet Advisory based on the weekly running average of Humpback whales observed in Zone 4 and the lack of recent survey data for Zones 1 and 5. Based on the CDFW aerial survey data for the adjacent Zones 2, 3 and 4, very few Actionable Species were observed, which serves as a proxy for anticipated observations in Fishing Zones 1 and 5. Although migration is expected to increase into Zone 4 and adjacent Zones based on known historic migration patterns, available data indicate the bulk of the migration has not started at this time. There are no confirmed entanglements this season, all indications are that the habitat compression remains low and ocean sea surface temperatures remain neutral to negative, and fleet participation is low and decreasing compared to activity levels from previous years; when paired with still low or nonexistent presence of Humpback whales and Blues whales respectively, risk appears low across all management considerations.

  The RAMP regulations indicate a Fleet Advisory is warranted if the level of risk is elevated and/or anticipated to increase but more restrictive management actions are not necessary at this time. The Director may issue an advisory notice to the Fleet to employ voluntary efforts and/or measures to reduce the risk of entanglements (i.e., fishing best practices) and to avoid triggering additional management actions. As a result, CDFW encourages the fleet to implement fishing best practices (e.g. minimizing knots, line scope) and to immediately remove all gear when an operator no longer intends to fish. Vessels fishing in Zone 4 should pay particular attention to the location of set gear and foraging whales and minimize entanglement risk by adhering to the Best Practices Guide.

CDFW will continue to monitor all available data to inform the next risk assessment (expected to occur on or around April 1, 2021).

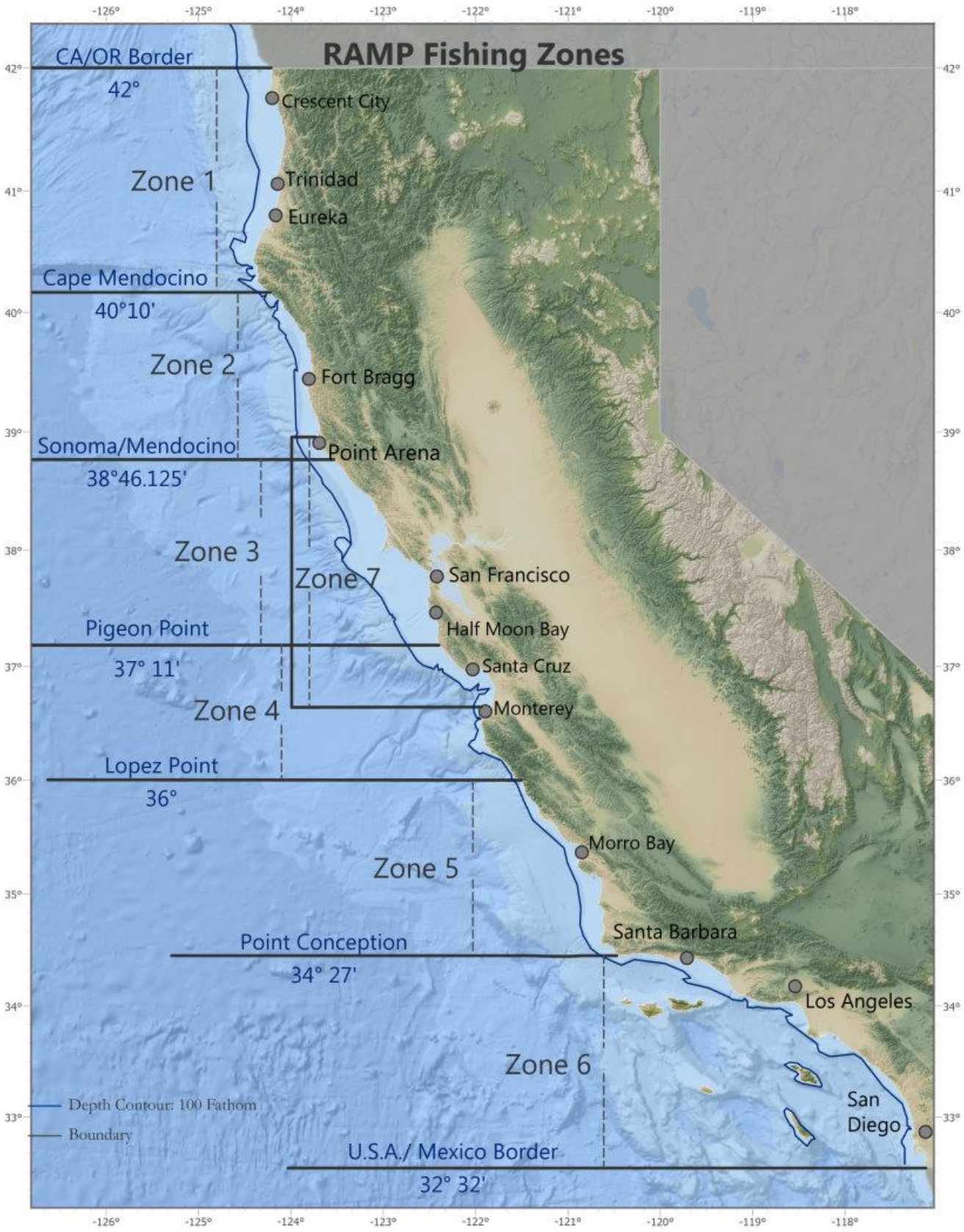

Figure 1. RAMP Fishing Zone boundaries.

2020-21 Risk Assessment Mitigation Program - Available Data

Last updated: March 16, 2021

TRIGGERS REQUIRING MANAGEMENT ACTION

Section 132.8(c)(1): Confirmed Entanglements

Data provided by: Lauren Saez and Dan Lawson, National Marine Fisheries Service (NMFS) and evaluated by the California Department of Fish and Wildlife (CDFW)

Summary of All West Coast Entanglements (by NMFS)

Fishing Zone: *All Zones*

- Humpback whales: 0 confirmed entanglements
- Blue whales: 0 confirmed entanglements
- Leatherback sea turtles: 0 confirmed entanglements

Total entanglements for calendar year 2021: 0 confirmed, 2 unconfirmed (Unknown species and Gray whale)

Supplemental Information:

- Unconfirmed whale entanglement reported February 17, 2021: Possible whale entanglement with CA Dungeness crab gear. A pile of blubber and large bones found on the beach in Manchester State Park loosely spun around CA Dungeness crab gear (3 buoys, a smaller marker buoy, line and an unattached trap further down the beach). At this time, we cannot confirm it was a whale (although likely based on the blubber depth and size of bones). We are hopeful to run genetics on the blubber soon, to determine what animal it was. The trained stranding network responders who examined it noted how easily the gear was removed as it was not really embedded in the remaining tissue.
- Unconfirmed Gray whale entanglement reported on February 2, 2021 near Oceanside, CA, entangling gear type unknown.
- All entanglement reports are subject to further review.

Evaluation of Entanglement Triggers (by CDFW)

Total number of Confirmed Entanglements in California Commercial Dungeness Crab Gear

- During the current Fishing Season: 0
- During the current calendar year: 0

Total number of Confirmed Entanglements in Unknown Fishing Gear reported from California

- During the current Fishing Season: 0
- During the current calendar year: 0

Section 132.8(c)(2): Marine Life Concentrations

Data provided by: CDFW and Monterey Bay Whale Watch (MBWW) (processed by Karin Forney, NMFS)

CDFW Aerial Survey *(Fishing Zones 2, 3 and 4)*

- CDFW staff conducted an aerial survey over Zones 2, 3 and 4, Point Arena to Point Sur on March 10, 2021 (Figure 1). One Humpback whale was observed near the Farallon Islands (Zone 3). Several Gray and Fin whales were observed south of Point Arena and south of Pigeon Point (Zone 3 and 4). Trap gear was observed across all three Fishing Zones, with high concentrations around the Farallon Islands and south of Half Moon Bay. Vessel activity was observed within those Zones as well, with some vessels picking up and/or resetting gear.

Monterey Bay Whale Watch *(Fishing Zone 4)*

- After a near-absence of humpback whales since late December, there have been four days with humpback whale sightings during March, including one day with 30 whales sighted. The 14-day average number of whales-per-half-day-trip is 3.4, and the 7-day average is 5.7.
- No Blue whales have been observed by MBWW since December 24, when a single whale was seen.

