



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

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

I

On November 24, 2020, 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 November 20, 2020. Prior to this risk assessment and management response, I considered the Working Group's November 23, 2020 management recommendation, and other relevant information provided to my staff.

II

Based on testing indicating poor crab quality, on November 20, 2020, I delayed the opening date in Fishing Zones 1 and 2 (Districts 6, 7, 8, and 9) until December 16, 2020, pursuant to Fish and Game Code Section 8276.3(b).

III

On November 16, 2020, staff from the Department's Marine Region conducted aerial surveys of Fishing Zones 2 and 3 and observed 29 Humpback whales in Fishing Zone 3. Additionally, an agency-approved vessel survey in Fishing Zone 4 made 45 sightings of an estimated 74 Humpback whales, and in a separate survey of Fishing Zones 3 made 31 sightings of an estimated 138 Humpback whales. Pursuant to Section 132.8(c)(2)(A)(4)(a), I must implement a Fishing Zone delay or other protective management action.

IV

NOAA-standardized data from commercial whale-watching trips in Fishing Zone 4 between November 1 and November 14 show weekly running averages of 14.6 and 9.7 Humpback whales in Monterey Bay. Pursuant to Section 132.8(c)(2)(A)(4)(a), I must implement a Fishing Zone delay or other protective management action.

V

An agency-approved vessel survey in Fishing Zone 4 made 11 sightings of an estimated 23 Blue whales. Pursuant to Section 132.8(c)(2)(A)(4)(b), I must implement a Fishing Zone delay or other protective management action.

VI

There are no marine life concentration data to inform risk assessment in Fishing Zones 5 and 6. Pursuant to Section 132.8(c)(2)(A)(2), the Fishing Season will be delayed in Fishing Zones 5 and 6 until December 15.

VII

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

VIII

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. The opening of the commercial Dungeness crab fishery in Fishing Zone(s) 3 – 6 is delayed. Take and possession of commercially caught Dungeness crab is prohibited in the delayed Fishing Zone.

This management action is in effect until the next risk assessment, which is expected to occur before December 15, 2020.

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

11/24/20 3:20 pm

Date/Time

ATTACHMENT TO DIRECTOR NOVEMBER 24, 2020 DECLARATION OF FISHERY SEASON
DELAY IN 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 November 24, 2020, 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 3: 15 sightings of 29 Humpback whales were observed during Department aerial surveys
- Fishing Zone 4: 45 sightings of 74 Humpback whales and 11 sightings of 23 Blue whales on a Cascadia Research vessel-based surveys, and a weekly running average of 9.7 Humpback whales based on Monterey Bay Whale Watch data
- Fishing Zones 5 and 6: no data available

Relevant Management Considerations Under Section 132.8(d)

1. Working Group Management Action Recommendation and Best Available Science Made Available to the Department
The Working Group provided recommendations for Fishing Zones 1-2 and for Fishing Zones 3-6. Although Fishing Zones 1-2 are delayed for quality through December 16, in the absence of a quality delay the Working Group would have recommended a December 1 season opener under a Fleet Advisory. For Fishing Zones 3-6, the Working Group recommended the season opener be delayed until December 16. The recommendation memo is available [here](#). Additional information from the Working Group Recommendation Memo is provided as relevant in the categories below. No other information was made available to the Department.
2. Information from NOAA
No additional information was made available for this risk assessment.
3. Effectiveness of Management Measures to Minimize Entanglement Risk
Based on the available information, a season delay is likely to be the most effective management action. A season delay would prevent commercial Dungeness crab traps from entering the water, which removes any entanglement risk from the commercial fishery. Additionally, a season delay is the anticipated management action in Section 132.8(c)(2)(1)(4)(a)-(b) in response to concentration triggers being reached for Humpback whales and Blue whales.
4. Total Economic Impact to the Fleet and Fishing Communities
Total economic costs are considered when deciding between management measures that equivalently reduce entanglement risk. A season delay can have variable economic cost depending on the circumstances. Current considerations include the loss of the Thanksgiving market, possible fishing effort shift, and general economic impacts due to the ongoing COVID pandemic. The Working Group noted the importance of the Christmas market in requesting the season open on December 16 in Fishing Zones 3-6.
5. Data Availability Within and Across Fishing Zones
Aerial and vessel surveys were conducted across Fishing Zones 1-4, with additional observation data from Point Blue Conservation Science, Monterey Bay National Marine Sanctuary, Channel Islands National Marine Sanctuary and habitat modeling from Whale

Watch 2.0 for Fishing Zones 1-6. 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

Seasonal migration for Humpback whales out of California waters typically occurs in November and early December. Humpback whales are anticipated to migrate from central and northern areas (where high numbers of Humpback whales were observed) south to Mexico and Central America; this will likely take migrating whales through Fishing Zones 3-6. Based on Monterey Bay Whale Watch data, observed Humpback whale numbers are above average when compared to historical averages, which may indicate that the bulk of the migration has yet to begin, although trend data from Point Blue Conservation Science indicates fewer whales are being observed in the Gulf of the Farallones.

7. Fishing Season Dynamics

No delay is anticipated due to public health hazards. Quality testing has delayed the season opener in Fishing Zones 1 and 2 until at least December 16. It is unclear how fishing effort may shift given any season delays, but any season opener is expected to result in relatively high gear concentrations. Working Group members requested any delays be until December 16 to align the opening of the season coastwide and support a fair and orderly fishery.

8. Known Distribution and Abundance of Key Forage

Distribution of anchovy, a key forage item for Humpback whales was evident during aerial surveys and vessel-based surveys. Humpbacks were observed lunge feeding near the surface north of the Russian River and west of Point Reyes (Fishing Zone 3). Additionally, according to NOAA fisheries and its partners high anchovy abundance is expected to drive high density aggregation of Humpback whales during the fall and early winter of 2020 while krill abundance is expected to increase to above average over the winter months.

9. Ocean Conditions

La Nina conditions are currently forecast. The habitat compression index in October 2020 indicates high compression (i.e. cool habitat restricted nearshore) is anticipated through December 2020.

10. Current Impact Score Calculations

- a. Fishing Season – n/a
- b. Calendar Year – calendar year impact score calculations will begin January 1, 2021

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

The large numbers of humpback whales distributed across several Fishing Grounds is an indication that migration out of Fishing Grounds has yet to occur. This is supported by above average whale concentrations based on historical averages from the Monterey Bay Whale Watch data set and the Cascadia Research vessel-based survey estimating at least 74 Humpback whales and 23 Blue whales distributed across Fishing Zone 4, as well as the Department aerial surveys in Zone 3 estimating at least 29 Humpback whales, and the Cascadia Research vessel-based survey in Zone 1 estimating 85 Humpback whales. Whale sighting data from trained observers working for the Marine Sanctuaries and the National Park Service in Fishing Zones 3, 4, and 6 further supports continued whale presence in those areas. The Working Group noted that fishing

industry-led pilot surveys on November 11, 2020 also confirmed presence of Humpback and Blue whales in Fishing Zone 1.

Chosen Management Action and Rationale

Based on the management considerations outlined above, the Director will implement a delay of the opening of the commercial Dungeness crab season in Fishing Zones 3-6. Fishing Zones 1 and 2 are subject to a crab meat quality delay until at least December 16 and therefore are not addressed in this risk assessment.

Large aggregations of foraging Humpback whales and surface feeding activity pose a risk of entanglement with surface gear. The wide distribution of Humpback whales across Fishing Zone depths indicates that a depth restriction on fishing activity would be ineffective in reducing the entanglement risk. Given the high volume of gear anticipated to be set during a season opener, in addition to possible fishing effort shift to any open areas given season delays, it has been determined that a gear reduction would not sufficiently reduce entanglement risk. A season delay is the most viable management action given the existing whale presence.

Per 132.8(c)(2)(A)(2), lack of available data in Fishing Zones 5 and 6 automatically delays the opening of the Fishing Season in that Fishing Zone until December 15.

Given the meat quality delay in Fishing Zones 1 and 2 and the desire expressed by the fleet for an orderly opening of the season statewide, the Department is targeting a unified opener on December 16th and will make all effort to perform the necessary surveys to collect data to inform the next risk assessment in order to provide timely information to the fleet as to the season opening date.

California Dungeness Crab Fishing Gear Working Group (Working Group) Management Recommendation Form

Submitted to the California Department of Fish and Wildlife (CDFW) Director 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.

Working Group Discussion Date: November 23, 2020– Finalized November 24, 2020

During their discussion, the Working Group considered [Available Data](#) provided by CDFW on November 20, 2020, as well as an initial CDFW assessment of management considerations and preliminary management action. The initial and final versions of CDFW's assessment are available on the [Whale Safe Fisheries webpage](#). Key elements of the Working Group discussion are summarized below.

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

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

- No additional information was shared during the Working Group discussion.

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

- No entanglements have been reported for the current season, despite the recreational crab fishery opening as scheduled in early November.

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

- Working Group members acknowledged the additional analysis provided by CDFW in the Available Data document. Based on the totals in Figure 6, Working Group members estimate a minimum loss of \$40 million in Ex-Vessel Value from the potential 4-week delay in the opener for Fishing Zones 3-6. A delayed opener for Fishing Zones 1 and 2 would result in additional economic impacts.

- Ex-Vessel value does not represent the full extent of impacts to the industry. Studies for the Port of San Diego estimate downstream impacts to associated businesses (e.g. fuel docks) as being eight times those to Ex-Vessel Value, and similar ratios are likely in these circumstances.
- Given the delays and closures during the prior two fishing seasons, a delay beyond December 15 would create a fishery disaster, and vessels would again be unable to recoup their losses during the remainder of the season.

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

- Working Group members received additional survey information collected on November 20 and 21 for Fishing Zones 3 and 4, which are reflected in the updated Available Data document.
- Working Group members noted the pilot industry survey on November 11, 2020 provides an additional source of information for Fishing Zone 1. The survey confirmed continued presence of Humpback whales in this Fishing Zone.

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

- Working Group members requested clarification regarding likely presence and abundance of whales in Fishing Zones 1 and 2 based on historic patterns as well as recent survey information. Working Group Advisors shared they expect most whales to move out of the area and initiate migration in late November or early December. While there is limited Fall survey information within the Fishing Grounds during prior years, that timing is consistent with typical arrival of Humpback whales in their breeding grounds. When they initiate migration, Advisors anticipate the whales will depart directly to the breeding grounds rather than stopping and feeding through central and southern California. There is some uncertainty around how much of the population will depart, given overwintering behaviors observed during and since the Large Marine Heatwave event in 2014-2016, however the bulk of the population should depart. Advisors also clarified that the late November/early December migration timeframe is anticipated, but there is no clear indication that whales have begun their migration yet.

- Working Group Advisors shared that Leatherback sea turtles are also expected to depart the fishing grounds in late November/early December. Their migration is triggered by multiple factors, including prey availability and light levels.

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

- Some Working Group members asserted the importance of providing a management recommendation for Fishing Zones 1 and 2, even with quality delay.
- If there is a further delay for Fishing Zones 3-6, the opener should be delayed until December 16 rather than December 15 to align with the quality-delayed opener for Fishing Zones 1 and 2.
- Working Group members stressed that any additional delays beyond December 15 should be as short as possible, both in terms of the time between collection of additional Marine Life Concentrations information and issuance of the CDFW Initial Assessment, and between a final CDFW determination and commencement of fishing activity (i.e. the 72-hour minimum requirement specified in Section 132.8).

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

- Working Group members noted abundant jellies, including sea nettles, have been observed off Half Moon Bay.
- Working Group Advisors noted that the inshore/offshore distribution of Humpback whales is more reflective of forage availability than impending migration. Humpback whales which have moved offshore may move inshore again if forage shifts before they begin their migration.
- A Working Group Member noted that the estimated population of the Central Subpopulation of Northern Anchovy remains at or near all-time highs.

Section 132.8(d)(9): Ocean conditions

- Working Group members noted high winds and large swells are expected towards the end of this week (beginning on Wednesday night), which may drive whales to begin migrating and leave the Fishing Grounds.

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

- No additional information was shared during the Working Group discussion.

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

- Working Group Advisors confirmed that recent trends in observations (i.e. sightings along the 70m vs 200m transect) for the areas surveyed indicate whales were more concentrated offshore (200m), other than a large cluster remaining off Point Reyes and some sightings reported in shallower portions of Monterey Bay.
- Working Group members inquired whether the Gray whale migration has begun, and whether WhaleAlert contributors are able to distinguish between Humpback whales and Gray whales. Working Group Advisors shared that Gray whales typically begin arriving in Monterey Bay during mid/late December, and that WhaleAlert contributors can distinguish between Gray and Humpback whales.
- Working Group members noted that during a recent transit from Half Moon Bay to Moss Landing, no Humpback whales were seen in shallower waters (less than 30 fathoms). Black cod fishers off Año Nuevo also report that they are only seeing whales offshore.

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

Fishing Zones 1 and 2: The Working Group acknowledges that due to low quality, Fishing Zones 1 and 2 have already been delayed until at least December 16. However, in the absence of a quality delay, the Working Group would recommend an on-time season opener under a Fleet Advisory on December 1. This recommendation was made due to ocean conditions, typical migration patterns and expected economic

impacts to the fleet from a delay and because marine life concentrations data indicate whales are moving into offshore waters and away from typical Fishing Grounds.

Fishing Zones 3 – 6: The Working Group recommends the season opener be delayed until December 16. This is one day later than the December 15 date from the CDFW Initial Assessment in order to align with the current proposed opener for Fishing Zones 1 and 2.

State-wide fishery: Notwithstanding additional quality constraints impacting Fishing Zones 1 and 2, the delayed opener would only be extended if new data gathered before December 16 indicates it would be prudent to do so. This recommendation is partially based on the potential of additional protective measures going into effect due to COVID, which may constrain the ability of CDFW and other partners to collect additional on-the-water observations. Furthermore, this based on the current and prior data which shows the whales have started to move offshore and historical patterns indicate migration is likely to have begun by December 16. Given the economic importance of the Christmas market(s), an absence of additional data in these Fishing Zones should not result in additional delays. Rather, further delays should only be implemented if additional surveys affirm continued presence of large whales in the Fishing Grounds. While no current survey data is available for Fishing Zone 5 or 6, Working Group members noted survey information was included for Fishing Zone 5 in the [prior Available Data document](#).

