



**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE (DEPARTMENT)
DECLARATION OF CONTINUED FISHING SEASON DELAY 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)”), I find and declare that:

I

On November 19, 2021, I evaluated entanglement risk for the commercial Dungeness crab fishery pursuant to Section 132.8(b) and the recreational Dungeness crab fishery pursuant to Section 29.80(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 November 15, 2021. Prior to this risk assessment and management response, I considered the Working Group’s November 17, 2021, management recommendation and other relevant information provided to my staff.

II

Aerial surveys undertaken by NOAA researchers on November 10 and 11 observed 73 humpback whales in Zone 3. Vessel surveys undertaken by Cascadia Research observed 79 Humpback whales in Zone 3 over two surveys days, with single-day observations of 44 whales and 21 whales. Pursuant to Section 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 throughout the summer and fall show continued presence of Humpback whales, with the most recent weekly running average of 8.7 Humpback whales in Monterey Bay. Pursuant to Section 132.8(c)(2)(A)(4)(a), I must implement a protective management action in the commercial crab fishery.

IV

Telemetry data show a Pacific leatherback sea turtle present in Fishing Zone 4. Pursuant to Section 132.8(c)(2)(A)(4)(c), I must implement a Fishing Zone delay or other protective management action.

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 and Pacific leatherback sea turtles 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 Sections 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 actions:

1. Continuation of the delay of the opening of the commercial Dungeness crab fishery in Fishing Zones 3 and 4. Take and possession of commercially caught Dungeness crab is prohibited in the delayed Fishing Zones.
2. Continuation of the temporary recreational crab trap prohibition in Fishing Zones 3 and 4. The deployment and use of crab traps in any recreational fishery is temporarily prohibited in those Zones.
3. Fleet Advisory for both commercial and recreational fisheries in Fishing Zones 1, 2, 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.

This declaration superseded my declaration on November 1, 2021. This management action is in effect until modified. The next risk assessment is expected to occur on or before 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 web page:
<http://www.wildlife.ca.gov/Conservation/Marine/Whale-Safe-Fisheries>.



Charlton H. Bonham, Director

11/19/21 3pm PT

Date/Time

ATTACHMENT TO DIRECTOR NOVEMBER 19, 2021, DECLARATION CONTINUED
FISHING SEASON DELAY 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 November 17, 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:** 73 Humpback whales observed during NOAA/Upwell aerial surveys, and 44 and 21 Humpback whales were observed by Cascadia Research vessel surveys during two survey days.
- **Fishing Zone 4:** weekly running average of 8.7 Humpback whales based on Monterey Bay Whale Watch (MBWW) data. Pacific leatherback sea turtle telemetry data indicate turtle presence.

Relevant Management Considerations Under Section 132.8(d)

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

Recommends that the commercial fishery open as scheduled on December 1. Commercial fishery participants should implement best practices, but CDFW should not open the fishery under a Fleet Advisory. The recreational fishery should remain open in Fishing Zones 1 and 2. While recreational fishery participants should continue to implement best practices, the Fleet Advisory should be lifted beginning December 1. There was broad support for CDFW's preliminary recommendation of an ongoing delay for the commercial season opener in Fishing Zones 3 and 4 and a continued crab trap restriction for the recreational fishery in those Zones.

2. Information from NOAA

No additional information was made available for this risk assessment.

3. Effectiveness of Management Measures to Minimize Entanglement Risk

Based on the available information, continuing the temporary prohibition on the use of recreational crab traps and delay of the commercial season in Fishing Zones 3 and 4 is likely to be the most effective management action to reduce entanglement risk. 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 and Pacific leatherback sea turtles.

Based on data for Fishing Zones 1, 2, 5, and 6, Humpback whale concentrations are minimal, although whales are still 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 commercial season delay will impact operators and businesses. There will be economic impacts to individual operators, however given the risk of entanglement (which is expected to decrease) the short-term economic impacts must be weighed against any possible longer-term viability of the commercial fishery across California.

