



**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (DEPARTMENT)
DECLARATION OF LIFTING SEASON DELAY AND DEPTH CONSTRAINT FOR THE
COMMERCIAL DUNGENESS CRAB FISHERY AND TEMPORARY CRAB TRAP
PROHIBITION FOR THE RECREATIONAL CRAB FISHERY, AND MODIFIED 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 15, 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 13, 2021. Prior to this risk assessment and management response, I considered the Working Group's December 14, 2021, management recommendation, and other relevant information provided to my staff.

II

Aerial surveys undertaken by NOAA/Upwell on December 10, 2021, observed 33 Humpback whales in Fishing Zone 3. Pursuant to 132.8(c)(2)(A)(4)(a) I must implement a Fishing Zone delay or other protective management action.

III

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

Three recognized port entities in Fishing Zone 3, as well as multiple members of the Working Group, requested additional delay of the commercial season in Fishing Zone 3 to allow additional time for the commercial fishery and related infrastructure to find sufficient crew staffing and increase processor capacity to ensure an orderly start to the commercial season in that Zone.

VI

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

VII

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 temporary recreational trap prohibition in Fishing Zone 3 until December 17, 2021 at 9:00am. Beginning at that time, recreational crab traps will no longer be prohibited in Fishing Zone 3. The season will be subject to a Fleet Advisory as described below.
2. Continuation of the delay of the opening of the commercial Dungeness crab fishery in Fishing Zone 3 until December 29, 2021, at 12:01am. Take and possession of commercially caught Dungeness crab is prohibited in Fishing Zone 3 until that time. The pre-soak period in Fishing Zone 3 will begin at 8:01am on December 26, 2021. The season opening will be subject to a Fleet Advisory as described below.
3. Continuation of the Depth Constraint for Fishing Zone 4 to limit fishing activity to less than 40 fathoms until December 26, 2021, at 8:01am. 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.
4. Fleet Advisory for both commercial and recreational fisheries in all Fishing Zones (Zones 1-6). 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). As well as an area off Pigeon Point in San Mateo County in depths between 50 and 100 fathoms along the border of Zones 3 and 4.

This management action is in effect until the next risk assessment, which is expected to occur on or around January 15, 2022.

Dungeness Crab Declaration of Lifting of Season Delay, Depth Constraint, Temporary Recreational Crab Trap Prohibition, and Modification of Fleet Advisory
California Department of Fish and Wildlife
December 15, 2021
Page 3

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](#).

A handwritten signature in black ink, appearing to read "CH Bonham", with a long horizontal flourish extending to the right.

Charlton H. Bonham, Director

12-15-21 2:50 PM PT
Date/Time

ATTACHMENT TO DIRECTOR DECEMBER 15, 2021, DECLARATION OF FISHERY
LIFTING SEASON DELAY AND DEPTH CONSTRAINT FOR THE COMMERCIAL
DUNGENESS CRAB FISHERY AND TEMPORARY CRAB TRAP PROHIBITION FOR THE
RECREATIONAL CRAB FISHERY, AND MODIFIED FLEET ADVISORY DUE TO RISK OF
MARINE LIFE ENTANGLEMENT

Information referenced in this Attachment is further described in the Available Data document dated December 13, 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:** 33 whales observed by NOAA/Upwell aerial survey

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 advanced a recommendation to further delay the season based on continued presence of whales until January 1, 2022. This recommendation received mixed support among the membership.

Working Group also recommended lifting the depth constraint in Zone 4 when Zone 3 opens, and this received broad support by the Working Group members. This is also consistent with the CDFW recommendation.

The recreational Working Group member recommended an immediate opening of the recreational fishery. This recommendation did not receive support from the membership.

2. Information from NOAA

No additional information was made available for this risk assessment.

3. Effectiveness of Management Measures to Minimize Entanglement Risk

Recent survey data in Fishing Zones 3 and 4 indicate that migration has begun and remaining whales are moving out of California waters. Therefore, entanglement risk is significantly reduced compared to the beginning of the season. Any additional time before a commercial season opener in Fishing Zone 3 and lifting the Depth Constraint in Fishing Zone 4 will allow additional Humpback whales to migrate out of

California waters. 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. Current considerations include the possible loss of the holiday market, possible fishing effort shift, and general economic impacts due to the ongoing COVID pandemic. Lifting the season delay in Fishing Zone 3 and the Depth Constraint in Fishing Zone 4 will maximize fishing opportunity for commercial fish businesses and vessel operators.

5. Data Availability Within and Across Fishing Zones

NOAA/Upwell aerial survey data are available for Zones 3 and 4. Cascadia Research vessel survey data are available for Zones 3 and 4. Monterey Bay Whale Watch (MBWW) data are available for Zone 4. The Department considers this data set to adequately cover the full geographic extent of Fishing Zones 3 and 4 (the only remaining Zones currently being evaluated for entanglement risk prior to opening) 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 Humpback concentrations were higher throughout the fall in Fishing Zones 3 and 4, south to Mexico and Central America. Aerial and vessel-based surveys indicate continued departures of Humpback whales from Zones 3 and 4. Humpback whale numbers are above average when compared to historical weekly averages from MBWW data, but numbers are below the Marine Life Concentration trigger and trending downward. This is an indication that the migration out of California waters is well underway.

7. Fishing Season Dynamics

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 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 mirror 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.

There are no domoic acid public health advisories currently in effect for Fishing Zone 3 or 4. Fair start provisions are in effect for the opening of both Fishing Zones 3 and 4. Fair start delays will expire for Zone 4 at 12:01 am on January 15, 2022, and for Zone 3 at 12:01 am on January 28, 2022.

Discussion at the Working Group meeting relayed concerns to CDFW that limited crew availability and processor capacity made it unlikely that a season opener prior to January 1 could happen in a fair and orderly manner. Additionally, three recognized port entities from Fishing Zone 3 have clearly stated they need more time for an orderly start to ensure the infrastructure and staffing to support the commercial fishery are in place. Those port associations requested the season opener be delayed until at least December 27, and noted the added benefit of lower entanglement risk with additional delay.

8. Known Distribution and Abundance of Key Forage

Based on aerial and vessel surveys in Fishing Zone 3 and 4, Humpback were observed at a variety of water depths feeding primarily on 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 aerial surveys in Zones 3 and 4.

9. Ocean Conditions

As of December 9, 2021, there is a 95% chance 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. The most recent Habitat Compression Index values are for October 2021. 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.

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

As of December 3, Cascadia Research reported that at least 18 Humpback whales known to be from California waters have arrived in Mexico breeding grounds, some of which are known to be from California waters. Aerial and vessel surveys show Humpback whales are still present in Fishing Zones 3 and 4, but primarily located offshore and declining in all areas. NOAA aerial survey

data observed 33 Humpback whales in the most recent survey compared to 73 Humpback whales in mid-November, and Cascadia vessel surveys observed 19 Humpback whales compared to 60 Humpback whales in early December. Cascadia surveys indicated that most whale sightings still appear to be in deeper water in Zone 4. Additionally, overall sighting frequency of humpback whales in Zones 3 and 4 has dropped from an average of 0.5 whales per nautical mile in early December to 0.2 whales per nautical mile.

Chosen Management Action and Rationale

Based on the management considerations outlined above, the Director will lift the Season Delay and Depth Constraint for the commercial Dungeness crab fishery and temporary trap prohibition for the recreational crab fishery, and modify the existing Fleet Advisory to extend it statewide. The recreational and commercial fisheries will open and the Depth Constraint will be lifted as described in the declaration above.