During the discussion, Working Group Advisors clarified the distinction between historical data (e.g. multiple years or decades of observations regarding when large whales are seen in the foraging grounds versus the breeding grounds), recent survey data (e.g. data which informed prior RAMP discussions), and current survey data (e.g. information collected since the last RAMP discussion). Advisors noted that a “no data” situation under the terms of the RAMP regulations does not prevent considering recent or historical survey data.



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

Date: November 24, 2020

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 November 20, 2020 and finalized at the conclusion of the Working Group meeting on November 23, 2020 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: 1 Humpback whale

Confirmed Entanglements in Unknown Fishing Gear reported from California:

- During the current Fishing Season: 0
- During the current calendar year: 3 Humpback whales

Marine Life Concentrations Surveys and/or Satellite Telemetry Observations:

Between November 8 and November 21, the following data was collected to assess Marine Life Concentrations.

- Fishing Zone 3: 15 sightings of 29 Humpback whales were observed during CDFW aerial surveys, 31 sightings of 138 Humpback whales were observed on Cascadia Research vessel-based surveys, both surveys exceed the Marine Life Concentration trigger under *RAMP (c)(2), 20 Humpback whales during a survey*
- Fishing Zone 4: 45 sightings of 74 Humpback whales and 11 sightings of 23 Blue whales on Cascadia Research vessel-based surveys, and a weekly running average of 9.7 sightings based on Monterey Bay Whale Watch data; both surveys exceed the Marine Life Concentration trigger under *RAMP (c)(2), 20 Humpback whales or 3 Blue whales during a survey or a running weekly average of 5 Humpback whales or 3 Blue whales*

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

- RAMP regulations 132.8(c)(2)(A)(4)(a) specify a season delay in the event of a concentration trigger being reached or other management action that the Director demonstrates protects Humpback whales and Blue whales based on the best available science. Based on available data, a season delay is likely to be the most effective Management Action because of the distribution of whales across Fishing Zones 3 and 4.

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

- Early season Management Action(s) have variable economic costs when seasons are delayed. CDFW will continue to work with the fleet to inform this management consideration and have provided recent analytical work in the Available Data document. Current economic considerations include loss of holiday markets, fishing effort shift, poor market conditions (price), crab availability and numerous impacts due to the ongoing COVID pandemic.

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

- Aerial and vessel-based surveys were conducted across Fishing Zones 1, 2, 3, and 4. Additional observation data were contributed for Fishing 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

- Seasonal migration for Humpback whales out of California waters typically occurs in November and early December. The November/early December timeframe is anticipated, but that there is no clear indication that whales have begun their migration yet.
- Humpback whales are anticipated to migrate from central and northern areas (where high numbers of Humpback whales were observed) to breeding grounds in Mexico and Central America.
- There is some uncertainty around how much of the population will depart, given overwintering behaviors seen during and since the Large Marine Heatwave event in 2014-2016, however the bulk of the population should depart.
- Trend data from Point Blue Conservation Science indicates fewer whales are being observed in the Gulf of the Farallones, Fishing Zone 3. A concentration of Humpback and Blue whales that has been observed in prior surveys appears to have moved further offshore from the 70m contour closer to the 200m contour.
- Observed Humpback and Blue whale numbers in Fishing Zone 4 (Monterey Bay) remain above average when compared to historical averages based on Monterey Bay Whale Watch data.

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

- No delay anticipated due to public health hazards.
- There is no fair start provision in the event of a delay due to elevated entanglement risk.

- Quality testing protocols apply to Fishing Zones 1 and 2. The Director delayed opening of the northern management area (Fishing Zones 1 and 2) because of failure to meet testing protocols of the Tri-state agreement governing crab quality. Additional tests will be conducted around Dec. 1. If successful, the season could open December 16, with a pre-soak period starting December 13. This delay triggers fair start provisions under Section 8276.3 of the Fish and Game Code.
- The timing of the quality delay has potential to shift fishing effort to the central management area, Fishing Zone 3,4 and 5.

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

- Distribution of anchovy and krill, key forage for Humpback and Blue whales was evident during aerial surveys and vessel-based surveys. Humpbacks were observed lunge feeding near the surface north of the Russian River and west of Point Reyes, Fishing Zone 3.
- High anchovy abundance is expected to drive high density aggregations of Humpback whales during fall 2020. Total krill abundance is expected to increase from below average to above average over the winter months.

Section 132.8(d)(9): Ocean conditions

- La Nina conditions are currently forecast for winter/spring 2021. High habitat compression, reflecting ongoing heatwave conditions and warmer than average sea surface temperature, is anticipated through December 2020.

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

- Impact score calculation under RAMP begins January 1, 2021.

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

- Based on vessel-based and aerial surveys, large numbers of Humpback whales were distributed across Fishing Zones 1, 3 and 4, an indication that the bulk of the migration out of Fishing Grounds has yet to occur. Vessel-based surveys documented continued Blue whale presence in Fishing Zones 1 and 4, though optimal Blue whale habitat is now largely confined to the Southern California Bight based on modeling work.

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

- Fishing Zones 1 and 2: Due to the quality delay in the northern Fishing Zones, CDFW Marine Region staff did not develop a Management Action recommendation. However, Marine Region staff note that based on Cascadia Research vessel-based surveys, the estimated number of Humpback and Blue whales is equal to or exceeds the RAMP triggers of 20 and 3, respectively. During the November 1 and 3 surveys, 85 Humpback and 3 Blue whales were observed in Fishing Zone 1. Fishing industry led pilot surveys also confirmed presence of Humpback and Blue whales in Fishing Zone 1 during a November 11, 2020 observation survey. Based on the Marine Life Concentrations triggers in RAMP, a delay would likely be the recommended Management Action for Zone 1. Zone 2 might have also been subject to a delay to avoid fishing effort shift which could raise the risk of entanglement if the adjacent zones were delayed.

- Fishing Zones 3 and 4: CDFW Marine Region staff's final recommendation is a season delay based on exceedance of Marine Life Concentration triggers for Humpback whales in Fishing Zones 3 and 4 and Blue whales for Fishing Zone 4. Fishing Zone delays are further supported by additional information outlined above under the Management Considerations. Foraging activity by large whales poses a risk of entanglement with vertical lines and surface gear if the season is allowed to begin on December 1, 2020. A season delay is the recommended Management Action based on the wide distribution of Humpback and Blue whales across Fishing Zone depths. A depth restriction or gear reduction would not minimize entanglement risk due to whale distribution and expected high gear concentrations during the season opener. As a result, CDFW Marine Staff preliminary recommendation is a delay of the Fishing Season for Fishing Zones 3 and 4 until the next risk assessment (expected to occur before December 15, 2020).
- Fishing Zone 5: Per 132.8(c)(2)(A)(1), lack of current approved survey or telemetry data in Fishing Zone 6 automatically delays the opening of the Fishing Season in that Fishing Zone until December 15.
- Fishing Zone 6: Per 132.8(c)(2)(A)(1), lack of current approved survey or telemetry data in Fishing Zone 6 automatically delays the opening of the Fishing Season in that Fishing Zone until December 15.

In the event of a delay, CDFW Marine staff recommend the Director notify the fleet as early as possible to allow them to delay gear preparation and plan for a potential delay of the season. CDFW will continue to monitor all available data and work to collect Marine Life Concentration data to inform the next risk assessment (expected to occur before December 15, 2020).

CDFW will continue to collect marine life concentrations data to inform the next risk assessment. CDFW aerial surveys are already planned and CDFW will work with its partners to bring forward as many data streams as possible to help inform the next risk assessment and to ensure a fair and orderly start to the fishery.



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

Date: November 20, 2020

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 has been developed by California Department of Fish and Wildlife (CDFW) Marine Region staff for consideration by the California Dungeness Crab Fishing Gear Working Group for the Risk Assessment Mitigation Program (RAMP; Section 132.8, Title 14, California Code of Regulations) regarding Management Actions to address marine life entanglement risk in the commercial Dungeness crab fishery. Available Data document is posted on the [CDFW Whale Safe Fisheries webpage](#).

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: 1 Humpback whale

Confirmed Entanglements in Unknown Fishing Gear reported from California:

- During the current Fishing Season: 0
- During the current calendar year: 3 Humpback whales

Marine Life Concentrations Surveys and/or Satellite Telemetry Observations:

- Fishing Zone 3: 15 sightings of 29 Humpback whales were observed during CDFW aerial surveys, which exceeds the Marine Life Concentration trigger under *RAMP (c)(2), 20 Humpback whales during a survey*
- Fishing Zone 4: 45 sightings of 74 Humpback whales and 11 sightings of 23 Blue whales on Cascadia Research vessel-based surveys, and a weekly running average of 9.7 sightings based on Monterey Bay Whale Watch data; both surveys exceed the Marine Life Concentration trigger under *RAMP (c)(2), 20 Humpback whales or 3 Blue whales during a survey or a running weekly average of 5 Humpback whales or 3 Blue whales*

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

- RAMP regulations 132.8(c)(2)(A)(4)(a) specify a season delay in the event of a concentration trigger being reached or other management action that the Director demonstrates protects Humpback whales and Blue whales based on the best available science. Based on available data, a season delay is likely to be the most effective Management Action because of the distribution of whales across Fishing Zones 3 and 4.

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

- Early season Management Action(s) have variable economic costs when seasons are delayed. CDFW will continue to work with the fleet to inform this management consideration and have provided recent analytical work in the Available Data document. Current economic considerations include loss of holiday markets, fishing effort shift, poor market conditions (price), crab availability and numerous impacts due to the ongoing COVID pandemic.

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

- Aerial and vessel-based surveys were conducted across Fishing Zones 1, 2, 3, and 4. Additional observation data were contributed for Fishing 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

- Seasonal migration for Humpback whales out of California waters typically occurs in November and early December to Mexico and Central America. Humpback whales are anticipated to migrate from central and northern areas (where high numbers of Humpback whales were observed).
- Trend data from Point Blue Conservation Science indicates fewer whales are being observed in the Gulf of the Farallones, Fishing Zone 3. A concentration of Humpback and Blue whales that has been observed in prior surveys appears to have moved further offshore from the 70m contour closer to the 200m contour.
- Observed Humpback and Blue whale numbers in Fishing Zone 4 (Monterey Bay) remain above average when compared to historical averages based on Monterey Bay Whale Watch data.

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

- No delay anticipated due to public health hazards.
- There is no fair start provision in the event of a delay due to elevated entanglement risk.
- Quality testing protocols apply to Fishing Zones 1 and 2. The Director will likely be delaying the opening in these zones through December 15 because of failure to meet testing protocols of the Tri-state agreement governing crab quality. Additional tests will be conducted around Dec. 1. If successful, the season could open December 16, with a pre-soak period starting December 13. This delay triggers fair start provisions under Section 8276.3 of the Fish and Game Code.

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

- Distribution of anchovy and krill, key forage for Humpback and Blue whales was evident during aerial surveys and vessel-based surveys. Humpbacks were observed lunge feeding near the surface north of the Russian River and west of Point Reyes, Fishing Zone 3.
- High anchovy abundance is expected to drive high density aggregations of Humpback whales during fall 2020. Total krill abundance is expected to increase from below average to above average over the winter months.

Section 132.8(d)(9): Ocean conditions

- La Nina conditions are currently forecast for winter/spring 2021. High habitat compression, reflecting ongoing heatwave conditions and warmer than average sea surface temperature, is anticipated through December 2020.

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

- Impact score calculation under RAMP begins January 1, 2021.

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

- Based on vessel-based and aerial surveys, large numbers of Humpback whales were distributed across several Fishing Zones, an indication that the bulk of the migration out of Fishing Grounds has yet to occur. Vessel-based surveys documented continued Blue whale presence in Fishing Zones 1 and 4, optimal Blue whale habitat is now largely confined to the Southern California Bight based on modeling work.

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

- Fishing Zones 3 and 4: CDFW Marine Region staff's preliminary recommendation is a season delay based on exceedance of Marine Life Concentration triggers for Humpback whales in Fishing Zones 3 and 4 and Blue whales for Fishing Zone 4. Fishing Zone delays are further supported by additional information outlined above under the Management Considerations. Foraging activity by large whales poses a risk of entanglement with vertical lines and surface gear if the season is allowed to begin on December 1, 2020. A season delay is the recommended Management Action based on the wide distribution of Humpback and Blue whales across Fishing Zone depths. A depth restriction or gear reduction would not minimize entanglement risk due to whale distribution and expected high gear concentrations during the season opener. As a result, CDFW Marine Staff preliminary recommendation is a delay of the Fishing Season for Fishing Zones 3 and 4 until the next risk assessment (expected to occur before December 15, 2020).
- Fishing Zone 5: CDFW Marine staff continue to review available data for Fishing Zone 5. The whales observed in Fishing Zones 3 and 4 are expected to begin their migration and may transit through Fishing Zone 5 and 6. Potential Management Actions for Zone 5 include Fleet Advisory or delay of the season until the next risk assessment (expected to occur before December 15, 2020). Additionally, as noted above, there is no fair start for delays under RAMP. Delaying the season opener for all three Fishing Zones will

ensure a fair and orderly opening for those zones and prevent concentration of effort and increased entanglement risk in this zone.

- Fishing Zone 6: Per 132.8(c)(2)(A)(1), lack of current approved survey or telemetry data in Fishing Zone 6 automatically delays the opening of the Fishing Season in that Fishing Zone until December 15.

In the event of a delay, CDFW Marine staff recommend the Director notify the fleet as early as possible to allow them to delay gear preparation and plan for a potential delay of the season. CDFW will continue to monitor all available data and work to collect Marine Life Concentration data to inform the next risk assessment (expected to occur before December 15, 2020).

