



**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (DEPARTMENT)
DECLARATION OF CONTINUED FISHING SEASON DELAY AND DEPTH CONSTRAINT
FOR THE COMMERCIAL DUNGENESS CRAB FISHERY, TEMPORARY CRAB TRAP
PROHIBITION FOR THE RECREATIONAL CRAB FISHERY, AND FLEET ADVISORY
DUE TO RISK OF MARINE LIFE ENTANGLEMENT**

Pursuant to Fish and Game Code Section 8276.1(b) and California Code of Regulations, Title 14, Sections 132.8 ("Section 132.8") and Section 29.80(c)(7) ("Section 29.80(c)(7)"), I find and declare that:

I

On December 9, 2021, I evaluated entanglement risk for the commercial Dungeness crab fishery pursuant to Section 132.8(b) and the recreational fishery pursuant to Section 2980(c). 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 December 6, 2021. Prior to this risk assessment and management response, I considered the Working Group's December 8, 2021, management recommendation, and other relevant information provided to my staff.

II

Vessel surveys undertaken by Cascadia Research on December 2, 2021, observed 60 Humpback whales in Zone 3. Pursuant to 132.8(c)(2)(A)(4)(a), I must implement a Fishing Zone delay or other protective management action.

III

NOAA-standardized data from commercial whale-watching trips in Fishing Zone 4 show a running weekly average of 6.3 Humpback whales in Monterey Bay. Pursuant to 132.8(c)(2)(A)(4)(a), I must implement a Fishing Zone delay or other protective management action.

IV

Section 132.8(b)(4) requires that when new information so indicates, I must lift or modify any commercial fishing restrictions in a manner that promotes fair and orderly fisheries. Similarly, Section 28.80(c)(7)(B)(2) requires that I lift or modify the recreational Dungeness crab season delay as appropriate.

V

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

VI

THEREFORE, under the authority granted by Fish and Game Code Section 8276.1(b), and Sections 132.8 and 28.80(c) of Title 14 of the California Code of Regulations, I am implementing the following management action:

1. Continuation of the delay of the opening of the commercial Dungeness crab fishery in Fishing Zone 3. Take and possession of commercially caught Dungeness crab is prohibited in the delayed Fishing Zone.
2. Continuation of the temporary recreational crab trap prohibition in Fishing Zone 3. The deployment and use of crab traps in any recreational fishery is temporarily prohibited in that Zone.
3. Continuation of the temporary recreational trap prohibition in Fishing Zone 4 until December 10, 2021 at 9:00am. Beginning at that time, recreational crab traps will no longer be prohibited in Fishing Zone 4.
4. Continuation of the delay of the opening of the commercial Dungeness crab fishery in Fishing Zone 4 until December 16, 2021 at 12:01am. Take and possession of commercially caught Dungeness crab is prohibited in Fishing Zone 4 until that time. The pre-soak period in Fishing Zone 4 will begin at 8:01am on December 13, 2021. The season opening will be subject to a Depth Constraint as described below.
5. Depth constraint for Fishing Zone 4 limiting fishing activity to less than 40 fathoms. Commercial crab traps shall not be used or placed in Zone 4 waters seaward of the 40-fathom contour line as defined by connecting the appropriate set of waypoints adopted in Federal regulations and published in Title 50, Code of Federal Regulations Part 660. While engaged in fishing activity, all vessels must carry onboard an electronic monitoring system capable of recording the vessel's location using GPS coordinates at a frequency of no less than once per minute during fishing operations. Electronic monitoring data must be made available to the Department upon request for the duration of the fishing period and 60 days thereafter.
6. Fleet Advisory for both commercial and recreational fisheries in Fishing Zones 1, 2, 4, 5, and 6. Both the commercial and recreational fishing fleet should remain vigilant and move or avoid setting trap gear in areas where whales are transiting or foraging to further minimize risk of entanglement, particularly in deep water areas of Zone 4 (canyon edges and the shelf break).

This management action is in effect until the next risk assessment, which is expected to occur on or around December 15, 2021.

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



Charlton H. Bonham, Director

12/9/21 12:15 pm PT
Date/Time

ATTACHMENT TO DIRECTOR'S DECEMBER 9, 2021, DECLARATION CONTINUED
FISHING SEASON DELAY AND DEPTH CONSTRAINT FOR THE COMMERCIAL
DUNGENESS CRAB FISHERY, TEMPORARY CRAB TRAP PROHIBITION FOR THE
RECREATIONAL CRAB FISHERY, AND FLEET ADVISORY DUE TO RISK OF MARINE
LIFE ENTANGLEMENT

Information referenced in this Attachment is further described in the Data Summary Compilation dated December 8, 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 3:** 60 Humpback whales observed by Cascadia Research vessel survey.
- **Fishing Zone 4:** weekly running average of 6.3 Humpback whales based on Monterey Bay Whale Watch (MBWW) data.

Relevant Management Considerations Under Section 132.8(d)

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

There was some support by the Working Group to open the commercial and recreational fishery on December 20, 2021, in Zones 3 and 4 under a Fleet Advisory, pending additional data. An additional recommendation was put forward to open the recreational fishery in Zone 4 immediately, but it did not receive broad support and some opposed. There was limited support for CDFW's preliminary recommendation, with most opposed.

2. Information from NOAA

No additional information was made available for this risk assessment.

3. Effectiveness of Management Measures to Minimize Entanglement Risk

In Zone 3, the aerial survey and vessel-based observations show continued aggregations of foraging humpback whales. Given the still significant numbers of foraging Humpback whales, a continuation of the Fishing Zone delay/temporary trap prohibition is the most effective Management Action for Zone 3. A season

delay/temporary trap prohibition will prevent crab traps from entering the water, which removes any entanglement risk from both the commercial and recreational fishery in those Zones. Additionally, a season delay is the anticipated management action in Section 132.8(c)(2)(1)(4)(a) in response to concentration triggers being reached for Humpback whales.

In Zone 4, the aerial survey, vessel-based observations and MBWW data show continued aggregations of humpback whales and foraging occurring along the canyon edges, although weekly averages from MBWW data are decreasing over the past few weeks. Given observed locations of humpback whales, a Depth Constraint for the commercial fishery is the most effective Management Action for Zone 4 to minimize co-occurrence with Dungeness crab trap fishing gear and Actionable Species. A Fleet Advisory in Zone 4 will further minimize entanglement risk by ensuring the commercial and recreational fleets are aware of the known locations of Humpback whales in the area, and modify fishing practices accordingly.

Based on data for Fishing Zones 1, 2, 5, and 6, Humpback whale concentrations are minimal, although whales are still likely present. A Fleet Advisory will ensure both the commercial and recreational fleets are aware of the possibility of marine life entanglements in the area, even though risk is low, and encourage them to modify fishing practices accordingly.

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 possible loss of the holiday market, possible fishing effort shift, and general economic impacts due to the ongoing COVID pandemic. A depth constraint in Fishing Zone 4 will allow fishing opportunity for operators and businesses during the coming holiday.

5. Data Availability Within and Across Fishing Zones

CDFW aerial survey data is available for Fishing Zones 3 and 4. Cascadia Research vessel survey data are available for Zones 3 and 4. MBWW data are available for Zone 4. Point Blue Conservation Science observer data is available for Fishing Zones 3, 4, and 6. The Department considers this data set to adequately cover the full geographic extent of Fishing Zones 3 and 4 (the only remaining Zones at issue) 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 north-central California (where high numbers of Humpback whales were observed in Fishing Zone 4) south to Mexico and Central America. Aerial and vessel-based surveys indicate continued aggregations of humpback whales broadly distributed across Fishing Zone 3. Based on MBWW data, observed Humpback whale numbers are slightly above average when compared to historical data, an indication that migration out of California waters is still ongoing.

7. Fishing Season Dynamics

There are no domoic acid public health advisories currently in effect for Fishing Zone 3 or 4. Landings information collected by the Department indicates low fishing activity in the currently open Fishing Zones. Fair start provisions would be in effect for the opening of both Fishing Zones 3 and 4. Anecdotal information from fishery participants indicates a general trend of greater effort shift to the northern coast, which could indicate lower effort in an opener on the central coast. Anecdotal information and contact with Department staff indicates other fishery participants are foregoing currently available fishing opportunities to wait for the season opener in Fishing Zone 3.

8. Known Distribution and Abundance of Key Forage

Based on aerial and vessel surveys within Fishing Zone 3, Humpbacks were distributed widely both inshore and offshore feeding primarily on schooling fish at a variety of depths. CDFW aerial surveys on November 27, 2021, observed bait balls off Bodega Bay and Point Reyes in waters between 50 and 100 m (27-54 fathoms) deep, and surveys on December 2, 2021, observed numerous bait balls across a range of depths.

9. Ocean Conditions

No additional information was request for this data assessment. Based on the previously available information, La Niña conditions are currently forecast, with an approximately 90% chance of La Niña continuing through the winter and an approximately 50% chance of it continuing into spring 2022. Waters are cooler than usual in the nearshore portions of Fishing Zones 1 – 6.

10. Current Impact Score Calculations

- a. Fishing Season – 0
- b. Calendar Year – 1.13 for Humpback whales; 0 for Blue whales and Pacific leatherback sea turtles

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

Cascadia Research reported that at least 18 Humpback whales known to be from California waters have arrived in Mexico breeding grounds, ten of which were seen off California in 2021 (some as late as October 10). However, the large numbers of Humpback whales distributed across Fishing Zone 4 as well as slightly above average numbers of Humpbacks seen based on MBWW data is an indication that migration out of California waters is still ongoing. Aggregations of whales seen in Zone 3 were widely distributed across the Fishing Zone. Humpback whales in Zone 3 were seen in depths between 50 and 100 meters (27 and 54 fathoms). Smaller aggregations in Zone 4 were primarily located on the edges of the shelf and canyon at depths greater than 50 fathoms. Whale sightings by Point Blue Conservation Science support whale presence in Fishing Zone 4 is primarily located at the shelf break and canyon edge.

Chosen Management Action and Rationale

Based on the management considerations outlined above, the Director will continue the delay in the opening of the commercial Dungeness crab season and continue the temporary crab trap prohibition in the recreational Dungeness crab fishery in Fishing Zone 3. Use of crab traps in other recreational fisheries is also temporarily prohibited pursuant to Section 29.89(c)(4) of Title 14 of the California Code of Regulations. The commercial fishery will open in Fishing Zone 4 on December 16, 2021 with a 64-hour presoak period beginning at 8:01am on December 13, 2021, subject to a Depth Constraint. A Fleet Advisory is issued for the recreational and commercial fisheries in Fishing Zones 1, 2, 4, 5, and 6.