Economic impacts from a temporary recreational trap prohibition are unknown at this time given the lack of data on the fishery, however businesses dependent on recreational fishing activity may be impacted.

5. Data Availability Within and Across Fishing Zones

Upwell/NOAA aerial survey data are available for Zones 3 and 4. Cascadia Research vessel survey data are available for Zones 1, 3 and 4. MBWW data are available for Fishing Zone 4. Point Blue Conservation Science observation data are available for Zones 3, 4, and 6. The Habitat Compression Index is available for Zones 2, 3, 4 and the northern portion of Zone 5. Whale Watch 2.0 habitat predictions are available for all Zones. In conjunction with the statewide survey data collected in advance of the November 19 risk assessment, the Department considers this comprehensive data set to adequately cover the full geographic extent of Fishing Zones 1 through 6 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) south to Mexico and Central America. Aerial surveys indicate continued presence of large aggregations of Humpback whales distributed across Fishing Zones 3 and 4. Based on MBWW data, observed Humpback whale numbers are above average when compared to historical data, which may indicate that the bulk of the migration has yet to begin.

Pacific leatherback sea turtles typically forage in an area extending from Monterey Bay to Point Reyes during the summer months. Recent surveys and satellite tagging observations indicate foraging turtles are still present in Fishing Zones 4.

7. Fishing Season Dynamics

Current domoic acid testing results indicate a potential delay for the commercial fishery in the northern portion of Zone 3 (Sonoma/Mendocino County Line to Point Reyes). Quality testing is complete for Zones 1 and 2, results indicate no additional delay will be required. It is unclear how fishing effort may shift given any season delays, but any season opener is expected to result in relatively high gear concentrations.

8. Known Distribution and Abundance of Key Forage

Both the Cascadia Research surveys and Upwell/NOAA surveys observed Humpback whales inshore and offshore feeding on schooling fish, a key prey element for Humpback whales. Leatherback foraging habitat, as indicated by aggregations of brown sea nettles and presence of large molas, were evident from around Point Reyes in depths of 20-40 fathoms. Krill were not observed.

9. Ocean Conditions

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 at least nine Humpback whales known to be from California waters have arrived in the Mexico breeding grounds, three of which were seen off California in 2021. Prior survey data by CDFW and the USCG indicates that few whales were present in Zones 1 and 2, indicating migration has likely occurred in the northern Fishing Zones. Prior survey data also indicates low concentrations of whales in Zones 5 and 6. However, the large numbers of humpback whales distributed across Fishing Zones 3 and 4 is an indication that significant migration has yet to occur out of central California waters. Aerial and vessel survey data is supported by MBWW data and Point Blue Conservation Science observation data collected by trained naturalists associated with the National Marine Sanctuaries and National Park Service as well as trained observers. At least one Leatherback sea turtles is still present offshore of Monterey Bay, although given the time of year is anticipated to be moving away from the Fishing Grounds. Humpback whales were observed foraging inshore and offshore.

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 in Fishing Zones 3 and 4, and continue the temporary crab trap prohibition in the recreational Dungeness crab fishery in Fishing Zones 3 and 4. 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. A Fleet Advisory is issued for the recreational and commercial fisheries in Fishing Zones 1, 2, 5, and 6.

Aerial and vessel survey data, including data from MBWW, shows large aggregations of foraging Humpback whales in Fishing Zones 3 and 4 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 Zones 3 and 4 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.

Furthermore, telemetry data show a Pacific leatherback sea turtle in Fishing Zones 4, and data indicates Leatherback sea turtle foraging opportunity is still present in Zone 3. Section

132.8 anticipates a delay in the season opener in the event Pacific leatherback sea turtles are present. Although it is anticipated that any remaining Pacific leatherback sea turtles are headed out of California waters, given the critical status of the species and the possibility of Pacific leatherback sea turtles remaining in observed foraging areas in Fishing Zones 3, a season delay/temporary crab trap prohibition is the most protective management response.