Pursuant to Section 132.8(b)(4), previously implemented management actions must be lifted or modified as new information is available if a different management action is more appropriate, and those modifications must be undertaken in a manner that promotes a fair and orderly fishery. In consideration of information collected throughout all risk assessments this season, marine life concentrations are trending downward. While small aggregations of Humpback whales remain in Fishing Zones 3 and 4, particularly along the canyon edges and shelf break in Monterey Bay, there have been significant decreases in the numbers of whale seen over the past month, particularly in Zone 3. NOAA aerial surveys documented a decline from 73 humpback whales to 33 humpback whales over a one-month period in Zone 3 (mid-November to mid-December). Cascadia vessel surveys documented a decline from 60 humpback whales to 19 humpback whales over a two-week period based on the latest data contribution (early December to mid-December). Additionally, MBWW weekly average observations have dropped to 4.9, which is below the trigger levels in Section 132.8 and continuing reduction consistent with reported weekly averages over the past weeks.

Information and observations are consistent with published migration trends indicating Humpback whales are leaving California waters at this time of year. Reports from collaborators in Mexico confirm humpback whales from California continue to arrive. We anticipate whale numbers to continue to decrease and entanglement risk to reduce significantly given all indications that the migration south has begun.

Remaining whales observed during surveys were primarily sighted at or near the edge of deep-water canyons. These areas are unlikely to see high levels of fishing effort due to their location on the outer edges of the Fishing Grounds. Given the reduced whale concentrations overall and limited Fishing Activity reported in Fishing Zone 4, the data supports lifting the Depth Constraint in Zone 4. However, it is still clear there are some whales remaining, in particular persistent aggregations off the coast of San Mateo County, and therefore a Fleet

Advisory statewide will provide additional information to allow fishery participants to avoid whales and further reduce entanglement risk.

Pursuant to Section 132.8(d)(7), fleet dynamics were taken into consideration. Following the release of the Department's initial recommendation to open the season in Fishing Zone 3 on December 22, multiple commercial port associations expressed support for an additional delay to allow time for adequate infrastructure and staffing to ensure a fair and orderly opening to the fishery. While the Department initially considered a Fishing Zone 3 season opener on December 22 with a Fleet Advisory, the Department also supports a more precautionary approach of an additional delay. Opening Fishing Zone 3 to commercial fishing and lifting the Depth Constraint in Zone 4 on December 26 will allow additional time for remaining whales to migrate out of California waters, further reducing the already low entanglement risk.

However, given the already low entanglement risk as based on the available data, as well as the anticipated lower intensity of trap use, the recreational fishery will open on December 17 in advance of the commercial fishery. Additionally, Section 132.8(b)(4) requires the Director to lift or modify any restrictions in a manner that promotes fair and orderly fisheries. Here, recreational trap use and commercial fishing in Fishing Zone 3 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. Lifting the temporary prohibition on the use of recreational crab traps on December 17 provides for an orderly start for the use of recreational crab traps 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 Zone 3 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 Final Management Recommendation

Date: December 14, 2021

An initial assessment and preliminary recommendation was developed by California Department of Fish and Wildlife (CDFW) Marine Region staff for consideration by the California Dungeness Crab Fishing Gear Working Group (Working Group) for the Risk Assessment Mitigation Program (RAMP; Section 132.8, Title 14, California Code of Regulations) regarding Management Actions to address marine life entanglement risk in the commercial Dungeness crab fishery. The initial assessment was shared with the Working Group on December 13, 2021, and finalized at the conclusion of the Working Group meeting on December 14, 2021 based on discussions with the group.

A. Recommended Management Actions

Recreational Fishery:

- **Fleet Advisory: Fishing Zones 1, 2, 3, 4, 5 and 6**

Commercial Fishery:

- **Fleet Advisory: Fishing Zones 1, 2, 3, 4, 5 and 6**

Fleet Advisory

Recreational Fishery: The recreational Dungeness crab fishery is currently open statewide in all Fishing Zones (see CCR Title 14, section 29.80(e)), although use of traps is temporarily restricted in Fishing Zone 3. CDFW Marine Region's final recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 4, 5 and 6 for the recreational fishery. Staff also recommend lifting the trap restriction in Zone 3 and including this Zone in a Fleet Advisory, with specific information on recent humpback whale sighting locations. The final recommendation is that the recreational trap restriction be lifted on December 17, 2021, at 9:00am in Zone 3.

Commercial Fishery: The commercial Dungeness crab fishery is currently open in Fishing Zones 1, 2, 5 and 6 under a Fleet Advisory and set to open in Zone 4 with a Depth Constraint and Fleet Advisory on December 16, 2021. CDFW Marine Region's final recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 4, 5 and 6 and open Zone 3 with Fleet Advisory on December 22, 2021, with specific information on recent humpback whale sighting locations. It is also recommended that the Depth Constraint be lifted in Zone 4 on December 19, 2021, at 8:01am which would align with the start of the 64-hour pre-soak period for Zone 3.

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. Small aggregations of humpback whales remain in Zones 3 and 4, particularly in waters south of Half Moon Bay to Pigeon Point and along the canyon edges and shelf break in Monterey Bay. However, aerial and vessel-based surveys have shown a steady decline in humpback whale observations since mid-November for Zone 3 in particular. NOAA aerial surveys documented a decline from 73 humpback whales to 33 humpback whales over a one-month period in Zone 3 (mid-November to mid-December). Cascadia vessel surveys documented a decline from 60 humpback whales to 19 humpback whales over a two-week period based on the latest data contribution (early December to mid-December). Monterey Bay Whale Watch weekly average observations have also declined from 8.7 humpback whales in mid-November to 4.9 humpback whales as of this risk assessment. All available data show a continued decline and based on this trend, CDFW anticipates risk of entanglement has abated sufficiently to allow the opening of all Fishing Grounds in Zone 3 and Zone 4 to the recreational and commercial trap fisheries. In addition, based on the most recent data indicating arrivals of humpback whales to the winter breeding grounds, entanglement risk is significantly reduced compared to previous risk assessments, as observations on the winter breeding grounds confirm humpback whales from California continue to arrive. However, to further minimize risk of entanglement, a Fleet Advisory is prudent as whales continue their migration out of California waters. Therefore, the recreational and commercial crab fleets should use precaution when setting trap gear in all Zones 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. Waters off the San Mateo coast (near Pigeon Point) have shown persistent aggregations of humpbacks during most surveys and both fleets should use caution when fishing on the border of Zones 3 and 4. Therefore the final recommendation is for the coastwide Fleet Advisory to remain in place until it can be reevaluated at the next risk assessment (expected to occur in mid-January 2022) by the CDFW Director.

Addendum:

A portion of the Working Group and the Port Associations/Boat Owner Associations of Bodega Bay, Half Moon Bay and San Francisco requested an additional delay of the commercial fishery in Zone 3 to provide for an orderly start of the fishery. An additional delay under the fair and orderly provision of RAMP would provide additional protection for humpback whales as they continue to migrate to winter breeding grounds before the commercial fishery opens.

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:** NOAA aerial surveys observed 33 humpback whales in Zone 3, exceeding the trigger pursuant to Title 14, CCR, section 132.8(c)(2)(A)(4)(a) of 20 humpback whales in a single Fishing Zone, which triggers a Management Action.