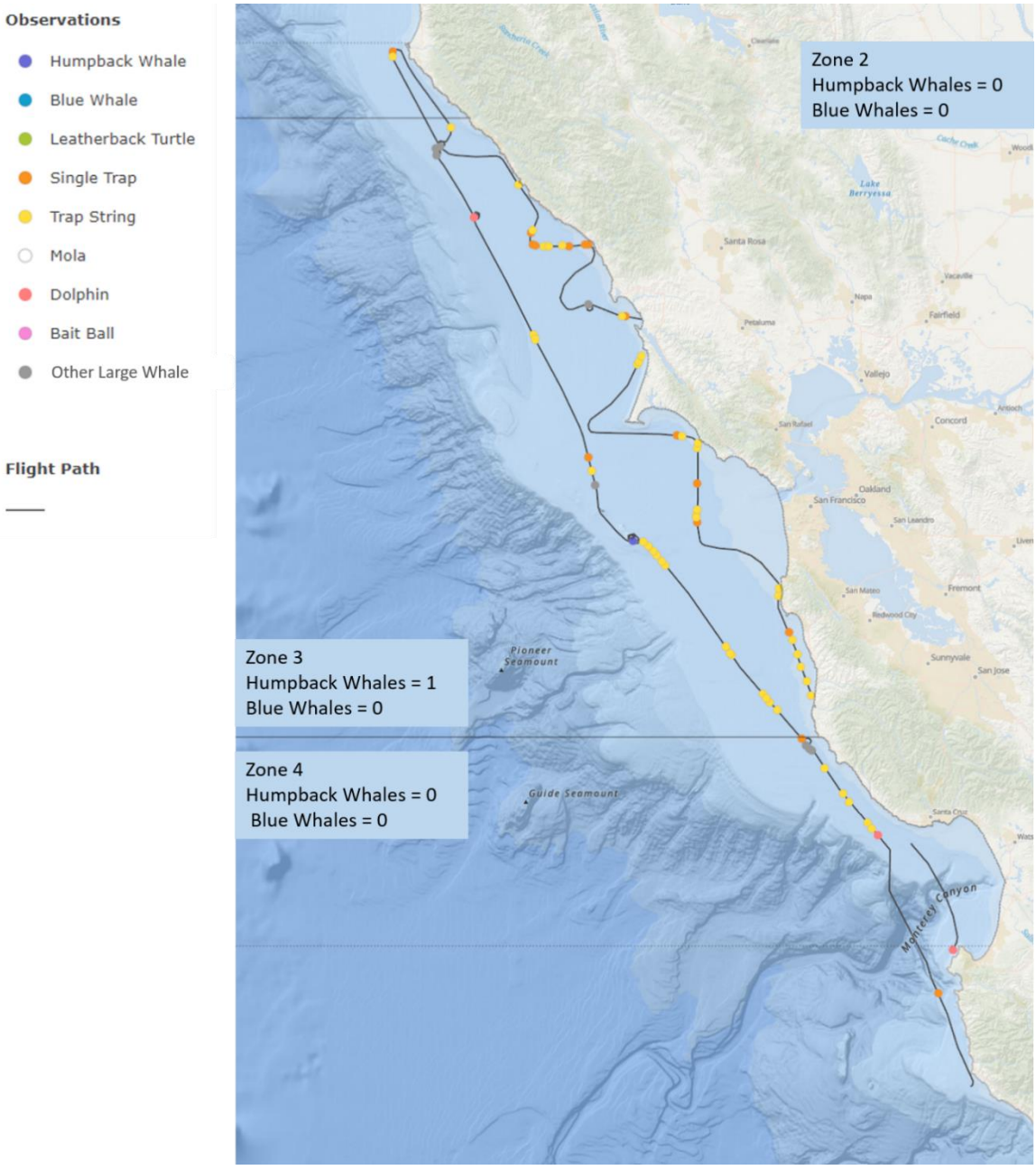

Figure 1. Flight path and observations during CDFW aerial survey in Fishing Zones 2, 3, and 4 on March 10, 2021.

MANAGEMENT CONSIDERATIONS

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

No additional information was shared.

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

Economic analysis beyond landings data submitted to CDFW is not available currently. See management consideration (d)(7) for available information on fishing activity to date during the 2020-21 fishing season.

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

Data provided by: John Calambokidis (Cascadia Research), Monterey Bay Whale Watch (processed by Karin Forney, NMFS)

Cascadia Research *(All Fishing Zones)*

- Recent surveys at these breeding areas (Central America and Mexico) resulted in lower numbers of Humpback whales than previously observed during mid-winter surveys indicating some departures.

Monterey Bay Whale Watch *(Fishing Zone 4)*

- The 7-day average number of whales is similar, but slightly higher than the average historical patterns (Figure 2), which show few or no humpback whale sightings during January-February (when whales are mostly at their breeding areas off Mexico and central America), and some whales starting to return to the central California feeding grounds during early March. Based on historical patterns, it is expected that whale numbers will continue to increase during the coming weeks.
- The absence of Blue whales is consistent with their known southward migration to breeding areas during winter (Figure 3).

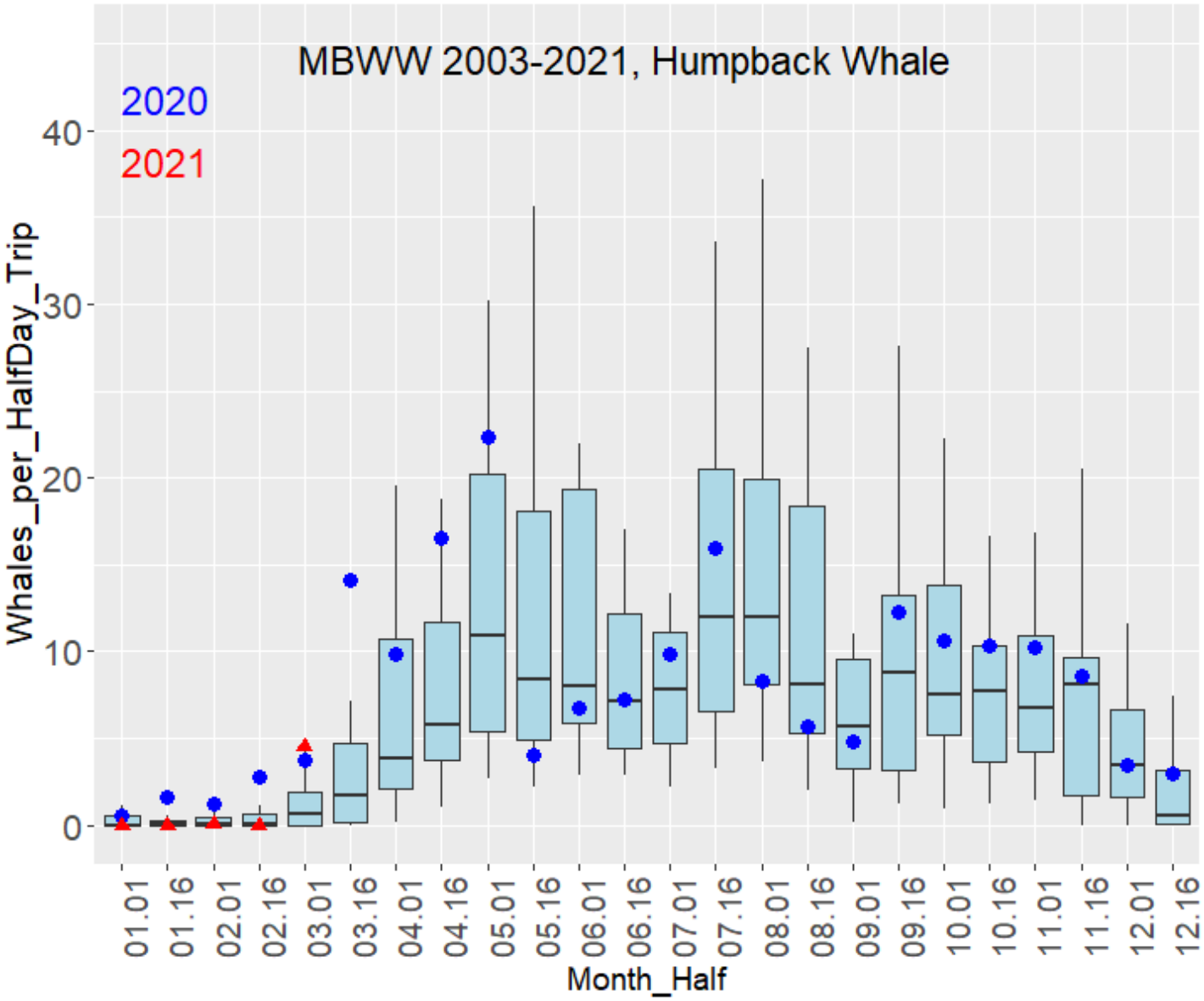

Figure 2. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of Humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2020 (large blue dots) and 2021 (red triangles) are provided for reference, placing recent whale numbers in a historical context.

