State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Director's Office
P.O. Box 944209
Sacramento, CA 94244-2090
wildlife.ca.gov

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 April 1, 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 30, 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

There are no marine life concentration 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.

III

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.

IV

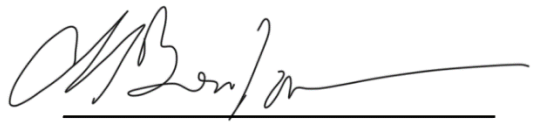
THEREFORE, under the authority granted by Fish and Game Code Section 8276.1(b) and Section 132.8 of Title 14 of the California Code of Regulations, I am implementing the following management action:

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 3 and 4 should pay particular attention to the location of set gear and

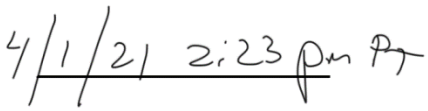
foraging whales and minimize entanglement risk by adhering to the Best Practices Guide.

This management action is in effect until lifted or modified. The next risk assessment is expected to occur on or around April 15, 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:



Charlton H. Bonham, Director



Date/Time

ATTACHMENT TO DIRECTOR APRIL 1, 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 30, 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 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 sightings of Humpback and Blue whales, a Fleet Advisory will be an effective Management Action due to relatively low fishing effort and abundance of whales.

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**

   Department aerial survey data are available for Zones 1, 2, 3 and 4 and additional Monterey Bay Whale Watch (MBWW) data are available for Fishing Zone 4. CCCA vessel observation surveys are available for Zones 1 and 5. Point Blue observation data are available for Zones 3, 4 and 6. The Habitat Compression Index and Whale Watch 2.0 habitat predictions are available for all Zones. Cascadia Research vessel

survey data are available for Zones 3 and 4. 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 Fishing Zones is consistent with average historical early spring 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 relative absence of Blue whales from Zones 1-5 is consistent with their overwintering at breeding areas outside of California.

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 CDFW landings data, 356 vessels have participated in the fishery as of March 29, 2021. Week 5 had the highest number of potential traps deployed across all Fishing Zones, with an estimated total of 134,350 traps. Fishing Zone 3 had the highest total, followed by Zone 1. Although the most recent landings data from week 13 indicates a similar level amount of crab is coming to market as compared to week 12, overall landings numbers have decreased significantly from the highest landing periods in weeks 4 and 5. Additionally, total numbers of vessels participating in the fishery has continued to decline over the past few weeks. The estimated maximum number of traps is currently 43,725 which is a slight decrease from the last risk assessment when 45,625 traps were estimated.

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.

Humpback whales were observed foraging on large krill patches at the 200-meter contour during vessel surveys.

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 multiple sources of observation data, significant migration into the Fishing Grounds has yet to occur.

Chosen Management Action and Rationale

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

No current survey data was available for Fishing Zones 5 and 6, which requires 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 arrived at this time. Department aerial survey data for Zones 1 through 4 observed very few Actionable Species, and vessel surveys performed by Cascadia Research and partners in Fishing Zones 3 and 4 similarly

observed whales at low densities; it is reasonable to use this data as a proxy for whale presence in Fishing Zones 5 and 6. Additionally, observation data from Point Blue Conservation Science and vessel survey data from CCCA (combined covering Zones 1, 3, 4, 5, and 6) supports low whale presence in the Fishing Grounds. Historic migration data indicates that when whales do arrive in large numbers, Fishing Zones 3 and 4 are likely to be the first areas to see increases in densities.

Furthermore, 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. As expected with low compression conditions, Humpback whales were primarily observed feeding along the 200-m depth line in Fishing Zones 3 and 4. Statewide fleet participation is low and decreasing compared to activity levels from previous years, and available biweekly reporting from the fleet indicates fishing activity is occurring at a maximum depth of 80 fathoms, and on average maximum depths are below 50 fathoms. Given the above, paired with low presence of Humpback whales and Blues whales, risk is low across all management considerations at this time.

A Fleet Advisory provides notice to fishermen of possible whale presence, and encourages fishery participants 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 in Fishing Zones 3 and 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: April 1, 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 30, 2021 and finalized at the conclusion of the Working Group meeting on April 1, 2021 based on discussions with the group.

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 5 and 6:** No current CDFW approved survey 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 and the low numbers observed during CDFW aerial surveys, a Fleet Advisory remains an

effective Management Action due to anticipated declining fishing effort in all Fishing 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

- CDFW aerial survey data are available for Zones 1, 2, 3 and 4 and additional Monterey Bay Whale Watch (MBWW) data are available for Fishing Zone 4. CCCA vessel observation surveys are available for Zones 1 and 5. Point Blue observation data are available for Zones 3, 4 and 6. The Habitat Compression Index and Whale Watch 2.0 habitat predictions are available for all Zones. Cascadia Research vessel survey data are available for Zones 3 and 4.

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

- Low presence of Humpback whales across all Fishing Zones is consistent with average historical early spring patterns that show few Humpback whale sightings when whales are still migrating from breeding areas off Mexico and Central America. Recent surveys at these breeding areas resulted in lower numbers of Humpback whales than previously observed during mid-winter surveys, indicating some departures. Three recent sightings of Humpback whales are of known animals from Mexico, indicating a few migration arrivals.

- Relative absence of Blue whales, except for one animal is consistent with their overwintering at the breeding grounds.

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, 356 vessels have participated in the fishery as of March 29, 2021. Week 5 had the highest number of potential traps deployed across all Fishing Zones, with an estimated total of 134,350 traps. Fishing Zone 3 had the highest total, followed by Zone 1. Based on the most recent landings data from week 13, vessel participation and landings volume has decreased significantly. The estimated maximum number of traps is currently 43,725 which is a slight decrease from the last risk assessment when 45,625 traps were estimated.

- CDFW required bi-weekly trap reporting estimated 39,907 traps fishing in average minimum depths of 10 – 27 fathoms and an average max depth of 24 – 49 fathoms across all Fishing Zones. *Note: CDFW has not achieved 100% reporting by all active permits.*

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.

- The few Humpback whales observed were foraging on large krill patches at the 200-meter contour during vessel surveys.

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

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

Fishing Zones 1-6: CDFW Marine Region recommendation is to maintain a state-wide Fleet Advisory based on the lack of recent RAMP approved survey data for Zones 5 and 6. Based on the CDFW aerial survey data for Zones 1, 2, 3 and 4, few Actionable Species were observed, which serves as a proxy for anticipated observations in Fishing Zones 5 and 6. Vessel surveys by the fleet confirm low numbers of actionable species were observed in Zone 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 to arrive at this time. In addition, based on favorable (low risk) oceanographic and forage condition data, cool conditions exist, resulting in low compression of available forage, decreasing the co-occurrence of trap gear and whales as they begin to arrive to the Fishing Grounds. This is

supported by recent sightings of Humpback whales foraging in deep water on krill patches. Currently, there are no confirmed entanglements this season of Actionable Species, ocean and forage conditions do not warrant concern, and fleet participation is low across most port complexes and decreasing when compared to activity levels from previous years. Given the above, paired with low presence of Humpback whales and Blues whales, 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 April 1, 2021. There was no opposition to the recommendation by Marine Region staff and a Fleet Advisory was broadly supported 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 15, 2021).

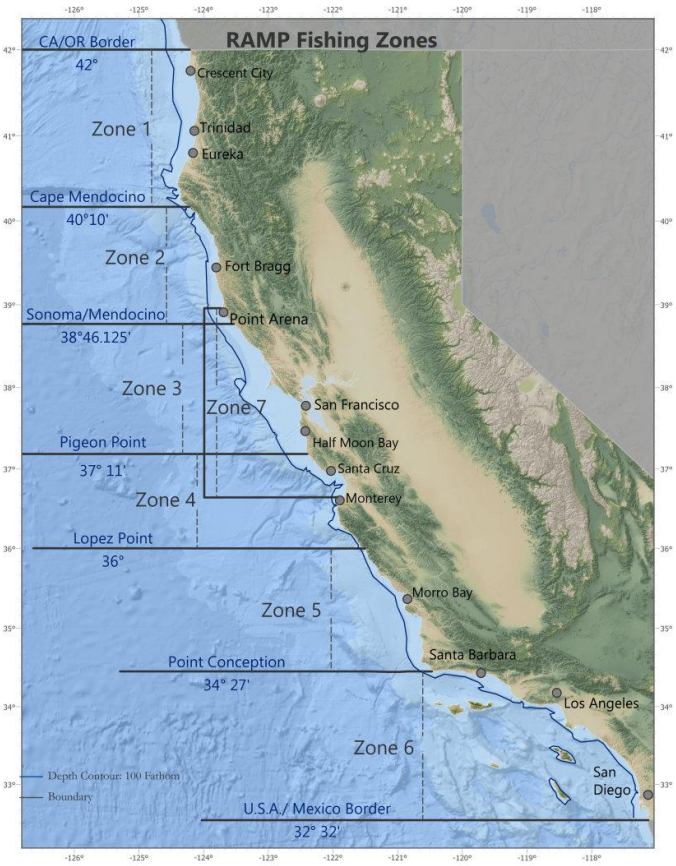


Figure 1. RAMP Fishing Zone boundaries.

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

Date: March 30, 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 5 and 6:** No current CDFW approved survey 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 and the low numbers observed during CDFW aerial surveys, a Fleet Advisory remains an effective Management Action due to anticipated declining fishing effort in all Fishing 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

- CDFW aerial survey data are available for Zones 1, 2, 3 and 4 and additional Monterey Bay Whale Watch (MBWW) data are available for Fishing Zone 4. CCCA vessel observation surveys are available for Zones 1 and 5. Point Blue observation data are available for Zones 3, 4 and 6. The Habitat Compression Index and Whale Watch 2.0 habitat predictions are available for all Zones. Cascadia Research vessel survey data are available for Zones 3 and 4.

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

- Low presence of Humpback whales across all Fishing Zones is consistent with average historical early spring patterns that show few Humpback whale sightings when whales are still migrating from breeding areas off Mexico and Central America. Recent surveys at these breeding areas resulted in lower numbers of Humpback whales than previously observed during mid-winter surveys, indicating some departures. Three recent sightings of Humpback whales are of known animals from Mexico, indicating a few migration arrivals.

- Relative absence of Blue whales, except for one animal is consistent with their overwintering at the breeding grounds.

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, 356 vessels have participated in the fishery as of March 29, 2021. Week 5 had the highest number of potential traps deployed across all Fishing Zones, with an estimated total of 134,350 traps. Fishing Zone 3 had the highest total, followed by Zone 1. Based on the most recent landings data from week 13, vessel participation and landings volume has decreased significantly. The estimated maximum number of traps is currently 43,725 which is a slight decrease from the last risk assessment when 45,625 traps were estimated.

- CDFW required bi-weekly trap reporting estimated 39,907 traps fishing in average minimum depths of 10 – 27 fathoms and an average max depth of 24 – 49 fathoms across all Fishing Zones. *Note: CDFW has not achieved 100% reporting by all active permits.*

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.

- The few Humpback whales observed were foraging on large krill patches at the 200-meter contour during vessel surveys.

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

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

Fishing Zones 1-6: CDFW Marine Region staff's preliminary recommendation is to maintain a state-wide Fleet Advisory based on the lack of recent RAMP approved survey data for Zones 5 and 6. Based on the CDFW aerial survey data for Zones 1, 2, 3 and 4, few Actionable Species were observed, which serves as a proxy for anticipated observations in Fishing Zones 5 and 6. Vessel surveys by the fleet confirm low numbers of actionable species were observed in Zone 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 favorable (low risk) oceanographic and forage condition data, cool conditions exist, resulting in low compression of available forage, decreasing the co-occurrence of trap gear and whales as they begin to arrive to the Fishing Grounds. This is supported by recent sightings of Humpback whales foraging in deep water on krill patches. Currently, there are no confirmed entanglements this season of Actionable Species, ocean and forage conditions do not warrant concern, and fleet participation is low across most port complexes and decreasing when compared to activity levels from previous years. Given the

above, paired with low presence of Humpback whales and Blues whales, 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 will continue to monitor all available data to inform the next risk assessment (expected to occur on or around April 15, 2021).