Aerial and vessel survey data shows large aggregations of foraging Humpback whales in Fishing Zone 3 could be at risk of entanglement with recreational and commercial crab traps. Additionally, data indicates that aggregations of schooling fish present Humpback foraging opportunity in that area. The wide distribution of Humpback whales both inshore and offshore in Zone 3 indicates that a depth restriction on fishing activity would be ineffective in reducing entanglement risk as these are depths at which fishing activity tends to occur. Furthermore, given the high volume of traps anticipated to be set during a season opener, it has been determined that a trap reduction would not sufficiently reduce entanglement risk. A season delay is the most protective management action given existing whale presence. At this time, no data available indicates a different management response is appropriate for the recreational fishery.

Although available data in Fishing Zone 4 shows that Humpback whale sightings remain slightly above average, vessel survey data largely observed humpback whales at depths greater than 50 fathoms. Lower whale densities that are trending downward combined with observations mostly occurring in deeper waters indicates a Depth Constraint limiting fishing to waters shallower than 40 fathoms would be an effective management action to reduce the

risk of marine life entanglement. Furthermore, the fair start provision and anecdotal information from fishery participants indicates lower levels of fishing activity are anticipated for the season opener in Fishing Zone 4 as fishery participants choose to wait for opportunity in Fishing Zone 3.

Pursuant to Section 132.8(b)(4), the Director must lift or modify any restrictions in a manner that promotes fair and orderly fisheries. Here, recreational and commercial fishing in Fishing Zone 4 were both delayed from the traditional season opening dates, which typically provide for a recreational-only fishing period in advance of the commercial season opener. In order to provide for an orderly opening consistent with existing expectations and historic practice the recreational fishery will open in advance of the commercial pre-soak.

Although current survey data was not available for Zones 1, 2, 5, and 6, survey data was collected in those Zones in advance of the November 1 risk assessment and sufficiently indicated low presence of whales such that it was no longer necessary to focus available resources in those areas to collect additional data. Given the availability of survey data statewide in advance of November 1, the no data scenarios under Section 132.8(c)(2)(A)(1)-(3) are no longer applicable, and Zones can be evaluated based on the totality of the management considerations and available data (including previous survey data). Fishing Zones 3 and 4 reached a marine life concentration trigger, leading to analysis of the management considerations under Section 132.8(d) and appropriate management response under Section 132.8(c). Those sections anticipate a broader analysis of the factors impacting entanglement risk statewide. Although no triggers for management action were met in Fishing Zones 1, 2, 5, and 6, past survey data indicates small concentrations of Humpback whales in those Fishing Zones. Both recreational and commercial fleets should use additional precaution when setting gear in those areas. 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 continues to remain low for any remaining Humpback whales in those Fishing Zones.



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

Date: December 8, 2021

An initial assessment and preliminary recommendation were developed by California Department of Fish and Wildlife (CDFW) Marine Region 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 recreational and commercial Dungeness crab fishery. The initial assessment and preliminary Management Action recommendation were shared with the Working Group on December 6, 2021, and finalized on December 8, 2021, based on discussions with the Working Group and after consideration of all available data.

A. Recommended Management Actions

Recreational Fishery:

- **Fleet Advisory: Fishing Zones 1, 2, 4, 5 and 6**
- **Temporary Crab Trap Restriction: Fishing Zone 3**

Commercial Fishery:

- **Fleet Advisory: Fishing Zone 1, 2, 4, 5 and 6**
- **Season Delay: Fishing Zone 3**
- **Depth Restriction: Fishing Zone 4**

Fleet Advisories

Recreational Fishery: The recreational Dungeness crab fishery is currently open statewide in all Fishing Zones (see CCR Title 14, section 29.80(e)). CDFW Marine Region's final recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 5 and 6 for the recreational fishery. Staff also recommend lifting the trap restriction in Zone 4 and including this Zone in a Fleet Advisory, with specific information on recent humpback sighting's locations.

Commercial Fishery: The commercial Dungeness crab fishery is currently open in Fishing Zones 1, 2, 5 and 6. CDFW Marine Region's final recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 5 and 6 and open Zone 4 with a Depth Restriction and Fleet Advisory such that fishing will only be allowed in ocean waters shallower than the 40-fathom depth contour as defined in the Code of Federal Regulations.

Rationale: Survey data for Zones 1, 2, 5, and 6 were available prior to this risk assessment. Therefore, the no data scenarios under RAMP are no longer applicable, and Zones can be evaluated based on the totality of the management considerations and previous survey data. Based on available data, no RAMP triggers have been reached in Fishing Zones 1, 2, 5, or 6

that would require Management Action. Several concentrations of humpback whales remain in Zones 3 and 4, indicating humpback whales remain in California waters and the migration to winter breeding grounds is still ongoing. However, the concentration and distribution of whales in Zone 4 could permit fishing to begin if a Depth Restriction is implemented for the commercial fishery to be protective of humpback whales as they continue their migration out of California. Therefore, the recreational and commercial crab fleets should use additional precaution when setting gear in Zones 1, 2, 4, 5 and 6 because humpback whales may still be present. Both the commercial and recreational fishing fleet should remain vigilant and move or avoid setting gear in areas where whales are transiting or foraging to further minimize risk of entanglement. The recommendation is for these Management Actions to remain in place until they can be reevaluated at the next risk assessment (expected to occur on or around December 15, 2021) to inform this next risk assessment by the Director.

Crab Trap Restriction/ Season Delay/ Depth Constraint

Recreational Fishery: A temporary recreational crab trap restriction is currently in place for Fishing Zones 3 and 4. CDFW Marine Region's final recommendation is for the Director to continue this temporary trap restriction for the recreational fishery in Zone 3 and lift the restriction for Zone 4.

Commercial Fishery: A season delay is currently in place for Fishing Zones 3 and 4 for the commercial Dungeness crab fishery. CDFW Marine Regions final recommendation is for the Director to continue a season delay for the commercial fishery in Zone 3 and implement a Depth Restriction for Zone 4 with a Depth Restriction such that fishing will only be allowed in ocean waters shallower than the 40-fathom depth contour as defined in the Code of Federal Regulations.

Rationale: Based on exceedance of Marine Life Concentration triggers for humpback whales in Zones 3 and 4, continued Management Action is necessary.

- Zone 3: Cascadia Research vessel surveys and CDFW aerial surveys indicated numerous aggregations of humpback whales across Zone 3. Based on both datasets, humpback whales were distributed widely both inshore and offshore. Given the significant number of humpback whales observed, there remains an increased risk of entanglement with vertical lines and surface gear in Zone 3. A continuation of the commercial season delay and temporary recreational trap restriction in Zone 3 is the recommended Management Action based on the wide distribution of humpback whales across all depths within this Zone. A Depth Restriction or Gear Reduction for the commercial fishery would not minimize entanglement risk due to whale distribution and expected high gear concentrations during the season opener for both fisheries in Zone 3. As a result, CDFW Marine Region's final recommendation is a continued delay of the Fishing Season for the commercial fishery and the continued temporary restriction on the use of crab traps for the recreational fishery in Zone 3. The recommendation is for these Management Actions to remain in place until they can be reevaluated at the next risk assessment (expected to occur on or around December 15, 2021). The next Working Group meeting date is likely to occur on or around December 14, 2021, to inform this next risk assessment by the Director.

- Zone 4: Monterey Bay Whale Watch (MBWW) data indicate above average daily sightings within Zone 4. Based on Cascadia vessel survey data, most sightings occurring on canyon edges over deep water (>50 fathoms). A Depth Constraint may therefore be effective at reducing co-occurrence between humpback whales and trap gear within Fishing Zone 4. The recommended Management Action for Zone 4 is to lift the temporary recreational trap restriction and to open the commercial fishery with a Depth Restriction seaward of the 40-fathom contour such that fishing will only be allowed in ocean waters shallower than the 40-fathom depth contour (as defined by approximating the 40-fathom depth contour by connecting the appropriate set of waypoints adopted in Federal Regulations and published in Title 50, Code of Federal Regulations Part 660). Humpback sightings continue to decline within this Zone and recent survey data indicate the remaining whales to be on the edge of the Fishing Grounds in predominately deeper water. CDFW Marine Region's final recommendation for the commercial fleet in Zone 4 is based on the continuing decline in whale abundance, their distribution, and the new "whale fair start provision" that is anticipated to discourage participants from fishing in Zone 4 if they plan on fishing Zone 3 without a 30-day delay penalty. In addition, vessels home ported in Half Moon Bay and San Francisco will not be able to transit back from Zone 4 with Dungeness crab on board. Although this may limit fishing activity in Zone 4 upon opening, the above historic average sightings of whales in Zone 4, along with their distribution over deep water make a Depth Restriction for the commercial fishery warranted. This is supported by the presence of numerous aggregations of humpback whales in Zone 3, in particular a grouping at the southern end of Zone 3 just north of the border with Zone 4, indicating a precautionary approach in adjacent Zone 4 is appropriate. The recommendation is for these Management Actions to remain in place until they can be reevaluated at the next risk assessment (expected to occur on or around December 15, 2021). to inform this next risk assessment by the Director.

Summary of RAMP triggers and Management Considerations analyzed during preparation of this Final Assessment and Final Recommendation.

B. 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: 1 humpback whale

Confirmed Entanglements in Unknown Fishing Gear reported from California:

- During the current Fishing Season: 0
- During the current calendar year: 1 Humpback whale
 - Note: Three additional confirmed entanglements in unidentified fishing gear are under review, one of which is known not to be commercial Dungeness crab gear.

Marine Life Concentration Surveys and/or Satellite Telemetry Observations:

- **Fishing Zone 3 and 4:** Cascadia Research Vessel surveys observed 60 humpback

whales in Zone 3, exceeding the trigger pursuant to Title 14, CCR, section 132.8(c)(2)(A)(4)(a) of 20 humpbacks in a single Fishing Zone. In addition, based on MBWW data, the most recent running weekly average for Zone 4 is 6.3 humpback whales, which exceeds 5 humpback whales in a single Fishing Zone and triggers management response under RAMP (c)(2)(A)(4).

C. 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

- In Zone 3, the aerial survey and vessel-based observations show continued aggregations of foraging humpback whales. As a result of Marine Life Concentration triggers for humpback whales being met, a continuation of the Fishing Zone delay/temporary trap prohibition is the most effective Management Action for Zone 3 to minimize co-occurrence with Dungeness crab trap fishing gear and Actionable Species.
- In Zone 4, the aerial survey, vessel-based observations and MBWW data show continued aggregations of humpback whales and foraging occurring along the canyon edges. As a result of Marine Life Concentration triggers for humpback whales being met, a Depth Constraint for the commercial fishery is the most effective Management Action for Zone 4 to minimize co-occurrence with Dungeness crab trap fishing gear and Actionable Species.
- In Zones 1, 2, 4, 5 and 6, a Fleet Advisory is the most effective Management Action based on the whales observed and known migration patterns in these areas.