2020-21 Risk Assessment: Available Data

Last updated: November 24¹, 2020

TRIGGERS REQUIRING MANAGEMENT ACTION

Section 132.8(c)(1): Confirmed Entanglements

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

Evaluation of RAMP Triggers (by CDFW)

Total number of Confirmed Entanglements in California Commercial Dungeness Crab Gear:

- During the current Fishing Season: NA
- During the current calendar year: 1 Humpback whale

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

- During the current Fishing Season: NA
- During the current calendar year: 3 Humpback whales

Summary of All West Coast 2020 Entanglements (by NMFS)

Total entanglements for calendar year 2020:

- 16 confirmed (10 Humpback whales, 5 Gray whales, and 1 Sperm whale)
- 9 unconfirmed (3 Humpback whales, 4 Gray whales, and 2 unidentified whales)

Total entanglements for calendar year 2020 (January 1 to November 13) by species:

- Humpback whales: 10 confirmed entanglements
 - o One confirmed Humpback whale entanglement involved California commercial Dungeness crab gear; the gear was set in Zone 3 (Bodega Bay to Point Reyes, 38-45 fathoms) and reported in Zone 4
- Blue whales: 0 confirmed entanglements
- Leatherback sea turtles: 0 confirmed entanglements

¹ Updates were made following the Working Group discussion on November 23 to incorporate additional survey information.

Additional details regarding confirmed Humpback whale entanglements (all entanglement reports are subject to further review):

- Feb 14, 2020: reported off San Diego (Zone 6), entangled with gillnet
- Feb 28, 2020: reported off Monterey (Zone 4), entangled with unidentified gear (line only)
- April 13, 2020: reported off Santa Barbara (Zone 6), entangled with CA spot prawn gear
- April 15, 2020: reported off Orange county (Zone 6), entangled with gillnet
- May 16, 2020: reported off Monterey (Zone 4), entangled with CA commercial Dungeness crab gear (set in Zone 3)
- June 13, 2020: dead stranding in Marin county (Zone 3), entangled with OR commercial Dungeness crab gear
- July 3, 2020: reported off Monterey (Zone 4), entangled with unidentified gear (line only)
- July 30, 2020: reported off Oregon, entangled with unidentified gear (line + buoys)
- Aug 31, 2020: reported off Washington, entangled with unidentified gear (line only)
- Oct 13, 2020: reported off Monterey (Zone 4), entangled with unidentified gear (line only)

[Section 132.8\(c\)\(2\): Marine Life Concentrations](#)

Data provided by: Scott Benson (NOAA), Monterey Bay Whale Watch (processed by Karin Forney, NOAA), John Calambokidis (Cascadia Research), California Department of Fish and Wildlife

[Leatherback Sea Turtle Observations and Satellite Telemetry – Fishing Zone 7](#)

- No new data are available; see [Available Data](#) prepared for the November 3, 2020 Working Group discussion for the most recent summary.

[Monterey Bay Whale Watch – Fishing Zone 4](#)

- Commercial MBWW whale-watching trips have been conducted from Monterey throughout the summer and fall. Karin Forney has standardized these research trips to the same ‘whales per half-day-trip’ unit used in previous summaries.
- The number of documented Humpback whales has been variable during the summer and early fall (Figure 1). The two most recent 7-day averages are 14.6 whales per half-day-trip during Nov 1-7 and 9.7 whales per half-day-trip during Nov 8-14. The 14-day average of 12.2 is similar to the previous 11.4 whales during Oct 14 – 27.
- There have been no documented sightings of Blue whales since Oct 9-10.

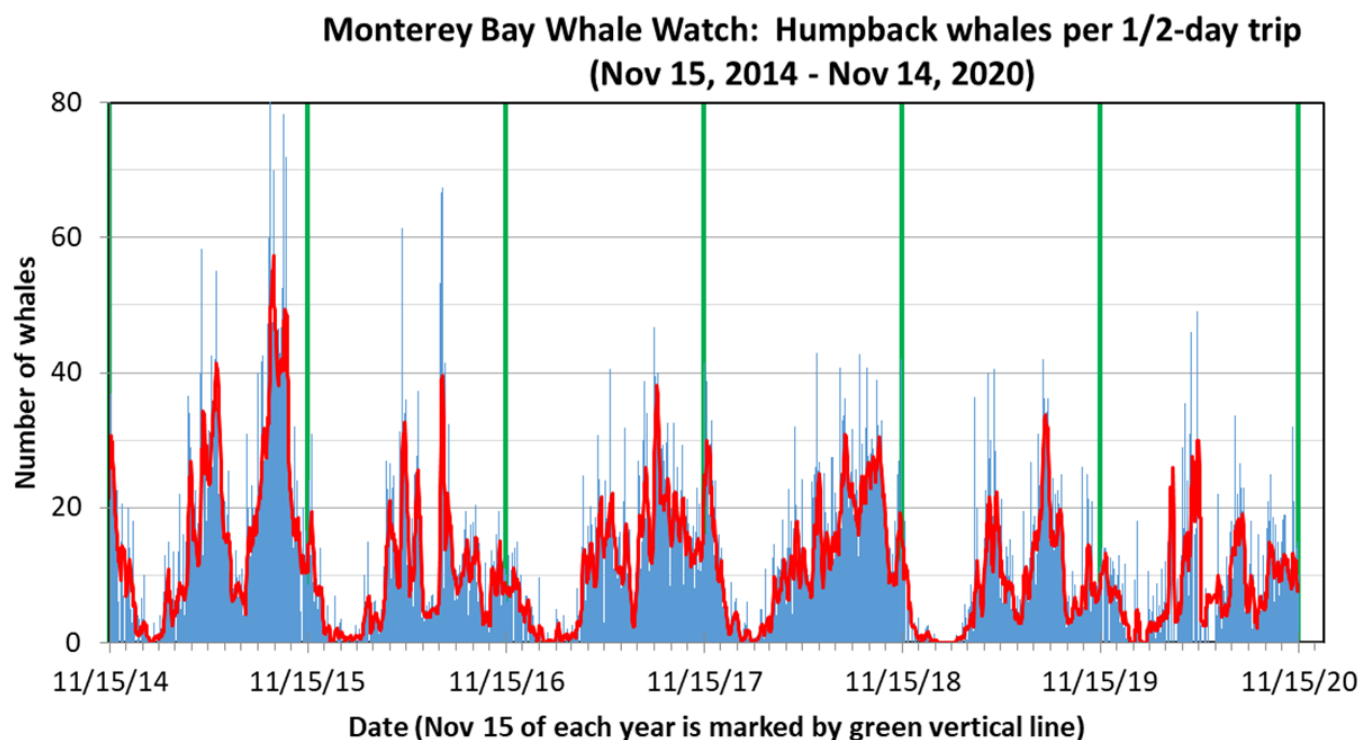


Figure 1. Standardized number of Humpback whale sightings from 15 November 2014 – 14 Nov 2020 for Monterey Bay Whale Watch. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns a bit easier to see. A vertical green line has been added at November 15 of each year for reference. Each tick mark is one month.

Cascadia Research, SR3 and The Marine Mammal Center – *Fishing Zones 1, 3 and 4*

Fishing Zone 1

- Small boat surveys were conducted out of Eureka on November 1-2 covering mostly transect effort along the 70 and 200m depth from just north of Eel River Canyon up to north of Patrick's Point. Small boat surveys were conducted out of Crescent City on November 3 covering from just south of the Klamath River up to near the Oregon Border. Fog and lowered visibility hampered many sections of the effort, so coverage was not complete.
- There were frequent sightings of Humpback whales during both surveys out of Eureka; sightings were primarily near the 70m depth contour but also at other depths (Figure 2). An estimated 78 Humpback whales and 3 Blue whales were seen during these two days of surveys, with an additional 19 unidentified whales (Table 1).
- Sightings out of Crescent City were more limited. The highest concentration of Humpback whales was near the Oregon border, though swell was a limiting factor.
- Humpback whales are suspected to be primarily feeding on fish, consistent with the higher sighting rate along the 70m depth out of Eureka.
- Some photo-identification was completed for both Humpback and Blue whales.

Table 1. Summary of effort and sightings during small boat survey off northern California on November 1-3 2020.

Date	Region	Trans/O pp	Humpbacks			Blue whales			Unident. Whales	
			Sight	Anim	Photo- IDs	Sight	Anim	Photo- IDs	Sight	Anim
01-Nov-20	Eureka area	70m	24	43		1	2	1	10	12
01-Nov-20	Eureka area	200m	4	8		1	1		5	6
01-Nov-20	Eureka area	Opp	7	17	4					
02-Nov-20	Eureka area	200m	3	4					1	1
02-Nov-20	Eureka area	Opp	1	6	1					
03-Nov-20	Crescent City area	70m							2	4
03-Nov-20	Crescent City area	200m							3	3
03-Nov-20	Crescent City area	Opp	4	7					3	3
Grand Total			43	85	5	2	3	1	24	29

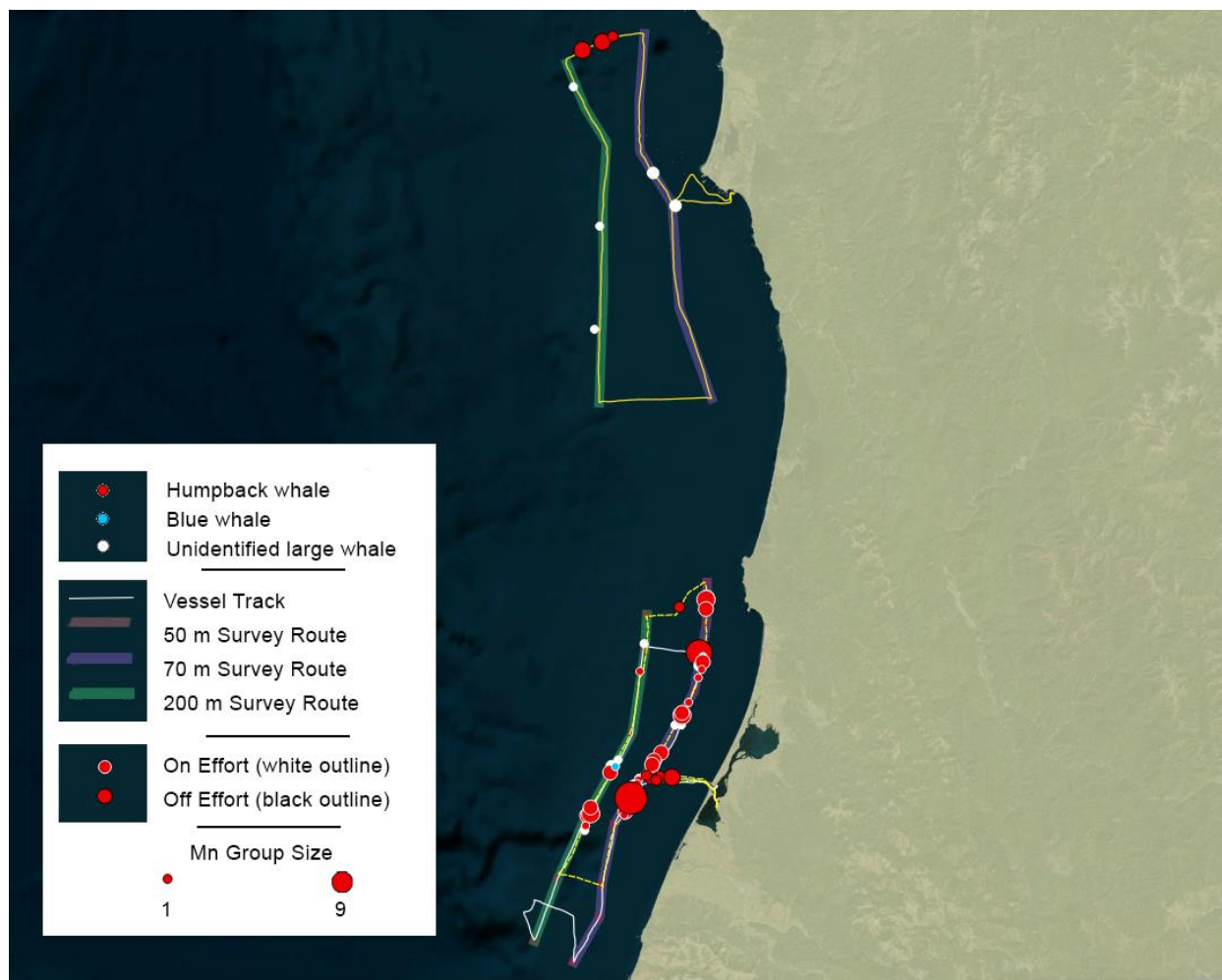


Figure 2. Map of effort and sightings from small boat surveys on 1-3 November 2020 off Northern California.

Fishing Zones 3 and 4

The November 13 survey covered transect effort along the 70m and 200m line within Fishing Zone 4 from west of Año Nuevo down to a little south of Monterey Bay (see Table 2 and Figure 3). Humpback whales were sighted along a broad area of the survey route with animals both to the northwest of and in Monterey Bay.

- Humpback whales were more concentrated closer to the 200m depth contour than the 70m. This represents a shift from the surveys in October ([see Available Data from 11/3/2020](#)) when they were not as concentrated near the 200m shelf edge.
- A concentration of Blue and Humpback whales was found near the shelf edge west of Año Nuevo. This is similar to what was seen in October and represents an area of persistent occurrence.
- There was greater evidence of Humpback whales feeding on krill than in previous surveys. However it appeared fish feeding was still occurring in some areas, especially inside Monterey Bay.

Table 2. Effort and sightings from survey by Nova in Monterey Bay area on November 13 2020.