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 Zones 1, 2, 3, 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

- Lifting the Season Delay in Zone 3 and the Depth Constraint in Zone 4 will maximize fishing opportunity for commercial fish businesses and vessel operators.

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

- NOAA 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 departures of humpback whales from Zones 3 and 4.
- Presence of humpback whales is slightly above average, but within normal ranges, based on MBWW data, an indication that migration out of California waters is still ongoing.

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

- 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 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 mirror 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.

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

- Humpback whales were observed feeding primarily on schooling fish at a variety of water depths in Zones 3 and 4.
- 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 aerial surveys in Zones 3 and 4.

Section 132.8(d)(9): Ocean conditions

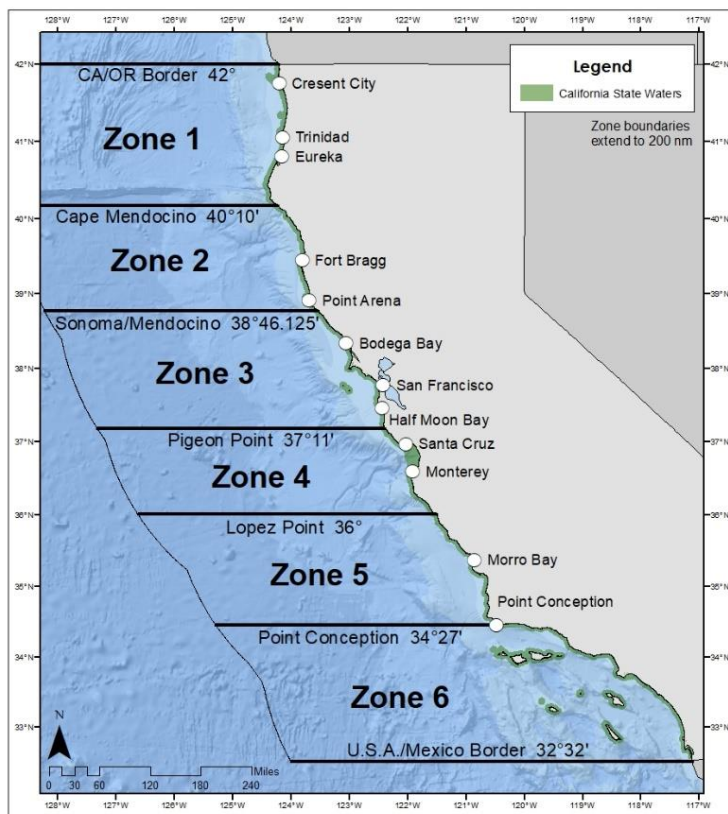
- As of December 9, 2021, there is a 95% chance of La Niña conditions continuing through the Northern Hemisphere winter 2021-22, with a 60% chance of transitioning to ENSO-neutral conditions during spring 2022.
- The most recent Habitat Compression Index values are for October 2021. At that time, there was low compression, with cooler water habitat available between 25 and 40°N. Compression is often variable during the month of December.

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 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.
- Based on NOAA aerial surveys and vessel surveys conducted by Cascadia Research, humpback whales are still present within the Gulf of the Farallones and Monterey Bay but declining across Fishing Zone 3 and 4.



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 14, 2021

Anticipated Director's Determination Date: December 15, 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

The Working Group discussed three recommendations during their meeting, only one of which received broad support. All three recommendations are presented below in order of highest to lowest support, rather than their chronological order during the discussion.

Recommendation 1

The Working Group recommends CDFW lift the depth restriction for the commercial fishery in Fishing Zone 4 at the same time as Fishing Zone 3 opens for the commercial fishery. The Working Group relied upon the rationale provided in [CDFW's December 13, 2021 Initial Assessment](#), particularly with regards to alleviating gear crowding. This recommendation received broad support from WG members, including both fishing and environmental representatives.

Recommendation 2

The Working Group discussed postponing the commercial season opener for Fishing Zone 3 until January 1, 2022. The recreational trap prohibition would be lifted at the same time. This proposal received mixed support from Working Group members, with similar numbers of members expressing support and opposition and two members remaining neutral. Working Group members who supported the recommendation pointed to the [December 13, 2021 Available Data document](#), and that some of the recent marine life concentration surveys indicate humpback whale abundances still exceed the RAMP triggers and thus pose continued entanglement risk. Members also pointed to the presence of juvenile humpback whales, which may overwinter off California rather than departing to the breeding grounds. Humpback whales have also been observed foraging on fish, rather than krill. While foraging opportunities and humpback whale presence is currently broadly distributed across a range of depths, if the distribution of fish shifts whales could follow their prey into typical fishing grounds,

resulting in elevated risk. Lastly, members noted that recent surveys have documented humpback whales in areas which typically have high effort once the season opens.

During the meeting, there was extensive discussion regarding the interplay between market conditions and entanglement risk. Some members pointed out that the proposed delay would also support a safe and orderly fishery opener and help address concerns regarding limited crew availability and processor capacity. However, multiple Working Group members pointed to the importance of having the Director's decisions under RAMP be based on available data and focused on reducing marine life entanglement risk, and that such concerns are outside the scope of the RAMP regulations.

Recommendation 3

The Working Group contemplated a recommendation to lift the prohibition on recreational use of traps in Fishing Zone 3 as soon as feasible, based on the analysis provided in [CDFW's December 13, 2021 Initial Assessment](#). However, this proposal received limited support, given uncertainty around when the commercial fishery will open in this Fishing Zone. Working Group members noted the need for consistency amongst both sectors regarding when entanglement risk has declined sufficiently to allow use of trap gear, and that the recreational trap prohibition should remain in place until conditions indicate the commercial fishery could open. In the absence of a set opening date for the commercial fishery in Fishing Zone 3, a majority of Working Group members decided against advancing a separate recommendation regarding the recreational fishery.

Other Working Group Requests

The Working Group expressed appreciation for the efforts by their Advisors and CDFW to collect additional marine life concentrations data during the short time between the December 9, 2021 assessment and their December 14, 2021 meeting. However, the Working Group also noted the high amount of uncertainty regarding allowable commercial activity within Fishing Zones 3 and 4. The Working Group requested CDFW schedule a follow up discussion regarding establishing date-certain milestones under RAMP, similar to the approach taken with regards to crab quality testing. While this might reduce fishing opportunity in some instances, the additional notice and predictability for the fleet could outweigh the cost.



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

Date: December 13, 2021

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, 3, 4, 5 and 6**

Commercial Fishery:

- **Fleet Advisory: Fishing Zones 1, 2, 3, 4, 5 and 6**

Fleet Advisory

Recreational Fishery: The recreational Dungeness crab fishery is currently open statewide in all Fishing Zones (see CCR Title 14, section 29.80(e)), although use of traps is temporarily restricted in Fishing Zone 3. CDFW Marine Region's preliminary recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 4, 5 and 6 for the recreational fishery. Staff also recommend lifting the trap restriction in Zone 3 and including this Zone in a Fleet Advisory, with specific information on recent humpback whale sighting locations. The preliminary recommendation is that the recreational trap restriction be lifted on December 16, 2021, at 9:00am in Zone 3.