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

- A continuation of the Fishing Zone 3 delay will impact operators and businesses. In particular, there will be economic costs to individual operators, however given the risk of entanglement (which is expected to decrease), the short-term economic costs must also be weighed against the longer-term viability of the commercial fishery across California. A Depth Constraint in Fishing Zone 4 will allow fishing opportunity for operators and businesses during the coming holidays.

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

- CDFW aerial survey data are available for Zones 3 and 4. Cascadia Research vessel survey data are available for Zones 3 and 4. MBWW data are available for Zone 4. Point Blue Conservation Science observation data are available for Zones 3, 4, and 6.

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

- Aerial and vessel-based surveys indicate continued aggregations of humpback

whale broadly distributed across Zone 3 and smaller aggregations on the canyon/shelf edges in Zone 4.

- Presence of humpback whales is slightly above average based on MBWW data, an indication that migration out of California waters is still ongoing.

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

- Landing's data and bi-weekly reporting are currently being compiled and will be included in the next risk assessment.

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

- Humpbacks were distributed widely both inshore and offshore feeding primarily on schooling fish within Zone 3.

Section 132.8(d)(9): Ocean conditions

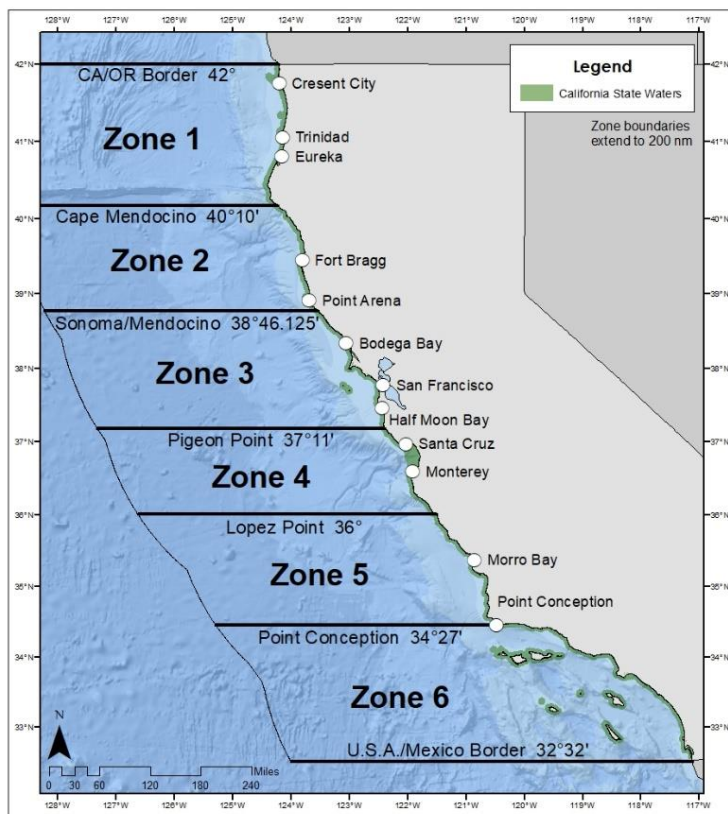
- The prediction of ENSO conditions was last updated on November 11, 2021. La Niña is likely to continue through the Northern Hemisphere winter 2021-22 (~90% chance) and into spring 2022 (~50% chance during March-May).

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

- Impact score calculation under RAMP began on January 1, 2021. The current impact score is 1.13 for humpback whales and 0 for blue whales and Pacific leatherback sea turtles.

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

- As of December 3, Cascadia Research reported at least 18 humpback arrivals to mainland Mexico and Baja breeding grounds, which are known to be from California waters. This is a twofold increase over the data that was reported during the last risk assessment.
- Based on aerial surveys conducted by CDFW and vessel surveys conducted by Cascadia Research, humpback whales are still present within the Gulf of the Farallones and Monterey Bay.



RAMP Fishing Zone Boundaries

California Dungeness Crab Fishing Gear Working Group (Working Group) Management Recommendation Form to inform the Risk Assessment and Mitigation Program for the California Department of Fish and Wildlife

Working Group Discussion Date: December 8, 2021

Anticipated Director's Determination Date: December 9, 2021

Submitted to the California Department of Fish and Wildlife Director for the Risk Assessment Mitigation Program Section 132.8 Title 14, California Code of Regulations to assess marine life entanglement risk in the Commercial Dungeness Crab Fishery.

The Working Group considered Available Data provided by CDFW and scientific advisors, as well as an initial CDFW assessment and the preliminary Management Action recommendation. The Available Data, initial and final versions of CDFW's assessment as well as this recommendation will be made available on the [Whale Safe Fisheries webpage](#) upon completion of the risk assessment process.

Working Group Recommendations

- 1) Recommends that the commercial and recreational fisheries in Fishing Zones 3 and 4 open under a Fleet Advisory on December 20, 2021, unless additional data collected in the interim indicates another management action is warranted. This recommendation is based on Marine Life Concentrations information provided in the December 6, 2021 Available Data Document, as well as additional information shared during the Working Group meeting and incorporated into [an updated Available Data Document on December 8, 2021](#). Available data indicates that foraging humpback whales remain in these Fishing Zones, however historic migration patterns suggest they generally depart California waters by mid-December. This recommendation also reflects Working Group observations regarding fleet dynamics, namely that the ongoing delayed commercial opener for Fishing Zones 3 and 4 has shifted early season effort to Fishing Zones 1 and 2 as compared to traditional opener dynamics, where Fishing Zones 3-6 open prior to Fishing Zones 1 and 2. Opening both Fishing Zones 3 and 4 would minimize potential economic harm to participants and dependent industries in Fishing Zone 3. The Working Group also expressed concerns regarding vacant positions, resulting in incomplete representation for ports located within Fishing Zone 3. This recommendation received some support from Working Group industry members, with other environmental and industry members expressing opposition and the remaining members either abstaining or remaining neutral.
- 2) A second recommendation was made to immediately lift the recreational fishery trap prohibition in Fishing Zone 4, based on the rationale provided in the [December 6, 2021 CDFW Initial Assessment](#). This recommendation received limited support from Working Group members, with some members expressing opposition and many either abstaining or remaining neutral.



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

Date: December 6, 2021

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

This initial assessment and preliminary recommendation have been developed by California Department of Fish and Wildlife (CDFW) Marine Region staff based on the most recently available data 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. These data will also facilitate discussion regarding potential management actions the Director may take pursuant to Section 29.80, Title 14, CCR to address marine life entanglement risk in the recreational Dungeness crab fishery.

A. Recommended Management Actions

Recreational Fishery:

- **Fleet Advisory: Fishing Zones 1, 2, 4, 5 and 6**
- **Temporary Crab Trap Restriction: Fishing Zone 3**

Commercial Fishery:

- **Fleet Advisory: Fishing Zone 1, 2, 5 and 6**
- **Season Delay: Fishing Zone 3**
- **Depth Restriction: Fishing Zone 4**

Fleet Advisories

Recreational Fishery: The recreational Dungeness crab fishery is currently open statewide in all Fishing Zones. CDFW Marine Region's preliminary recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 5 and 6 for the recreational fishery. Staff also recommend lifting the trap restriction in Zone 4 and including this Zone in a Fleet Advisory.

Commercial Fishery: The commercial Dungeness crab fishery is currently open in Fishing Zones 1, 2, 5 and 6. CDFW Marine Region's preliminary recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 5 and 6 and open Zone 4 with a Depth Restriction such that fishing will only be allowed in ocean waters shallower than the 40-fathom depth contour as defined in the Code of Federal Regulations.

Rationale: Survey data for Zones 1, 2, 5, and 6 were available prior to this risk assessment. Therefore, the no data scenarios under RAMP are no longer applicable, and Zones can be

evaluated based on the totality of the management considerations and previous survey data. Based on available data, no RAMP triggers have been reached in Fishing Zones 1, 2, 5, or 6 that would require Management Action. Several concentrations of humpback whales remain in Zones 3 and 4, indicating humpback whales remain in California waters and the migration to winter breeding grounds is still ongoing. However, the concentration and distribution of whales in Zone 4 could permit fishing to begin if a Depth Restriction is implemented for the commercial fishery to be protective of humpback whales as they continue their migration out of California. Therefore, the recreational and commercial crab fleets should use additional precaution when setting gear in Zones 1, 2, 4, 5 and 6 because humpback whales may still be present. Both the commercial and recreational fishing fleet should remain vigilant and move or avoid setting gear in areas where whales are transiting or foraging to further minimize risk of entanglement. The recommendation is for these Management Actions to remain in place until they can be reevaluated at the next risk assessment (expected to occur on or around December 15, 2021). The next Working Group meeting date is likely to occur on or around December 14, 2021, to inform this next risk assessment by the Director.

Crab Trap Restriction/ Season Delay/ Depth Constraint

Recreational Fishery: A temporary recreational crab trap restriction is currently in place for Fishing Zones 3 and 4. CDFW Marine Region's preliminary recommendation is for the Director to continue this temporary trap restriction for the recreational fishery in Zone 3 and lift the restriction for Zone 4.

Commercial Fishery: A season delay is currently in place for Fishing Zones 3 and 4 for the commercial Dungeness crab fishery. CDFW Marine Regions preliminary recommendation is for the Director to continue a season delay for the commercial fishery in Zone 3 and implement a Depth Restriction for Zone 4 with a Depth Restriction such that fishing will only be allowed in ocean waters shallower than the 40-fathom depth contour as defined in the Code of Federal Regulations.

Rationale: Based on exceedance of Marine Life Concentration triggers for humpback whales in Zones 3 and 4, continued Management Action is necessary.

- Zone 3: Cascadia Research vessel surveys and CDFW aerial surveys indicated numerous aggregations of humpback whales across Zone 3. Based on both datasets, humpback whales were distributed widely both inshore and offshore. Given the significant number of humpback whales observed, there remains an increased risk of entanglement with vertical lines and surface gear in Zone 3. A continuation of the commercial season delay and temporary recreational trap restriction in Zone 3 is the recommended Management Action based on the wide distribution of humpback whales across all depths within this Zone. A Depth Restriction or Gear Reduction for the commercial fishery would not minimize entanglement risk due to whale distribution and expected high gear concentrations during the season opener for both fisheries in Zone 3. As a result, CDFW Marine Region's preliminary recommendation is a continued delay of the Fishing Season for the commercial fishery and the continued temporary restriction on the use of crab traps for the recreational fishery in Zone 3. The recommendation is for these Management Actions to remain in place until they can be reevaluated at the next

risk assessment (expected to occur on or around December 15, 2021). The next Working Group meeting date is likely to occur on or around December 14, 2021, to inform this next risk assessment by the Director.