Trans/Opp	Transect Nmi	Humpbacks			Blue whales			Unident. Whales	
		Sight	Anim	Photo-IDs	Sight	Anim	Photo-IDs	Sight	Anim
70m	48	5	8	0	0	0	0	2	2
200m	58	25	47	7	3	4	0	11	15
Opp		15	19	14	8	19	9	1	2
		45	74	21	11	23	9	14	19

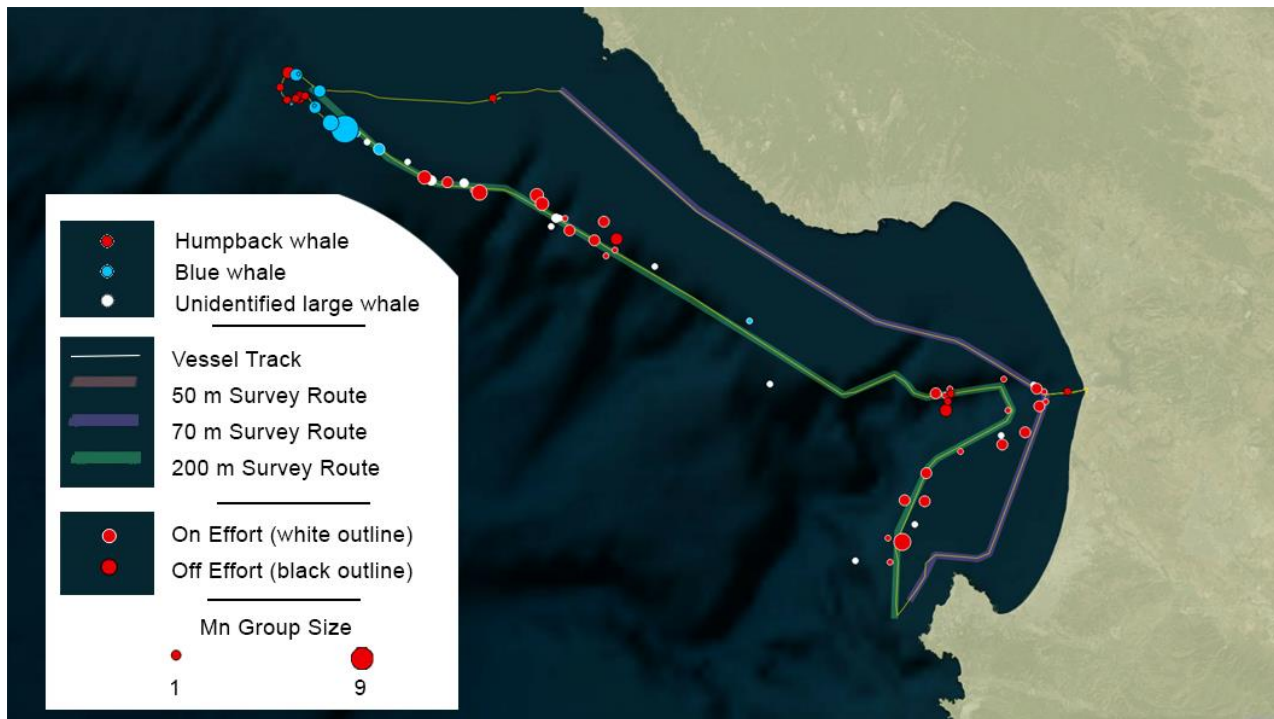


Figure 3. Survey from Nova on November 13 2020.

An additional survey on November 20 and 21 covered transect effort within Fishing Zones 3 and 4 along the 70m and 200m transects between Moss Landing and Point Reyes (see Table 3 and Figure 4).

Table 3. Effort and sightings from survey on November 20 and 21, 2020.

Date	Region	Trans /Opp	Trans Nmi	Humpbacks			Blue whales			Unident. Whale	
				Sight	Anim	Photo- IDs	Sight	Anim	Photo- IDs	Sight	Anim
By day and type of effort											
20-Nov-2020	Moss Landing to HMB	70m	57	3	3	1	1	1	0	1	1
20-Nov-2020	Moss Landing to HMB	Opp		4	4	3	0	0	0	1	1
21-Nov-2020	HMB-Pt Reyes-Moss Landing	70m	30	1	1	0	0	0	0	1	1
21-Nov-2020	HMB-Pt Reyes-Moss Landing	200m	79	10	24	0	0	0	0	5	10
21-Nov-2020	HMB-Pt Reyes-Moss Landing	Opp		23	119	45	0	0	0	2	15
	Totals			41	151	49	1	1	0	10	28
By Zone											
20-21-Nov-2020	Zone 3 (N of 37 11'N)			31	138	48	0	0	0	5	9
20-21-Nov-2020	Zone 4 (S of 37 11'N)			10	13	1	1	1	0	5	19
	Totals			41	151	49	1	1	0	10	28

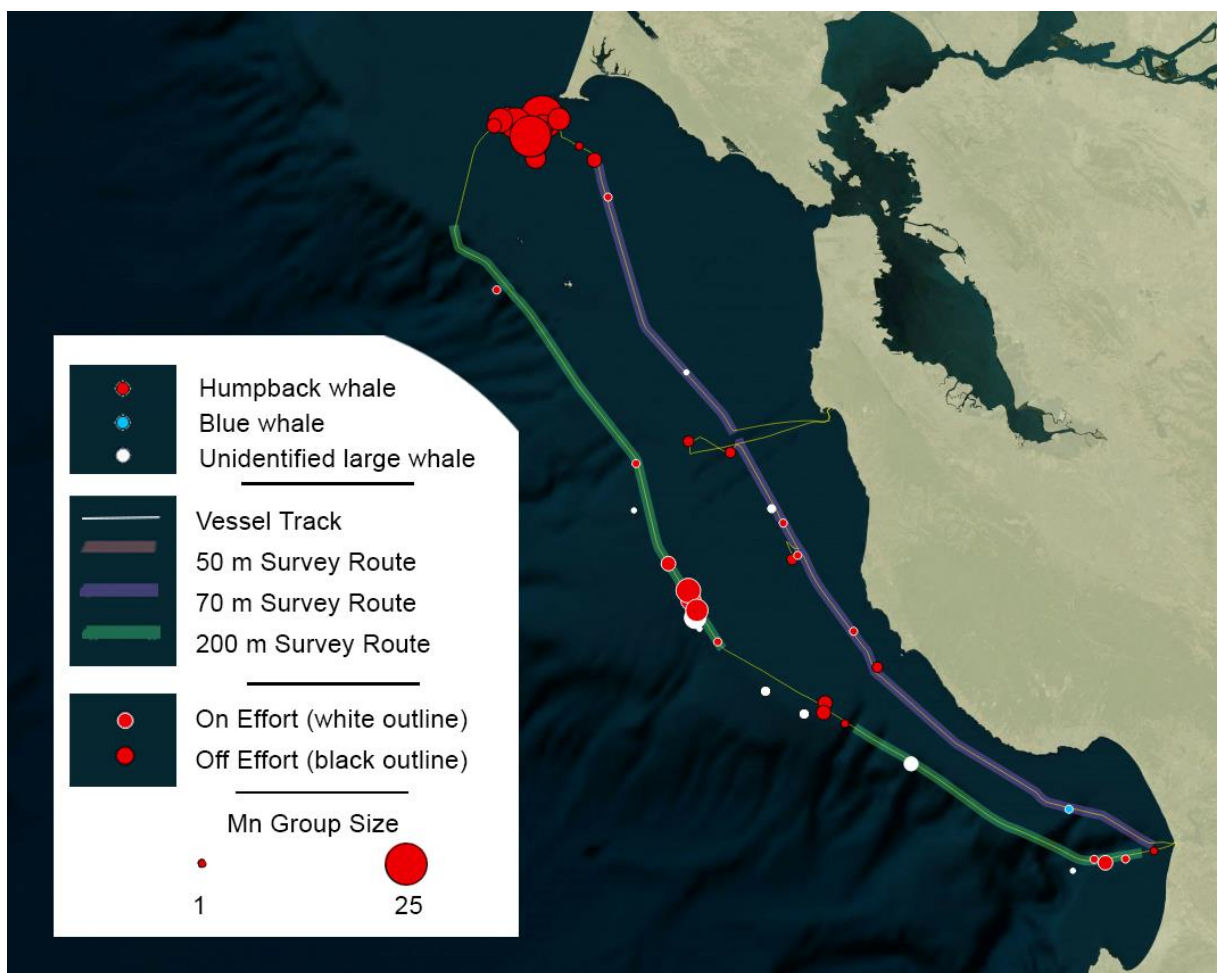


Figure 4. Map of effort and sightings from small boat surveys on November 20-21 2020 in Central California.

CDFW Aerial Survey – Fishing Zones 2 and 3

CDFW staff conducted aerial surveys beginning at Tomales Point and flew north to Cape Mendocino on November 16, 2020. No whales were observed in Fishing Zone 2. Humpback whales were observed in an area north of the Russian River. Fog and low clouds were

encountered at Cape Mendocino. The survey crew then flew back to Point Reyes to cover the east/west transect lines from Point Reyes to Pigeon Point. Humpback whales were observed in an area south of Point Reyes toward the Farallon Islands. In Fishing Zone 3, there were 15 observations of Humpback whales, with a total of count 29 and 1 observation of an unidentified large whale (Figure 5).

CDFW staff conducted a limited aerial survey from Bodega Bay to Point Pinos on November 19, 2020. Most of the survey area was obscured due to fog or wind waves resulting in very limited observation of Fishing Zones 3 and 4. Due to the poor survey conditions, results cannot be used to inform the November 23 risk assessment.

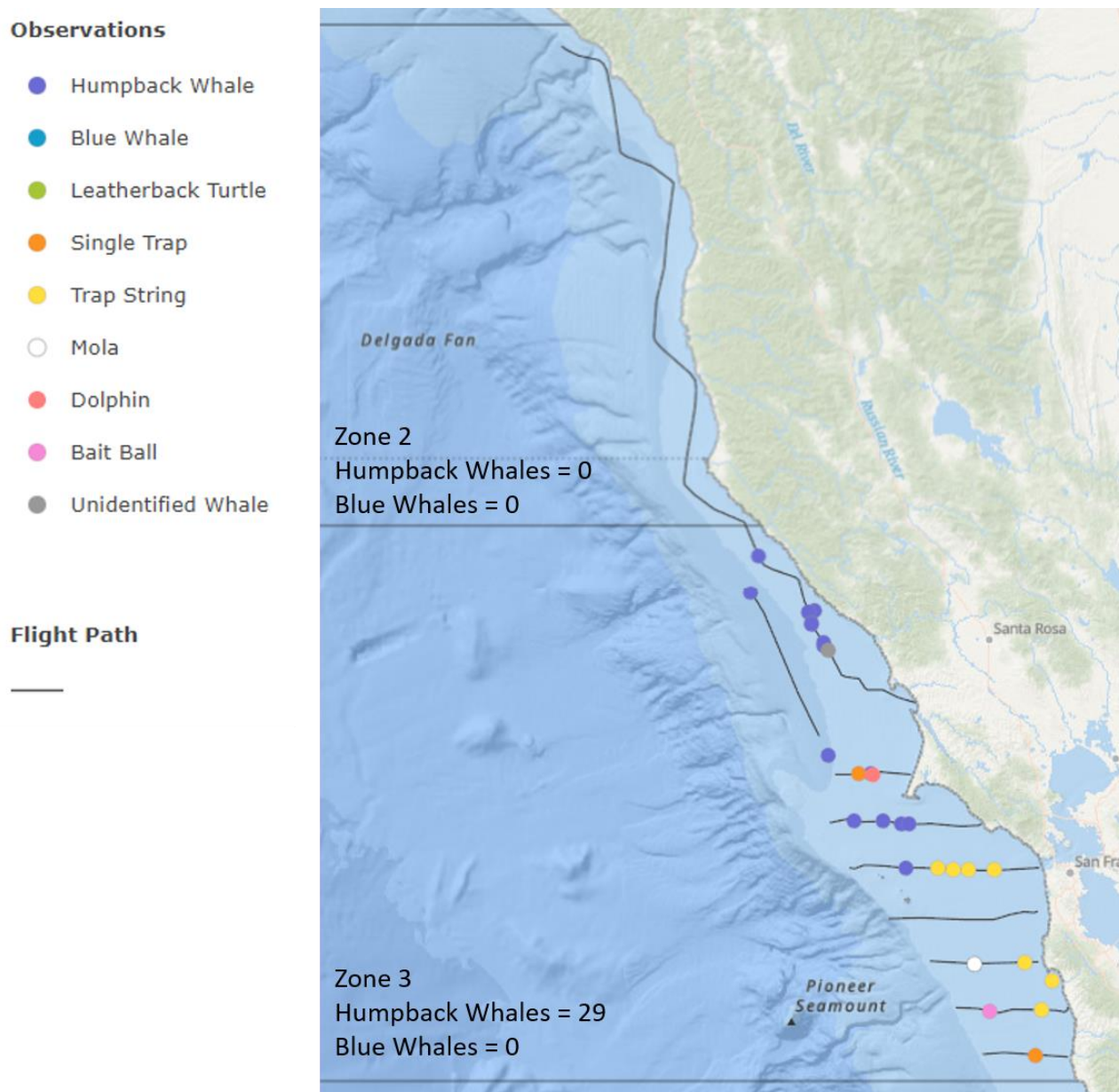


Figure 5. Flight path and observations during CDFW aerial survey in Fishing Zones 2 and 3 on November 16, 2020. Fishing Zone 3 = 29 Humpback whales and 0 Blue whales. No large whales were observed in Fishing Zone 2.

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

Data provided by: California Department of Fish and Wildlife

The following summaries of the nine port complexes (Figures 6-8) are being provided by request from members of the Working Group to understand how total landings, total value and average price change each week from the scheduled season start date of November 15 for the recent four seasons of the fishery from 2016-2017 to 2019-2020. In addition, summary tables of total landings, total value and average price (Tables 4-6) by season for each management area and statewide are being provided as reference to understand how the seasons used in the analysis compare to one another.