Commercial Fishery: The commercial Dungeness crab fishery is currently open in Fishing Zones 1, 2, 5 and 6 under a Fleet Advisory and set to open in Zone 4 with a Depth Constraint and Fleet Advisory on December 16, 2021. CDFW Marine Region's preliminary recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 4, 5 and 6 and open Zone 3 with Fleet Advisory on December 22, 2021, with specific information on recent humpback whale sighting locations. It is also recommended that the Depth Constraint be lifted in Zone 4 on December 19, 2021, at 8:01am which would align with the start of the 64-hour pre-soak period for Zone 3.

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. Small aggregations of humpback whales remain in Zones 3 and 4, particularly in waters south of Half Moon Bay to Pigeon Point and along the canyon edges and shelf break in Monterey Bay. However, aerial and vessel-based surveys have shown a steady decline in humpback whale observations since mid-November for Zone 3 in particular. NOAA aerial surveys documented a decline from 73 humpback whales to 33 humpback whales over a one-month period in Zone 3 (mid-November to mid-December). Cascadia vessel surveys documented a decline from 60 humpback whales to 19 humpback whales over a two-week period based on the latest data contribution (early December to mid-December). Monterey Bay Whale Watch weekly average observations have also declined from 8.7 humpback whales in mid-November to 4.9 humpback whales as of this risk assessment. All available data show a continued decline and based on this trend, CDFW anticipates risk of entanglement has abated sufficiently to allow the opening of all Fishing Grounds in Zone 3 and Zone 4 to the recreational and commercial trap fisheries. In addition, based on the most recent data indicating arrivals of humpback whales to the winter breeding grounds, entanglement risk is significantly reduced compared to previous risk assessments, as observations on the winter breeding grounds confirm humpback whales from California continue to arrive. However, to further minimize risk of entanglement a Fleet Advisory is prudent as whales continue their migration out of California waters. Therefore, the recreational and commercial crab fleets should use precaution when setting trap gear in all Zones 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. Waters off the San Mateo coast have shown persistent aggregations of humpbacks during most surveys and both fleets should use caution when fishing on the border of Zones 3 and 4. Therefore the preliminary recommendation is for the coastwide Fleet Advisory to remain in place until it can be reevaluated at the next risk assessment (expected to occur in mid-January 2022) by the CDFW 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:** NOAA aerial surveys observed 33 humpback whales in Zone 3, exceeding the trigger pursuant to Title 14, CCR, section 132.8(c)(2)(A)(4)(a) of 20 humpback whales in a single Fishing Zone, which triggers a Management Action.

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 Zones 1, 2, 3, 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

- Lifting the Season Delay in Zone 3 and the Depth Constraint in Zone 4 will maximize fishing opportunity for commercial fish businesses and vessel operators.

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

- NOAA 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 departures of humpback whales from Zones 3 and 4.
- Presence of humpback whales is slightly above average, but within normal ranges, based on MBWW data, an indication that migration out of California waters is still ongoing.

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

- 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 fishing activity thus far has been in the Northern Management Area, with approximately half of the landings thus far (52.7%) made into Eureka, followed by Trinidad (24.7%), Crescent City (19.8%), and Fort Bragg (2.7%).
- Trends in vessel activity closely mirror those of landing volume, with 46 active vessels making landings into Eureka, 15 vessels making landings into Trinidad, and 12 vessels each making landings into Crescent City and Fort Bragg.

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

- Humpback whales were observed feeding primarily on schooling fish at a variety of water depths in Zones 3 and 4.
- 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 aerial surveys in Zones 3 and 4.

Section 132.8(d)(9): Ocean conditions

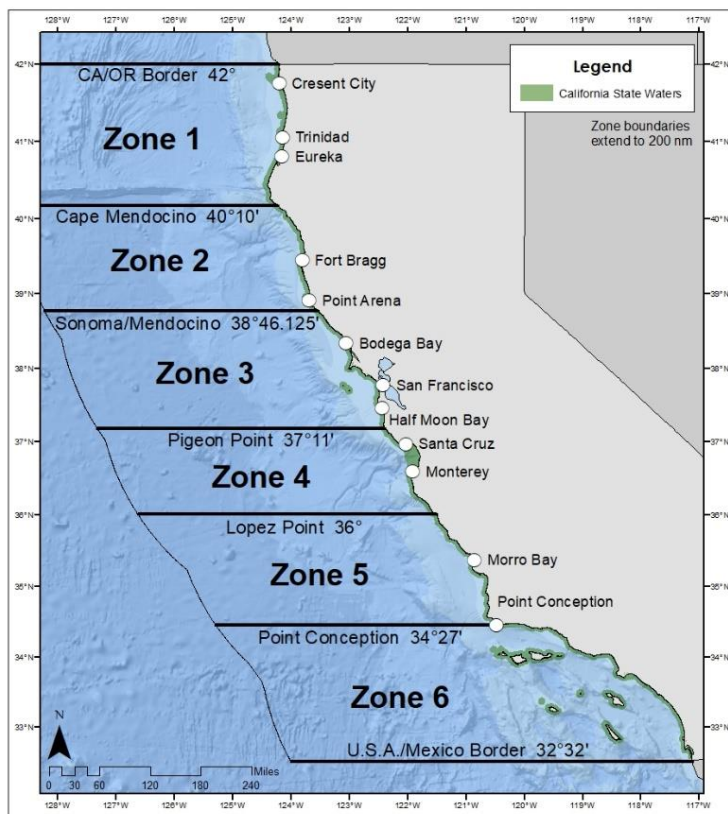
- As of December 9, 2021, there is a 95% chance of La Niña conditions continuing through the Northern Hemisphere winter 2021-22, with a 60% chance of transitioning to ENSO-neutral conditions during spring 2022.
- The most recent Habitat Compression Index values are for October 2021. At that time, there was low compression, with cooler water habitat available between 25 and 40°N. Compression is often variable during the month of December.

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 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.
- Based on NOAA aerial surveys and vessel surveys conducted by Cascadia Research, humpback whales are still present within the Gulf of the Farallones and Monterey Bay but declining across Fishing Zone 3 and 4.



RAMP Fishing Zone Boundaries

2021-22 Risk Assessment: Available Data

Last updated: December 13, 2021

Contents

Items with updated information are followed by an *.

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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.