Although current survey data was not available for Zones 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, 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 Preliminary Management Recommendation

Date: November 19, 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 November 17, 2021, and finalized on November 19, 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, 5 and 6**
- **Temporary Crab Trap Restriction: Fishing Zones 3 and 4**

Commercial Fishery:

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

Fleet Advisories

Recreational Fishery: The recreational Dungeness crab fishery is currently open statewide in all Fishing Zones. 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.

Commercial Fishery: The commercial Dungeness crab fishery is currently open in Fishing Zones 5 and 6 and scheduled to open on December 1 in Zones 1 and 2. CDFW Marine Region's final recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 5 and 6 and extend the Advisory to Zones 1 and 2 when the fishery opens.

Rationale: Survey data for Zones 2, 5, and 6, were available prior to the November 1 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. However, Cascadia Research vessel surveys indicated small concentrations of humpback whales in Zone 1. Due to remaining humpbacks in Zone 1 a Fleet Advisory is prudent. Based on NOAA/Upwell aerial surveys and Cascadia Research vessel surveys, several concentrations of humpback whales remain in

Zones 3 and 4. These data indicate humpback whales remain in California waters and the migration to winter breeding grounds is still ongoing and the recreational and commercial crab fleets should use additional precaution when setting gear in Zones 1, 2, 5 and 6 because humpbacks 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. This advisory will remain in place until the next risk assessment (expected to occur on or before December 15, 2021) and will be reevaluated based on recent data. Working Group meeting dates are scheduled on December 1 or December 6 in anticipation of new data to inform this next risk assessment.

Crab Trap Restriction/Season Delay

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 Zones 3 and 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 Zones 3 and 4.

Rationale: Based on exceedance of Marine Life Concentration triggers for humpback whales in Zones 3 and 4, continued management action is necessary. Cascadia Research vessel surveys and NOAA/Upwell aerial surveys indicated numerous aggregations of humpback whales across Zones 3 and 4. Based on both datasets, humpback whales were distributed widely both inshore and offshore. Given the significant number of humpback whales observed there is an increased risk of entanglement with vertical lines and surface gear in Zones 3 and 4 if the recreational fishery were allowed to use crab traps and the commercial season were allowed to open. A commercial season delay and temporary recreational trap restriction in those Zones is the recommended Management Action based on the wide distribution of humpback whales across all depths of Fishing Zone 3 and 4 and the potential for leatherback sea turtles to be foraging in Zones 3 based on prey availability. 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. 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 for Zones 3 and 4. 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 before December 15, 2021). Working Group meeting dates are scheduled on December 1 or December 6 in anticipation of new data to inform this next risk assessment.

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:** NOAA/Upwell aerial surveys observed 73 humpback whales in Zone 3, exceeding the trigger pursuant to Title 14, CCR, section 132.8(c)(2)(A)(4)(a). Cascadia Research Vessel surveys observed 79 humpback whales in Zone 3 over two survey days, exceeding the trigger pursuant to Title 14, CCR, section 132.8(c)(2)(A)(4)(a). In addition, based on MBWW data, the running weekly average for Zone 4 is 8.7 humpback whales, which exceeds 5 humpback whales in a single Fishing Zone and triggers management response under RAMP (c)(2)(A)(4). NOAA and Upwell tagging data indicate one leatherback sea turtle in Zone 4, exceeding a trigger pursuant to 132.8, Title 14, CCR (c)(2)(A)(4)(c).

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 3 and 4, 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 Fishing Zone delay/trap restriction is the most effective Management Action for Zones 3 and 4 to minimize co-occurrence with Dungeness crab trap fishing gear and Actionable Species.
- In Zones 1, 2, 5 and 6, a Fleet Advisory is the most effective Management Action based on the few Humpback whales observed and known migration patterns in these areas. Additionally, based on adjacent Zone, a Fleet Advisory is appropriate given the lower level of fishing effort by the commercial fleet in Zone 6.