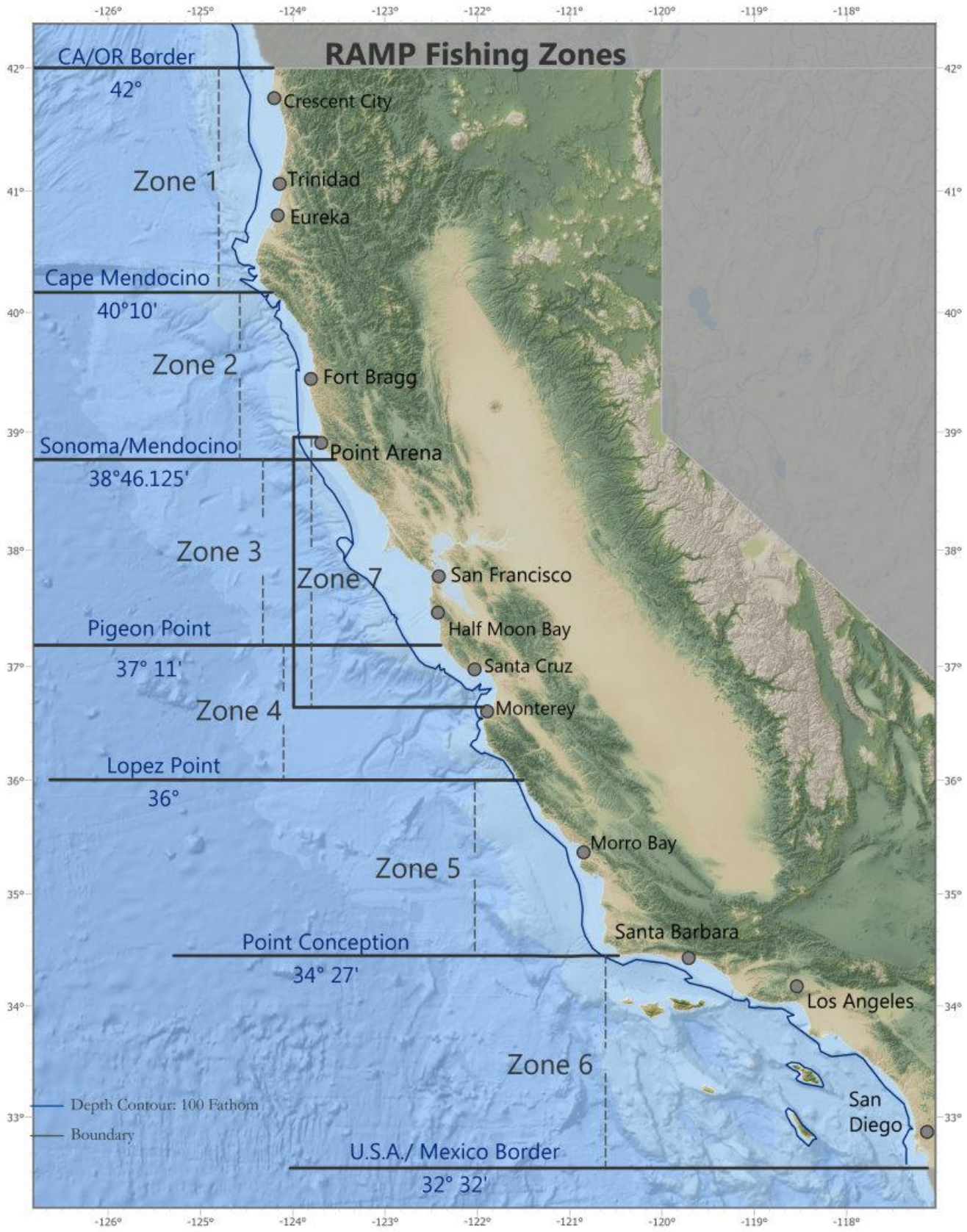


Figure 1. RAMP Fishing Zone boundaries.

2020-21 Risk Assessment Mitigation Program - Available Data

Last updated: March 30, 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. *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), John Calambokidis (Cascadia Research, SR3, and The Marine Mammal Center)

CDFW Aerial Survey *(Fishing Zones 1, 2, 3 and 4)*

- CDFW staff conducted aerial surveys on March 26 and 27, 2021 between Trinidad Head north of Eureka and Point Piños in Monterey. Figure 1 shows the flight path for Fishing Zone 1 and Fishing Zone 2. Figure 2 shows the flight path in Fishing Zone 3 and Fishing Zone 4.
- A total of 36 Gray whales were observed across Fishing Zones 2-4. A single Blue whale, Humpback whale, and Fin whale were seen in Zone 3, along with 4 Orcas (noted as “Other”).

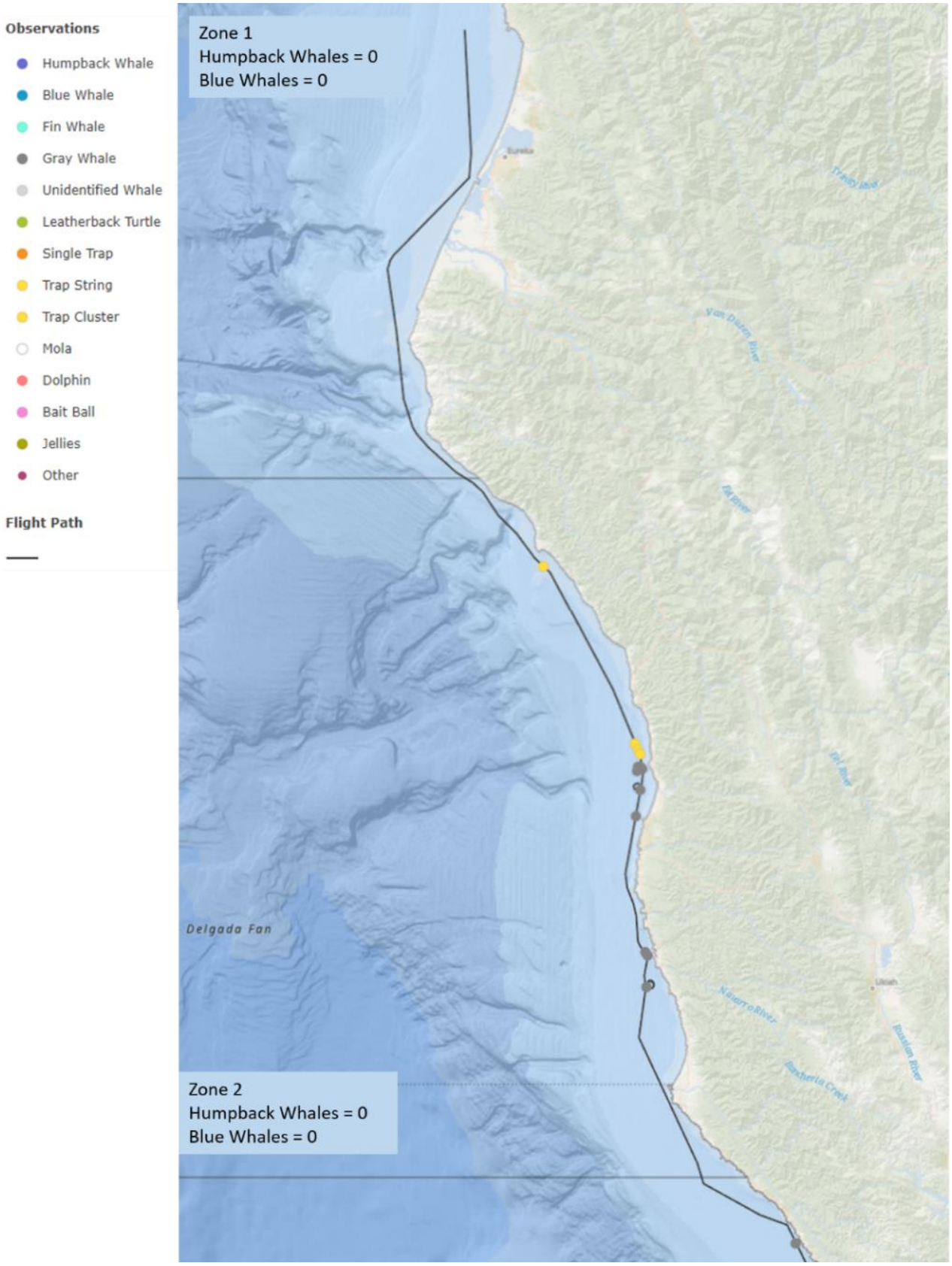


Figure 1. Flight path and observations during CDFW aerial survey in Fishing Zones 1 and 2 on March 26-27, 2021.

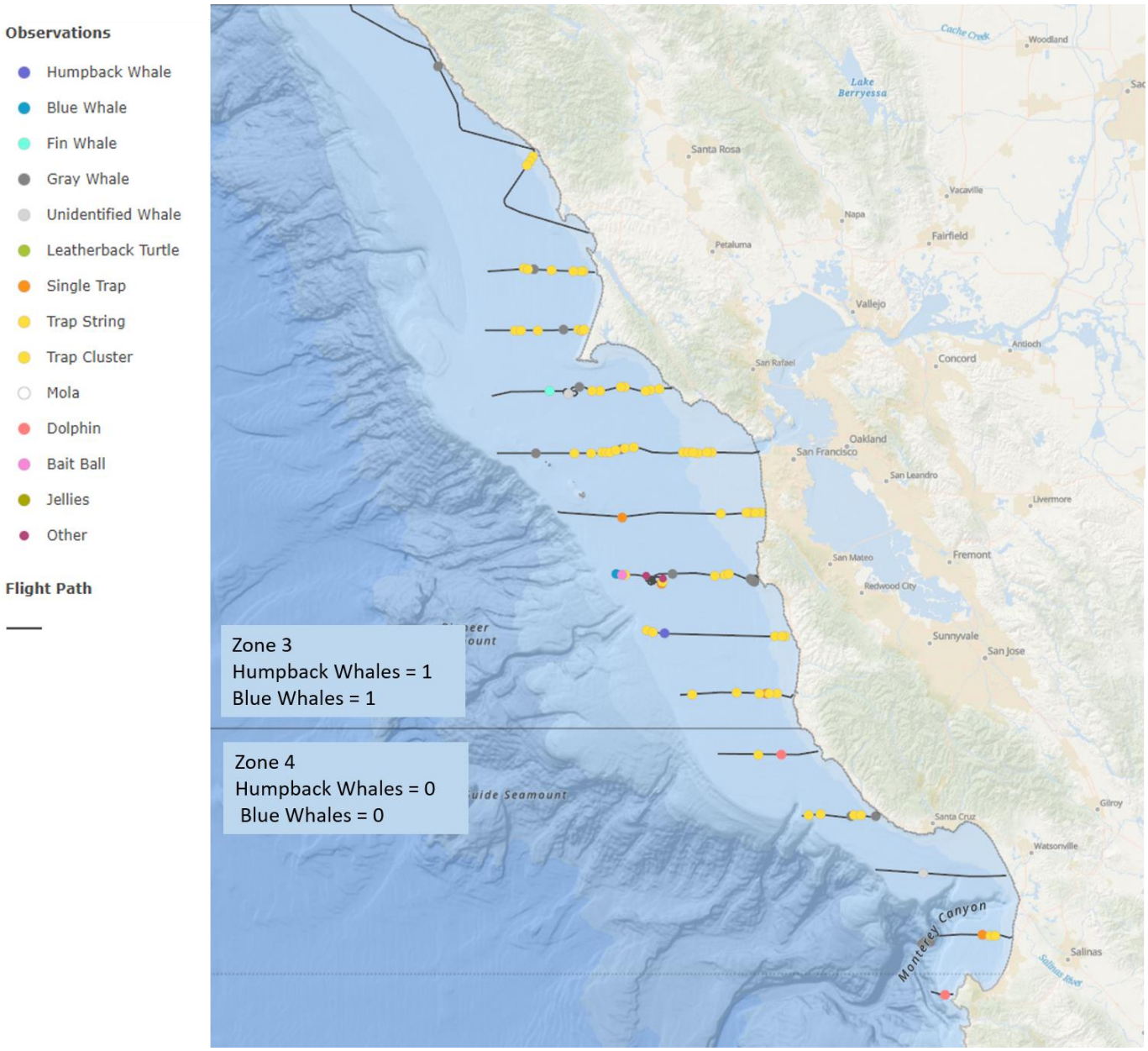


Figure 2. Observations made over flight path and survey transects conducted during CDFW aerial survey in Fishing Zones 3 and 4 on March 26-27, 2021.