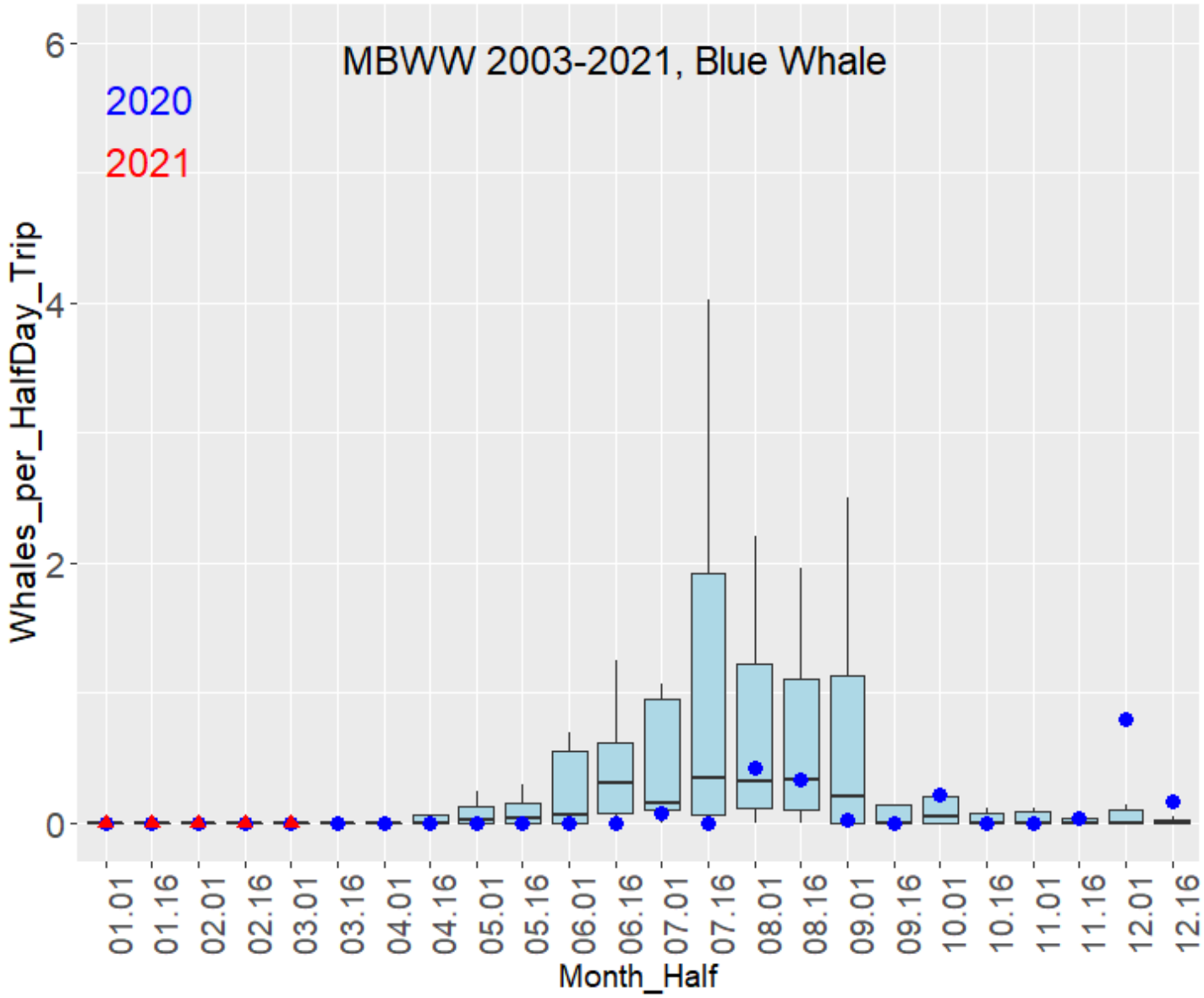

Figure 3. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of Blue whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average 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 2020 (large blue dots) and 2021 (red triangles) are provided for reference, placing recent whale numbers in a historical context.

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

Data provided by: California Department of Fish and Wildlife; Accessed from CDFW's Marine Landings Data System (MLDS) on March 5, 2021 and Automatic Licensing Data System (ALDS) on February 25, 2021, Bi-Weekly Reporting Database on March 11, 2021, Solar Logger Pilot Project provided by Kathi George (The Marine Mammal Center).

Marine Landings Data System *(All Fishing Zones)*

The commercial Dungeness crab fishery opened statewide on December 23, 2020. Due to ongoing price negotiations, most vessels did not begin fishing until January 11, 2021.

As of March 2, 2021, there have been 2,280 landings of Dungeness crab with a total volume of 3,016,532 pounds and with a total Ex-Vessel Value of $14,638,746. Average unit price for these landings was $5.28 (excluding receipts with unit price of $0 reported). A total of 351 vessels have made at least one landing during the 2020-21 season.

- CDFW Fishing Zones (aggregated CDFW Fishing Blocks used to report catch location) are shown in Figure 9 with 10 complete weeks of landings to analyze. The highest volume came from Fishing Zone 3 (Figure 14).
- Of the 351 vessels, 349 could be tied to a Dungeness crab vessel permit and are organized in the trap tiers as follows:
    - Tier 1: 45 vessels
    - Tier 2: 44 vessels
    - Tier 3: 43 vessels
    - Tier 4: 39 vessels
    - Tier 5: 35 vessels
    - Tier 6: 96 vessels
    - Tier 7: 47 vessels
- Week 5 shows the highest number of aggregated maximum potential traps represented by the number of vessels that made at least one landing and the overall traps represented by their vessel permit tier, with an estimated total of 94,350 traps deployed. Overall the highest number of these maximum potential traps are deployed in Fishing Zone 3, followed by Zone 1 (Figure 15). By Week 10, the maximum potential traps was estimated to be 45,625 traps.
- Average landings by week and port complex are ranging between $4.50 and $9 each week for the month of February and average price has been increasing each week for all ports from Week 6 onward (Figure 16).
- Number of vessels that made at least one landing each month separated by management area is compared between the prior season of 2019-20 and the current season, 2020-21, and (Figure 17). The data that we have complete months for this comparison are December

through February. In the northern management area, the number of vessels is observably lower this season than last season during these months. In the central management area, the number of vessels this season is lower in January than last season, but by February the numbers look relatively similar.

Bi-Weekly Fishing Activity Reports *(All Fishing Zones)*

CDFW has received bi-weekly reports since the first reporting period of January 1, 2021 through the most recent reporting period of March 1, 2021. Although total reports for each period may not reflect all permitted vessels participating in the fishery, summaries are being provided for the following periods: February 1, 2021 (Table 1), February 16, 2021 (Table 2), March 1, 2021 (Table 3).

Table 1. Summary of information provided in February 1,2021 bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on March 11, 2021. NR-C refers to data withheld due to confidentiality and all data are preliminary and subject to change.

Fishing Zone	Permits Reporting	Average Trap Number	Total Traps	Average Min. Depth (fathoms)	Average Max. Depth (fathoms)	Max. Reported Depth (fathoms)	Final Report	Number of Lost Traps
Zone 1	58	318	18,434	13	29	50	7	0
Zone 2	15	240	3,596	15	32	64	0	0
Zone 3	118	289	34,073	22	43	80	NR-C	NR-C
Zone 4	8	207	1,654	21	41	60	0	0
Zone 5 & 6	4	153	612	32	50	60	0	0
Totals	203		58,369				7	0

Table 2. Summary of information provided in February 16,2021 bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on March 11, 2021. NR-C refers to data withheld due to confidentiality and all data are preliminary and subject to change.

Fishing Zone	Permits Reporting	Average Trap Number	Total Traps	Average Min. Depth (fathoms)	Average Max. Depth (fathoms)	Max. Reported Depth (fathoms)	Final Report	Number of Lost Traps
Zone 1	48	259	12,420	11	25	65	16	17
Zone 2	11	257	2,831	13	34	80	NR-C	NR-C
Zone 3	122	284	34,687	20	41	80	9	32
Zone 4	11	192	2,116	21	44	80	0	0
Zone 5 & 6	5	141	703	34	51	60	0	0
Totals	197		52,757				25	49

Table 3. Summary of information provided in March 1, 2021 bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on March 11, 2021. NR-C refers to data withheld due to confidentiality and all data are preliminary and subject to change.

Fishing Zone	Permits Reporting	Average Trap Number	Total Traps	Average Min. Depth (fathoms)	Average Max. Depth (fathoms)	Max. Reported Depth (fathoms)	Final Report	Number of Lost Traps
Zone 1	33	288	9,505	13	30	65	4	12
Zone 2	12	227	2,720	12	27	51	NR-C	NR-C
Zone 3	99	275	27,263	19	43	100	8	35
Zone 4	9	191	1,723	23	43	65	0	0
Zone 5 & 6	5	153	764	30	49	60	0	0
Totals	158		41,975				12	47

Solar Loggers *(Fishing Zones 1 – 5)*

The vessel track data provided by the solar logger pilot project was divided into three separate report periods to show movement of the fishing activity over time between: 1) February 10 – 28, 2021 (Figure 4 and 5) and 2) March 1 – 9, 2021 (Figure 6 and 7). From vessel participation in the project (and not necessarily representative of the entire fishery), Fishing Zone 3 showed the most activity. Several vessels participating in the pilot are fishing outside of California this season. A summary of cumulative fishing trips every one to two weeks since January 1, 2021 is provided in Table 4.

Table 4. Summary of individual fishing trips based on data provided by the solar logger project (and not necessarily representative of the entire fishery) between different time periods since December 19, 2020 until March 9, 2021.