The 2016-2017 season opened on time however some smaller areas within the Central Management Area (CMA) continued to be delayed due to domoic acid with the last area opening on December 24, 2016. Areas in the Northern Management Area (NMA) continued to be delayed with the last area opening on January 16, 2017. In 2017-2018, the NMA was delayed due to quality until January 15, 2018 with the fleet voluntarily continuing to wait until crab condition improved until the first week of February. The 2018-2019 season was delayed due to domoic and quality. Most of the CMA opened on time except for one area being delayed due to domoic acid until December 8, 2018. The NMA was delayed due to quality until January 15, 2019 with one remaining area opening 10 days later on January 25, 2019 due to domoic acid. For the 2019-2020 season, the CMA was delayed due to marine life entanglement risk until December 15, 2019. The NMA was delayed due to quality until December 31, 2019. Both the 2018-2019 and 2019-2020 seasons had all or parts of the fishery closed early due to marine life entanglement risk.

The first set of four graphs (Figure 6) shows total landings in pounds for the first 12 weeks from November 15 to February 6 with the last bar graph representing the total remainder of landings until the end of the season. The chronological order of seasons is arranged with the most recent season 2019-2020 at the bottom. The next set of four graphs (Figure 7) shows total ex-vessel value and finally the last set (Figure 8) shows average price per pound. Data points that are missing were either absent or removed due to confidentiality.

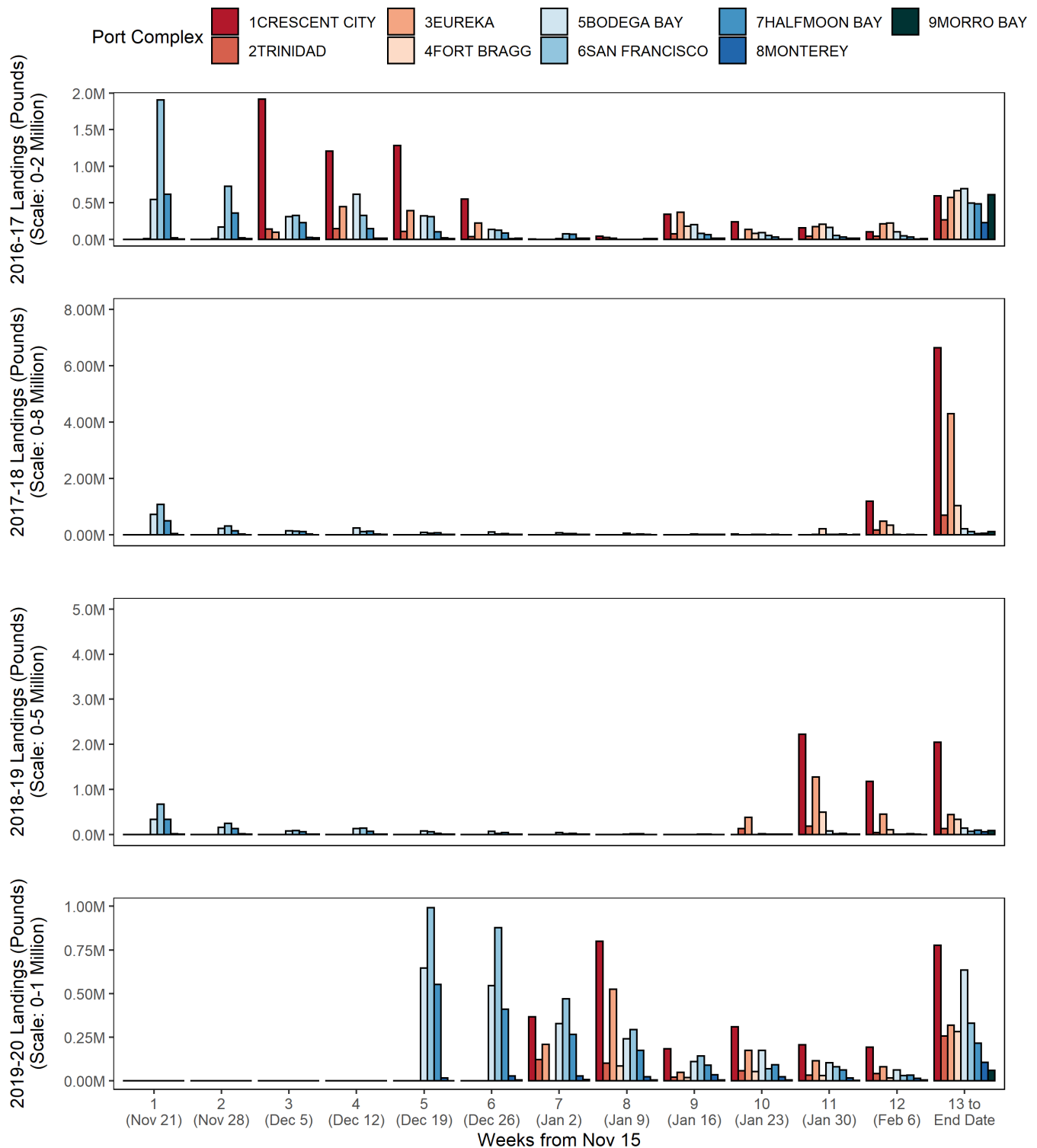


Figure 6. Total landings in pounds for each major port complex by week from Nov. 15 until Feb. 6 with the last bars representing all remaining weeks until the end date of the season. The last four seasons are shown: 2016-2017 (top panel), 2017-2018 (2nd top panel), 2018-2019 (3rd top panel), and 2019-2020 (bottom panel).

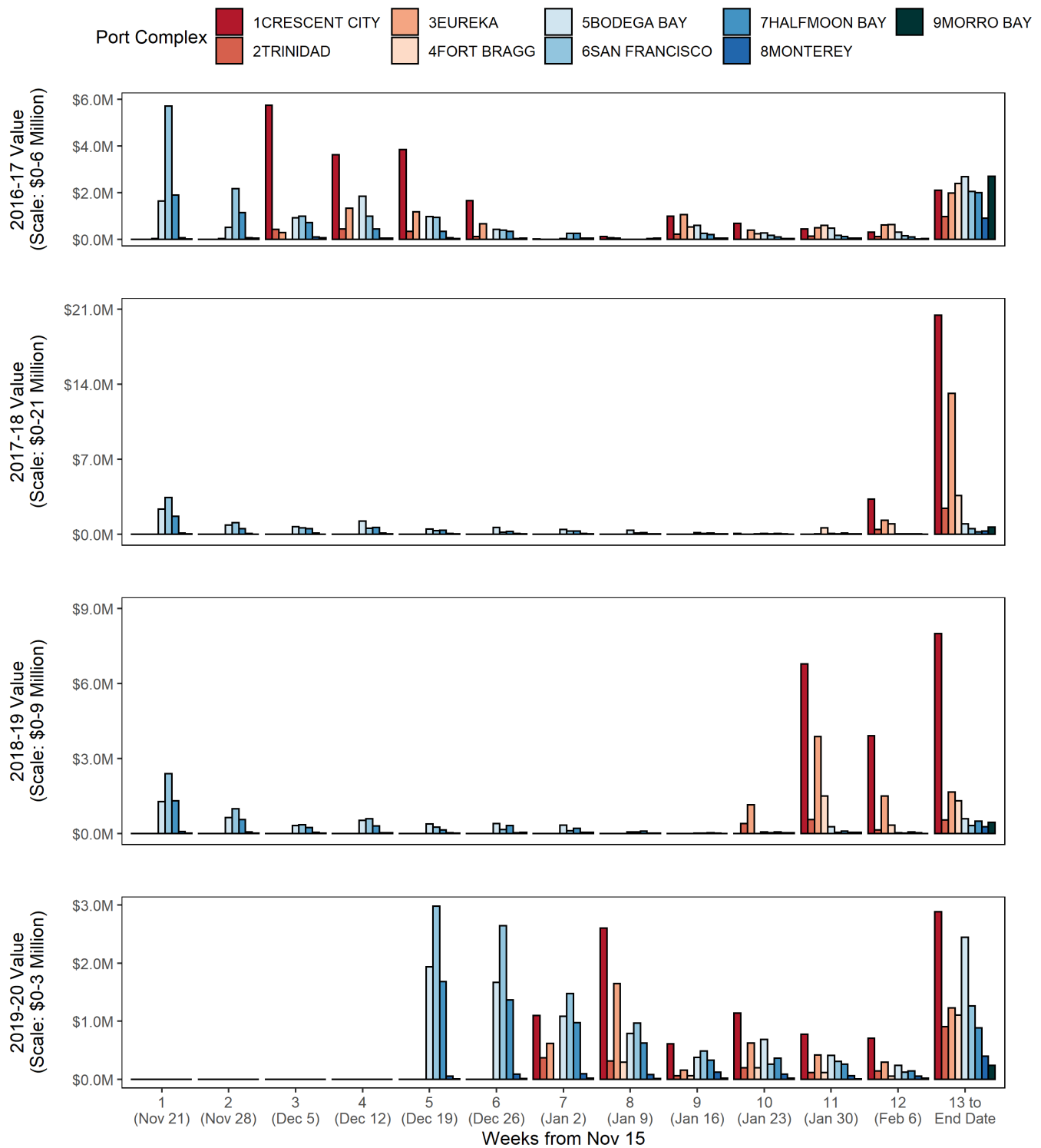


Figure 7. Total ex-vessel value for each major port complex by week from Nov. 15 until Feb. 6 with the last bars representing all remaining weeks until the end date of the season. The last four seasons are shown: 2016-2017 (top panel), 2017-2018 (2nd top panel), 2018-2019 (3rd top panel), and 2019-2020 (bottom panel).

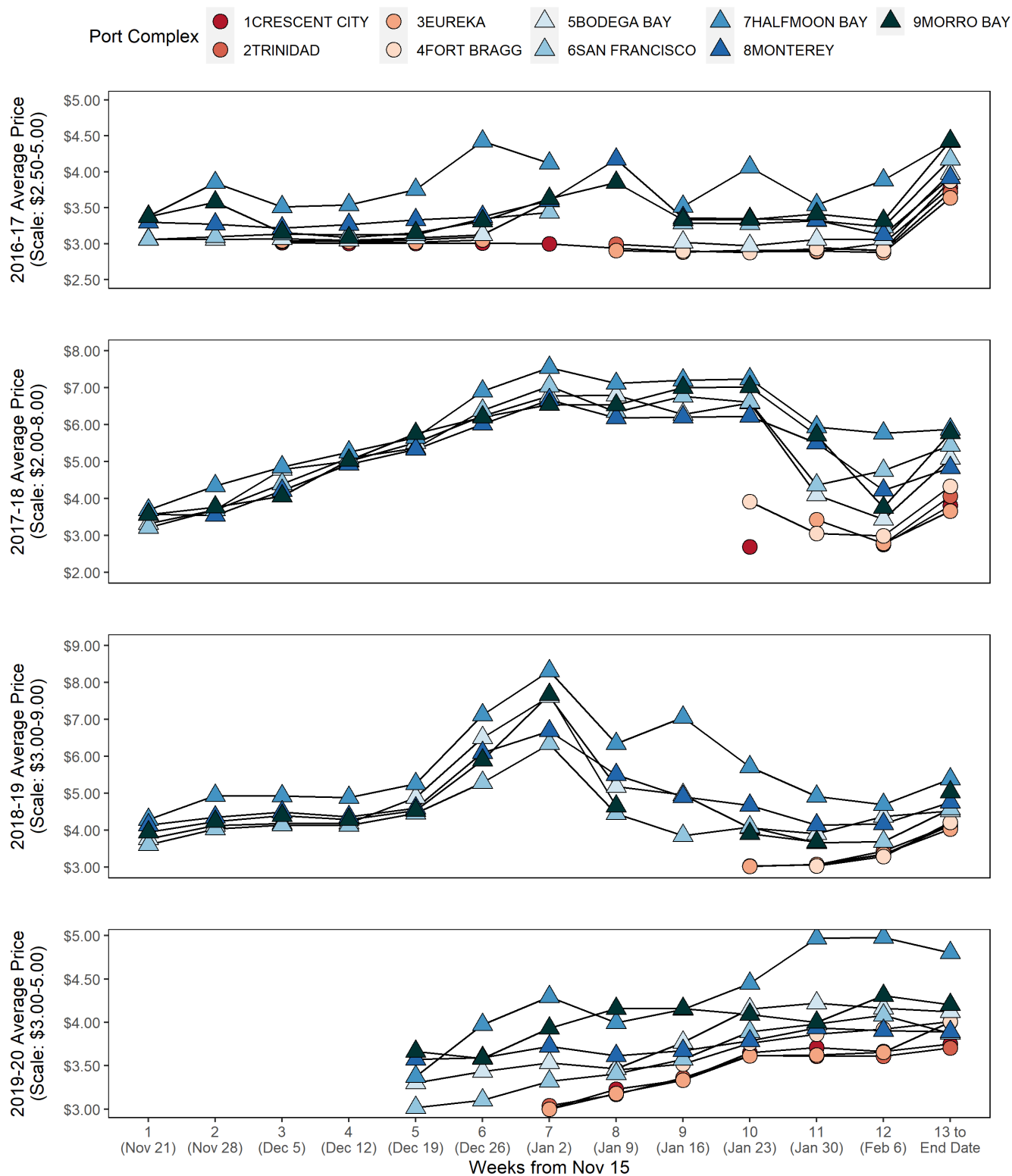


Figure 8. Average price per pound for each major port complex by week from Nov. 15 until Feb. 6 with the last bars representing all remaining weeks until the end date of the season. The last four seasons are shown: 2016-2017 (top panel), 2017-2018 (2nd top panel), 2018-2019 (3rd top panel), and 2019-2020 (bottom panel).

Table 4. Total landings in pounds between 2016-2017 and 2019-2020 seasons.

Season Landings (Pounds)	Northern	Central	Total Statewide
2016-2017	11,410,366	11,239,929	22,650,295
2017-2018	15,116,607	5,335,955	20,452,562
2018-2019	9,417,096	3,686,722	13,103,818
2019-2020	5,372,196	8,383,652	13,755,848

Table 5. Total value between 2016-2017 and 2019-2020 seasons.

Season Total Value (\$)	Northern	Central	Total Statewide
2016-2017	\$35,119,934	\$37,070,433	\$72,190,367
2017-2018	\$46,477,453	\$22,566,092	\$69,043,545
2018-2019	\$31,610,645	\$15,525,166	\$47,135,811
2019-2020	\$18,604,768	\$28,161,855	\$46,766,622

Table 6. Average price per pound between 2016-2017 and 2019-2020 seasons.