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

- A Fishing Zone closure 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.

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

- Upwell/NOAA aerial survey data are available for Zones 3 and 4. Cascadia Research vessel survey data are available for Zones 1, 3 and 4. MBWW data are available for Fishing Zone 4. Point Blue Conservation Science observation data are available for Zones 3, 4, and 6. The Habitat Compression Index is available for Zones 2, 3, 4 and the northern portion of Zone 5. Whale Watch 2.0 habitat predictions are available for all Zones.

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

- Aerial and vessel-based surveys indicate continued aggregations of humpback whale distributed across Zones 3 and 4.
- Presence of humpback whales is slightly above average based on MBWW data, an indication that significant migration out of California waters has yet to occur.

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

- Current domoic acid testing results indicate a potential delay for the commercial fishery in the northern portion of Zone 3 (Sonoma/Mendocino County Line to Point Reyes). Updated quality test results indicate no additional testing is required and Zones 1 and 2 will not be delayed.

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.
- Leatherback foraging habitat was evident from about Pt. Reyes to Pigeon Point, as indicated by aggregations of brown sea nettles and abundant large molas.
- No krill were observed during Upwell/NOAA aerial surveys.

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

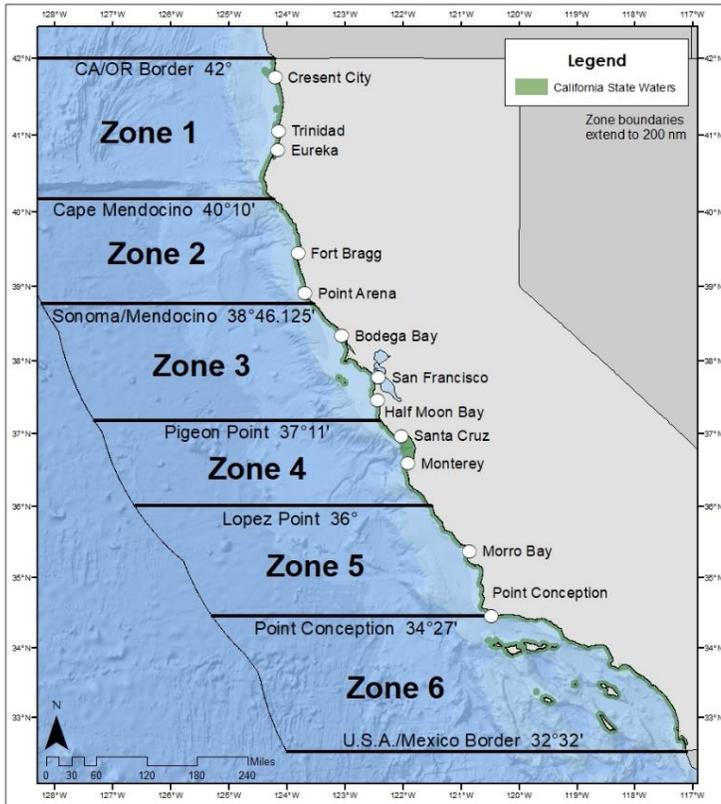
- Impact score calculation under RAMP began on January 1, 2021. The current impact score is 1.13 for humpback whales and 0 for blue whales and Pacific leatherback sea turtles.

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

- As of November 17, Cascadia Research reported at least nine humpback arrivals to mainland Mexico and Bajaj breeding grounds, which are known to be from California

waters.

- Based on aerial surveys conducted by NOAA/Upwell and vessel surveys conducted by Cascadia Research, humpback whales and are still present within the Gulf of the Farallones and Monterey Bay. Based on previous CDFW and USCG aerial surveys, few whales were observed in Zones 1 and 2, indicating migration has likely occurred from these northern zones.