Date Ranges	Fishing Trips
March 1-9, 2021	50
February 10-28, 2021	78
February 1-9, 2021	50
January 16-31, 2021	81
January 1-15, 2021	58

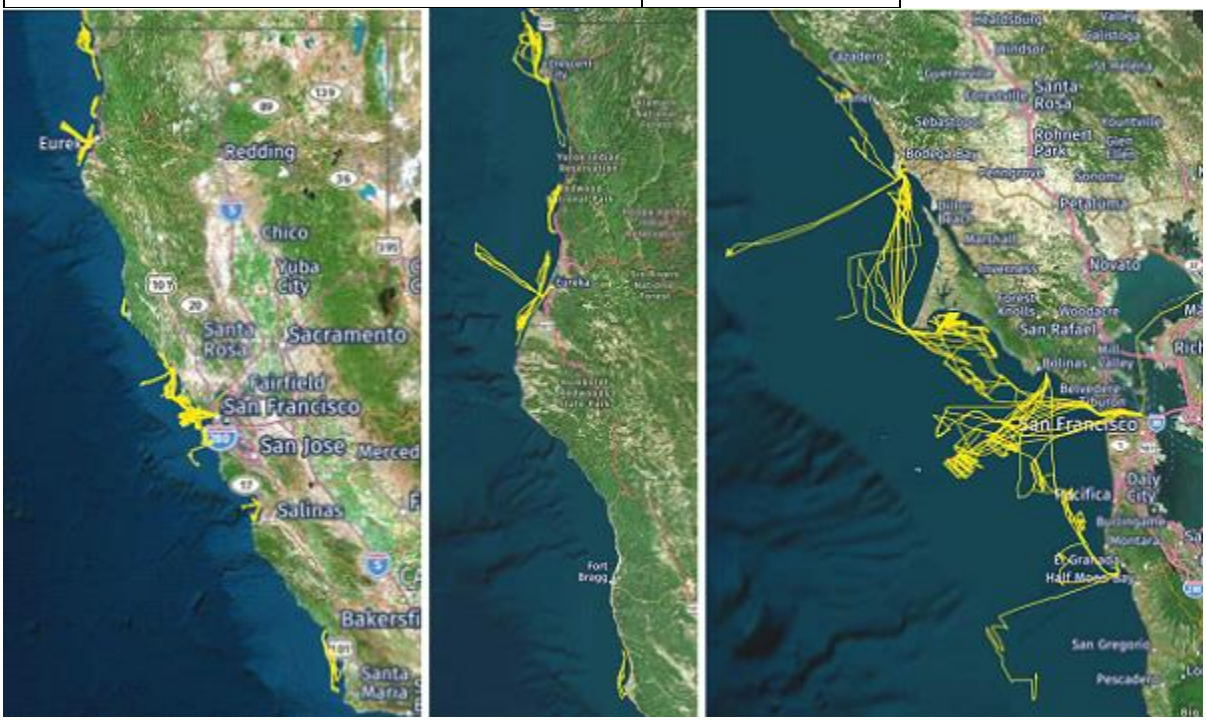

Figure 4. Fishing trips from February 10 - 28, 2021. The figure on the left represents the entire coast where vessels may be participating. The center figure focuses on fishing activity in the middle of Fishing Zones 1 and 2 while the figure on the right focuses in on fishing activity within Fishing Zone 3.

Figure 5. Fishing trips from February 10 - 28, 2021. The figure on the left shows fishing activity in Fishing Zone 4 while the figure on the right shows fishing activity in Fishing Zone 5.

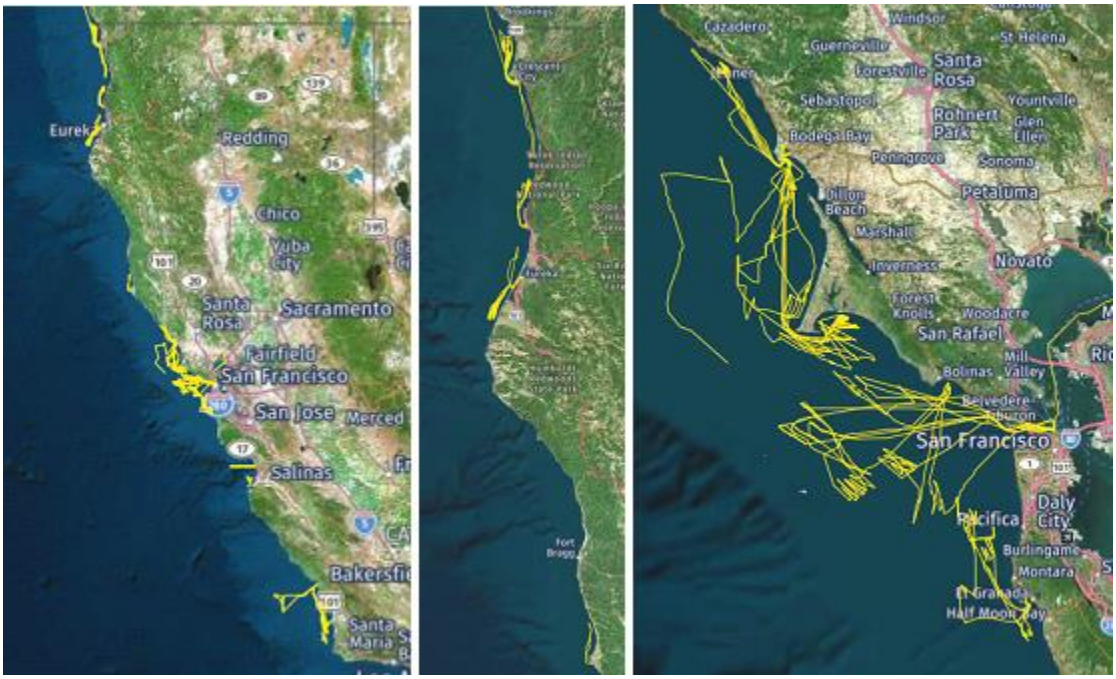

Figure 6. Fishing trips from March 1 – 9, 2021. The figure on the left represents the entire coast where vessels may be participating. The center figure focuses on fishing activity within Fishing Zones 1 and 2 while the figure on the right focuses in on fishing activity within Fishing Zone 3.

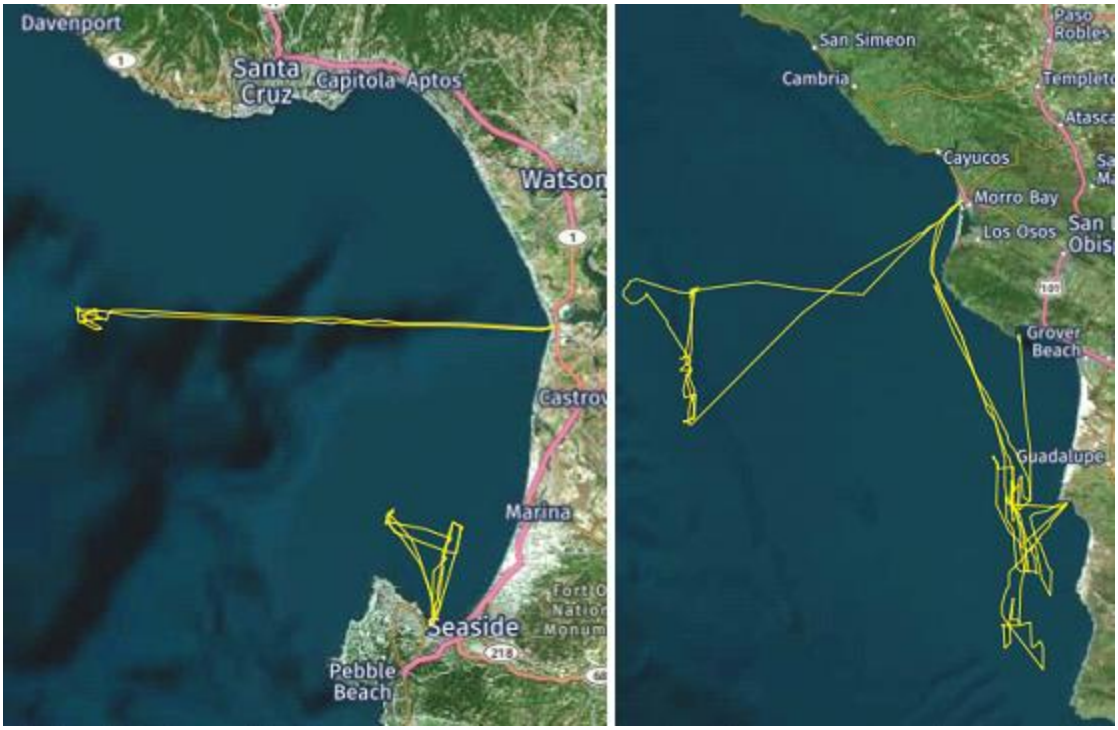

Figure 7. Fishing trips from March 1 – 9, 2021. The figure on the left shows fishing activity in Fishing Zone 4 while the figure on the right shows fishing activity in Fishing Zone 5.