Season Average Price Per Pound (\$)	Northern	Central	Total Statewide
2016-2017	\$3.33	\$3.69	\$3.52
2017-2018	\$3.78	\$5.09	\$4.39
2018-2019	\$3.69	\$4.81	\$4.25
2019-2020	\$3.66	\$3.91	\$3.80

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

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

Monterey Bay Whale Watch – Fishing Zone 4

- Compared to historical patterns (Figure 9), the most recent Humpback whale numbers are above-average.
- There have been no documented sightings of blue whales since Oct 9-10, which is consistent with their expected late fall migration away from the California feeding grounds (Figure 10).

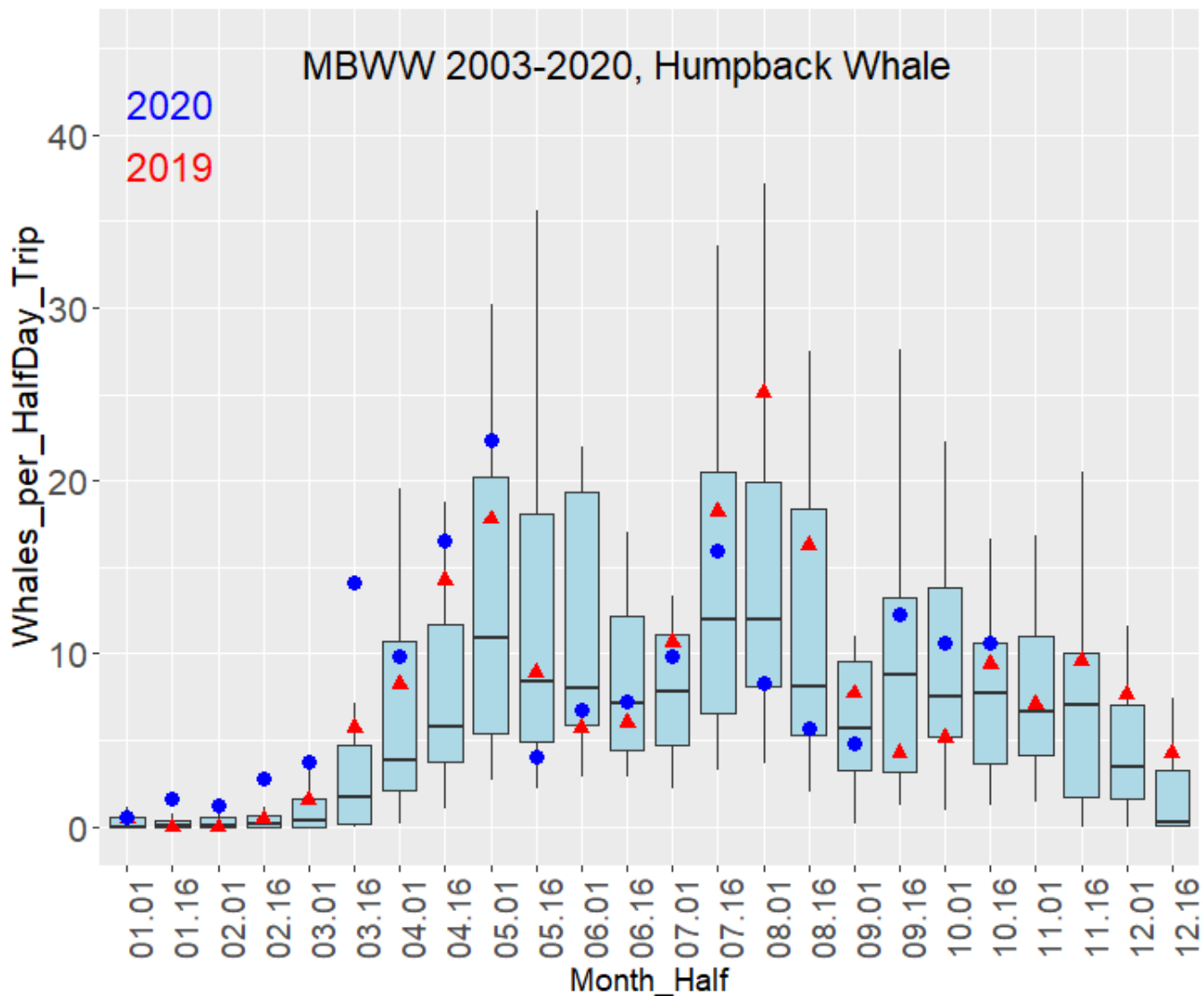


Figure 9. Historical Monterey Bay Whale Watch data for 2003-2020, summarizing the average and variation in the number of Humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2019 (red triangles) and 2020 (large blue dots) are provided for reference, placing recent whale numbers in a historical context.

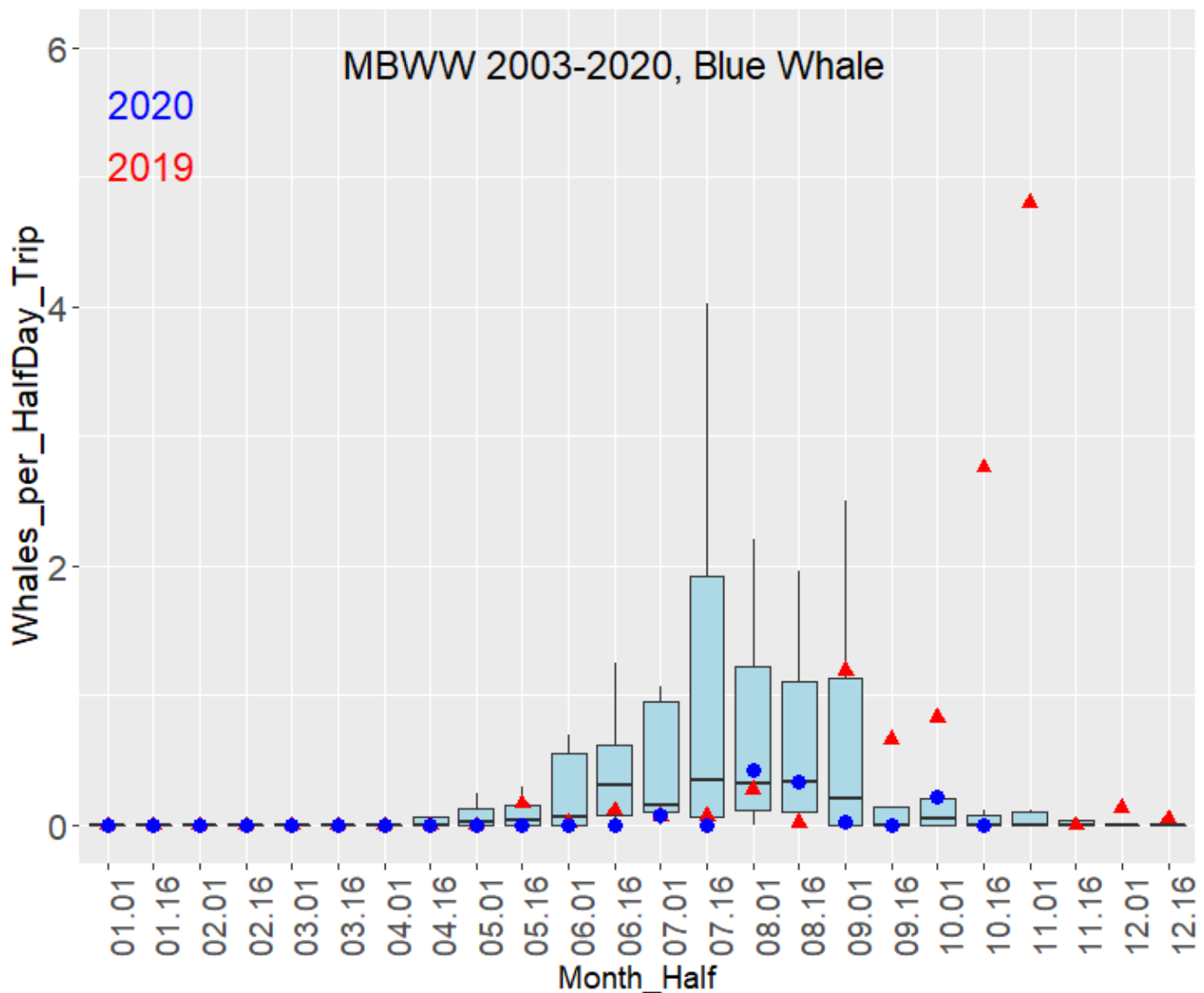


Figure 10. Historical Monterey Bay Whale Watch data for 2003-2020, summarizing the average and variation in the number of Blue whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2019 (red triangles) and 2020 (large blue dots) are provided for reference, placing recent whale numbers in a historical context.

Cascadia Research, SR3 and The Marine Mammal Center – *Fishing Zone 4*

Preliminary analysis of the 345 Humpback whales identified during surveys from October 27-29 off Central California revealed at least 106 unique individuals (additional animals being matched). So far only 10 of these 106 whales were identified on more than one day, which is consistent with the suspected large number in the area. Breeding areas have been identified for at least 18 of these whales and include Central America (Costa Rica and Nicaragua) and different areas of Mexico (including southern Mexico which may be part of the Central America DPS).

Data provided by: California Department of Fish and Wildlife in collaboration with industry and California Department of Public Health

Domoic Acid Testing – Fishing Zones 1-5

All sites have passed (Figure 11).

CDPH SUMMARY OF DOMOIC ACID LEVELS IN CRABS				JULY 1, 2020 - OCTOBER 28, 2020							
PORT	AREA	SAMPLE COLLECTION DATE	CRAB TYPE VISCERA	INDIVIDUAL SAMPLE RESULTS (FDA ACTION LEVEL >30 PPM)						AVERAGE LEVEL (Information Only)	PERCENT OF SAMPLES EXCEEDING ACTION LEVEL
Crescent City	George Reef	10/8/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	4.9	<2.5	0.8	0%
	Klamath River	10/8/2020	Dungeness	6.1	3.1	<2.5	<2.5	<2.5	<2.5	1.5	0%
Trinidad	Lagoons	9/18/2020	Dungeness	6.8	3.1	8.0	<2.5	<2.5	<2.5	3.0	0%
	Trinidad Head	9/18/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detected	0%
	LP Eureka	9/29/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	5.0	3.7	1.5	0%
Eureka	Eel River	9/29/2020	Dungeness	3.3	4.7	4.6	<2.5	<2.5	<2.5	2.1	0%
Fort Bragg	Usal	10/13/2020	Dungeness	<2.5	<2.5	2.9	<2.5	<2.5	3.1	1.0	0%
Fort Bragg	Manchester Beach	10/17/2020	Dungeness	3.6	<2.5	<2.5	<2.5	<2.5	<2.5	0.6	0%
Bodega Bay	Salt Point	9/30/2020	Dungeness	<2.5	<2.5	<2.5	19	<2.5	<2.5	3.2	0%
	Russian River	9/30/2020	Dungeness	<2.5	<2.5	<2.5	12	<2.5	18	5.0	0%
	Bodega Head	9/20/2020	Dungeness	<2.5	26	10	13	4.1	<2.5	8.9	0%
	Point Reyes	9/20/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	26	4.3	0%
Half Moon Bay/ San Francisco	Duxbury Reef	9/29/2020	Dungeness	46	<2.5	5.6	3.7	2.6	<2.5	9.7	17%
	Duxbury Reef	10/6/2020	Dungeness	4.8	9.2	<2.5	6.8	5.1	9.2	5.9	0%
	Duxbury Reef	10/14/2020	Dungeness	4.4	<2.5	2.9	<2.5	<2.5	5.8	2.2	0%
	HMB/Pillar Point	10/5/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detected	0%
	Pigeon Point	10/5/2020	Dungeness	<2.5	2.7	<2.5	<2.5	<2.5	<2.5	0.5	0%
Monterey	Monterey Bay	9/30/2020	Dungeness	5.1	13	4.6	<2.5	<2.5	8.1	5.1	0%
	Monterey Bay	9/30/2020	Rock*	9.5	27	NA	NA	NA	NA	18.3	0%
Morro Bay	Avila Beach	10/15/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detected	0%

*Only 2 crabs available

1 SET = 6 SAMPLES

Figure 11. Domoic acid testing results for Dungeness and rock crab as of October 28, 2020. [See updated results.](#)

Quality Testing – Fishing Zones 1 and 2

For initial testing results, [see Available Data from 11/3/2020](#).

An additional test occurred on November 11 and 12 at Crescent City and Eureka. The number of test pots was increased by 2/3 from the original number and still total pounds did not meet the minimum requirement, while the meat quality again yielded crab above the criteria (Figure 12). Based on insufficient test results at this time, Tri-State managers have agreed to delay the fishery within the Tri-State region that includes the Northern Management Area until December 16 based Available Data, November 23, 2020 Working Group Discussion

on the authority stated under Fish and Game Code Section 8276.2. An additional round of testing at all 3 sites will be scheduled on or around December 1 while the next call with Tri-State managers will be scheduled around December 7.