- Zone 4: Monterey Bay Whale Watch (MBWW) data indicate above average daily sightings within Zone 4 with most sightings occurring on canyon edges over deep water (>50 fathoms). A Depth Constraint may therefore be effective at reducing co-occurrence between humpback whales and trap gear within Fishing Zone 4. The recommended Management Action for Zone 4 is to lift the temporary recreational trap restriction and to open the commercial fishery with a Depth Restriction seaward of the 40-fathom contour such that fishing will only be allowed in ocean waters shallower than the 40-fathom depth contour (as defined by approximating the 40-fathom depth contour by connecting the appropriate set of waypoints adopted in Federal Regulations and published in Title 50, Code of Federal Regulations Part 660). Humpback sightings continue to decline within this Zone and recent survey data indicate the remaining whales to be on the edge of the Fishing Grounds in predominately deeper water. CDFW Marine Region's preliminary recommendation for the commercial fleet in Zone 4 is based on the continuing decline in whale abundance, their distribution, and the new "whale fair start provision" that is anticipated to discourage participants from fishing in Zone 4 if they plan on fishing Zone 3 without a 30-day delay penalty. In addition, vessels based out of Half Moon Bay and San Francisco will not be able to transit back from Zone 4 with Dungeness crab on board. Although this may limit fishing activity in Zone 4 upon opening, the above historic average sightings of whales in Zone 4, along with their distribution over deep water make a Depth Restriction for the commercial fishery warranted. This is supported by the presence of numerous aggregations of humpback whales in Zone 3, in particular a grouping at the southern end of Zone 3 just north of the border with Zone 4, indicating a precautionary approach in adjacent Zone 4 is appropriate. The recommendation is for these Management Actions to remain in place until they can be reevaluated at the next risk assessment (expected to occur on or around December 15, 2021). The next Working Group meeting date is likely to occur on or around December 14, 2021, to inform this next risk assessment by the Director.

Summary of RAMP triggers and Management Considerations analyzed during preparation of this Initial Assessment and Preliminary Recommendation.

B. 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: 1 humpback whale

Confirmed Entanglements in Unknown Fishing Gear reported from California:

- During the current Fishing Season: 0
- During the current calendar year: 1 Humpback whale
 - Note: Three additional confirmed entanglements in unidentified fishing gear are under review, one of which is known not to be commercial Dungeness

crab gear.

Marine Life Concentration Surveys and/or Satellite Telemetry Observations:

- **Fishing Zone 3 and 4:** Cascadia Research Vessel surveys observed 60 humpback whales in Zone 3, exceeding the trigger pursuant to Title 14, CCR, section 132.8(c)(2)(A)(4)(a) of 20 humpbacks in a single Fishing Zone. In addition, based on MBWW data, the running weekly average for Zone 4 is 7.5 humpback whales, which exceeds 5 humpback whales in a single Fishing Zone and triggers management response under RAMP (c)(2)(A)(4).

C. 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

- In Zone 3, the aerial survey and vessel-based observations show continued aggregations of foraging humpback whales. As a result of Marine Life Concentration triggers for humpback whales being met, a continuation of the Fishing Zone delay/temporary trap prohibition is the most effective Management Action for Zone 3 to minimize co-occurrence with Dungeness crab trap fishing gear and Actionable Species.
- In Zone 4, the aerial survey, vessel-based observations and MBWW data show continued aggregations of foraging humpback whales along the canyon edges. As a result of Marine Life Concentration triggers for humpback whales being met, a Depth Constraint for the commercial fishery is the most effective Management Action for Zone 4 to minimize co-occurrence with Dungeness crab trap fishing gear and Actionable Species.
- In Zones 1, 2, 4, 5 and 6, a Fleet Advisory is the most effective Management Action based on the whales observed and known migration patterns in these areas.

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

- A continuation of the Fishing Zone 3 delay will impact operators and businesses. In particular, there will be economic costs to individual operators, however given the risk of entanglement (which is expected to decrease), the short-term economic costs must also be weighed against the longer-term viability of the commercial fishery across California. A Depth Constraint in Fishing Zone 4 will allow fishing opportunity for operators and businesses during the coming holidays.

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

- CDFW aerial survey data are available for Zones 3 and 4. Cascadia Research vessel survey data are available for Zones 3 and 4. MBWW data are available for Zone 4.

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

- Aerial and vessel-based surveys indicate continued aggregations of humpback whale broadly distributed across Zone 3 and smaller aggregations on the canyon/shelf edges in Zone 4.
- Presence of humpback whales is slightly above average based on MBWW data, an indication that migration out of California waters is still ongoing.

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

- Landing's data and bi-weekly reporting are currently being compiled and will be included in the next risk assessment.

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

- Humpbacks were distributed widely both inshore and offshore feeding primarily on schooling fish within Zone 3.

Section 132.8(d)(9): Ocean conditions

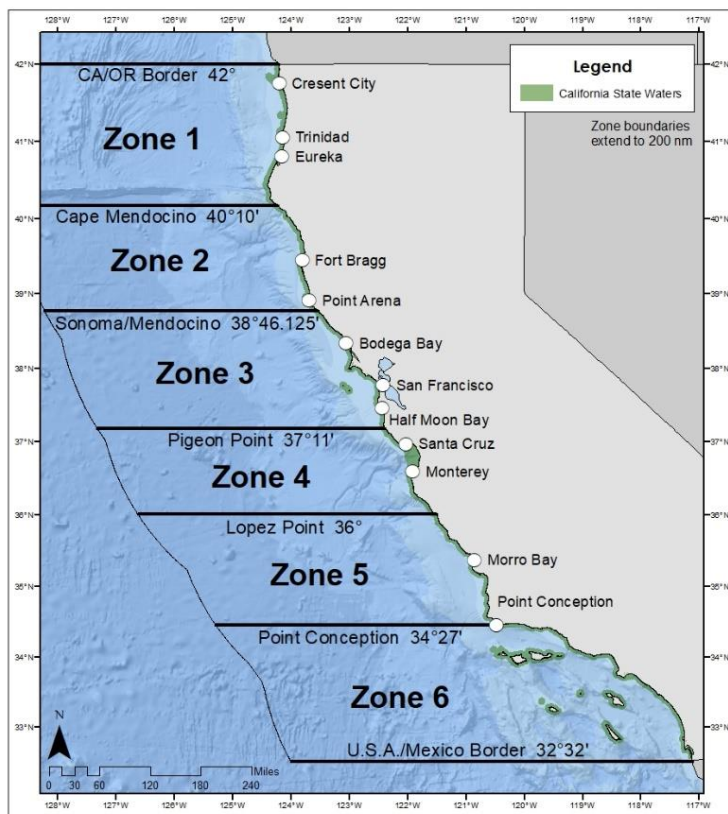
- The prediction of ENSO conditions was last updated on November 11, 2021. La Niña is likely to continue through the Northern Hemisphere winter 2021-22 (~90% chance) and into spring 2022 (~50% chance during March-May).

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

- Impact score calculation under RAMP began on January 1, 2021. The current impact score is 1.13 for humpback whales and 0 for blue whales and Pacific leatherback sea turtles.

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

- As of December 3, Cascadia Research reported at least 18 humpback arrivals to mainland Mexico and Baja breeding grounds, which are known to be from California waters. This is a twofold increase over the data that was reported during the last risk assessment.
- Based on aerial surveys conducted by CDFW and vessel surveys conducted by Cascadia Research, humpback whales are still present within the Gulf of the Farallones and Monterey Bay.



RAMP Fishing Zone Boundaries

2021-22 Risk Assessment: Available Data

Last updated: December 13, 2021

Contents

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TRIGGERS REQUIRING MANAGEMENT ACTION

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

Data provided by: Lauren Saez and Dan Lawson, NMFS

- Between January 1 and December 12, 2021 there have been 14 confirmed humpback whale entanglements, 0 confirmed blue whale entanglements, and 0 confirmed leatherback sea turtle entanglements reported to NMFS West Coast Region.
- Humpback whales:
 - 14 confirmed entanglements (9 reported in California, two reported from Mexico, one reported in Oregon, and two reported in Washington)
 - Fishery confirmations

- One confirmed humpback whale entanglement with California commercial Dungeness crab gear, reported from Mexico, gear set Fishing Zone unknown
- One confirmed humpback whale entanglement with Washington commercial Dungeness crab gear, reported from Mexico
- Of the nine confirmed reported in California, five were contributed to fisheries other than California commercial Dungeness crab: one spot prawn, one experimental box crab, one Washington commercial Dungeness crab gear, one gillnet, and one commercial lobster pending review
- Of the nine confirmed reported in California, four are currently considered entanglements in unidentified gear
 - Fishery Zone: Of the nine confirmed humpback whale entanglements in California, eight were reported in Fishing Zone 6 and 1 in Fishing Zone 5
- Blue whales: 0 confirmed entanglements
- Leatherback turtles: 0 confirmed entanglements

Table 1. Actionable Species Entanglements, prepared by West Coast Region.

Actionable Species	Number Confirmed Entanglements in CA commercial Dungeness crab gear	Number Confirmed Entanglements in Unknown Fishing Gear Reported off California
Humpback whales	1	4
Blue whales	0	0
Leatherback sea turtles	0	0

Table 2. Impact Score Calculations based on Confirmed Entanglements in California commercial Dungeness crab gear and confirmed entanglements in Unknown Fishing Gear reported off California.

Actionable Species	Current Fishing Season Impact Score	Current Calendar Year Impact Score
Humpback whales	0	0.75 + 0.38 = 1.13 *Preliminary total
Blue whales	0	0
Leatherback sea turtles	0	0

- Thus far, there have been no entanglements of Actionable Species either confirmed in California commercial Dungeness crab gear (reported from any location) or confirmed in Unknown Fishing Gear (reported from California), so the current Fishing Season Impact Score is 0 for all three species (Table 2).
- There have been no confirmed entanglements of either blue whales or leatherback sea turtles in California commercial Dungeness crab gear (reported from any location) or Unknown Fishing Gear (reported from California) during the current calendar year, so the cumulative Impact Score for the current calendar year is 0 for these two species.
- See the [November 17, 2021 Available Data document](#) for additional details regarding the current Calendar Year Impact Score calculation for humpback whales.