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

Data provided by: Jarrod Santora and Isaac Schroeder (NMFS SWFSC and UC Santa Cruz)
https://www.integratedecosystemassessment.noaa.gov/regions/california-current/cc-projects-whale-entanglement

Forage Indices (All Fishing Zones)

- Krill abundance (higher offshore in the outer slope) is also anticipated to be closer to average while anchovy is still considered to be above average, given the historical record.

Section 132.8(d)(9): Ocean conditions

ENSO prediction accessed from NOAA's Climate Prediction Center website *on March 10, 2021,*
Data provided by: Jarrod Santora and Isaac Schroeder (NMFS SWFSC and UC Santa Cruz)

El Nino/Southern Oscillation (ENSO) Alert System Status *(All Fishing Zones)*

- The prediction of ENSO conditions last updated on February 11, 2021 has not changed since the last data compilation. La Niña conditions persisted in January with a 60% chance

of a transition from this condition to ENSO-neutral in the northern hemisphere by the spring months of April, May and June.

Habitat Compression Index *(All Fishing Zones)*

- The latest outlook of late winter/spring ocean ecosystem conditions shows that ocean conditions have cooled significantly over this past winter and conditions in spring are trending toward cool and productive conditions. It is anticipated that cool conditions will continue, with expanded upwelling habitat and no signs of impact of habitat compression that would otherwise result in increased concentrations and aggregations of whales and forage nearshore.
- The February 2021 Habitat Compression Index (HCI) now indicates that there is no risk of a high compression state (Figure 8) and this is in stark contrast to the HCI values in February for the past 7 years between 2014 and 2020 (Figure 9). A low compression state for February has not been observed since 2013, the year just prior to the emergence of the large marine heatwave. This HCI information applies to all CDFW Fishing Zones.

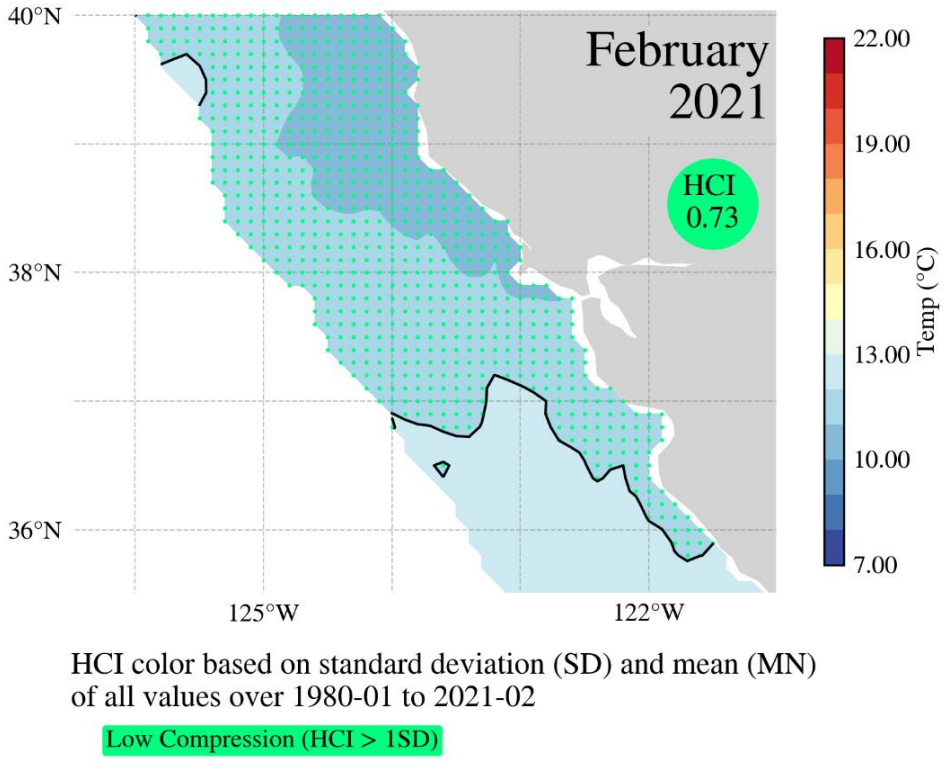

Figure 8. Map of February 2021 sea surface temperature and location of Habitat Compression Index (HCI) boundary (black thin line) with an HCI value indicating low compression for the month. Source: https://oceanview.pfeg.noaa.gov/hci/

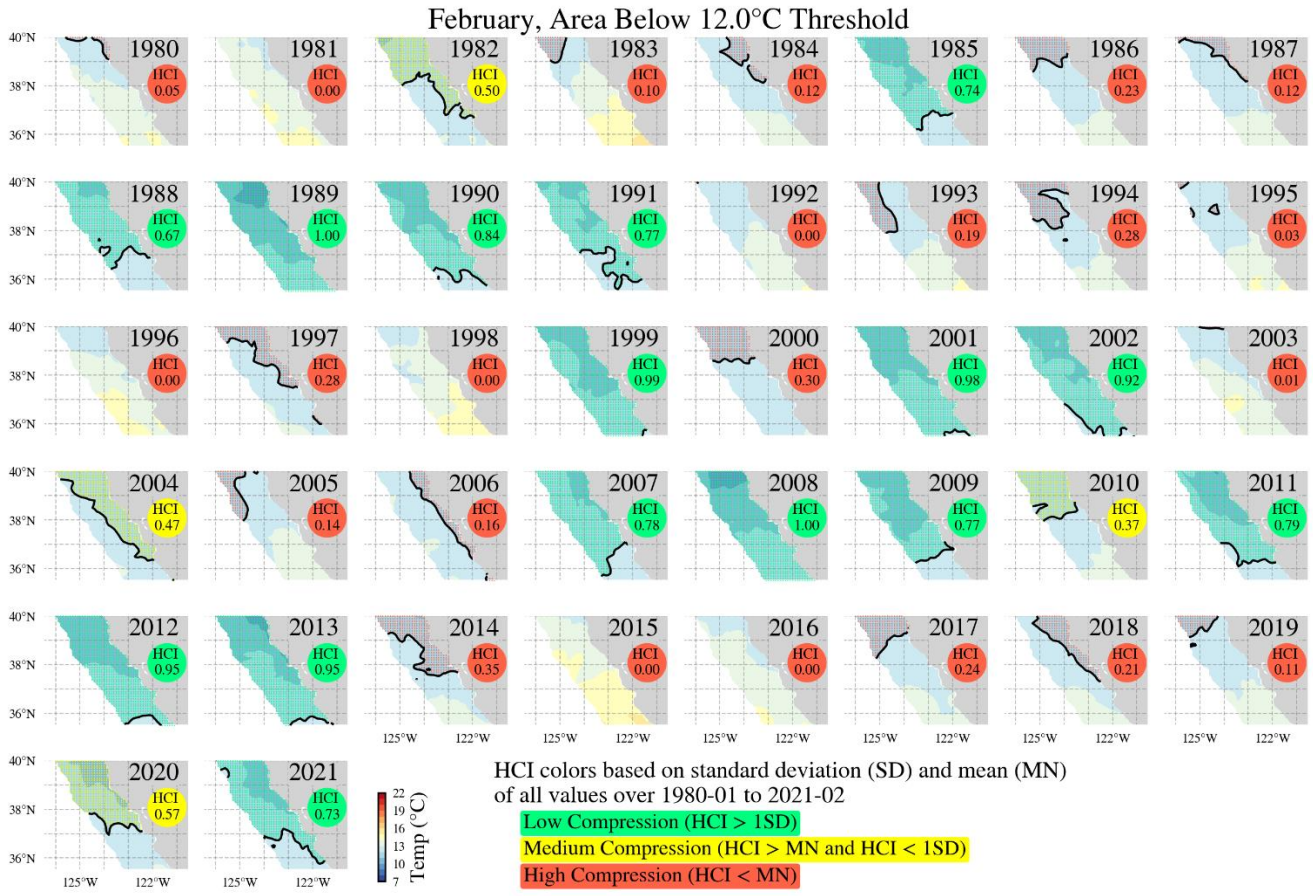

Figure 9. Maps of historical February sea surface temperature and location of Habitat Compression Index (HCI) boundary (black thin line) between 1980 and 2021 and resulting HCI values for each time period. Source: https://oceanview.pfeg.noaa.gov/hci/

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

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. As described in Section 132.8(c)(1) above, no confirmed entanglements of Actionable Species have been reported for the current calendar year. Therefore, the Impact Score Calculation is 0 for all three species.

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

*Data provided by: John Calambokidis (*Cascadia Research), *Briana Abrahms (University of Washington), Kathi George (The Marine Mammal Center), Jaime Jahncke (Point Blue Conservation Science)*

Cascadia Research *(Fishing Zone 6)*

One Blue whale was observed in Zone 6 within Santa Monica Bay.

WhaleWatch 2.0 *(All Fishing Zones)*

The best whale habitat predictions for March 5, 2021 indicate that probability of Blue whale presence is low in Fishing Zones 1-6 (Figure 10).