Monterey Bay Whale Watch *(Fishing Zone 4)*

- Monterey Bay Whale Watch (MBWW) was able to conduct trips on 8 of the last 14 days (high winds prevented trips on 6 days). The 14-day average number of whales-per-half-day-trip (based on 8 days with trips) was 4.8, with a maximum of 22 Humpback whales observed on a trip on March 20. Over the past 7 days the running weekly average (per-half-day-trip) was 2.2 Humpback whales observed, with 3 trips made.
- No Blue whales have been observed by MBWW since December 24.

Available Data - CDFW - Risk Assessment Mitigation Program - March 30, 2021

Cascadia Research, SR3, and The Marine Mammal Center *(Fishing Zones 3 and 4)*

- Surveys were completed on March 27-28, 2021 covering most of the transect lines along the 70-m and 200-m line from Monterey Bay to Pt Reyes (Figure 3). Weather was mostly good, but visibility was limited during the 200m line from Half Moon Bay to Monterey along with higher winds on the southern end of that line.
- There was a high diversity of whale species with sightings of Humpback, Blue, Fin, and Gray whales.
- Humpback whales were sighted at low densities in several areas though there were 7 sightings of 10 humpbacks along the 200-m line compared to only a single sighting of one whale along the 70-m line. Humpback whales appeared to be feeding primarily on krill and large prey patches of krill were observed near the surface along the 200m line especially between the Farallon Islands and Cordell Bank along with the presence of krill-feeding murrelets.
- One blue whale was observed along the 70-m line.
- Gray whales were mostly observed inshore and traveling northward and were primarily the whales seen closest to Dungeness crab gear.
- Fin whales were at a higher density (5 sightings of 16 whales) than seen in past surveys.

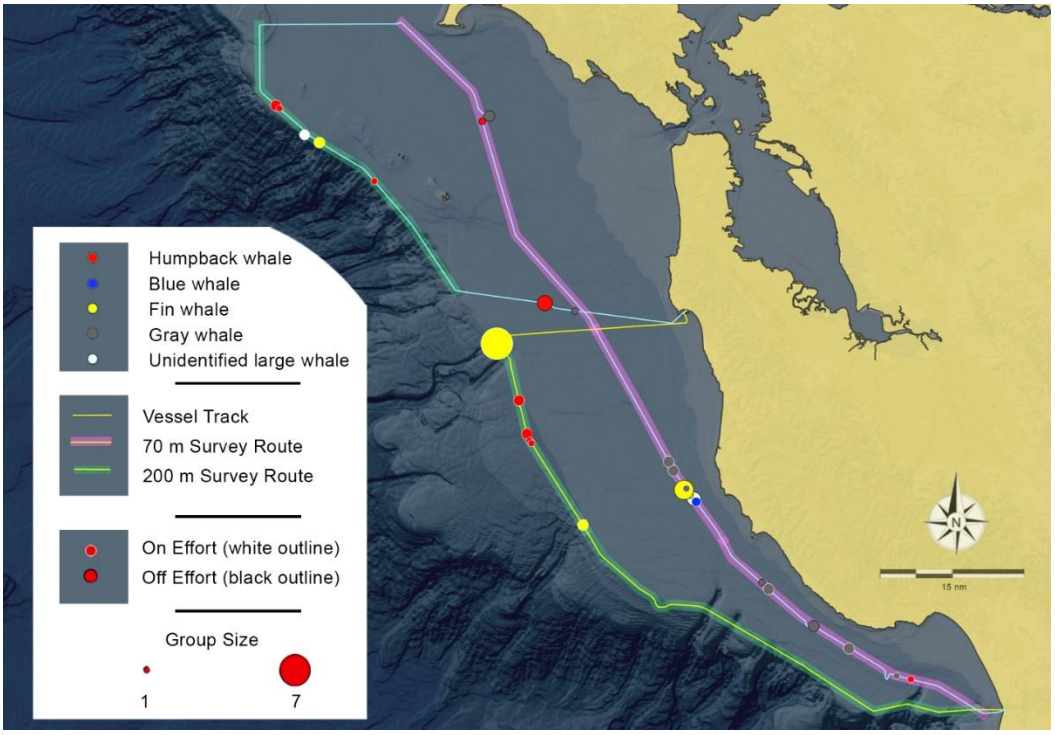


Figure 3. Vessel-based surveys from R/V Nova on March 27-28, 2021 showing vessel track and observations.

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: Monterey Bay Whale Watch (processed by Karin Forney, NMFS)

Monterey Bay Whale Watch *(Fishing Zone 4)*

- The 14-day average of 4.8 whales-per-half-day-trip is slightly higher than the average historical patterns (Figure 4), which show increasing numbers of humpback whales during March-April as they return to the central California feeding grounds. Based on historical patterns, it is expected that humpback whale numbers will continue to increase during the coming weeks.
- The absence of Blue whales is consistent with their overwintering at the breeding grounds (Figure 5).

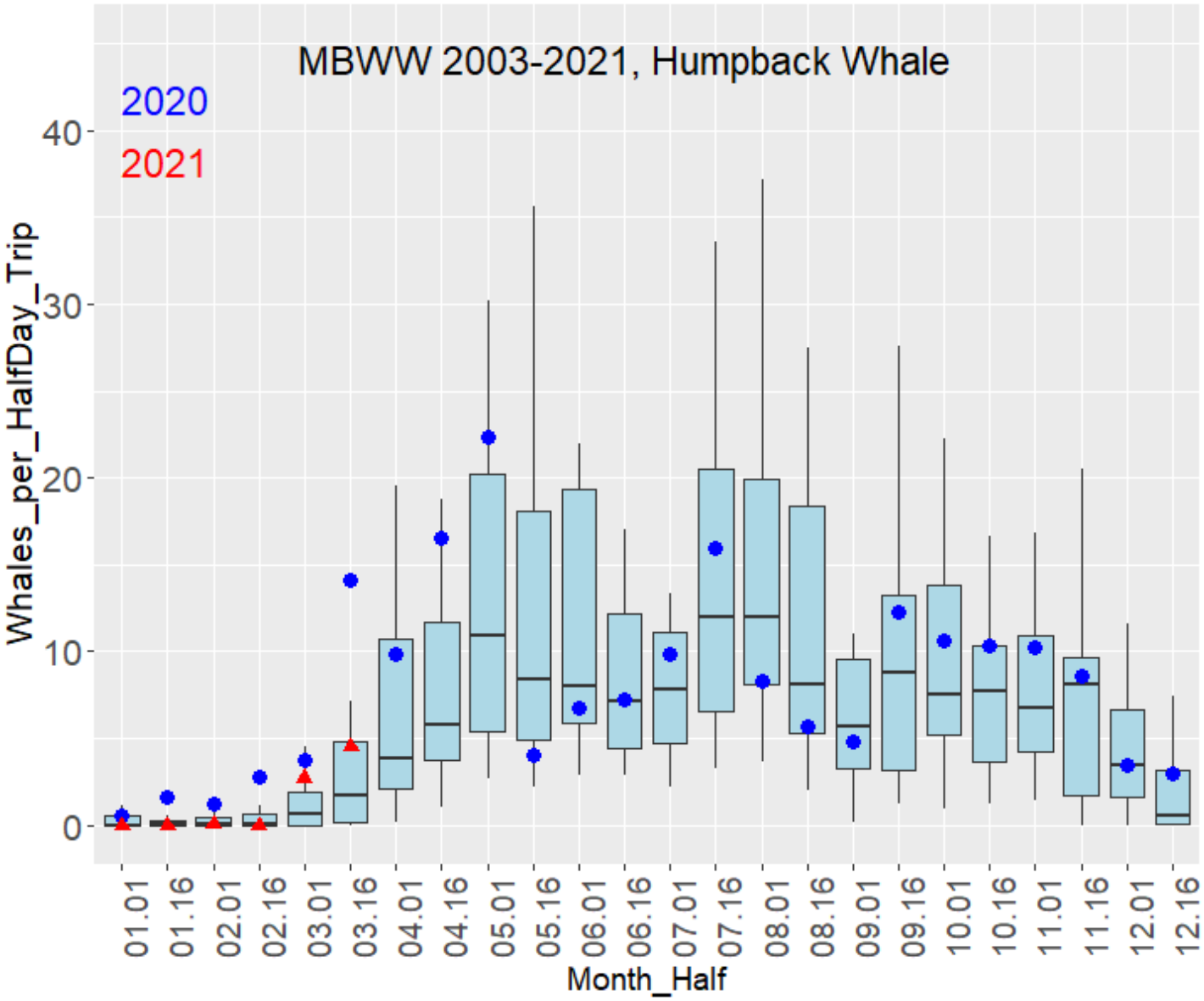


Figure 4. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of Humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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.