Marine Life Concentrations: §132.8(c)(1) *

Data provided by: Karin Forney, NOAA SWFSC and Upwell; Monterey Bay Whale Watch (processed by Karin Forney, NOAA SWFSC); Cascadia Research and The Marine Mammal Center; Scott Benson, NOAA SWFSC

Table 3. Summary of available CDFW-approved survey data for marine life concentrations for Fishing Zones 1-6, and whether the triggers established in Section 132.8(c)(2) have been met for any Fishing Zone.

Fishing Zone	CDFW-approved survey data	Triggers attained?
Zone 1	NA	NA
Zone 2	NA	NA
Zone 3	NMFS Aerial Survey, Cascadia/TMMC Survey	Yes (NMFS Aerial Survey)
Zone 4	NMFS Aerial Survey, MBWW, Cascadia/TMMC Survey	No
Zone 5	NA	NA
Zone 6	NA	NA

NMFS Aerial Survey (*Fishing Zones 3 and 4*)

- Aerial surveys were conducted from Santa Cruz to just north of Pt. Reyes on December 10, 2021 in a Partenavia P68 Observer aircraft. The survey covered east-west lines spaced every 6 nautical miles between the coast an approximately 200 m (110 fm) water depth (see Figure 1).
- Surveys were led by Karin Forney, with a team that included three trained Upwell observers. The observers search on both sides of the aircraft and downward through a belly window, and a data recorder entered sighting and effort data directly into a GPS-linked laptop computer (see the [RAMP Data Sources document](#) for additional details).
- Weather conditions were good to fair, with clear skies and winds ranging from about 6-8 knots nearshore to 12-16 knots offshore.
- Humpback whales were observed in two broad areas (see Figure 1) within water depths of approximately 25-100 fm. During the systematic east-west transect lines, 24 sightings of 41 humpback whales were recorded, including 33 humpback whales on the 10 transect lines within Fishing Zone 3, and eight humpback whales on the two transect lines in the northern portion of Fishing Zone 4.
- Five additional unidentified whales that probably were humpback whales were also recorded (four in Fishing Zone 3, one in Fishing Zone 4).
- No blue whales or leatherback sea turtles were observed during the aerial surveys.

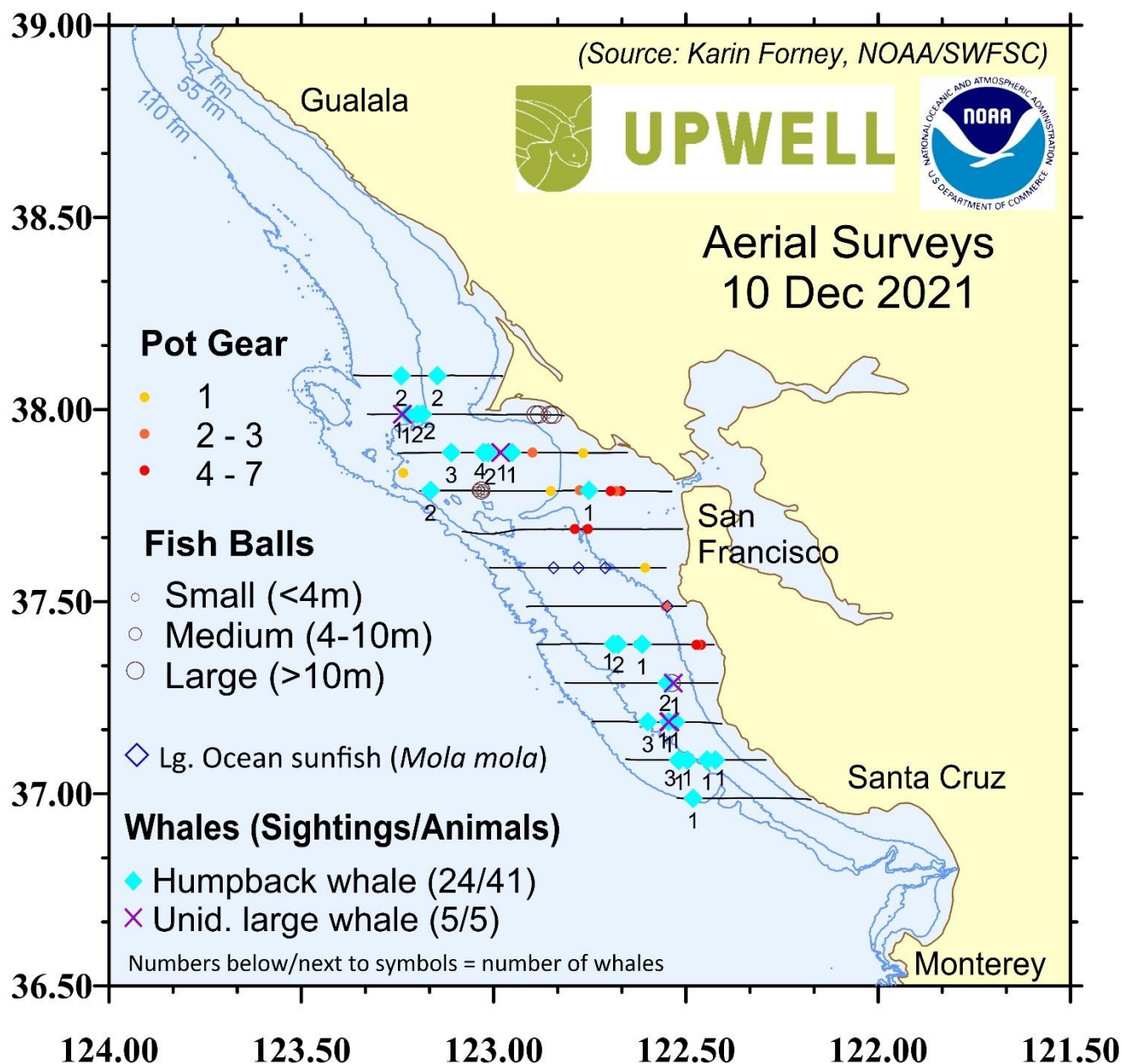


Figure 1. Aerial survey track lines and observations of humpback whales, unidentified whales, large molas (ocean sunfish), fish balls (anchovies), and unidentified fishing gear within in Fishing Zones 3 and 4 on December 10, 2021. The number of whales in each sighting is shown below the symbols.

Monterey Bay Whale Watch (Fishing Zone 4)

- MBWW conducted whale-watching trips in southern Monterey Bay on all 7 days during the week of December 5 - December 11, 2021.
- The average number of humpback whales-per-trip during the last seven days (December 5-11) was 4.9, with a peak of 9 whales observed on a single trip on December 9.
- No blue whales have been observed by MBWW since November 13, when one whale was documented.

Cascadia Research/TMMC Small Vessel Surveys (Fishing Zones 3 and 4)

- Additional surveys have been conducted since those shared in the [December 8, 2021 Available Data document](#). Four small vessel surveys conducted on December 10 and 11, 2021 covered a total of 426.7 miles in Fishing Zones 3 and 4 (Table 4). Total number of humpback whales observed per survey date were:

- December 10
 - Robustus, Zone 4 = 9 humpback whales
 - Musculus, Zone 4 = 5 humpback whales
- December 11
 - Current'Sea, Zone 3 = 4 humpback whales
 - Robustus, Zone 3 = 15 humpback whales
 - Current'Sea, Zone 4 = 16 humpback whales
- Humpback whales continued to be sighted in widely distributed areas of Fishing Zones 3 and 4 (Figures 2-3).
- Overall sighting rates of large whales have dropped and for both transect and non-transect legs now averaged 0.2 whales per nautical mile compared to sightings rates that were 0.8-0.9 in September and 0.3 to 0.5 in late October to early December for some of the same areas.
- A higher proportion of juvenile animal compared to adults were seen in the most recent surveys.

Table 4. Summary of small boat effort survey effort on December 10 and 11, 2021.

Date	Vessel	Zone	Area	Type	Hrs	NMi	Hump.	UnWh
10-Dec	Robustus	4	MB Area	Non transect	7.1	72	9	1
10-Dec	Musculus	4	MB Area	Non transect	6.9	83.4	5	0
11-Dec	Current'Sea	4	Davenport - Pigeon Point	70 m transect	1.1	17.6	10	4
11-Dec	Current'Sea	4	Pigeon Point - Moss Landing	200 m transect	3.1	51.5	6	0
11-Dec	Current'Sea	4	Pigeon Point - Moss Landing	Non transect	2.7	34.6	0	0
11-Dec	Current'Sea	3	Pigeon Point - Half Moon Bay	70 m transect	0.9	21.2	2	5
11-Dec	Current'Sea	3	Half Moon Bay - Pigeon Point	200 m transect	1.9	15.5	0	0
11-Dec	Current'Sea	3	Half Moon Bay - Pigeon Point	Non transect	1.45	10.3	2	0
11-Dec	Robustus	3	Half Moon Bay - Point Reyes	70 m transect	2.3	28.4	1	0
11-Dec	Robustus	3	Point Reyes - Half Moon Bay	200 m transect	3	42.1	13	0
11-Dec	Robustus	3	Point Reyes - Half Moon Bay	Off Effort	2.8	50.1	1	0

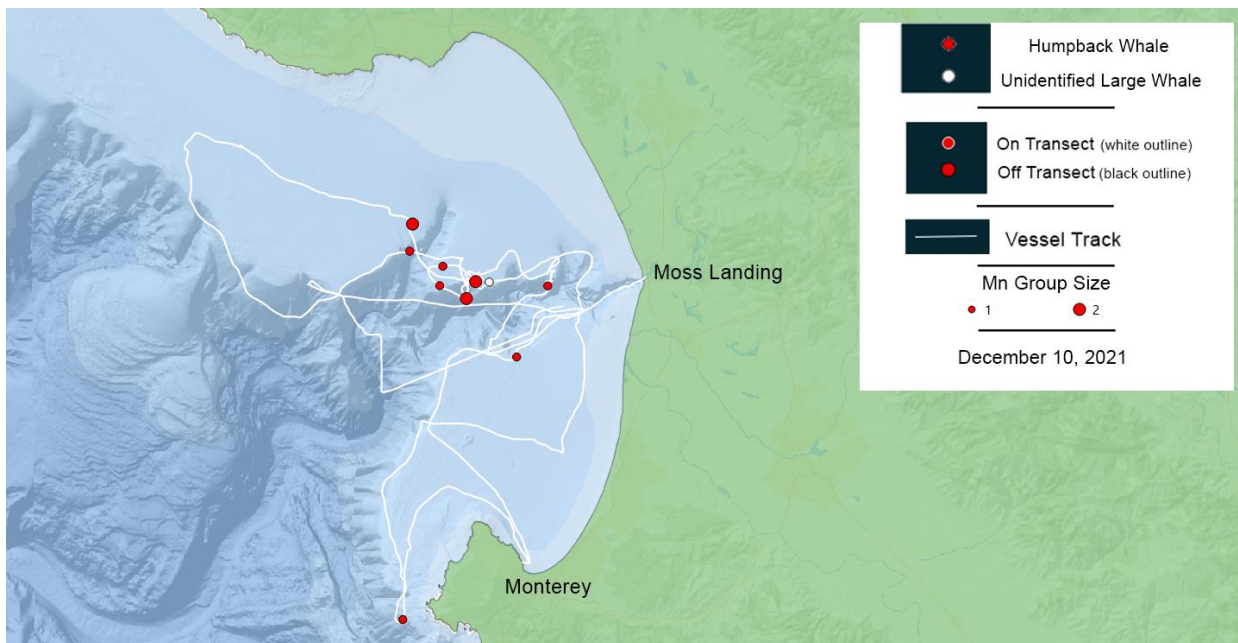


Figure 2. Tracks and sightings from survey conducted on December 10, 2021 by two Cascadia RHIBs.