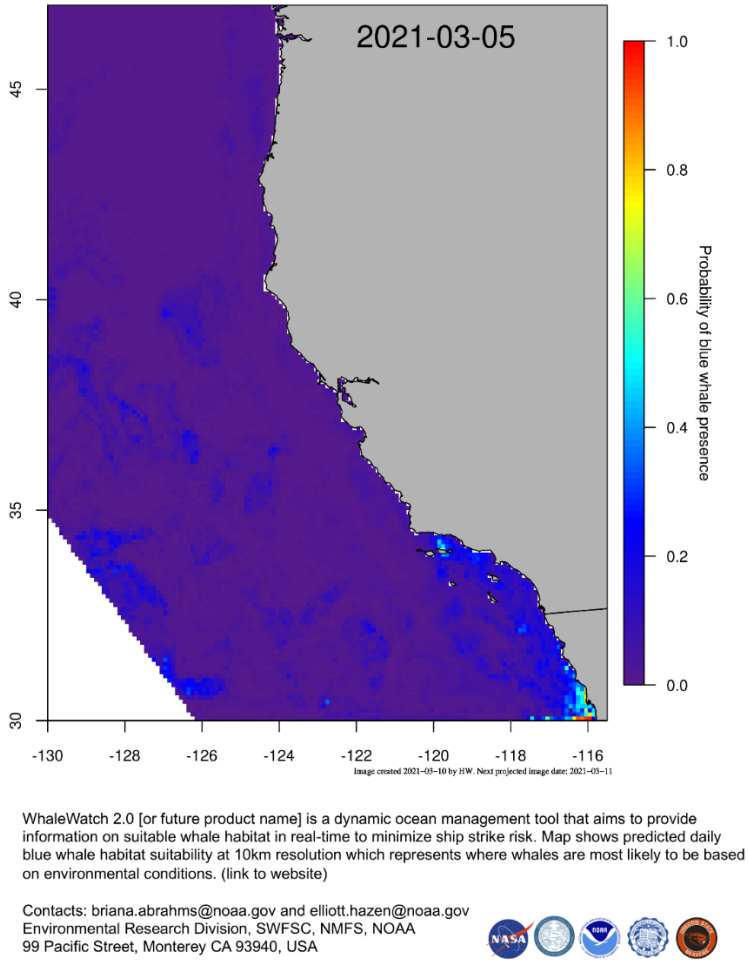

Figure 10. WhaleWatch 2.0 map for March 5, 2021. View a current map.

Solar Loggers *(Fishing Zone 4)*

Track lines from whale watching vessels participating in the solar logger pilot project (Figures 11 and 12) indicate a high amount of effort in the southern half of Monterey Bay during 59 trips between February 10 – March 9, 2021. A summary of cumulative whale watching trips every one and two weeks since January 1, 2021 is provided in Table 5.

Table 5. Summary of whale watching trips based on data provided by the solar logger project between different time periods from December 19, 2020 until March 9, 2021.

Time Periods	Whale Watching Trips
March 1-9, 2021	21
February 10-28, 2021	38
February 1-9, 2021	15
January 16-31, 2021	19
January 1-15, 2021	28

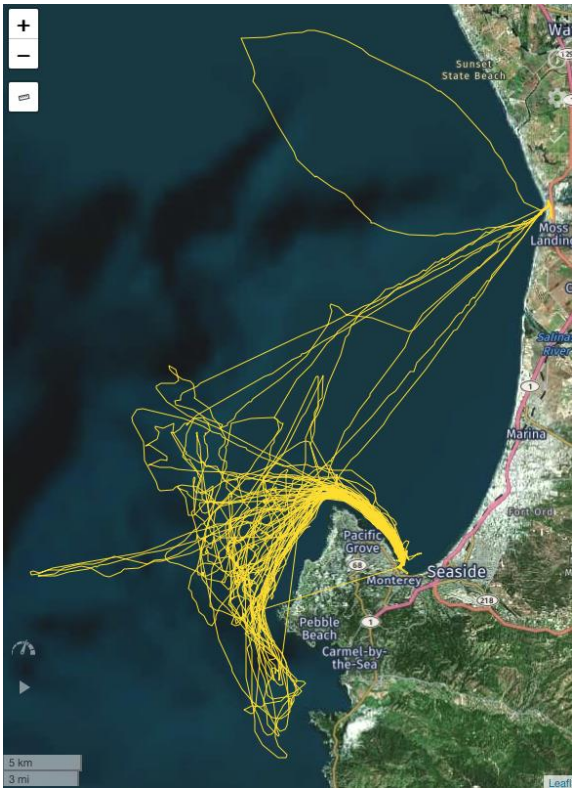

Figure 11. Track lines for 38 whale watch trips in Monterey Bay from February 10 - 28, 2021. Sightings, numbers and species are not reflected on this map.

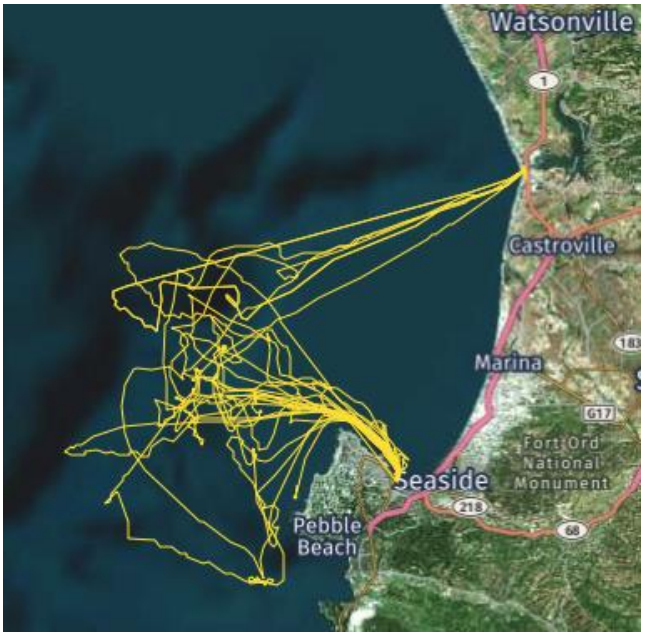

Figure 12. Track lines for 21 whale watch trips in Monterey Bay from March 1 - 9, 2021. Sightings, numbers and species are not reflected on this map.

Point Blue Conservation Science Data Portal *(Fishing Zones 3, 4 and 6)*

- The Gulf of the Farallones (GFNMS) and Monterey Bay National Marine Sanctuaries (through the Spotter/Whale Alert app) have observed two Humpback whales in Zone 3 on March 14, 2021 while no whales have been reported in the last 30 days for Zone 4. Another Humpback whale observed inside San Francisco Bay was not recorded on the app.
- Three Humpback whales were observed in Zone 6 while no Blue whales were observed in this zone. These are observations conducted by trained naturalists from the Channel Islands National Marine Sanctuary and National Park Service. Two of the Humpback whales were observed off San Diego and 1 was observed off Los Angeles.