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: November 17, 2021

Anticipated Director's Determination Date: November 19, 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

Fishing Zones 1 and 2

Recommends that the commercial fishery open as scheduled on December 1 (assuming no delays are needed due to low crab quality or domoic acid). Commercial fishery participants should implement best practices, but CDFW should not open the fishery under a Fleet Advisory. The recreational fishery should remain open in Fishing Zones 1 and 2. While recreational fishery participants should continue to implement best practices, the Fleet Advisory should be lifted beginning December 1.

The rationale for this recommendation was because marine life concentration triggers have not been met for these Fishing Zones. The Working Group noted that economic impacts from prior actions under RAMP (e.g., season delays and early closures) during the last three fishing seasons are more extensive than indicated by [CDFW's November 15, 2021 Initial Assessment](#). In the absence of attaining a specified RAMP trigger, and given the anticipated economic impact to the fleet, a management action for these Fishing Zones is not warranted.

Several Working Group members expressed support for this recommendation, with none opposed. The remaining Working Group members either abstained or remained neutral. The recommendation was deemed to have broad support.

Fishing Zones 3 and 4

Recommends an ongoing delay for the commercial season opener in Fishing Zones 3 and 4. No additional rationale was expressed beyond what was provided in [CDFW's November 15, 2021 Initial Assessment](#) and the Working Group supported the rationale as described by CDFW preliminary recommendation. There was broad support for CDFW's preliminary recommendation of an ongoing delay for the commercial season

opener in Fishing Zones 3 and 4 and a continued crab trap restriction for the recreational fishery in those Zones.

A recommendation was also put forward to immediately lift the recreational crab trap restriction in Fishing Zones 3 and 4, but it did not receive support from the Working Group.

The Working Group requested CDFW work with Advisors and other RAMP data contributors to compile available data and reconvene the Working Group as soon as possible (no later than December 1, 2021) to evaluate the need for additional management actions in these Fishing Zones. In addition, if the commercial season opener is delayed beyond December 15, 2021, the Working Group recommends CDFW allow the simultaneous use of traps in both the commercial and recreational fisheries. Specifically, the Working Group recommends against CDFW providing any additional “head start” for the recreational fishery. Working Group members noted that the recreational fishery opened on November 6, 2021, and there has been ongoing harvest with other types of gear (e.g., hoop nets) since that time. If the commercial opener is delayed beyond December 15, 2021, and there is an additional period of recreational-only harvest, there will be no opportunity for the commercial fishery to harvest crab in time for the holiday markets. There was mixed support for the recommendation regarding recreational “head start”; recreational members and one commercial member were opposed, with other members in support and several either abstaining or remaining neutral.

[Other Working Group requests](#)

The Working Group requested CDFW work with RAMP data contributors to clearly delineate between sightings, total observed individuals, number of uniquely identified individuals, and other methods of presenting abundance within the marine life concentration sections of the Available Data document. Additionally, the Working Group requested CDFW provide additional information regarding economic impacts of RAMP management actions during future assessments. Lastly, the Working Group requested CDFW schedule discussions regarding questions of recreational “head start” and integration of the recreational fishery into RAMP during future meetings.



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

Date: November 15, 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, 5 and 6**
- **Temporary Crab Trap Restriction: Fishing Zones 3 and 4**

Commercial Fishery:

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

Fleet Advisories

Recreational Fishery: The recreational Dungeness crab fishery is currently open statewide in all Fishing Zones. CDFW Marine Region staff's initial recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 1, 2, 5 and 6 for the recreational fishery.

Commercial Fishery: The commercial Dungeness crab fishery is currently open in Fishing Zones 5 and 6 and scheduled to open on December 1 in Zones 1 and 2 (pending quality testing results). CDFW Marine Region staff's initial recommendation is for the Director to maintain the current Fleet Advisory for Fishing Zones 5 and 6 and extend the Advisory to Zones 1 and 2 when the fishery opens.