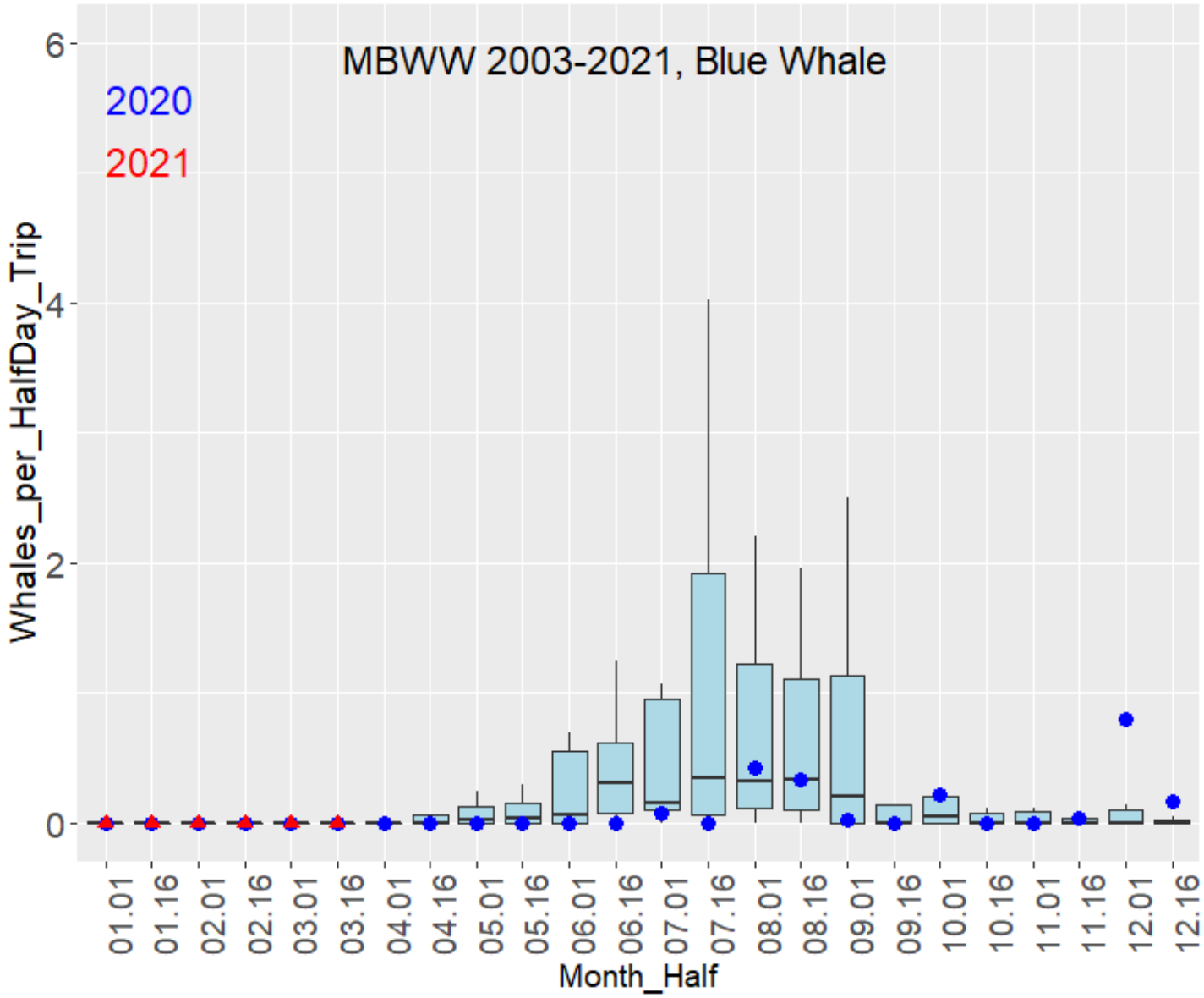


Figure 5. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of Blue whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average 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 29, 2021 and Automatic Licensing Data System (ALDS) on March 19, 2021, Bi-Weekly Reporting Database on March 26, 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 23, 2021, there have been 2,786 daily landings of Dungeness crab with a total volume of 3,294,895 pounds and with a total Ex-Vessel Value of $16,491,443. Average unit price for these landings was $5.57 (excluding receipts with unit price of $0 reported). A total of 356 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 6 with 13 complete weeks of landings to analyze. The highest volume came from Fishing Zone 3.
- Of the 356 vessels, 355 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: 36 vessels
    - Tier 6: 97 vessels
    - Tier 7: 51 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 134,350 traps deployed. Overall the highest number of these maximum potential traps are deployed in Fishing Zone 3, followed by Zone 1 (Figure 7). By Week 13, the maximum potential traps was estimated to be 43,725 traps.
- For the past 3 weeks (Weeks 11-13), average weekly price per landings by port complex are ranging between $5.50 and $9.50 each week (Figure 8).
- Two figures of graphs showing number of vessels (Figure 9) and the maximum potential trap number they represent (Figure 10) between the years of 2014 and 2021 are being provided to compare with the current low Dungeness crab season (2021 panel). This information is being summarized by port complex over five bi-weekly periods between

March 1 and April 30. Data are current as of March 19, 2021 and will be populated as the current season progresses.

- Although the latest March 15-28 period is showing declines for the current season, the landings data populating this summary is incomplete. The March 1-14 period is showing higher overall maximum trap numbers in relation to the past season average between 2014 and 2020 (removing 2016 data) for those ports in Fishing Zone 3 while this number is below average for those ports in Fishing Zones 1, 2, 4 and 5.

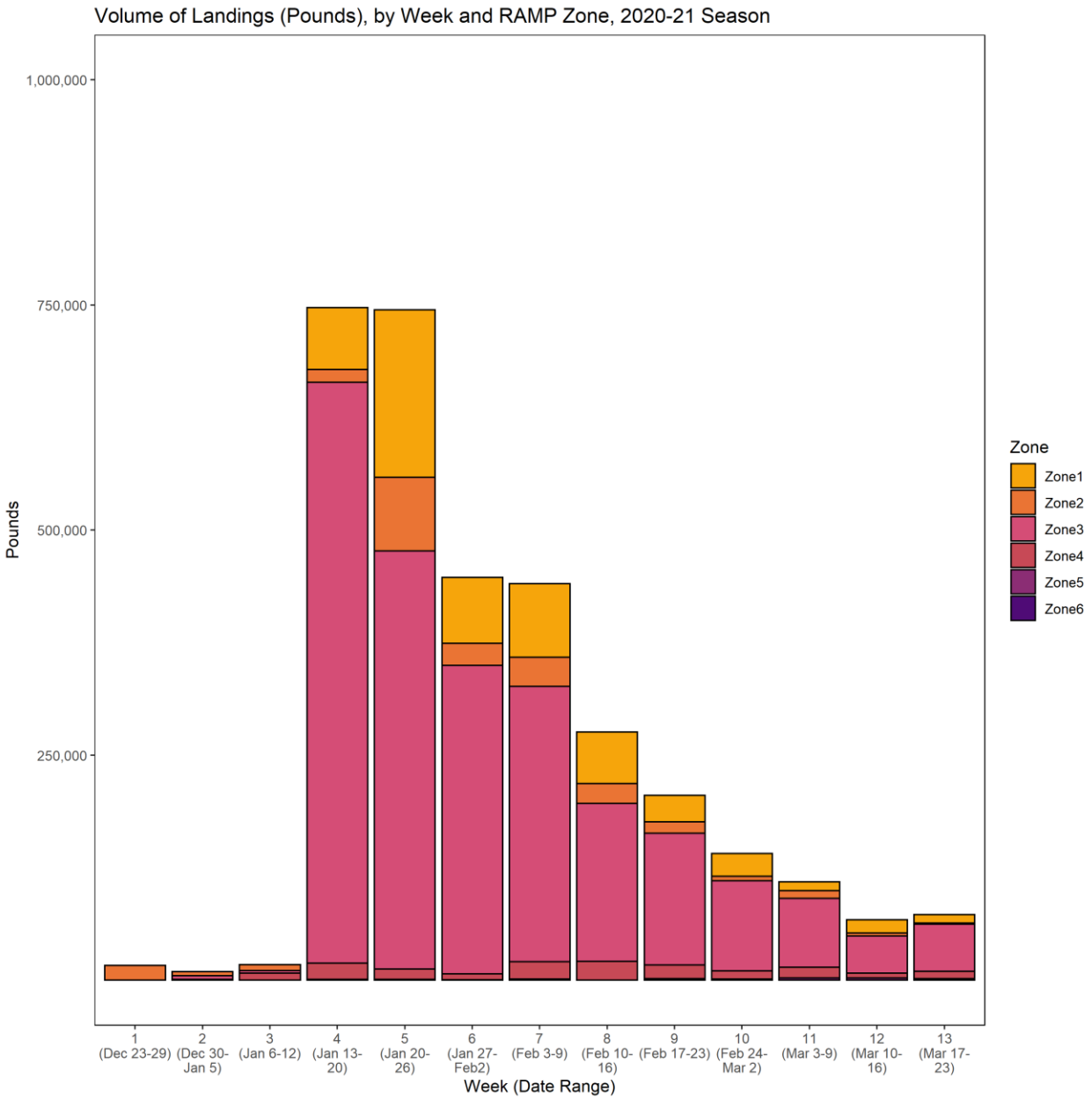


Figure 6. Dungeness crab landings (pounds) by week and Fishing Zone. Accessed from CDFW's MLDS on March 29, 2021. All data are preliminary and subject to change.

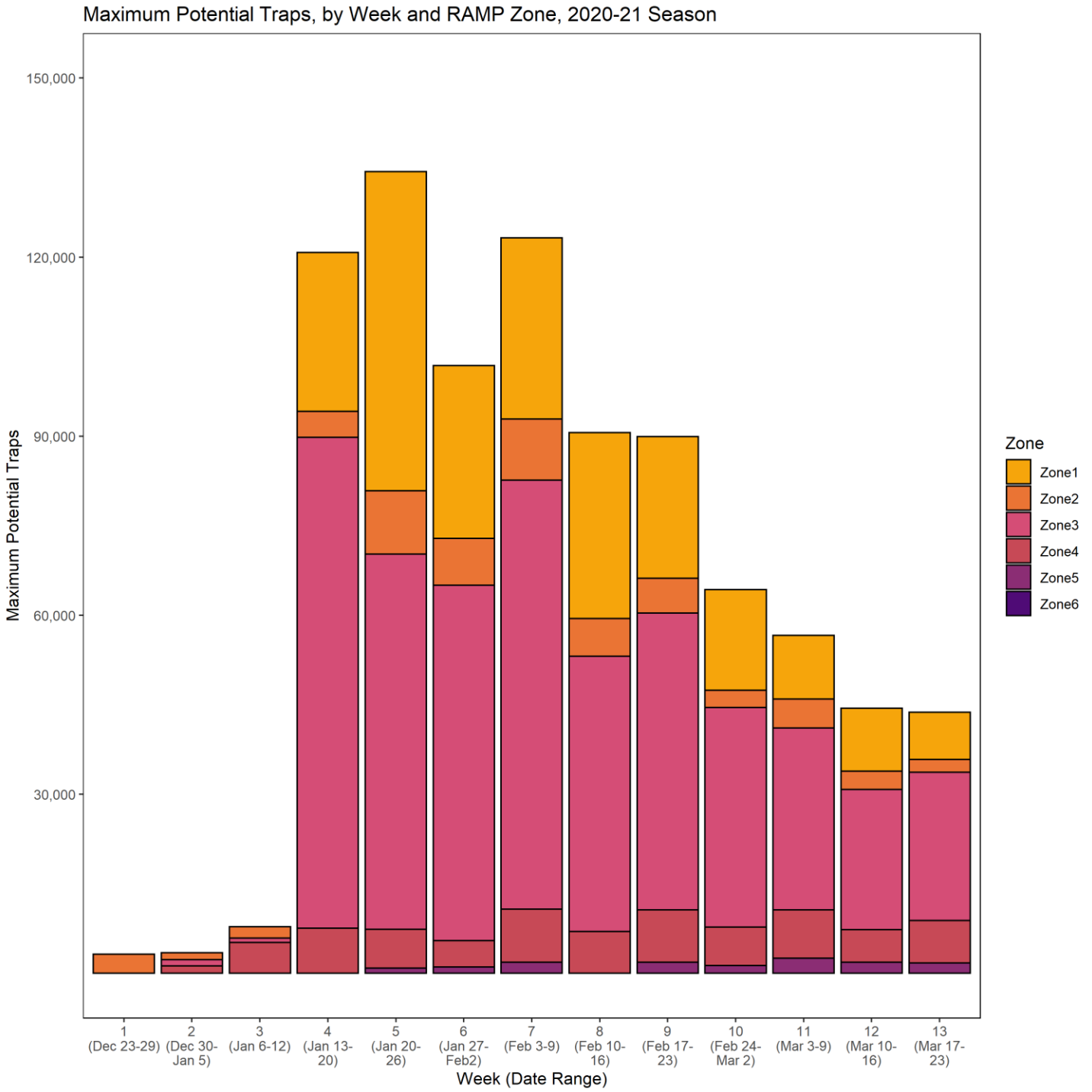


Figure 7. Maximum potential traps by week and Fishing Zone, based on landings data and Dungeness crab vessel permit tier information. Accessed from CDFW's MLDS on March 29,2021 and CDFW's ALDS on March 19, 2021. All data are preliminary and subject to change.