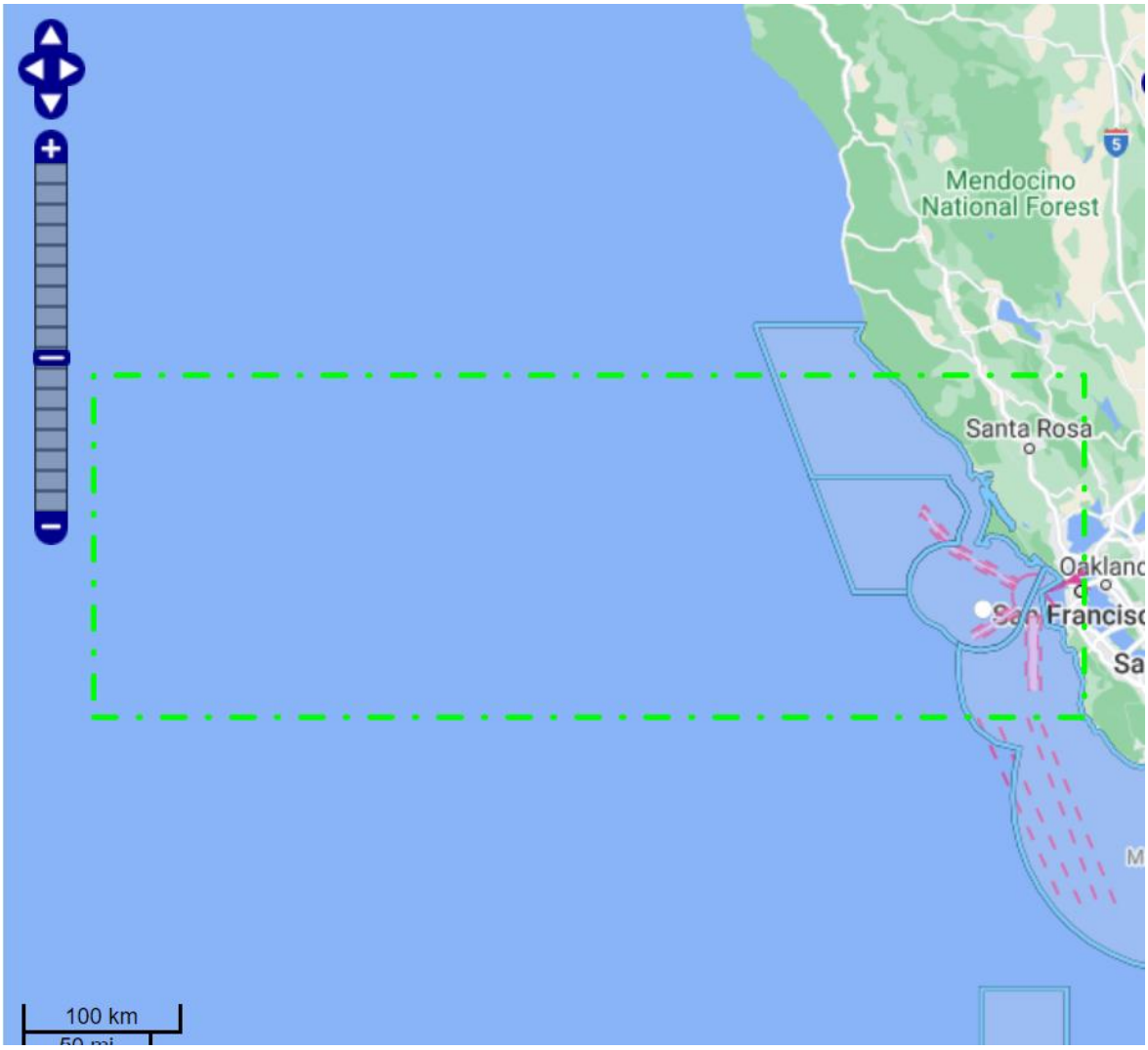

Figure 13. Location of a Humpback whale sighting in Fishing Zone 3 on March 14, 2021. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.

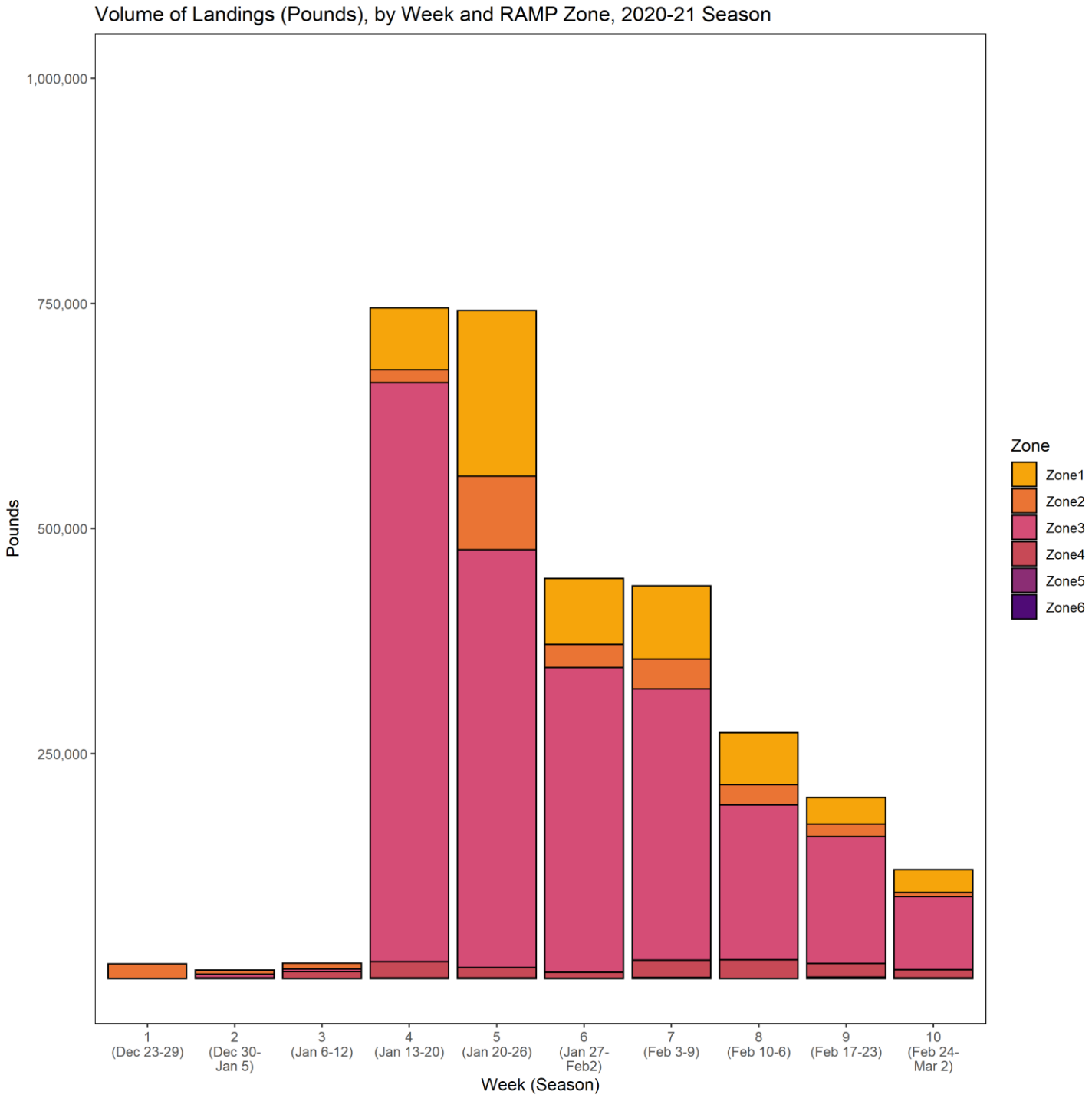

Figure 14. Dungeness crab landings (pounds) by week and Fishing Zone. Accessed from CDFW's MLDS on March 5, 2021. All data are preliminary and subject to change.

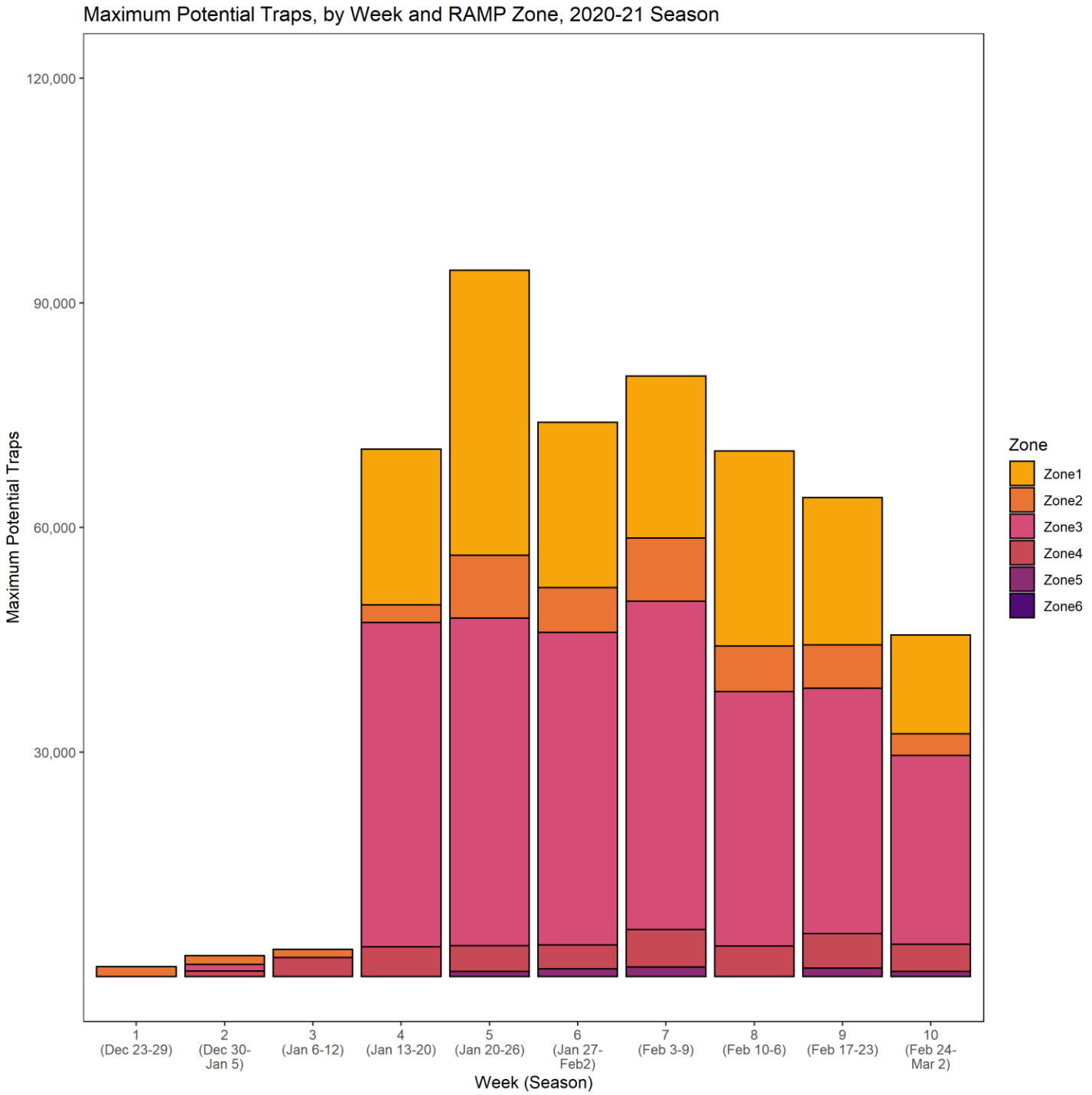

Figure 15. Maximum potential traps by week and Fishing Zone, based on landings data and Dungeness crab vessel permit tier information. Accessed from CDFW's MLDS on March 5,2021 and CDFW's ALDS on March 5, 2021. All data are preliminary and subject to change.