Rationale: Survey data for Zones 2, 5, and 6, were available prior to the November 1 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. However, Cascadia Research vessel

surveys indicated small concentrations of humpback whales in Zones 1. In addition, based on NOAA/Upwell aerial surveys and Cascadia Research vessel surveys, several concentrations of humpback whales remain in Zones 3 and 4. These data indicate humpback whales remain in California waters and the migration to winter breeding grounds is still ongoing. As a result, the recreational and commercial crab fleets should use additional precaution when setting gear in Zones 1, 2, 5 and 6 because humpbacks may still be present. Both the commercial and recreational fishing fleet should however remain vigilant and move or avoid setting gear in areas where whales are transiting or foraging to further minimize risk of entanglement. This advisory will remain in place until the next risk assessment (expected to occur on or before December 15, 2021) and will be reevaluated based on recent data.

Crab Trap Restriction/Season Delay

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

Commercial Fishery: A season delay is currently in place for Fishing Zones 3 and 4 for the commercial Dungeness crab fishery. CDFW Marine Region staff's initial recommendation is for the Director to continue a season delay for the commercial fishery in Zones 3 and 4.

Rationale: Based on exceedance of Marine Life Concentration triggers for humpback whales in Zones 3 and 4, continued management action is necessary. Cascadia Research vessel surveys and NOAA/Upwell aerial surveys indicated numerous aggregations of humpback whales across Zones 3 and 4. Based on both datasets, humpback whales were distributed widely both inshore and offshore. Given the significant number of humpback whales observed there is an increased risk of entanglement with vertical lines and surface gear in Zones 3 and 4 if the recreational fishery were allowed to use crab traps and the commercial season were allowed to open. A commercial season delay and temporary recreational trap restriction in those Zones is the recommended Management Action based on the wide distribution of humpback whales across all depths of Fishing Zone 3 and 4 and the potential for leatherback sea turtles to be foraging in Zones 3 based on prey availability. 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. As a result, CDFW Marine Staff's initial 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 for Zones 3 and 4. 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 before December 15, 2021).

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:** NOAA/Upwell aerial surveys observed 73 humpback whales in Zone 3, exceeding the trigger pursuant to Title 14, CCR, section 132.8(c)(2)(A)(4)(a). Cascadia Research Vessel surveys observed 79 humpback whales in Zone 3 over two survey days and 20 humpbacks in Zone 4 over two days, exceeding the trigger pursuant to Title 14, CCR, section 132.8(c)(2)(A)(4)(a). In addition, based on MBWW data, the running weekly average for Zone 4 is 8.7 humpback whales, which exceeds 5 humpback whales in a single Fishing Zone and triggers management response under RAMP (c)(2)(A)(4). NOAA and Upwell Aerial tagging data indicate one leatherback sea turtle in Zone 4, exceeding a trigger pursuant to 132.8, Title 14, CCR (c)(2)(A)(4)(c).

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 3 and 4, 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 Fishing Zone delay/trap restriction is the most effective Management Action for Zones 3 and 4 to minimize co-occurrence with Dungeness crab trap fishing gear and Actionable Species.
- In Zones 1, 2, 5 and 6, a Fleet Advisory is the most effective Management Action based on the few Humpback whales observed and known migration patterns in these areas. Additionally, based on adjacent Zone, a Fleet Advisory is appropriate given the lower

level of fishing effort by the commercial fleet in Zone 6.

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

- A Fishing Zone closure 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.

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

- Upwell/NOAA aerial survey data are available for Zones 3 and 4. Cascadia Research vessel survey data are available for Zones 1, 3 and 4. MBWW data are available for Fishing Zone 4. Point Blue Conservation Science observation data are available for Zones 3, 4, and 6. The Habitat Compression Index is available for Zones 2, 3, 4 and the northern portion of Zone 5. Whale Watch 2.0 habitat predictions are available for all Zones.

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

- Aerial and vessel-based surveys indicate continued aggregations of humpback whale distributed across Zones 3 and 4.
- Presence of humpback whales is slightly above average based on MBWW data, an indication that significant migration out of California waters has yet to occur.