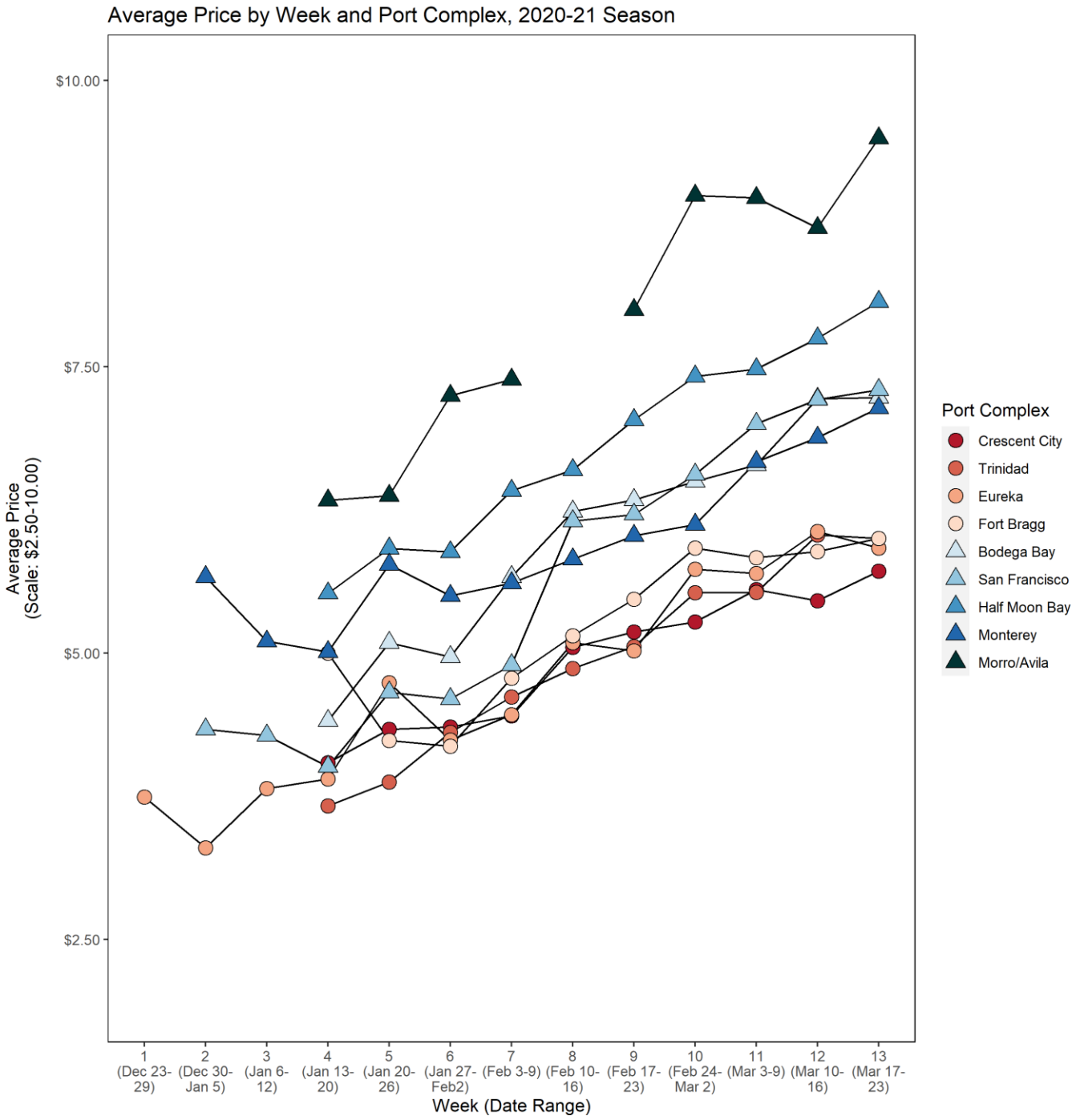


Figure 8. Average price per pound by week and port complex (removing receipts that reported $0 unit price). Northern management area ports are designated by circles while central management area ports are designated by triangles. Accessed from CDFW's MLDS on March 29, 2021. All data are preliminary and subject to change.

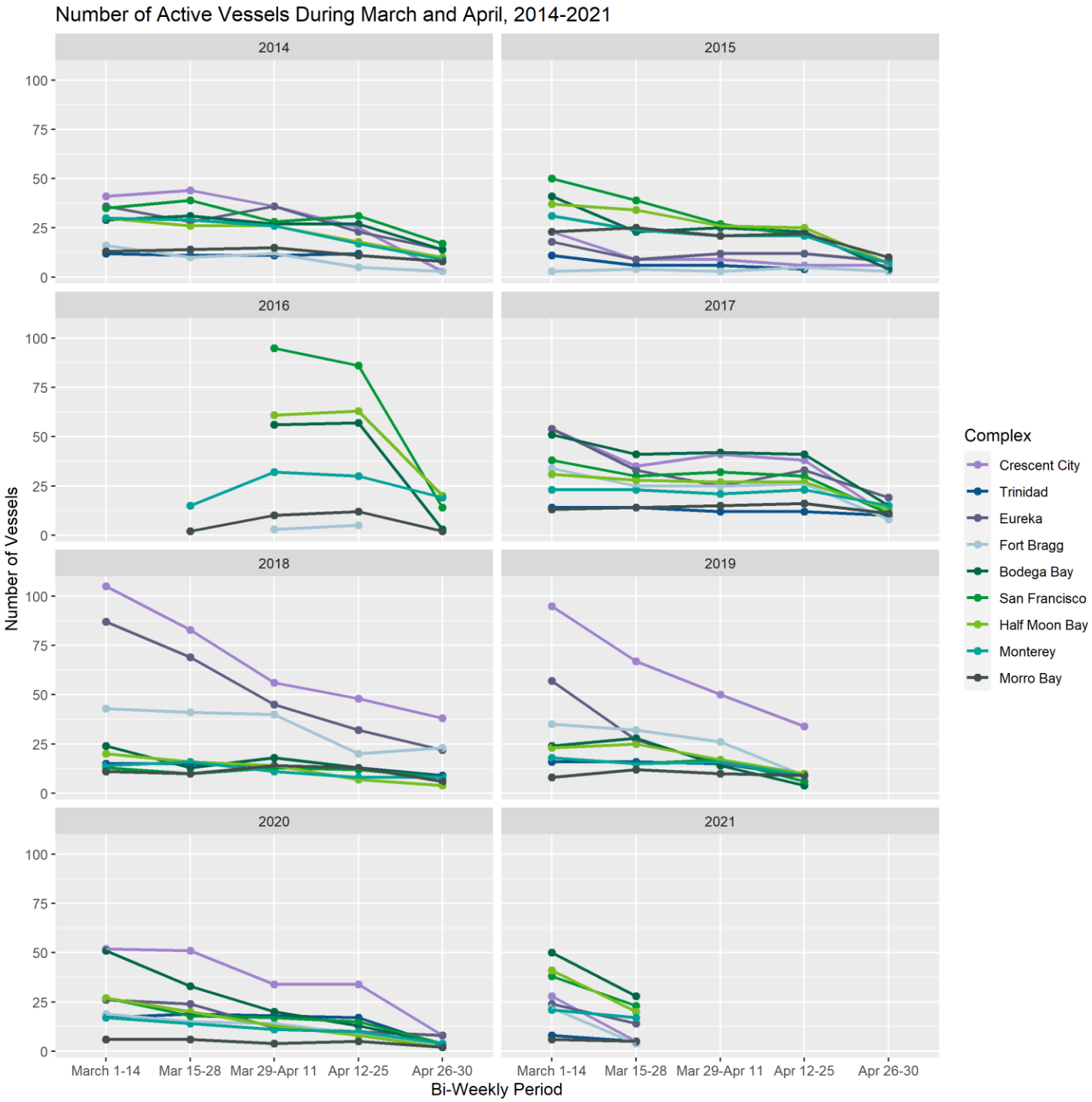


Figure 9. Panels showing number of active Dungeness crab vessels each year between 2014 to 2021 by port complex over each bi-weekly period between March 1 and April 30. Accessed from CDFW's custom PowerBi report with last data refresh on March 19, 2021. All data are preliminary and subject to change.

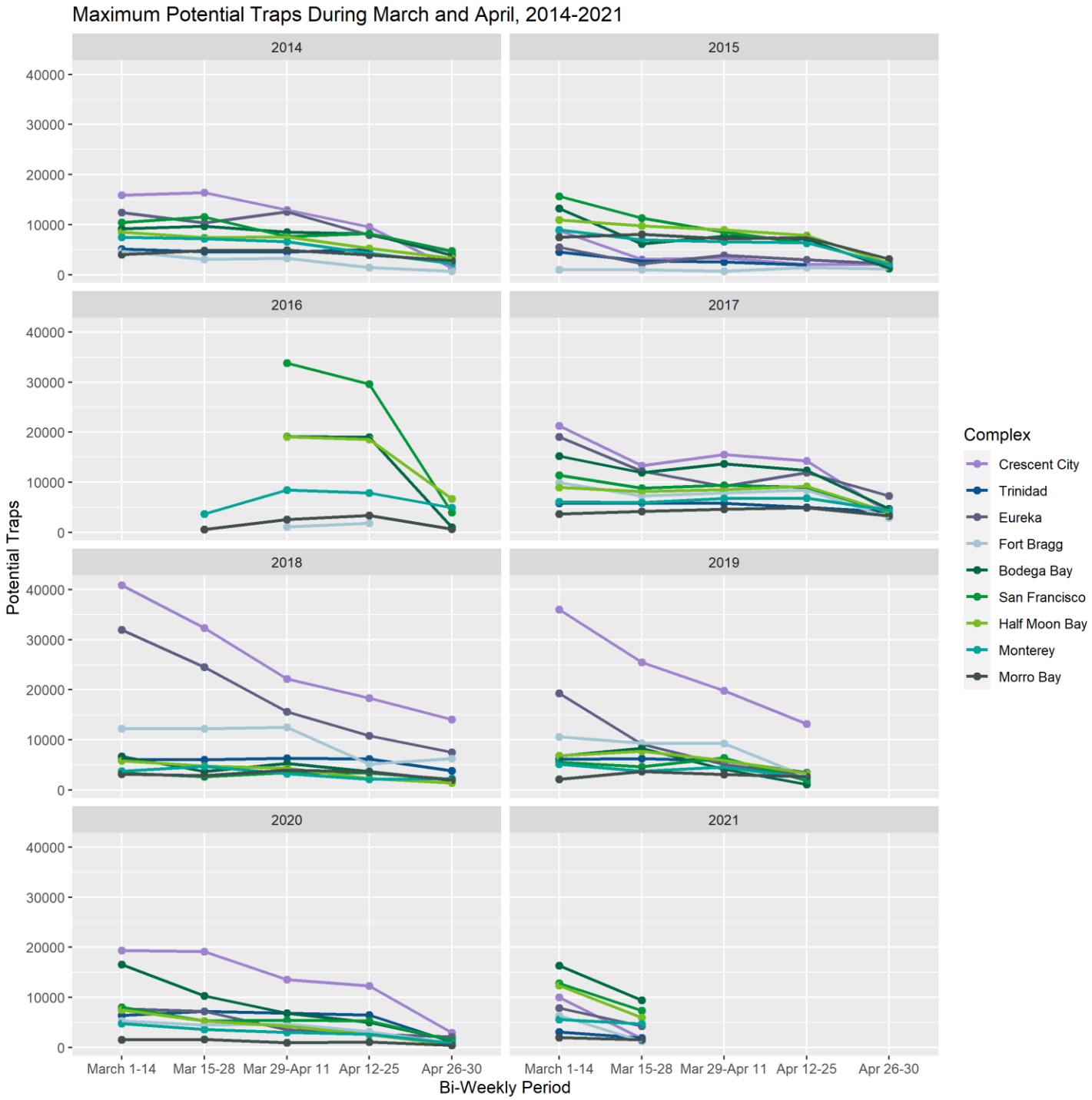


Figure 10. Panels showing number of maximum potential traps based on active Dungeness crab vessels each year between 2014 to 2021 by port complex over each bi-weekly period between March 1 and April 30. Accessed from CDFW's custom PowerBi report with last data refresh on March 19, 2021. All data are preliminary and subject to change.