2020 Preseason Coastal Dungeness crab Test Fishery Results for WA, OR and CA

* Date is the date the pots were pulled

		Optional Early Round		Round 1		Round 2		Round 3	
Test Area	Number of pots	Date*	Meat Recovery %	Date*	Meat Recovery %	Date*	Meat Recovery %	Date*	Meat Recovery %
Washington									
Northern		no test	no test	no test	no test				
Westport		10/22/20	19.6%	11/9/20	21.8%				
Long Beach		10/23/20	18.7%	11/9/20	21.8%				
Oregon									
Astoria (50-A)	18	no test	no test	11/9/20	21.6%				
Garibaldi (50-B)	18	no test	no test	11/9/2020 **~	24.8%				
Newport North (50-C and 50-D)	36	no test	no test	11/9/20	25.1%				
Newport South (50-E and 50-F)	36	no test	no test	11/10/20	23.5%				
Coos Bay North (50-G and 50-H)	36	no test	no test	11/9/2020 ~	26.4%				
Coos Bay South (50-I and 50-J)	36	no test	no test	11/12/2020 ~	24.9%				
Port Orford (50-K)	18	no test	no test	11/9/2020 **	23.9%				
Brookings (50-L)	18	11/9/2020 ^	25.6%	11/12/2020 ^**	25.3%				
California									
Crescent City	36/60	10/27/2020 **	25.1%	11/12/2020 **	26.8%				
Trinidad	36	10/27/2020 **	25.2%	TBD	TBD				
Eureka	36/60	10/27/2020 **	25.6%	11/12/2020 **	24.8%				
District 10 (not bound by Tri-State)									
Bodega Bay	no test	no test	no test	no test	no test				
San Francisco	no test	no test	no test	no test	no test				

**below 300lb minimum poundage

^ The first test (reported above in the early round column) was significantly below 150lbs allowed for a test area with 18 pots. In the re-do of this test area 45 pots were set due to the significantly low poundage.

~ less than a 24hr soak time

Figure 12. Quality testing results for Dungeness crab as of November 17, 2020. [See updated results.](#)

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

Data provided by: Jarrod Santora and Isaac Schroeder (NOAA Fisheries, Southwest Fisheries Science Center and University of California Santa Cruz), John Calambokidis (Cascadia Research)

NOAA Ecosystem Surveys – All Fishing Zones

NOAA Fisheries ecosystem surveys indicate significant elevated anchovy abundance in coastal and offshore waters (throughout the shelf and outer slope), Anchovy abundance and high density aggregation continue to be high for consecutive years and should be anticipated throughout winter and spring 2021. Total krill abundance is below average and likely trending to above average over the winter (Figure 13).

Recent surveys of marine life concentrations (e.g., Cascadia Research vessel surveys) indicate significant elevated abundance and aggregations of Humpback whales on the shelf, especially the mid-shelf (associated with anchovy schools). Given the Habitat Compression Index in late fall

2020 is high (low and restricted cool habitat) and anchovy concentrations are high, high density aggregations of Humpbacks whales should be anticipated. At this time, changes in anchovy distribution and abundance, or major declines, are not expected in the coming months.

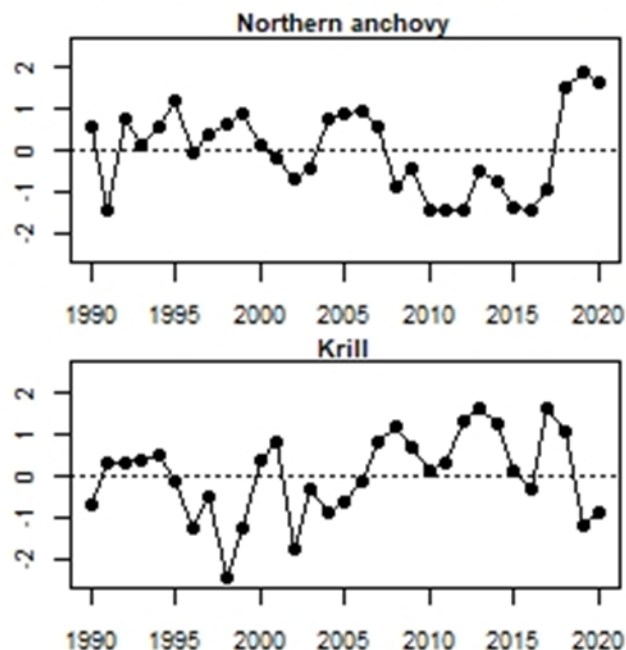


Figure 13. Updated California Current Integrated Ecosystem Assessment (CCIEA) ecosystem indicators: NOAA-NMFS Rockfish Recruitment and Ecosystem Survey (RREAS) 2020 Catch-per-unit-effort (CPUE) anomaly estimates for (top) northern anchovy and (bottom) total krill abundance, as per Santora et al. 2020 (Nature Communications).

Cascadia Research, SR3 and The Marine Mammal Center – *Fishing Zone 4*

A tagged Blue whale from the October surveys moved to the area of blue whale concentration west of Año Nuevo and was feeding on deep layers of krill near the shelf edge during the day and one night (Figure 14).

For forage observations during November surveys in Fishing Zones 1 and 2, see the Marine Life Concentrations section above.

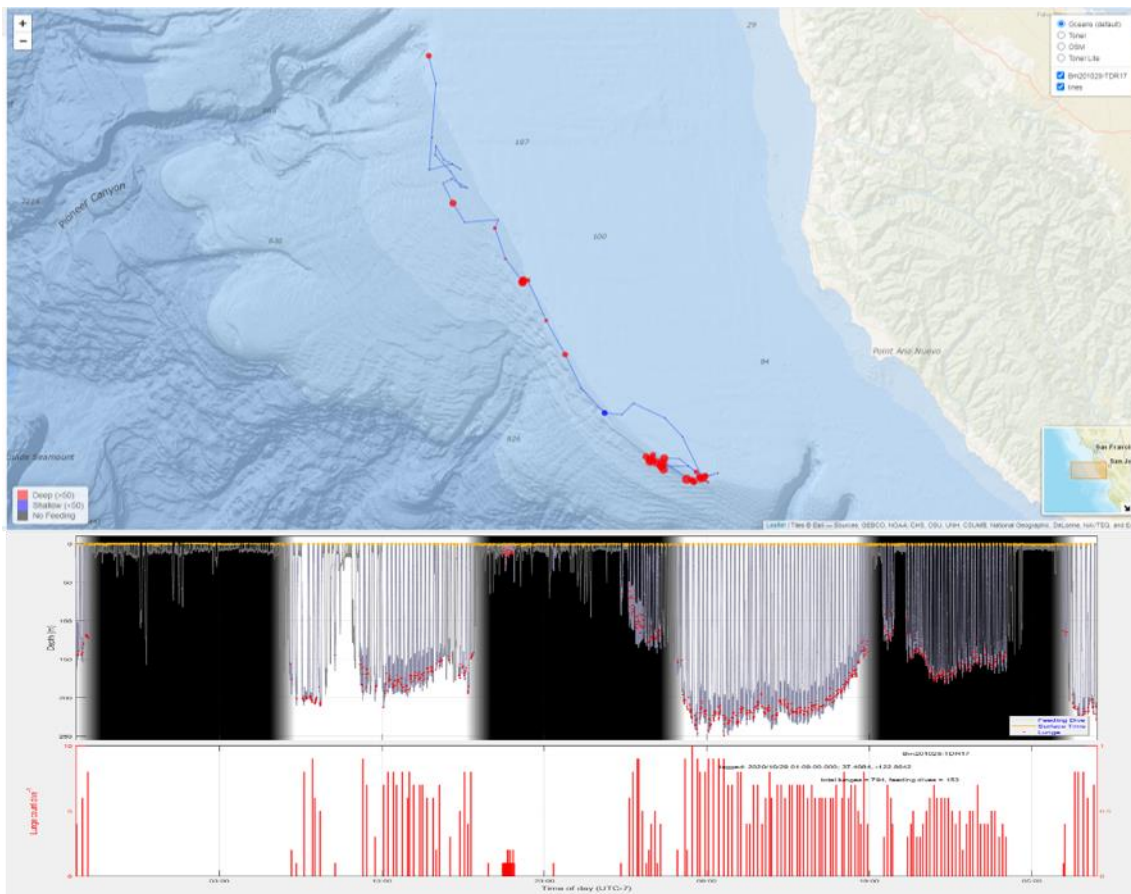


Figure 14. Blue whale track (Oct 28-31 2020) showing deep feeding during both day and night.

Section 132.8(d)(9): Ocean conditions

Data provided by: Jarrod Santora and Isaac Schroeder (NOAA Fisheries, Southwest Fisheries Science Center and University of California Santa Cruz)

NOAA climate prediction center indicates La Niña conditions are expected for winter-spring 2021. Conditions may favor increase krill concentrations, depending on regional upwelling conditions during January-February 2021.

The monthly Habitat compression Index in October 2020 indicates a high compression state (low cool habitat area), reflecting ongoing heatwave conditions and sea surface temperatures that are warmer than average (Figures 15 and 16). Habitat compression conditions (area and temperature) in October 2020 are similar to October 2019, but not as extreme as during the previous large marine heatwave of 2014-16 (Figure 16). High compression (low cool habitat, restricted nearshore) is anticipated through December 2020.

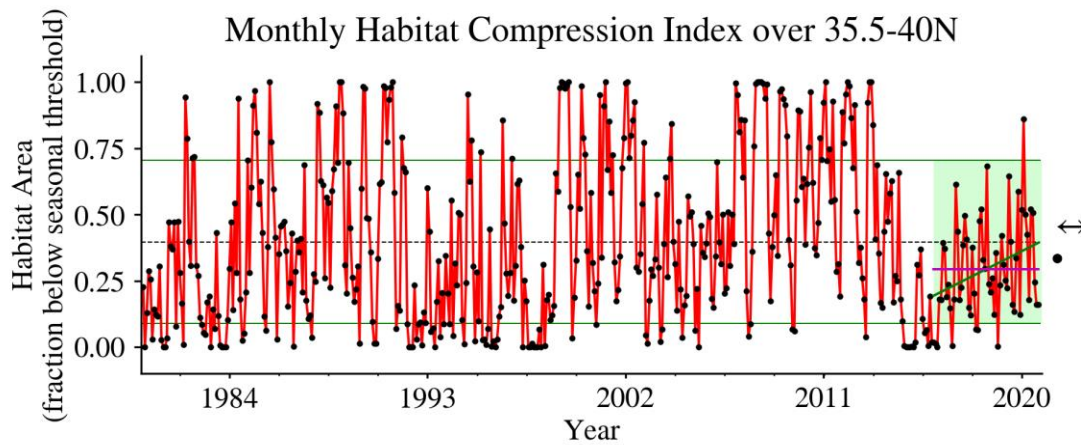


Figure 15. Seasonal standardized Habitat Compression Index (monthly); high compression ranges below the mean (dashed line) and indicates reduced cool upwelling habitat area on the shelf; low compression is above the mean and indicates increased cool. High compression may result in increased entanglement risk as per Santora et al. 2020 (Nature Communications). Updated through October 2020.

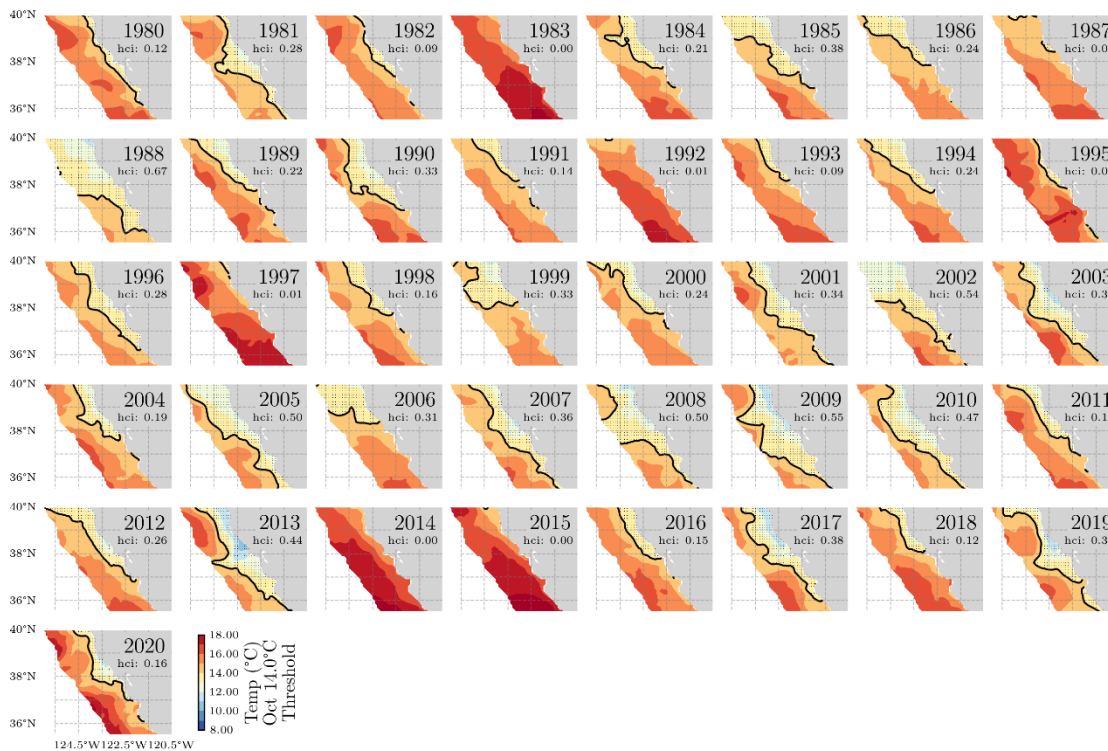


Figure 16. Habitat Compression Index (HCI): October temperature maps depicting the area of cool temperature habitat off California (40N to 35N; thin black line indicates the areal extent of cool habitat). October 2020 HCI values are lower than 2019, are similar to previous heatwave (2014-16), indicating high compression and potential increase entanglement risk as per Santora et al. 2020 (Nature Communications).

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

Data provided by: California Department of Fish and Wildlife

All Confirmed Entanglements reported above occurred prior to the November 1, 2020 effective date of the Risk Assessment and Mitigation Program regulations (Section 132.8,

Title 14, California Code of Regulations). Impact Score Calculations for each Calendar Year will be assigned for Confirmed Entanglements beginning with the 2021 calendar year.

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

Data provided by: Karen Grimmer (MBNMS) and Jaime Jahncke (Point Blue Conservation Science), Briana Abrahms (University of Washington) and Elliot Hazen (NOAA Southwest Fisheries Science Center), Kathi George (The Marine Mammal Center), California Coast Crab Association

Point Blue Conservation Science – Fishing Zones 3, 4 and 6

Current observations and additional details are available at the [Point Blue Conservation Science Data Portal](#).