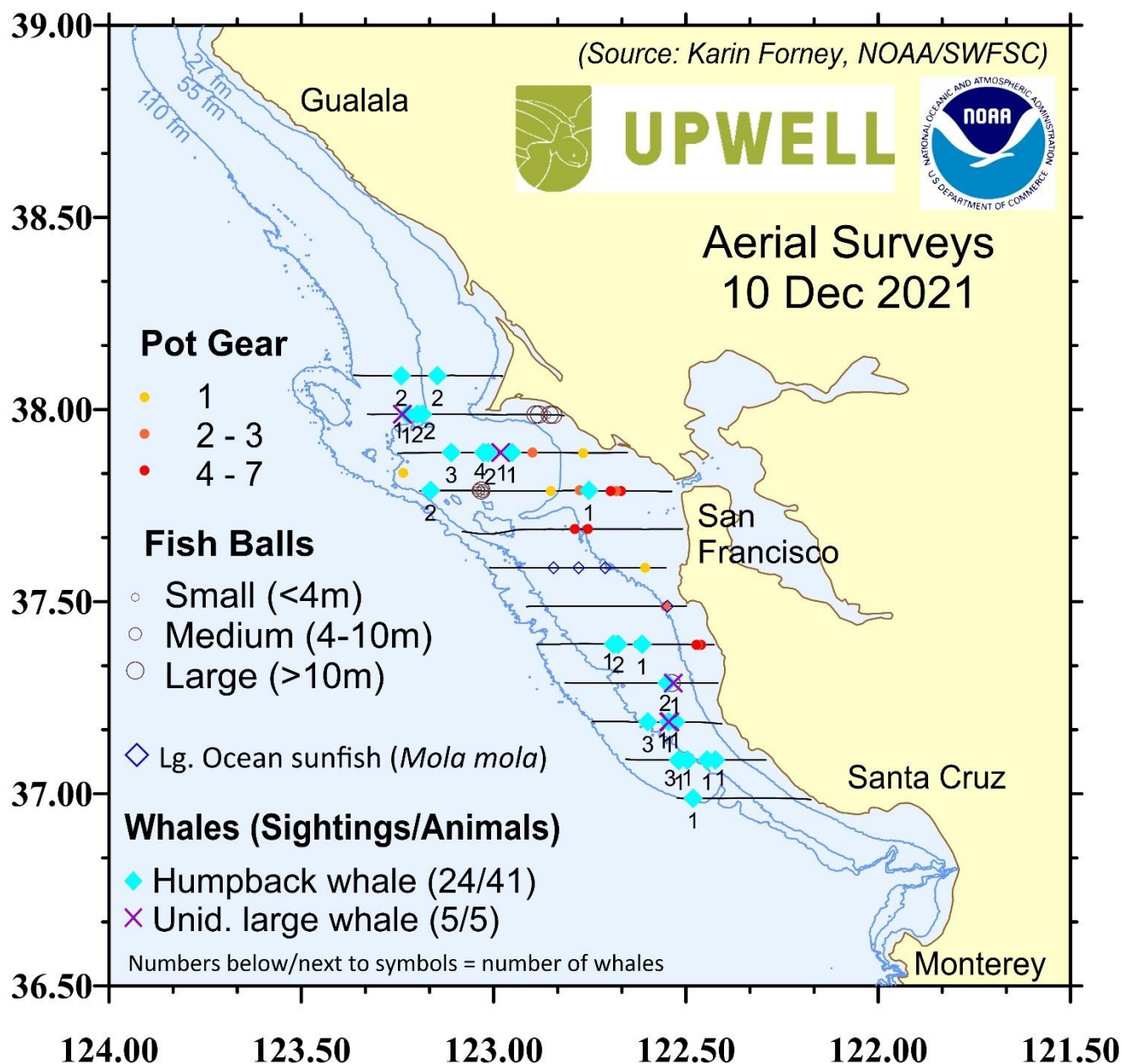


Figure 1. Aerial survey track lines and observations of humpback whales, unidentified whales, large molas (ocean sunfish), fish balls (anchovies), and unidentified fishing gear within in Fishing Zones 3 and 4 on December 10, 2021. The number of whales in each sighting is shown below the symbols.

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

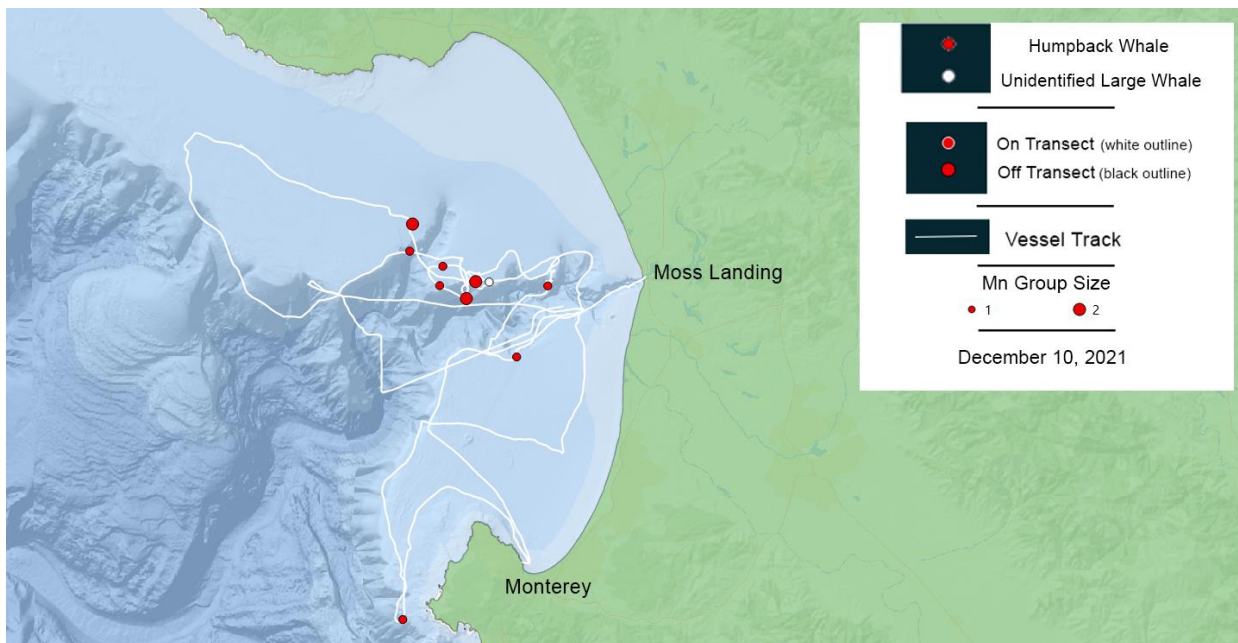


Figure 2. Tracks and sightings from survey conducted on December 10, 2021 by two Cascadia RHIBs.