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

- Current domoic acid testing results indicate a potential delay for the commercial fishery in the northern portion of Zone 3 (Sonoma/Mendocino County Line to Point Reyes). Updated quality test results, which could affect the commercial fishery opener in Zones 1 and 2, are not yet available. The first round of testing did not pass the minimum standard.

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.
- Leatherback foraging habitat was evident from about Pt. Reyes to Pigeon Point, as indicated by aggregations of brown sea nettles and abundant large molas.
- No krill were observed during Upwell/NOAA aerial surveys.

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

- Cascadia Research reported at least five humpback arrivals to Mexico breeding grounds, which are known to be from California waters.
- Based on aerial surveys conducted by NOAA/Upwell and vessel surveys conducted by Cascadia Research, humpback whales are still present within the Gulf of the Farallones and Monterey Bay. Based on previous CDFW and USCG aerial surveys, few whales were observed in Zones 1 and 2, indicating migration has likely occurred from these northern zones..

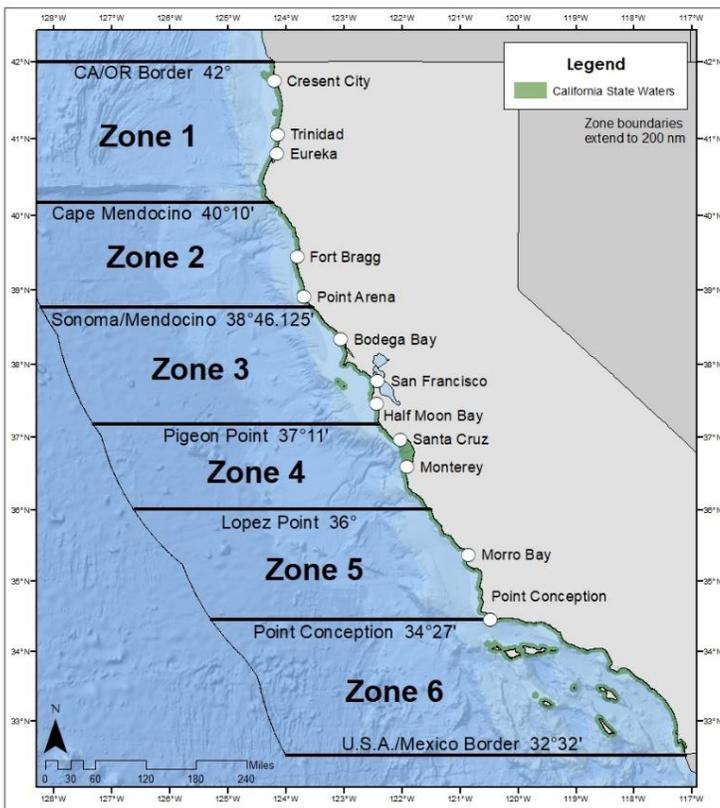


Figure 1. RAMP Fishing Zone boundaries.

2021-22 Risk Assessment: Available Data

Last updated: November 17, 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

Table 1. Actionable Species Entanglements, prepared by NMFS West Coast Region between January 1 and November 15, 2021.

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

- Between January 1 and November 15, 2021 there have been 12 confirmed humpback whale entanglements, 0 confirmed blue whale entanglements, and 0 confirmed leatherback sea turtle entanglements reported to NMFS West Coast Region (Table 1).
- Humpback whales:
 - 12 confirmed entanglements (nine reported in California, one reported from Mexico with CA commercial Dungeness crab gear, one reported in Oregon, and one reported in Washington)
 - Fishery confirmations:
 - One confirmed humpback whale entanglement with California commercial Dungeness crab gear, reported from Mexico, gear set fishing zone unknown
 - 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 unidentified entanglement source
 - 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 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; see below
Blue whales	0	0
Leatherback sea turtles	0	0