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 16, 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 16, 2021 (Table 1), March 1, 2021 (Table 2), and March 16, 2021 (Table 3).

Table 1. 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 26, 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	62	263	16,280	12	25	65	7	20
Zone 2	13	240	3,123	13	34	80	3	1
Zone 3	130	283	36,782	20	41	80	9	32
Zone 4	11	192	2,116	21	44	80	0	0
Zone 5	4	122	486	34	55	55	0	0
Zone 6	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C
Totals	220		58,787				31	53

Table 2. 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 26, 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	46	267	12,280	12	26	65	7	14
Zone 2	14	220	3,082	13	28	51	2	1
Zone 3	109	269	29,3077	19	42	100	10	51
Zone 4	10	185	1,851	24	43	65	0	0
Zone 5	4	129	517	30	52	55	0	0
Zone 6	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C
Totals	183		52,757				19	66

Table 3. Summary of information provided in March 16, 2021 bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on March 26, 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	35	269	9,425	10	24	65	10	22
Zone 2	12	200	2,400	18	30	51	3	5
Zone 3	96	264	25,379	20	43	80	8	44
Zone 4	10	191	1,913	22	42	60	1	2
Zone 5	5	158	790	27	49	52	0	0
Zone 6	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C
Totals	158		39,907				24	73

Solar Loggers *(Fishing Zones 1-5)*

- The vessel track data provided by the solar logger pilot project is shown for the March 10-28, 2021 period. The following maps show vessel activity in 1) entire coast of California and Fishing Zone 1 (Figure 12), 2) Fishing Zones 2 and 3 (Figure 13) and 3) Fishing Zones 4 and 5 (Figure 14). 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 28, 2021.

Date Ranges	Fishing Trips
March 10-28, 2021	81
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

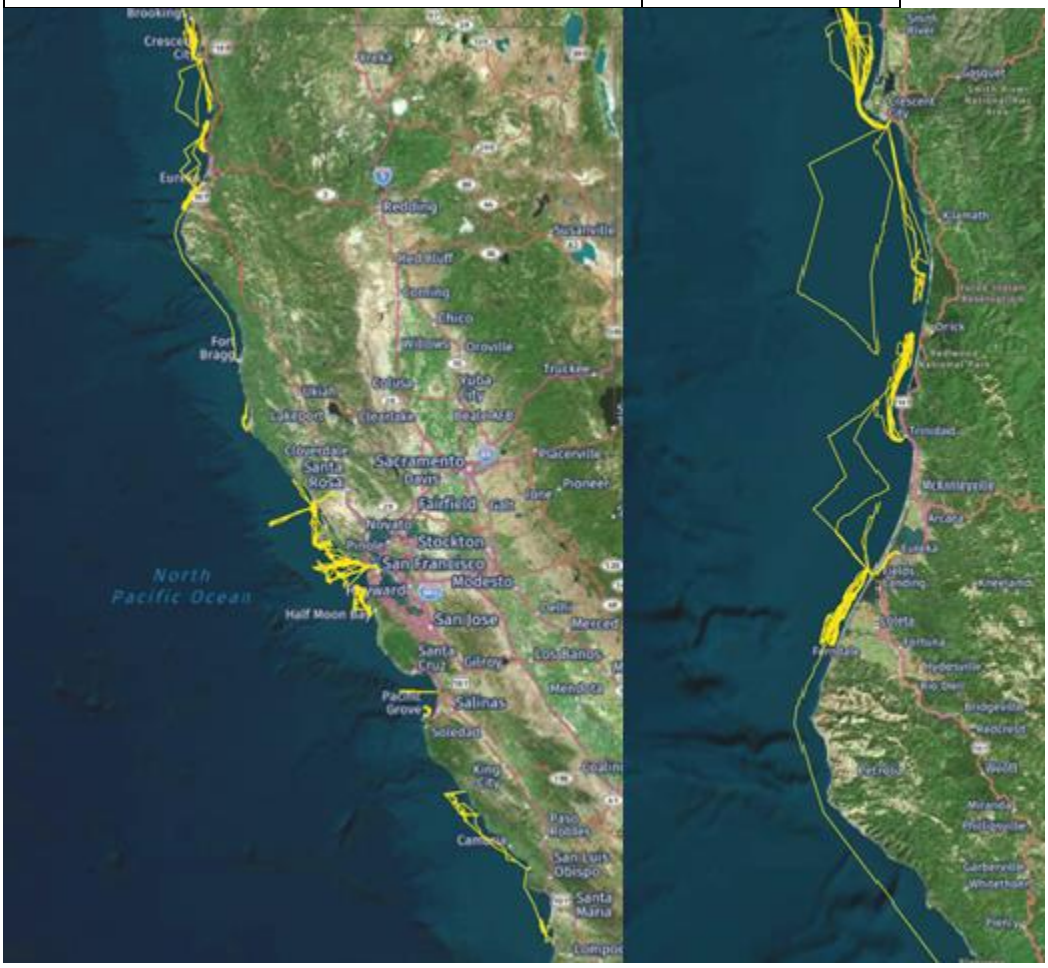


Figure 11. Fishing trips from March 10 - 28, 2021. The map on the left represents the entire coast where vessels may be participating. The map on the right focuses on fishing activity in Fishing Zone 1.

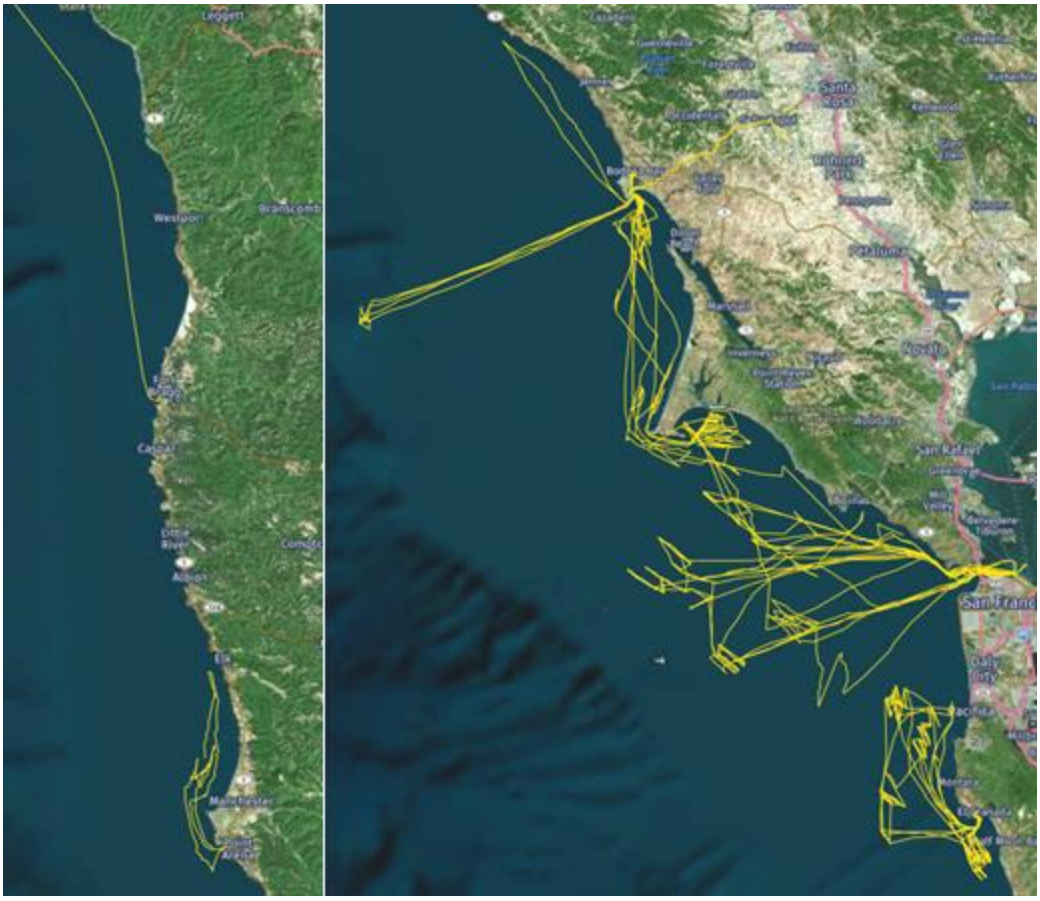


Figure 12. Fishing trips from March 10 - 28, 2021. The map on the left shows fishing activity in Fishing Zone 2 while the map on the right shows fishing activity in Fishing Zone 3.

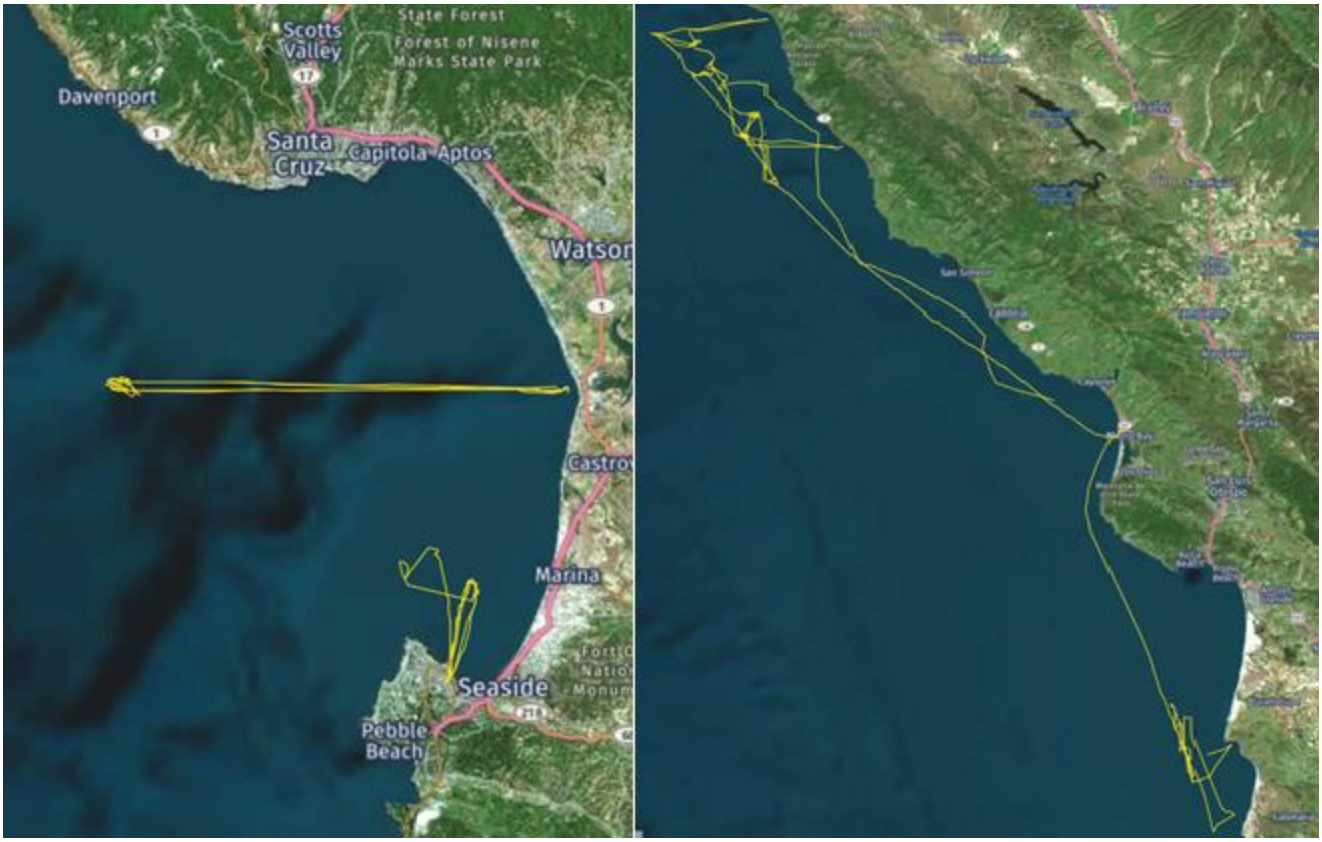


Figure 13. Fishing trips from March 10 - 28, 2021. The map on the left shows fishing activity in Fishing Zone 4 while the map on the right shows fishing activity in Fishing Zone 5.