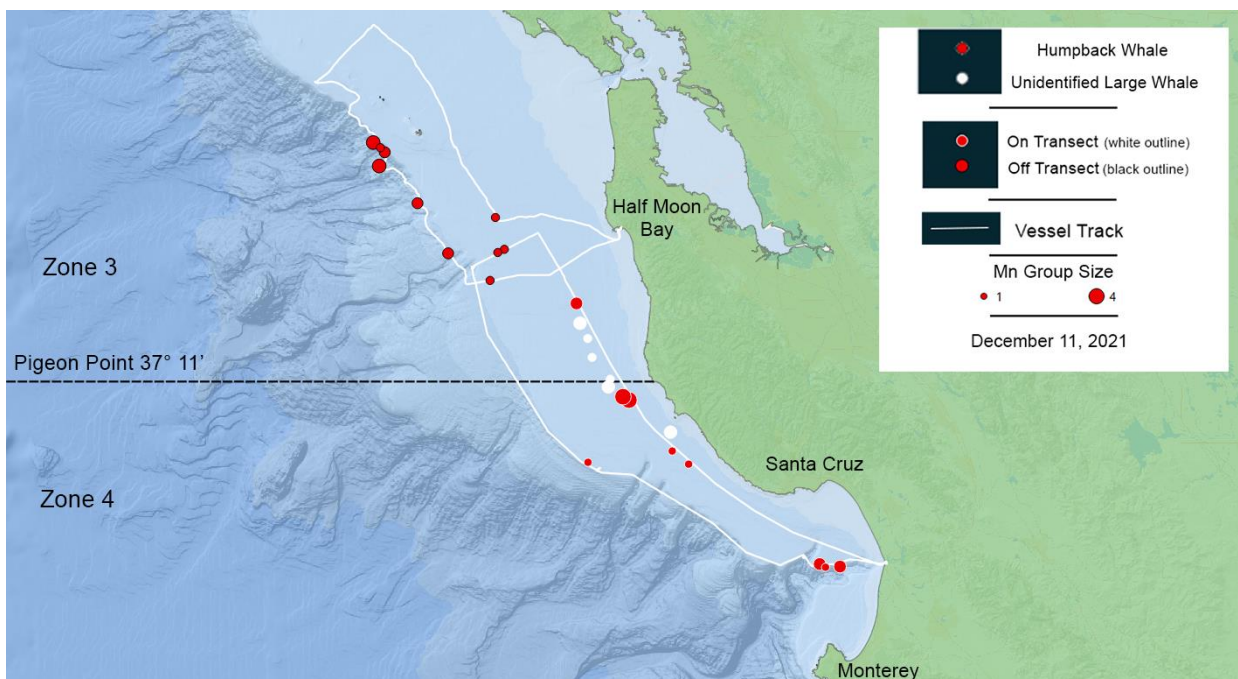


Figure 3. Tracks and sightings from surveys conducted on 11 December 2021 in Zone 3 and 4 by both Current'Sea (MLS) and Cascadia RHIB.

Leatherback Sea Turtle Telemetry

The adult male leatherback turtle that was captured approximately 3 miles northwest of Pillar Point (Half Moon Bay, CA) and tagged with a satellite-linked transmitter on October 16, 2021 is outside the US EEZ and approximately 345 miles southwest of Pt. Conception, CA. The turtle continues to move in a southwest direction.

MANAGEMENT CONSIDERATIONS

Information from NOAA: §132.8(d)(2)

No additional information was shared.

Effectiveness of management measures: §132.8(d)(3)

Data provided by: CDFW

CDFW's effectiveness evaluation for the management actions specified in §132.8(e) will be provided in the December 13, 2021 Initial Assessment.

For equally effective measures, total economic impact to the fleet: §132.8(d)(4)

Data provided by: CDFW

The RAMP regulations specify that, when deciding amongst multiple management measures which would equivalently reduce entanglement risk, CDFW shall consider total economic impact to the fleet and fishing communities. CDFW will provide this evaluation in the December 13, 2021 Initial Assessment.

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

Data provided by: Monterey Bay Whale Watch (processed by Karin Forney, NOAA SWFSC), NOAA Environmental Research Division, Cascadia Research

Monterey Bay Whale Watch – Fishing Zone 4

- The semi-monthly average number of whales-per-half-day-trip during the first half of December is lower than in late November, but above average for this time of year compared to the overall 2003-2020 record (Figure 4).
- The absence of blue whales during the last several weeks is largely consistent with their historical seasonal migration patterns during late summer and fall (Figure 5).

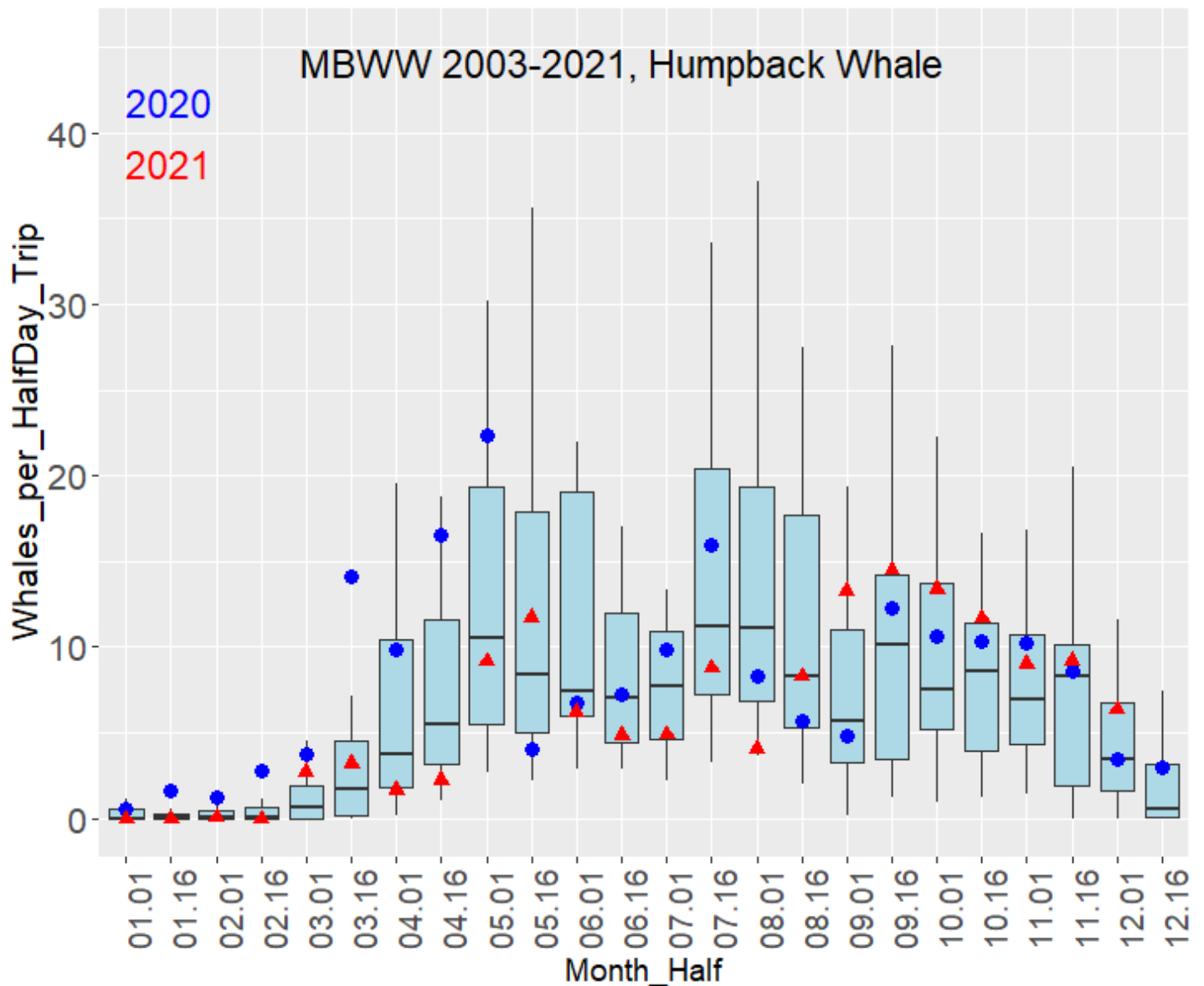


Figure 4. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the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