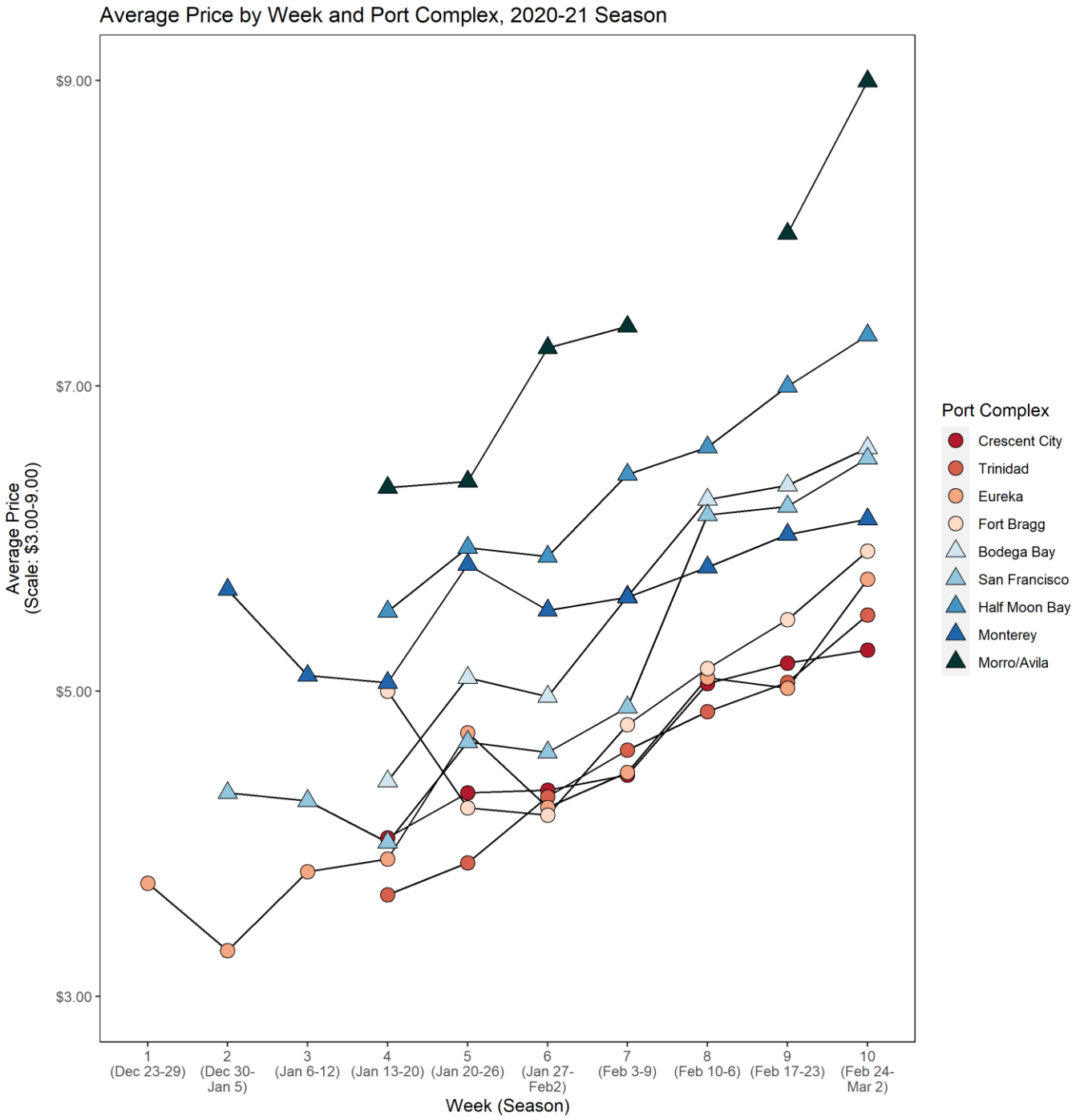

Figure 16. Average price per pound by week and port complex (removing receipts that reported $0 unit price). Accessed from CDFW's MLDS on March 5, 2021. All data are preliminary and subject to change.

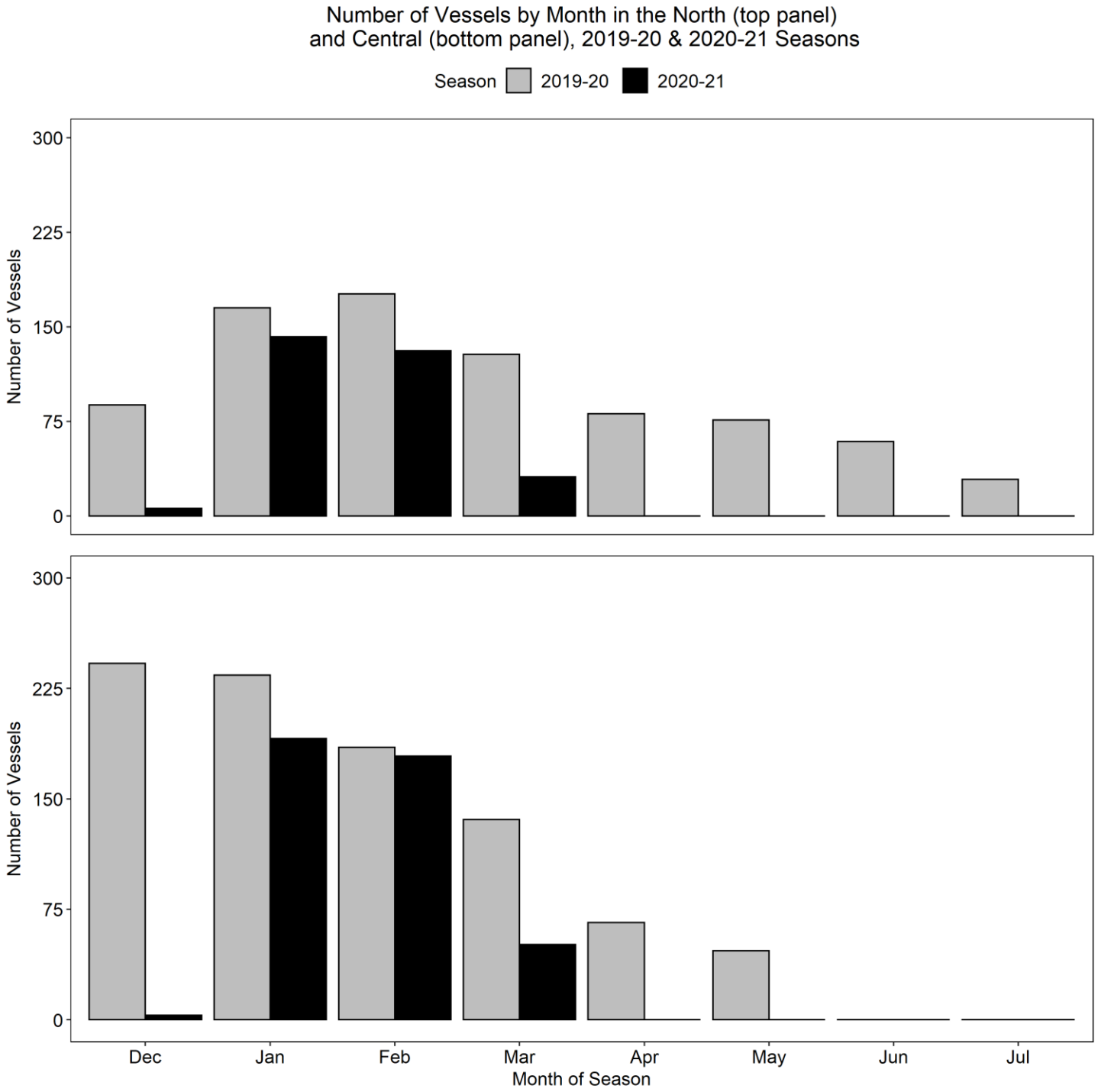

Figure 17. Comparison of the number of vessels that have made at least one landing by month and season, 2019-20 (gray bars) and 2020-21 (black bars) in ports of the northern management area (top panel) and the ports of the central management area (bottom panel). Accessed from CDFW's MLDS on March 5, 2021. All data are preliminary and subject to change.