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, John Calambokidis (Cascadia Research, SR3, and The Marine Mammal Center)

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.
- Large prey patches of krill were observed near the surface along the 200-meter line, between the Farallons and Cordell Bank.

Section 132.8(d)(9): Ocean conditions

ENSO prediction accessed from NOAA's Climate Prediction Center website on March 23, 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 were last updated on March 11, 2021. La Niña conditions persisted in February 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*)

- Please refer to the last Available Data package for the latest information on the Habitat Compression Index.

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, SR3, and The Marine Mammal Center),Briana Abrahms (University of Washington), Kathi George (The Marine Mammal Center), Jaime Jahncke (Point Blue Conservation Science), Jon Gonzalez (California Coast Crab Association)

Cascadia Research, SR3, The Marine Mammal Center *(Fishing Zone 3 and 4)*

- Three Humpback whales identified in recent vessel-based surveys in Fishing Zones 3 and 4 conducted on March 27-28, 2021 were known animals from Mexico.
- Recent surveys in north Costa Rica (where high sightings of humpback whales were seen in January and February) revealed few whales suggesting migration north is underway from there.

WhaleWatch 2.0 *(All Fishing Zones)*

- WhaleWatch habitat predictions for March 25, 2021 indicate that probability of Blue whale presence is low in Fishing Zones 1-6 (Figure 15).

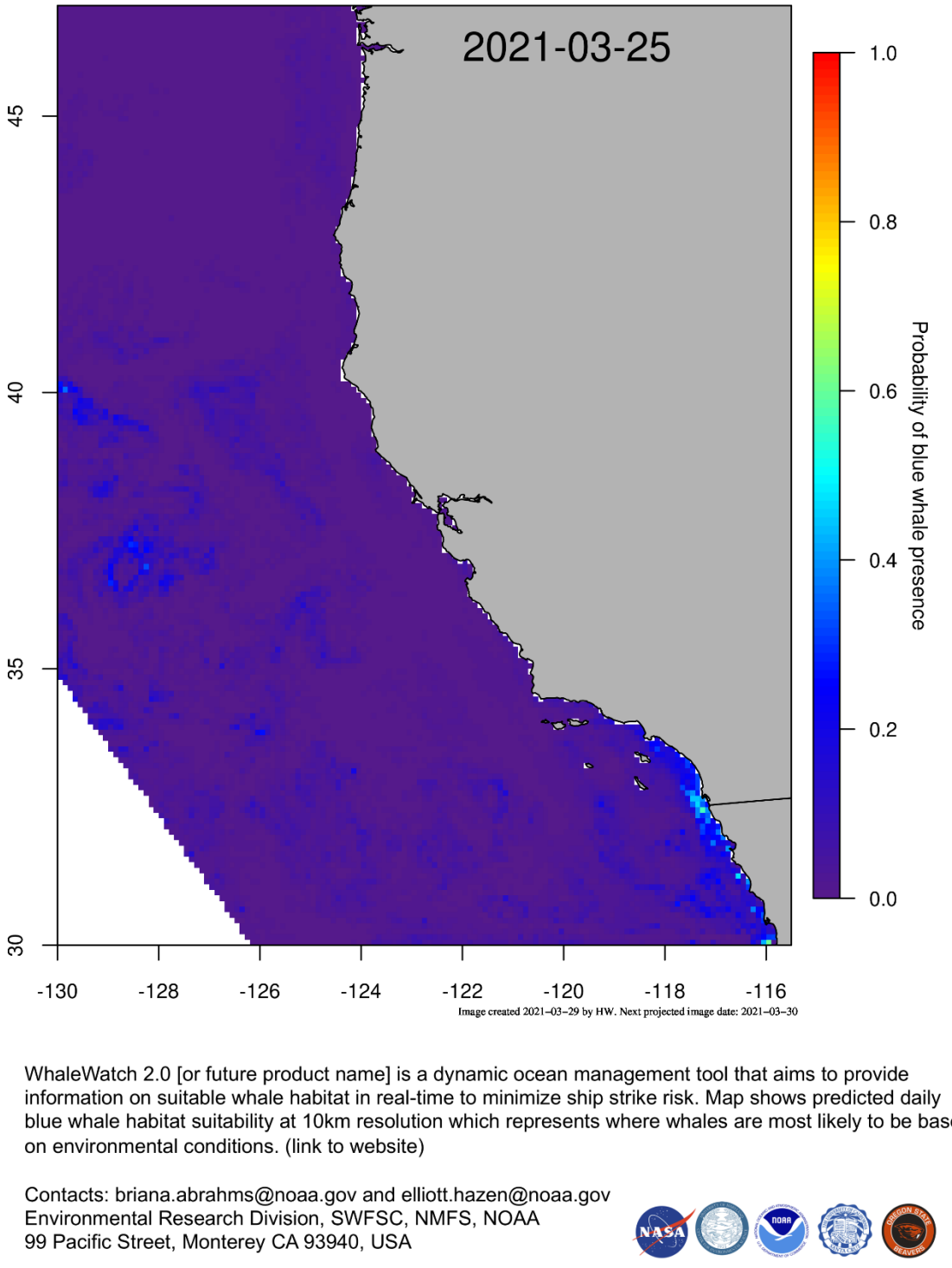


Figure 14. WhaleWatch 2.0 map for March 29, 2021. View a current map.

Solar Loggers *(Fishing Zone 4)*

- Track lines from whale watching vessels participating in the solar logger pilot project (Figure 16) indicate a high amount of effort in the southern half of Monterey Bay during 46 trips between March 10 – 28, 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 28, 2021.

Time Periods	Whale Watching Trips
March 10-28, 2021	46
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

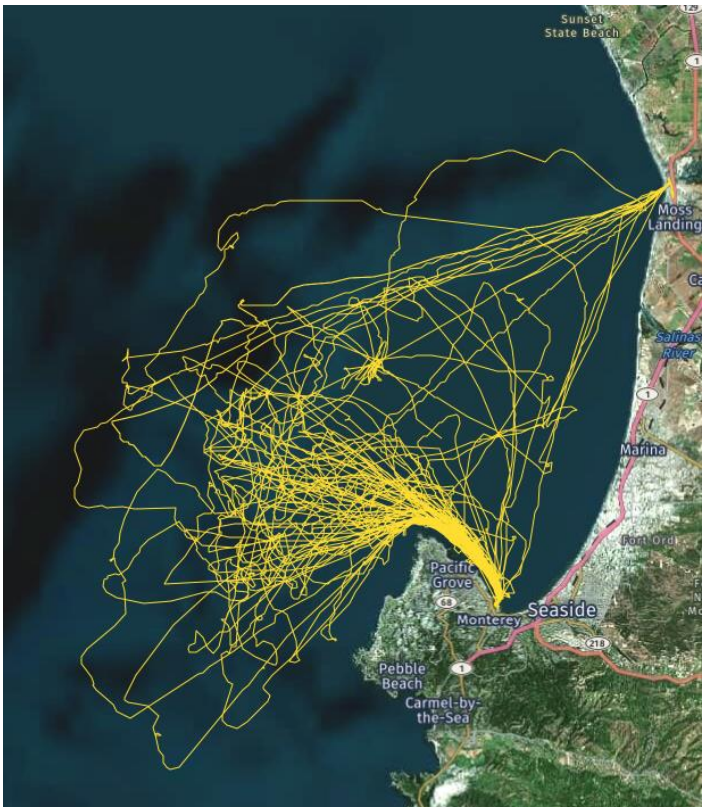


Figure 15. Track lines for 46 whale watch trips in Monterey Bay from March 10 - 28, 2021. Sightings, numbers and species are not reflected on this map.

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

- The Gulf of the Farallones and Monterey Bay National Marine Sanctuaries (through the Spotter/Whale Alert app) has observed two Humpback whales in Fishing Zone 3 on March 14, 2021 (Figure 17). No Blue whales have been observed, yet 26 Gray whales have been observed over the past seven days (March 22-29, 2021). Observations were recorded by trained observers on the Farallon Islands.
- Monterey Bay National Marine Sanctuary has observed eight Humpback whales from March 22-29, 2021 within Fishing Zone 4 (Figure 18). No Blue whales sighted during this period. Observations were reported from trained naturalists aboard Monterey Bay Whale Watch and a newly trained naturalist aboard Secret Harbors Charter.
- Channel Islands National Marine Sanctuary observed ten Humpback whales and no Blue whales within Fishing Zone 6. These observations are conducted by trained naturalists from the Channel Islands National Marine Sanctuary and National Park Service.

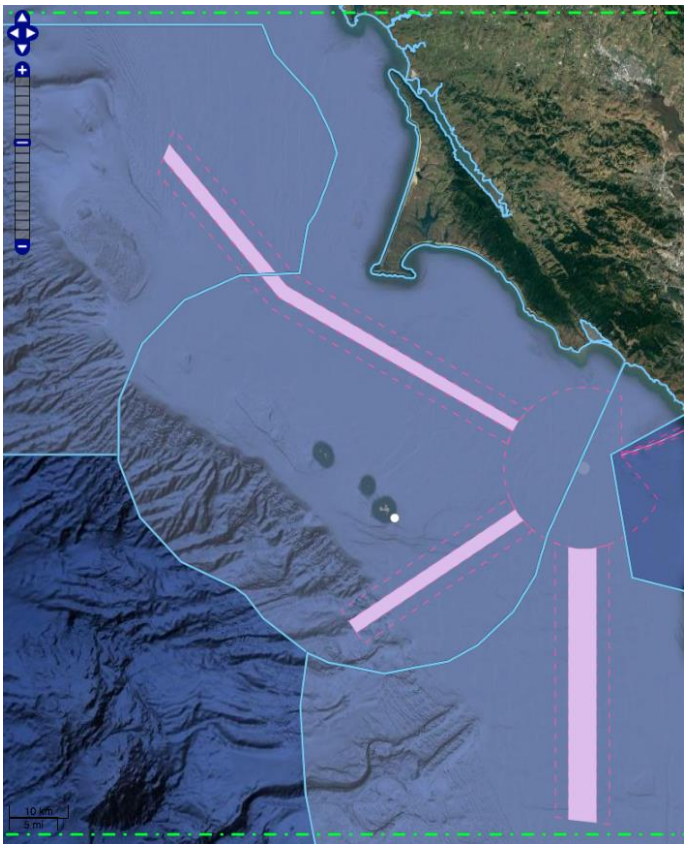


Figure 16. Location of 2 Humpback whale sightings in Fishing Zone 3 on March 14, 2021. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.