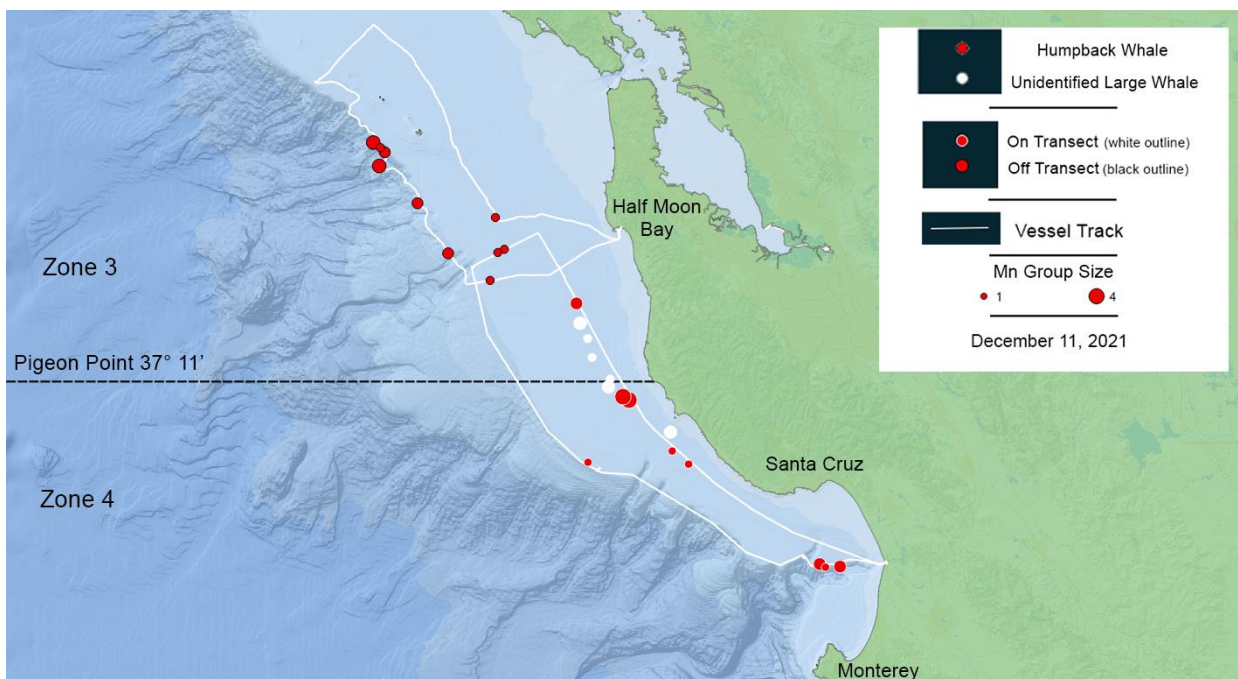


Figure 3. Tracks and sightings from surveys conducted on 11 December 2021 in Zone 3 and 4 by both Current'Sea (MLS) and Cascadia RHIB.

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).

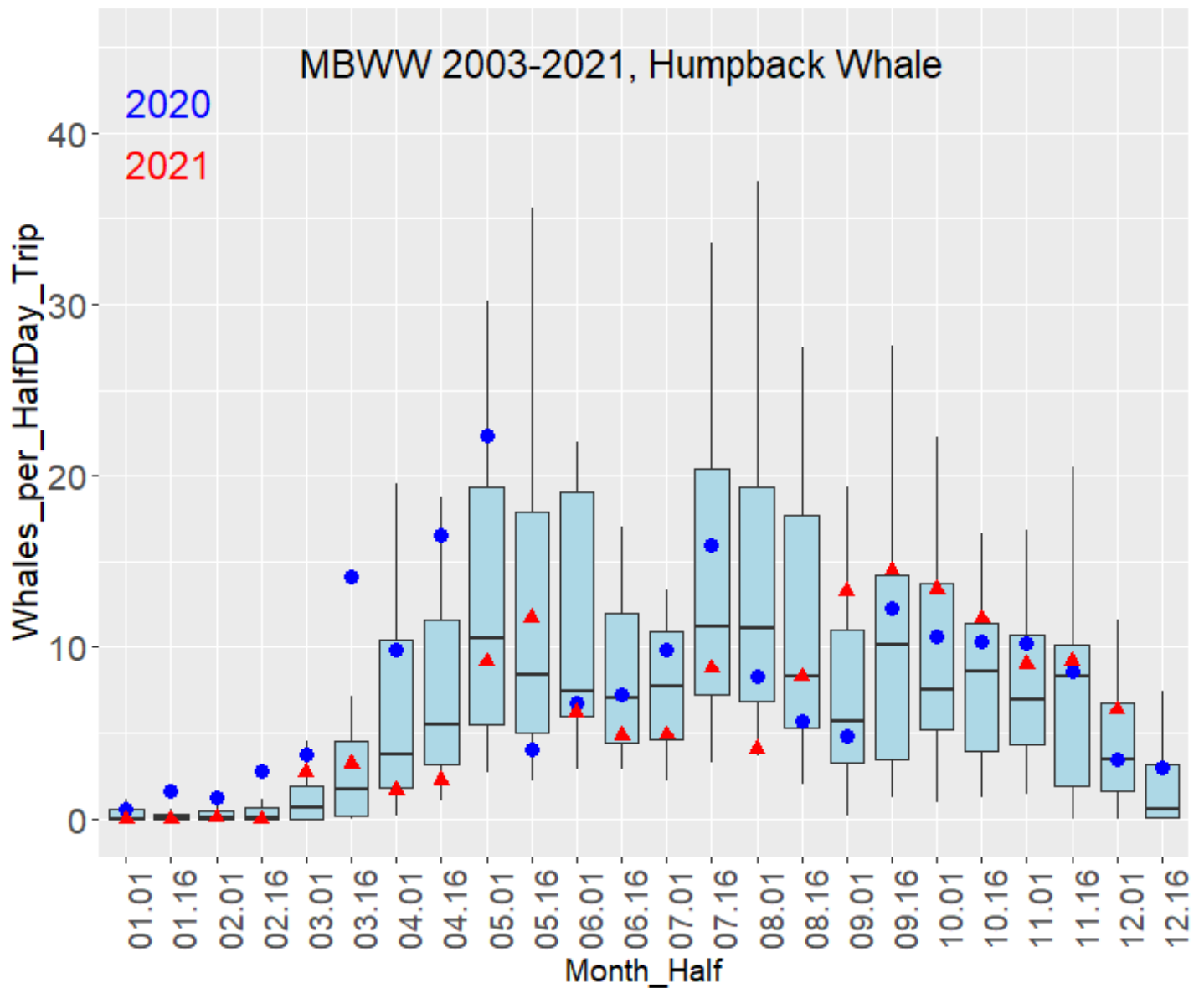


Figure 4. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the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