Gulf of the Farallones – Fishing Zone 3

Over the 30-day period ending on November 16, a total of 161 Humpback whales were observed on 11 days, with a daily average of 14.63 Humpback whales/day (Table 7). The general trend in daily averages over this period is declining, indicating that Humpback whales are beginning to migrate south and depart Fishing Zone 3 (Figure 17). Locations of Humpback whale observations over the 7-day period ending on November 16 are shown in Figure 18. No Blue whales were observed during this 30-day period. Days with zero observations are not included.

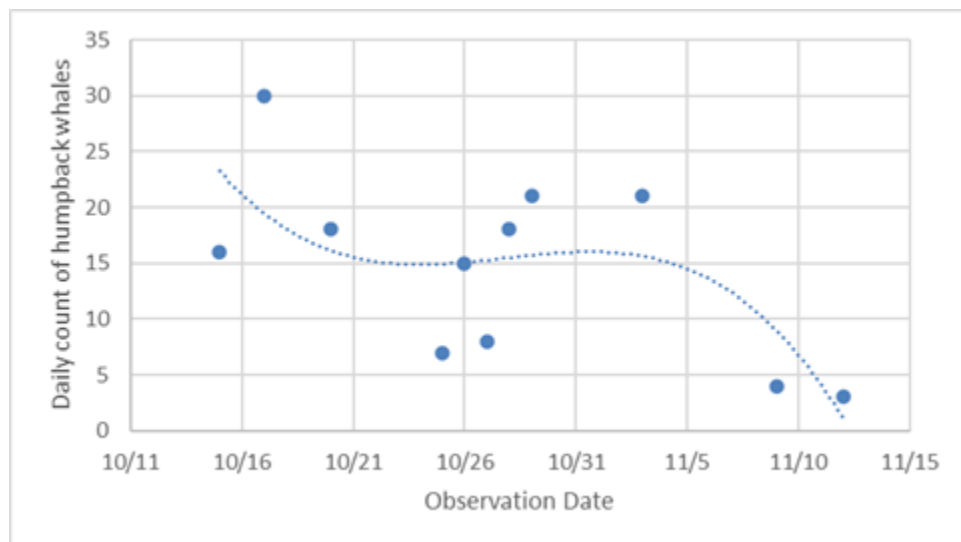


Figure 17. Daily observations of Humpback whales by trained biologists at the Farallon Islands. Dashed line indicates the trend over time.

Table 7. Whale Alert sightings over the 30-day period ending November 16, 2020 at the Farallon Islands.

Date	Species	Number Observed	Effort (hours)	Observer
10/15	Humpback	16	1	Farallon Island staff
10/17	Humpback	30	1	Farallon Island staff
10/20	Humpback	18	1	Farallon Island staff
10/25	Humpback	7	1	Farallon Island staff
10/26	Humpback	15	1.1	Farallon Island staff
10/27	Humpback	8	1.1	Farallon Island staff
10/28	Humpback	18	1	Farallon Island staff
10/29	Humpback	21	1	Farallon Island staff
11/3	Humpback	21	1	Farallon Island staff
11/9	Humpback	4	1	Farallon Island staff
11/12	Humpback	3	1.2	Farallon Island staff

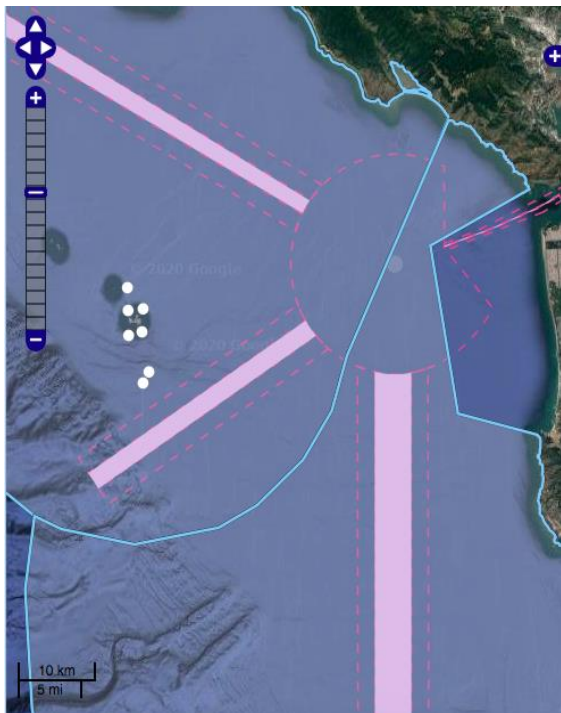


Figure 18. 8 Humpback whale sightings in Zone 3 during the seven-day period ending Nov 16, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals. Right hand panel shows total counts by species and time period.

Monterey Bay National Marine Sanctuary – *Fishing Zone 4*

In the Monterey Bay region, 37 Humpback whale sightings were reported through the Spotter/WhaleAlert app over the seven-day period ending November 16 (Figure 19). No Blue whales were reported during this period.

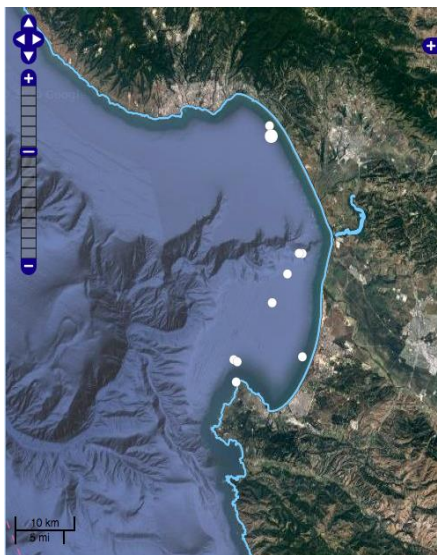


Figure 19. 37 Humpback whale sightings in Zone 4 during the seven-day period ending Nov 16, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals. Right hand panel shows total counts by species and time period.

Channel Islands National Marine Sanctuary – *Fishing Zone 6*

11 Humpback whales (Figure 20) and 8 Blue whales were reported by trained naturalists from Channel Islands National Marine Sanctuary and the National Park Service during the seven-day period ending on November 16.

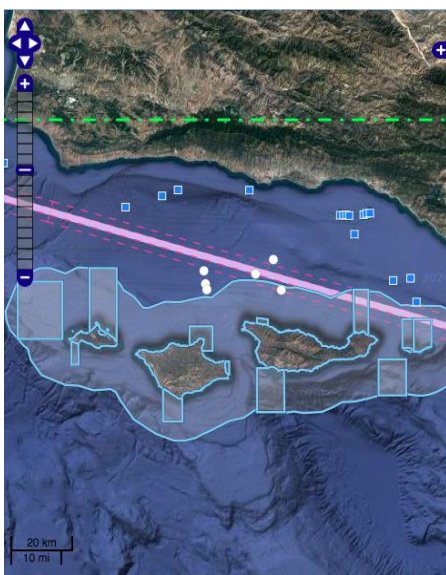


Figure 20. 11 Humpback whale sightings in Zone 6 during the seven-day period ending Nov 16, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals. Right hand panel shows total counts by species and time period.

Whale Watch 2.0 – All Fishing Zones

The best whale habitat predictions for November 13, 2020 (Figure 21) indicate probability of blue whale presence is low in central (Pt. Conception to Mendocino) and northern California (Mendocino northward), and is moderate in parts of southern California (south of Pt. Conception).

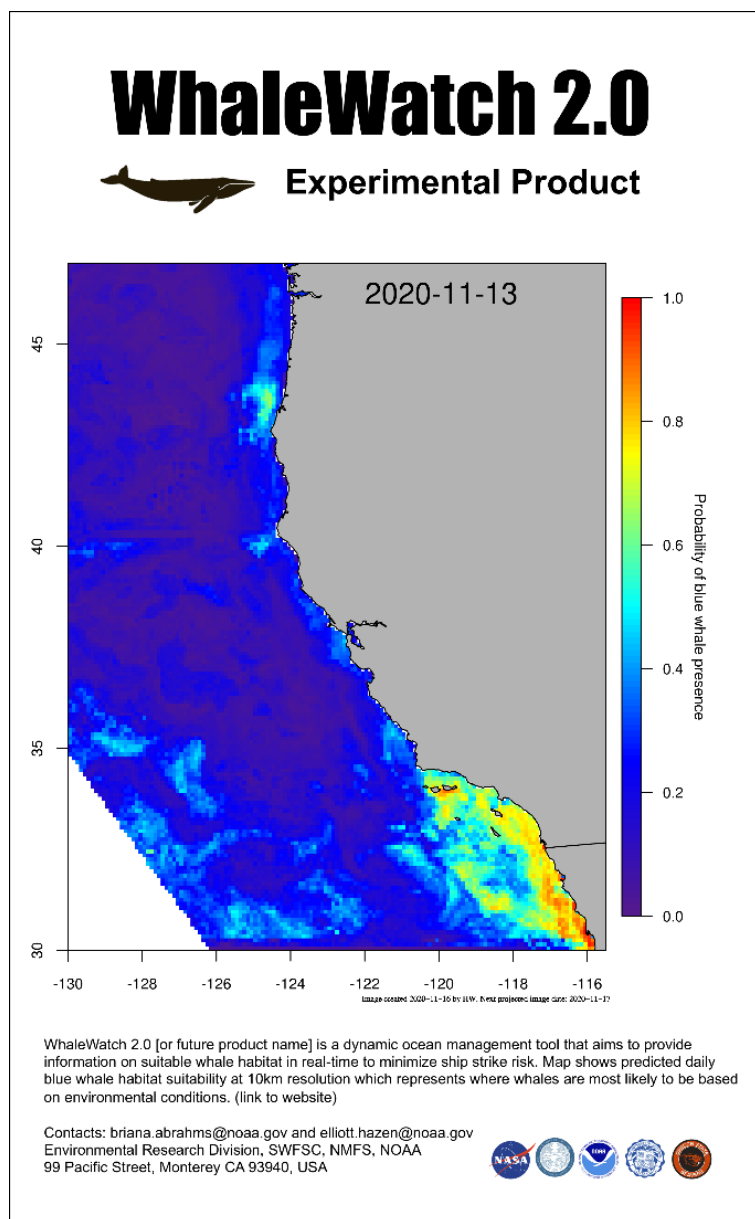


Figure 21. WhaleWatch 2.0 map for November 13, 2020.

Whale Watching Vessel Solar Loggers –Fishing Zones 3 and 4

Track lines from whale watching vessels participating in the solar logger project indicate a high amount of effort out of Monterey and Moss Landing (Figure 22) and limited effort in San Francisco ports (Figure 23) during 42 trips between November 1 and November 16. Effort was primarily focused in the southern portion of Monterey Bay. Trips out of San Francisco targeted various locations between Bolinas and Pacifica.

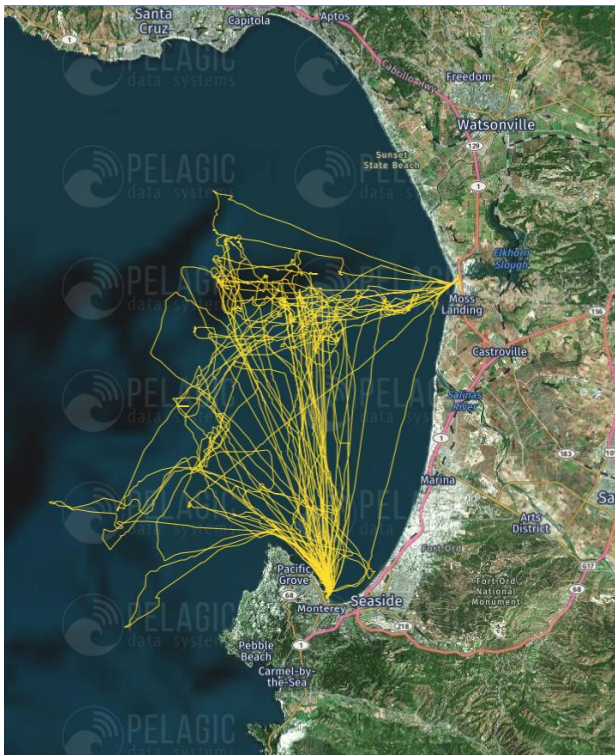


Figure 22. Track lines for all whale watch trips from November 1 – November 16, 2020, within the Monterey Bay area.

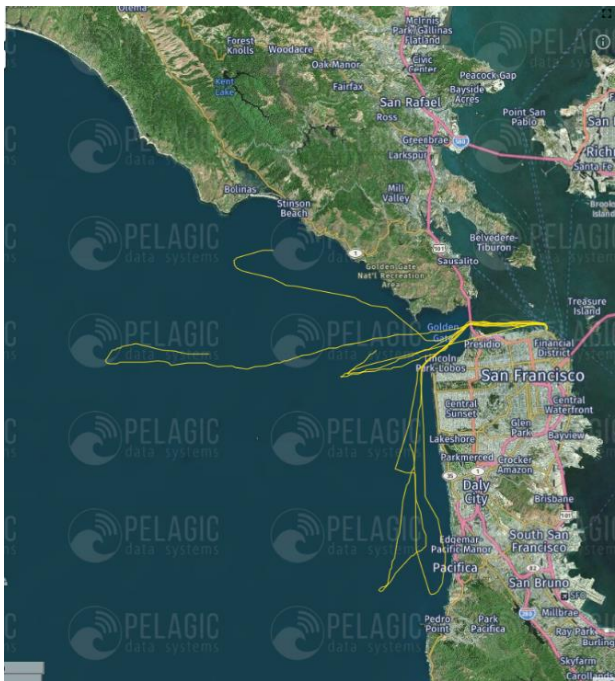


Figure 23. Track lines for all whale watch trips from November 1 – November 16, 2020, within the San Francisco Bay area.

California Coast Crab Association Vessel Survey Pilot – *Fishing Zone 1*

This industry-led pilot effort to collect Marine Life Concentrations data surveyed an area from Cape Mendocino to the Oregon border. Limited data was collected but the survey noted aggregations of Humpback whales between Eureka and Patrick's Point as well as in an area south of Crescent City.