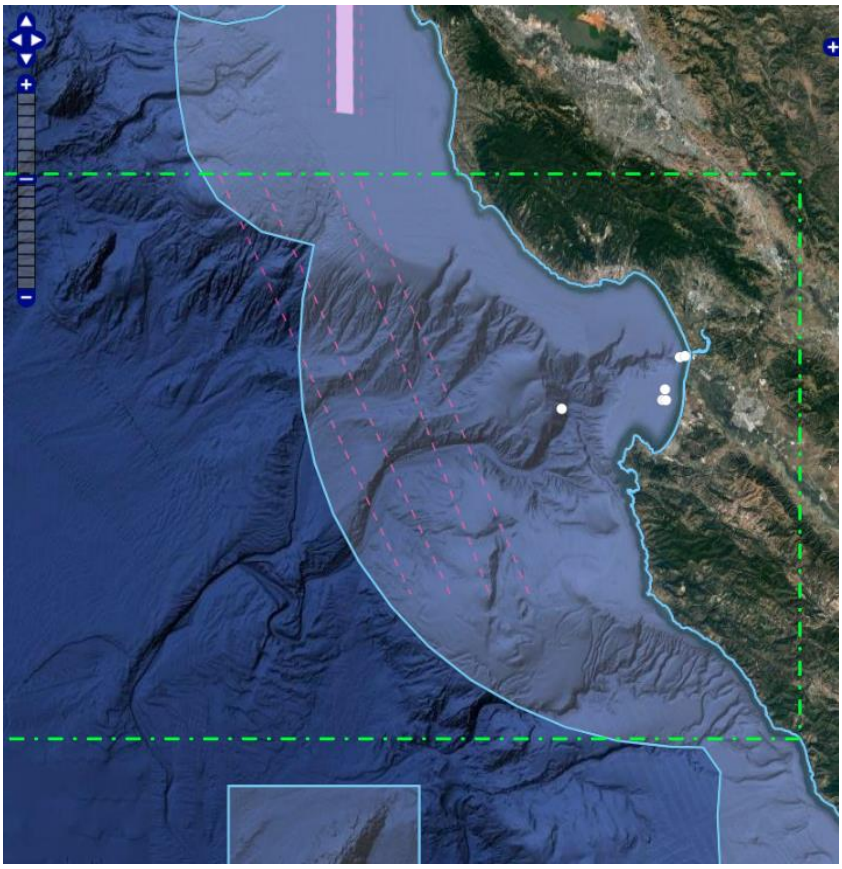


Figure 17. Location of 8 Humpback whale sightings in Fishing Zone 4 from March 22-29, 2021. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.

California Coast Crab Association *(Fishing Zones 1 and 5)*

- Vessel-based surveys conducted in Fishing Zone 1 from Dungeness crab commercial vessels occurred on March 22, 2021 (Figure 19). Weather conditions were amenable with 6 miles of visibility and 4-foot swells. Two Humpback whales were observed feeding, with the one in Crescent City breaching a bait ball with a lot of bird life. Eight Gray whales and 11 unknown whales were also observed. The distinguishable blow of Gray whales was observed in all 11 unknown whale sightings, however the whales were either too far away or not visible at the surface to positively assign it to species.
- Vessel-based surveys conducted in Fishing Zone 5 from Dungeness crab commercial vessels occurred on March 26, 2021 (Figure 20). Weather conditions were amenable with 6 miles to unlimited visibility and 4- to 6-foot swells. Ocean temperatures were recorded to be cold (48.9ºC – 52.1ºC) and there was very little to no forage present. One Humpback whale and eight Gray whales were observed traveling north and not feeding, while were also observed traveling north the one in Crescent City breaching a bait ball with

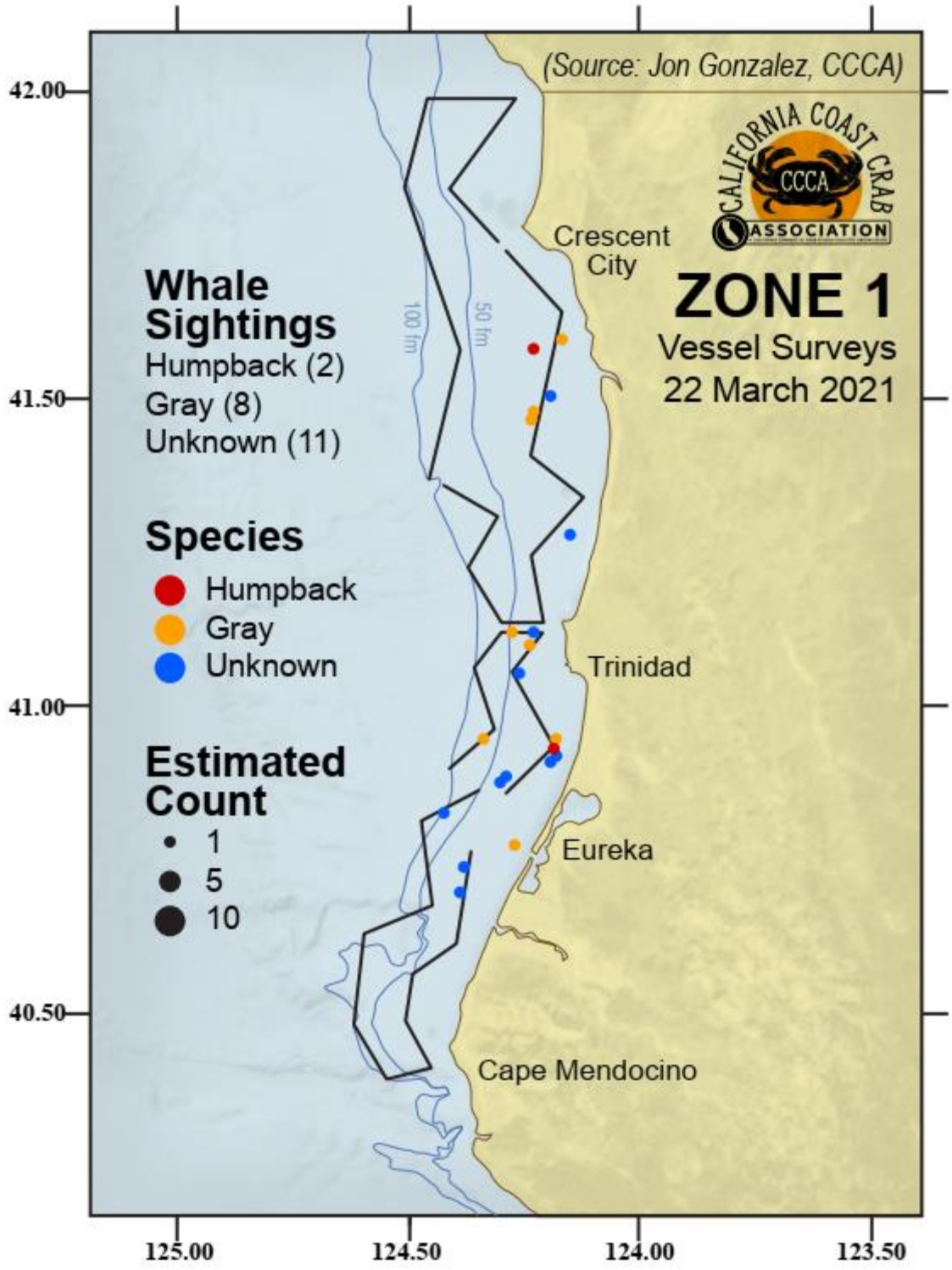


Figure 18. Vessel-based surveys conducted in Fishing Zone 1 on March 22, 2021 showing vessel path and whale observations.

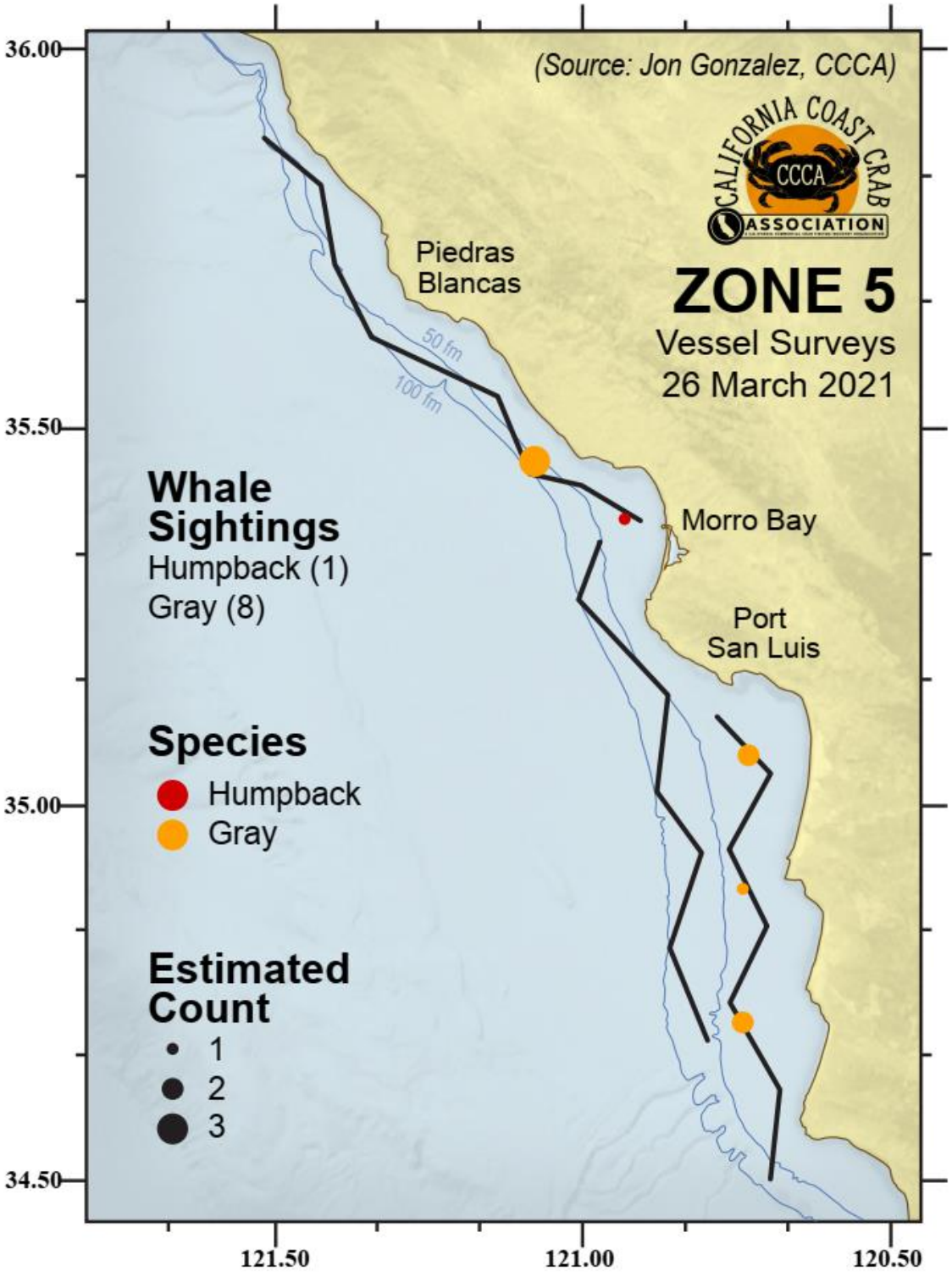


Figure 19. Vessel-based surveys conducted in Fishing Zone 5 on March 26, 2021 showing vessel path and whale observations.