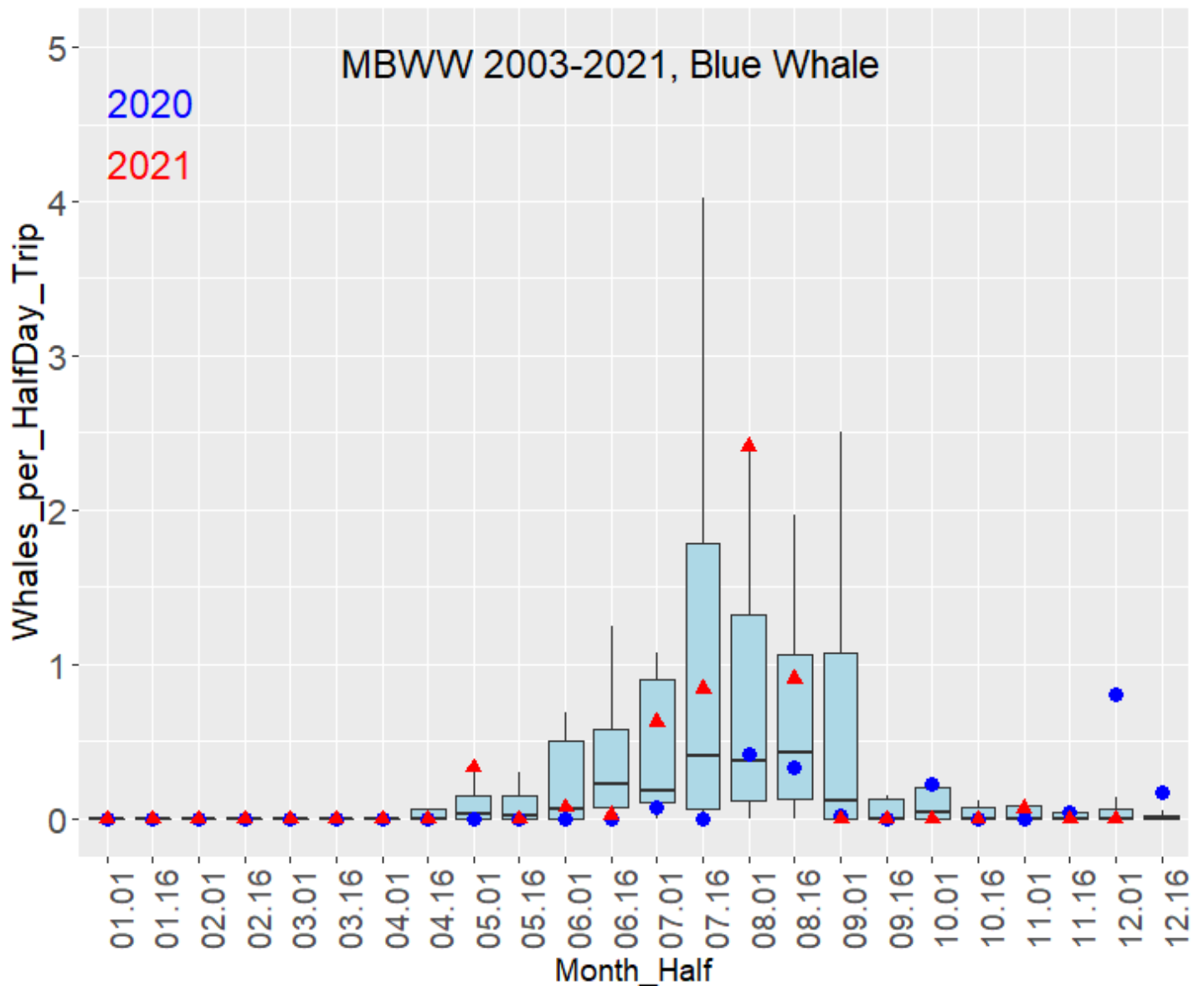


Figure 5. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of blue whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average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

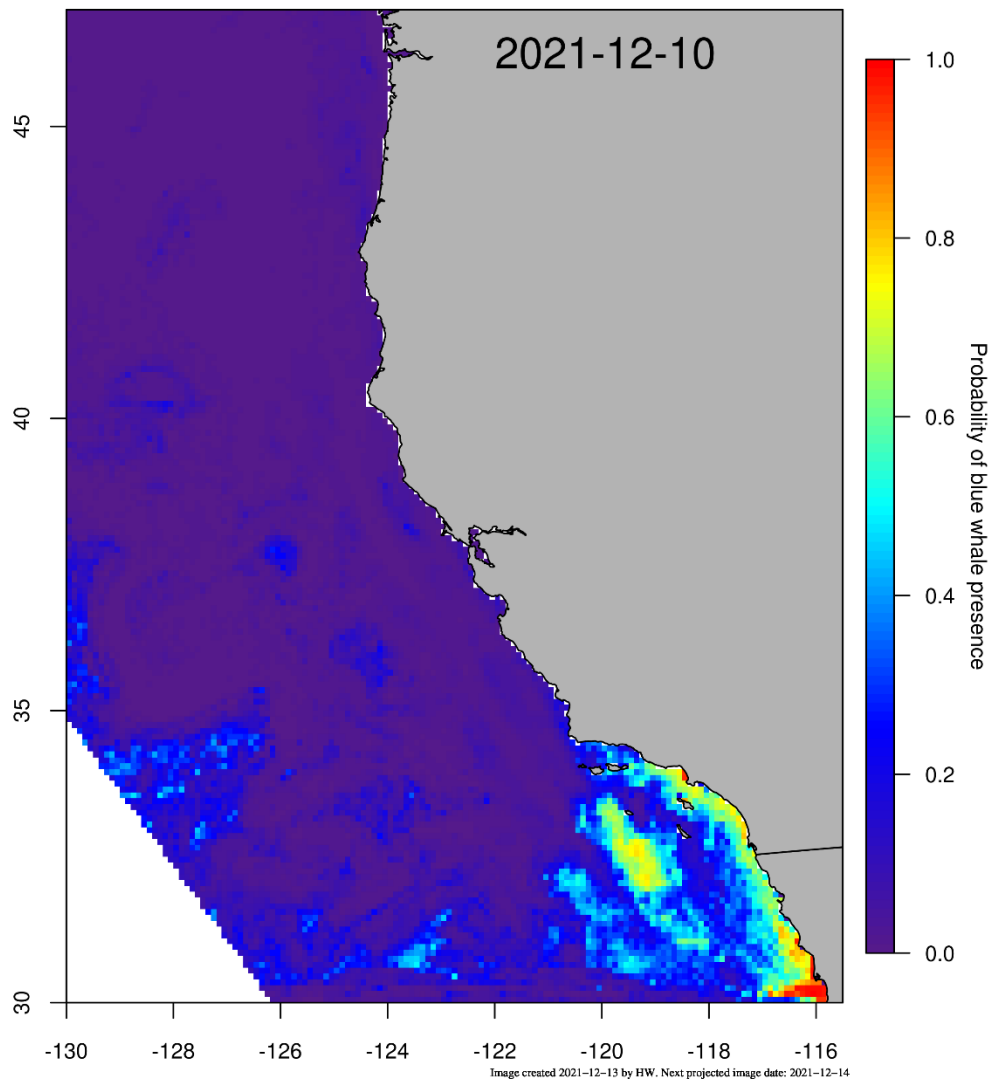
WhaleWatch 2.0 (All Fishing Zones)

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

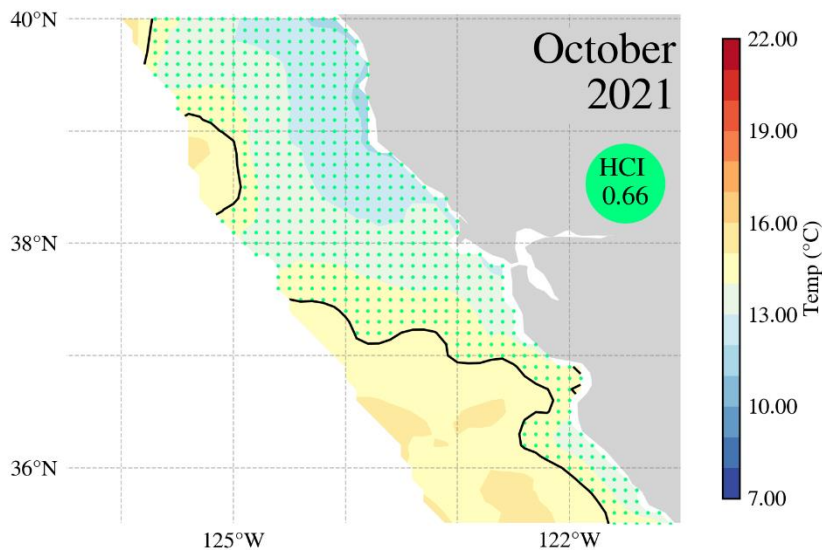
El Niño/Southern Oscillation Diagnostic Discussion

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).