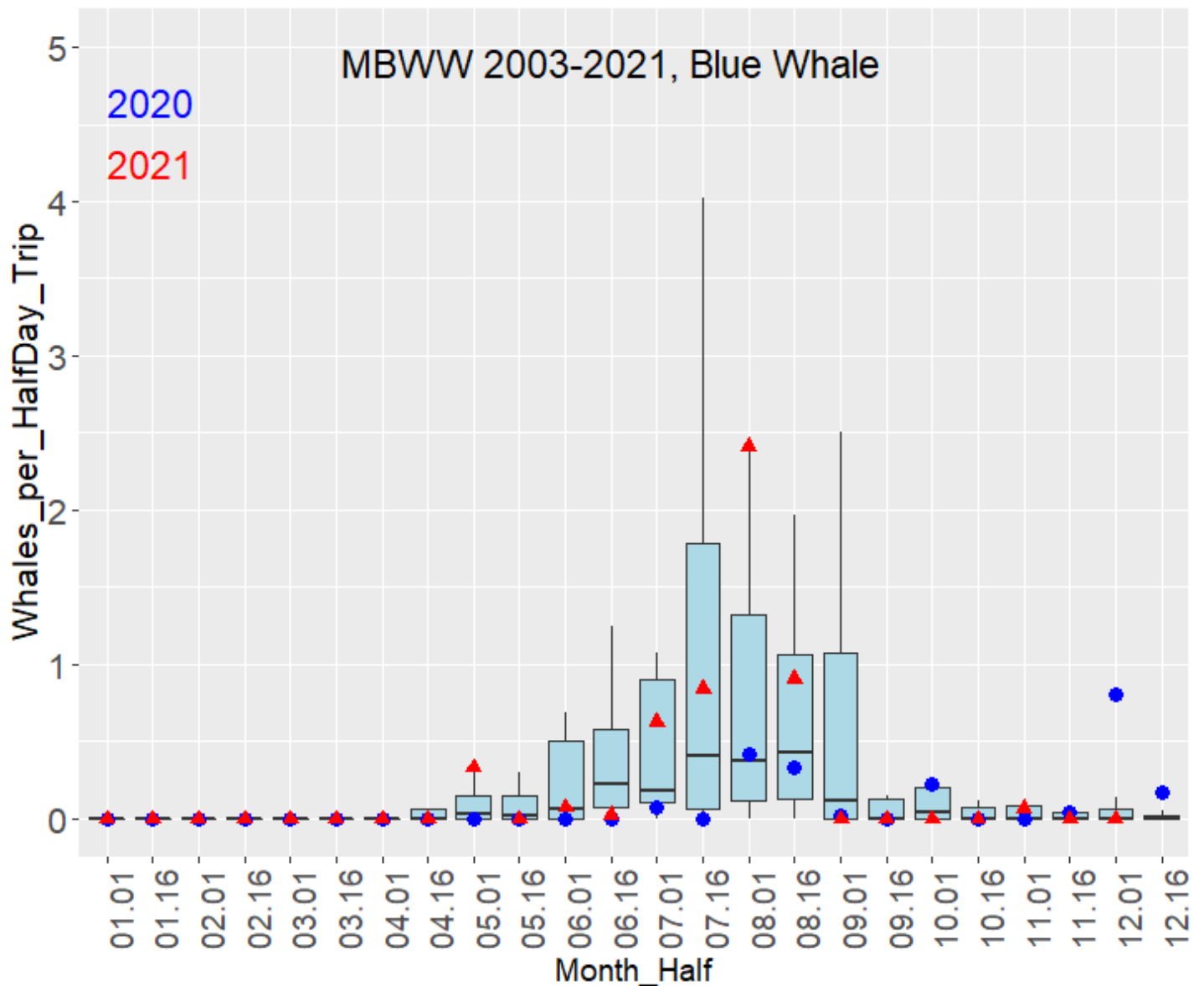


Figure 5. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of blue whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average 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) and are provided for reference, placing recent whale numbers in a historical context.

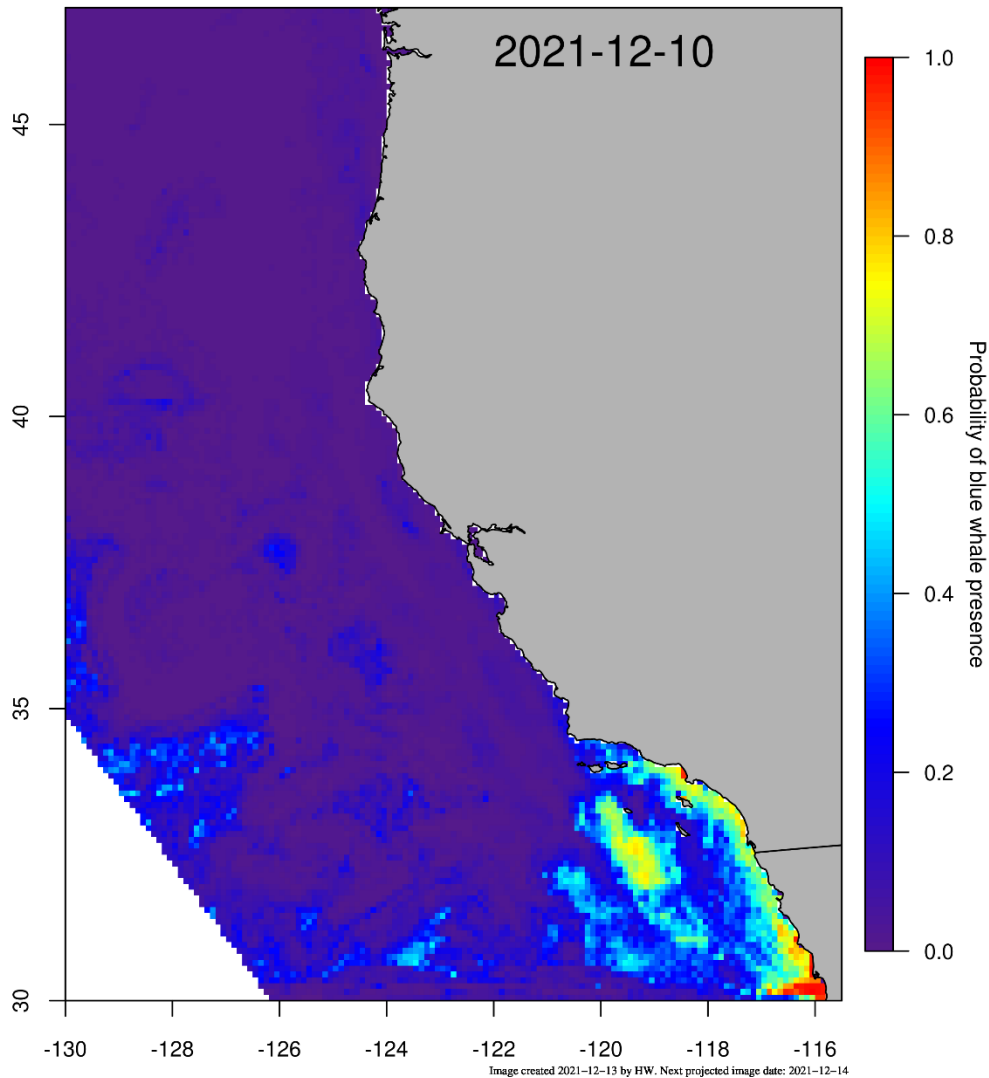
WhaleWatch 2.0 (All Fishing Zones)

Blue whale habitat predictions for December 10, 2021 (Figure 6) indicate low habitat suitability in Fishing Zones 1-5, with some suitable habitat remaining within the Southern California Bight (Fishing Zone 6).

WhaleWatch 2.0



Experimental Product



WhaleWatch 2.0 [or future product name] is a dynamic ocean management tool that aims to provide information on suitable whale habitat in real-time to minimize ship strike risk. Map shows predicted daily blue whale habitat suitability at 10km resolution which represents where whales are most likely to be based on environmental conditions. ([link to website](#))

Contacts: briana.abrahms@noaa.gov and elliott.hazen@noaa.gov
Environmental Research Division, SWFSC, NMFS, NOAA
99 Pacific Street, Monterey CA 93940, USA



Figure 6. WhaleWatch 2.0 map for December 10, 2021. [View a current map.](#)

Breeding Ground Reports

Sightings and identification of humpback whales on wintering grounds in Mexico from late October to December continue to confirm many humpback whales from California have already migrated south.

Fishing Season dynamics: §132.8(d)(7) *

Data provided by: CDFW

CDFW data presented in this section is preliminary and subject to revision.

Marine Landings Data System (All Fishing Zones)

Fishing Zones 5 and 6 opened under a Fleet Advisory on November 15, 2021 and Fishing Zones 1 and 2 opened under a Fleet Advisory on December 1, 2021. Nearly all of the fishing activity thus far has been in the Northern Management Area, with 96% of harvest from Fishing Zone 1 and over half of the landings made into Crescent City (58.4%) followed by Eureka (28.5%), Trinidad (9.6%), and Fort Bragg (3.5%).

Trends in vessel activity generally track those of landing volume, with 79 vessels making landings into Crescent City, 61 vessels making landings into Eureka, 26 vessels making landings into Fort Bragg, and 15 vessels making landings into Trinidad.

Table 5. Summary of commercial fleet dynamics information, as of December 10, 2021.

Metric	Value	Additional Info
Season status	Partially open	Open in Fishing Zones 1-2 and 5-6 under a Fleet Advisory, will open in Fishing Zone 4 under a Depth Restriction on December 16, 2021
Number of daily landings	732	NA
Total volume (pounds)	3,746,835	NA
Total Ex-Vessel Value	17,913,003	NA
Average unit price	\$4.60	NA
Total number of active vessels	181	NA
Maximum potential traps (based on active permits)	265,425	NA

Bi-Weekly Fishing Activity Reports (All Fishing Zones)

Bi-weekly fishing activity reports are being received and entered; summaries will be made available in January 2022.

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

Data provided by: Karin Forney, NOAA SWFSC and Upwell

NMFS Aerial Survey (Fishing Zones 3 and 4)

- Anchovy schools and piscivorous (fish-eating) seabird feeding flocks were observed during the survey, especially in or near the areas where humpback whales were documented. A few of the humpback whales were observed lunge-feeding on near-surface schooling fish.

- No sea nettles (leatherback turtle prey) were observed, and only a few large ocean sunfish (*Mola mola*), a sea nettle predator that often co-occurs with leatherback turtles, were observed during this survey.

Cascadia Research/TMMC Small Vessel Surveys (*Fishing Zones 3 and 4*)

- Humpback whales continue to feed mostly on fish at a variety of water depths including observed surface feeding though other whales were seen not feeding and either traveling or engaged in reproductive behaviors.