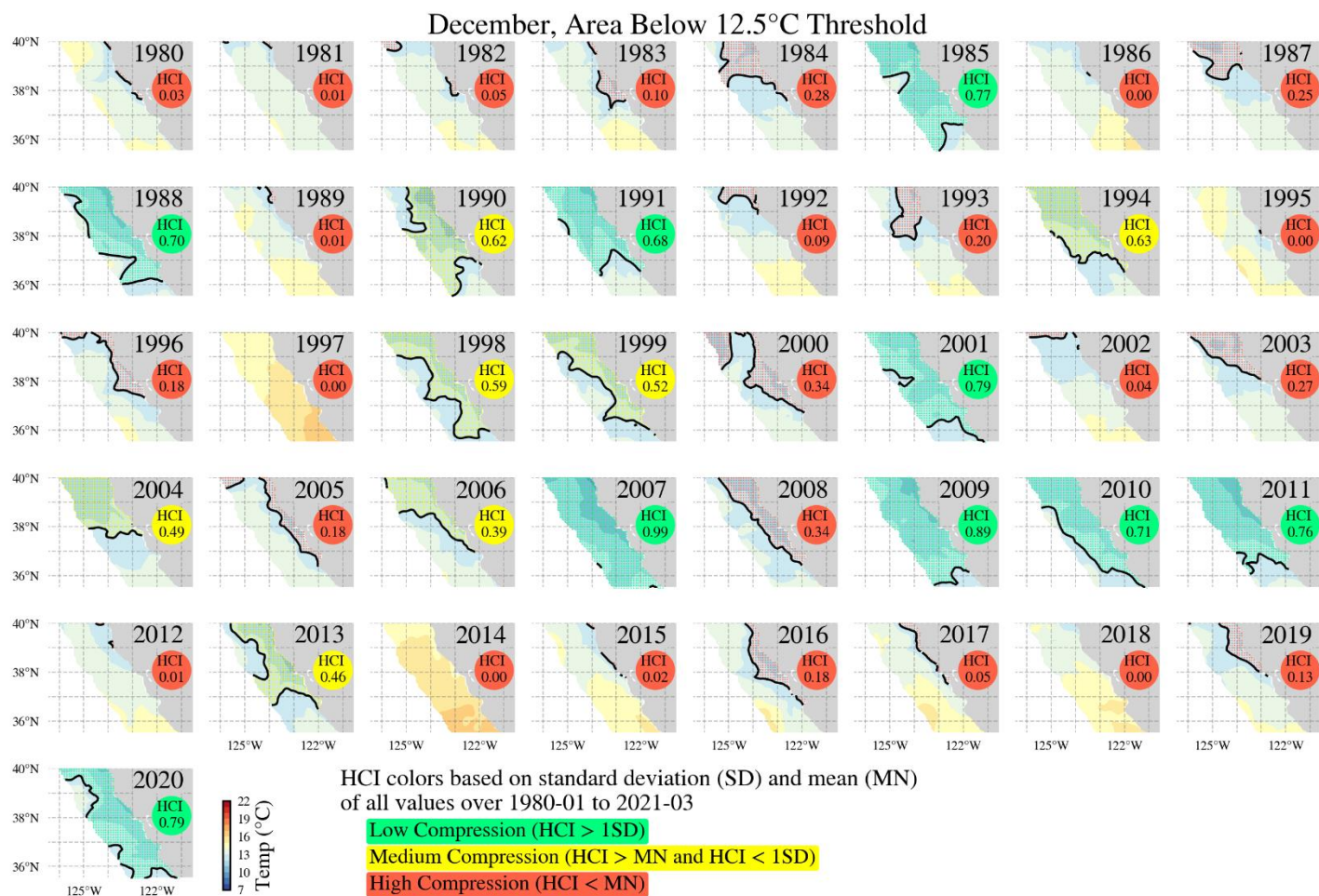


Figure 8. Maps of historical December sea surface temperature and location of the Habitat Compression Index boundary (thin black line) between 1980 and 2020.

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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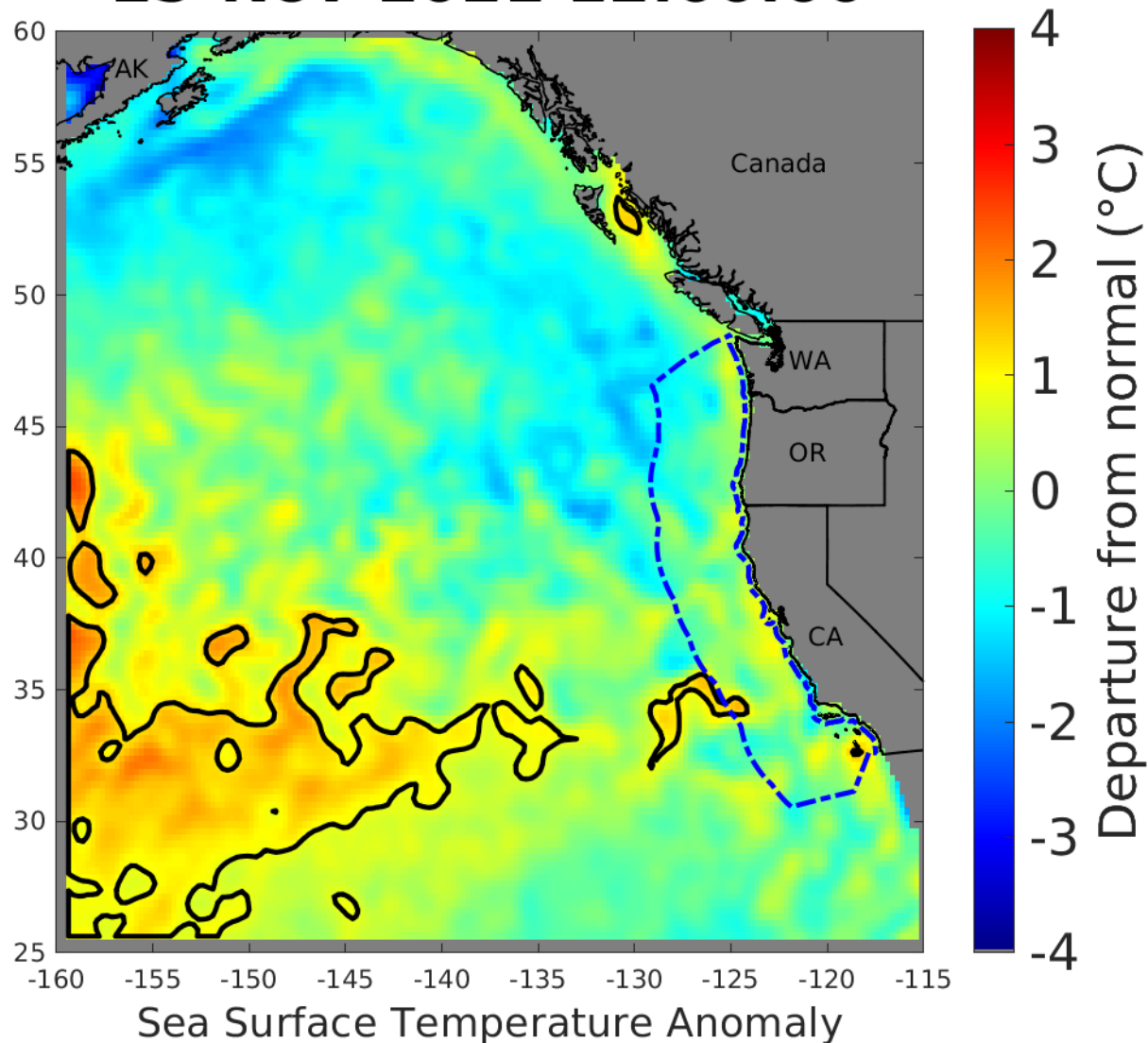


Figure 9. Science-quality (delayed 3-weeks), daily interpolated standardized sea surface temperature anomalies (SSTa) in the California Current ecosystem available for analysis of MHW presence. Dark outline shows the current extent of MHW conditions, as delineated by values of the normalized SST + 1.29 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).