Ocean conditions: §132.8(d)(9) *

Data provided by: National Weather Service Climate Prediction Center, California Current Ecosystem Assessment Program

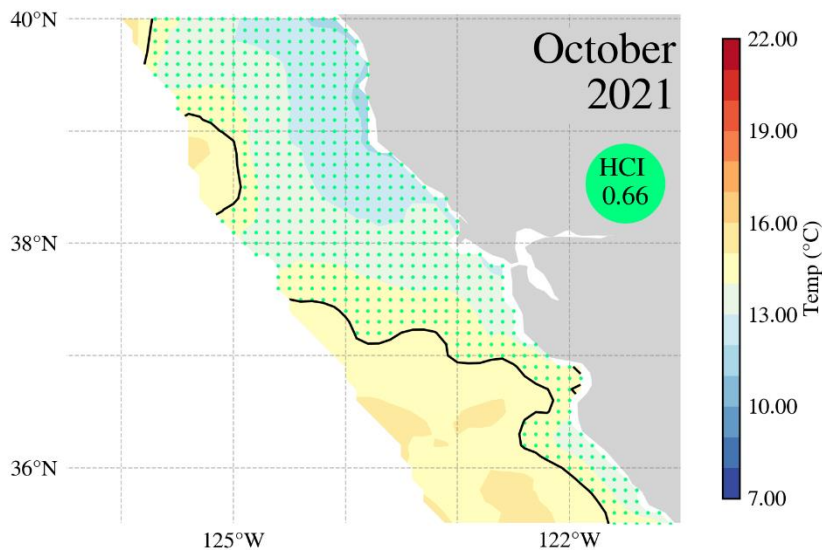
El Niño/Southern Oscillation Diagnostic Discussion

As of December 9, 2021, there is a 95% change of La Niña conditions continuing through the Northern Hemisphere winter 2021-22, with a 60% chance of transitioning to ENSO-neutral conditions during spring 2022.

Habitat Compression Index

The most recent Habitat Compression Index values are for October 2021 (Figure 7). At that time, there was low compression, with cooler water habitat available between 25 and 40°N.

Compression is often variable during the month of December (Figure 8).



HCI color based on standard deviation (SD) and mean (MN) of all values over 1980-01 to 2021-10

Low Compression (HCI > 1SD)

Figure 7. Map of October 2021 sea surface temperature and location of the Habitat Compression Index boundary (thin black line).

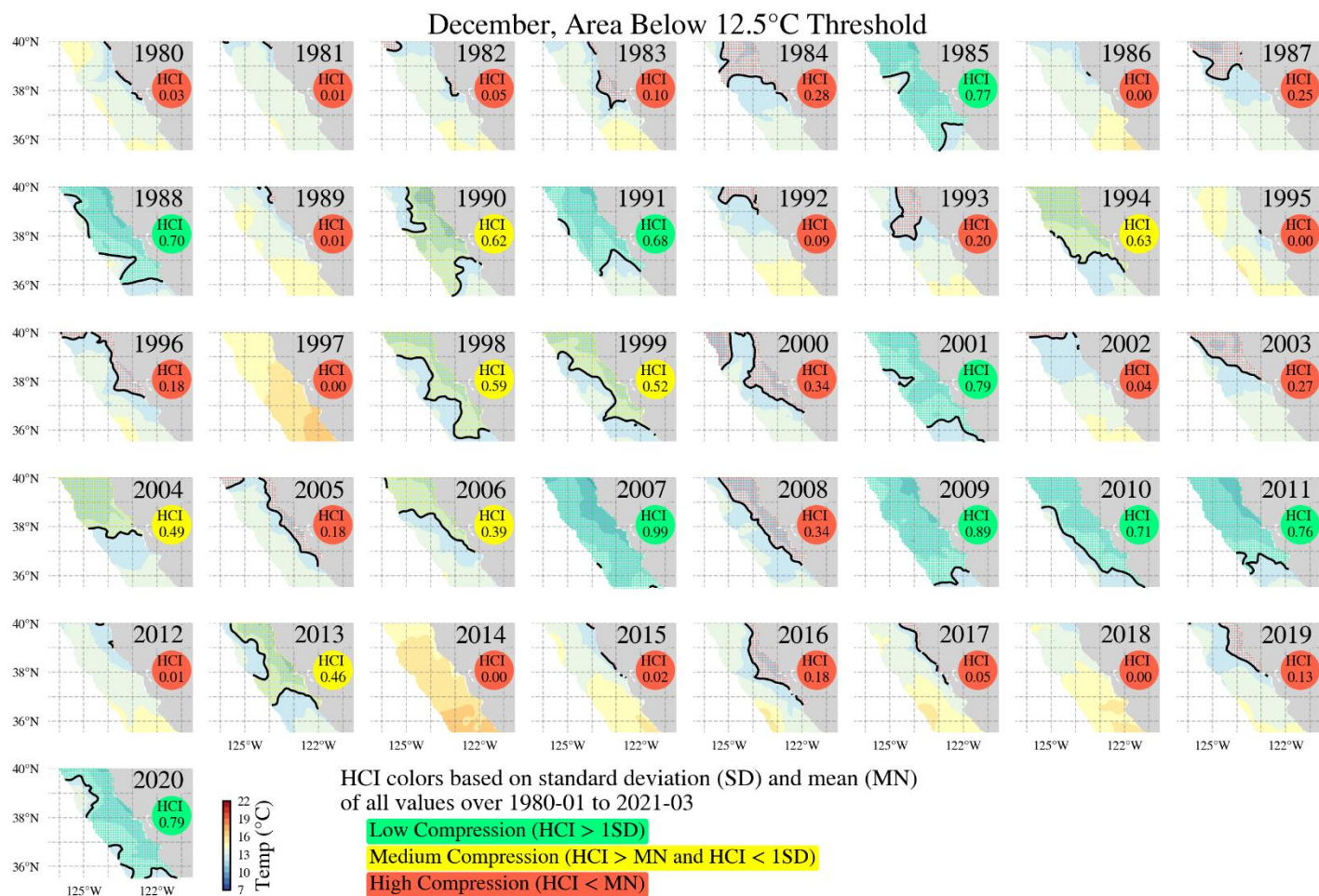


Figure 8. Maps of historical December sea surface temperature and location of the Habitat Compression Index boundary (thin black line) between 1980 and 2020.

Large Marine Heatwave Tracker

The NEP21A large marine heatwave began in late April 2021 and as of October 26, 2021 continues to shrink in size and recede from the coast. The latest satellite imagery (Figure 9) shows some coastal warming separate from the marine heatwave, which is typical of the seasonal succession from summertime upwelling to wintertime downwelling.

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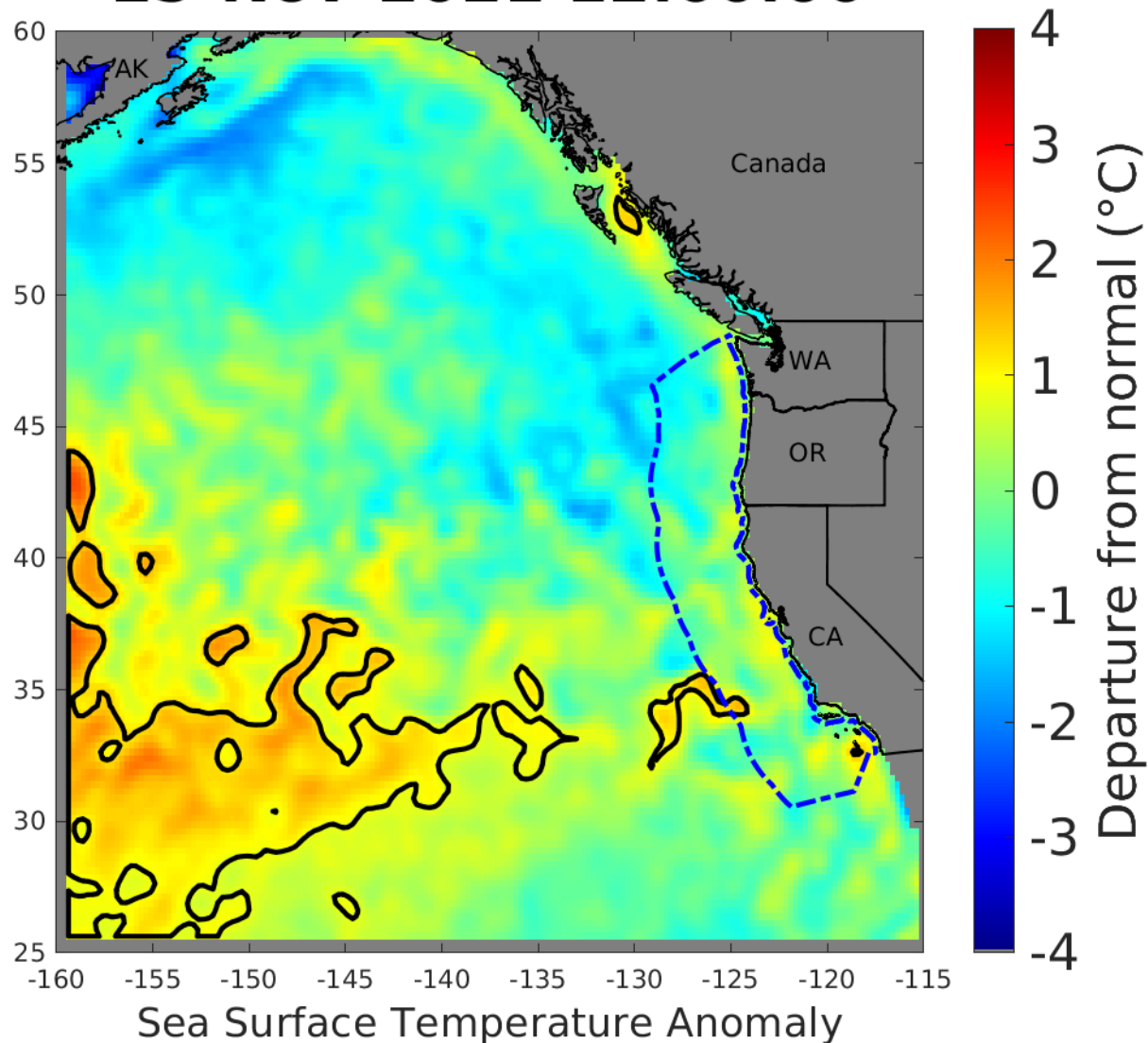


Figure 9. Science-quality (delayed 3-weeks), daily interpolated standardized sea surface temperature anomalies (SSTa) in the California Current ecosystem available for analysis of MHW presence. Dark outline shows the current extent of MHW conditions, as delineated by values of the normalized SST + 1.29 SD from normal. Blue dashed line represents the US West Coast EEZ. SST data from NOAA's Optimum interpolation Sea Surface Temperature analysis (OISST), with the SST anomaly calculated using climatology from NOAA's AVHRR-only OISST dataset.

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

Data provided by: CDFW

Pursuant to the Risk Assessment and Mitigation Program (Section 132.8, Title 14, CCR), Impact Score Calculations will be assigned beginning with the 2021 calendar year based on confirmed entanglements of Actionable Species (humpback whales, blue whales, or leatherback sea turtles) reported to CDFW by NOAA. Impact Score totals for the current fishing season (2021-22) and calendar year (2021) are provided in Table 2 (see above).