- The fishing season has not yet started, so the cumulative Impact Score for the current fishing season 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 unidentified 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.
- For humpback whales, there have been two confirmed entanglements during the current calendar year for which CDFW has assigned an Impact Score. One was confirmed in California commercial Dungeness crab gear and assigned an Impact Score of 0.75; one was from Unknown Fishing Gear (i.e., unidentified fishing gear which could not be ruled out as California commercial Dungeness crab gear) and was assigned an impact score of 0.38. See the [April 13, 2021 Available Data document](#) for additional information regarding the

Unknown Fishing Gear entanglement. Three additional confirmed entanglements in unidentified fishing gear are pending review by CDFW. An entanglement involving unknown gear and an unidentified whale is currently being reviewed by NOAA and CDFW. The entanglement was first reported on November 15, 2021 in an area near Trinidad, north of Eureka by CDFW staff.

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

Data provided by: CDFW; Karin Forney and Scott Benson (NMFS), in collaboration with Upwell Turtles (Upwell.org); Cascadia Research and The Marine Mammal Center; Monterey Bay Whale Watch (processed by Karin Forney, NMFS)

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	Cascadia/TMMC Vessel Survey	No
Zone 2	none	No
Zone 3	NOAA Aerial Survey, Cascadia/TMMC Vessel Survey	Yes
Zone 4	NOAA Aerial Survey, Cascadia/TMMC Vessel Survey, MBWW	Yes
Zone 5	none	No
Zone 6	none	No

Cascadia Research and TMMC Small Vessel Surveys (Fishing Zones 1, 3, and 4)

- Research teams working out of four harbors conducted surveys in Fishing Zones 1, 3, and 4 between October 29-31, 2021 (Table 4 and Figures 1 & 2). Surveys revealed low to intermediate concentrations of humpback whales widely distributed in both nearshore and offshore waters. While overall numbers and sighting rates have decreased since September (see the [October 29, 2021 Available Data Document](#)), many humpback whales had not yet migrated out of the area. Researchers observed a lot of behaviors and interactions more common to the winter breeding ground, which might indicate some of these whales were close to migrating.

Table 4. Summary of surveys and sightings conducted October 29-31, 2021. ZIP and ROB are RHIBs operated by Cascadia, TMMC is the Marine Mammal Center RHIB, and MLS is the Marine Life Studies vessel Current Sea chartered for these surveys. Includes both on and off-transect observations.

Date	Vessel	Locality (Zone)	Hours	NMi	Humpback	Unid./Other
29-Oct-21	ZIP	Pt. St George (1)	3.7	60	1	1
30-Oct-21	ZIP	Pt. St George (1)	9.4	110	9	0
31-Oct-21	ZIP	Pt. St George (1)	5.6	69	0	4

Date	Vessel	Locality (Zone)	Hours	NMi	Humpback	Unid./Other
30-Oct-21	MLS	Pigeon Pt. to Pt. Reyes (3)	2.9	47	19	3
30-Oct-21	MLS	Pt. Reyes to HMB (3)	2.2	30	16	1
30-Oct-21	ROB	HMB-Gulf of Farallones (3)	10.4	120	44	0
31-Oct-21	ROB	HMB and south (3)	6.3	54.5	21	2
31-Oct-21	TMMC	SF-Gulf of Farallones (3)	5.8	111	14	3
30-Oct-21	MLS	MB-Pigeon Pt. (4)	3.3	40	9	0
30-Oct-21	MLS	Monterey Bay (4)	1.9	10.5	2	0
31-Oct-21	ROB	S of Pigeon Pt. (4)	3.1	34	9	3

- Within Fishing Zone 1, three surveys were conducted October 29-31, 2021 out of Crescent City but mostly in more challenging conditions in two of the days. Surveys generally found low concentrations of humpback whales (10 total seen across the three days) scattered in both inshore and offshore waters (Figure 1). Four gray whales that were likely part of the Pacific Coast Feeding Aggregation were also sighted in nearshore waters.

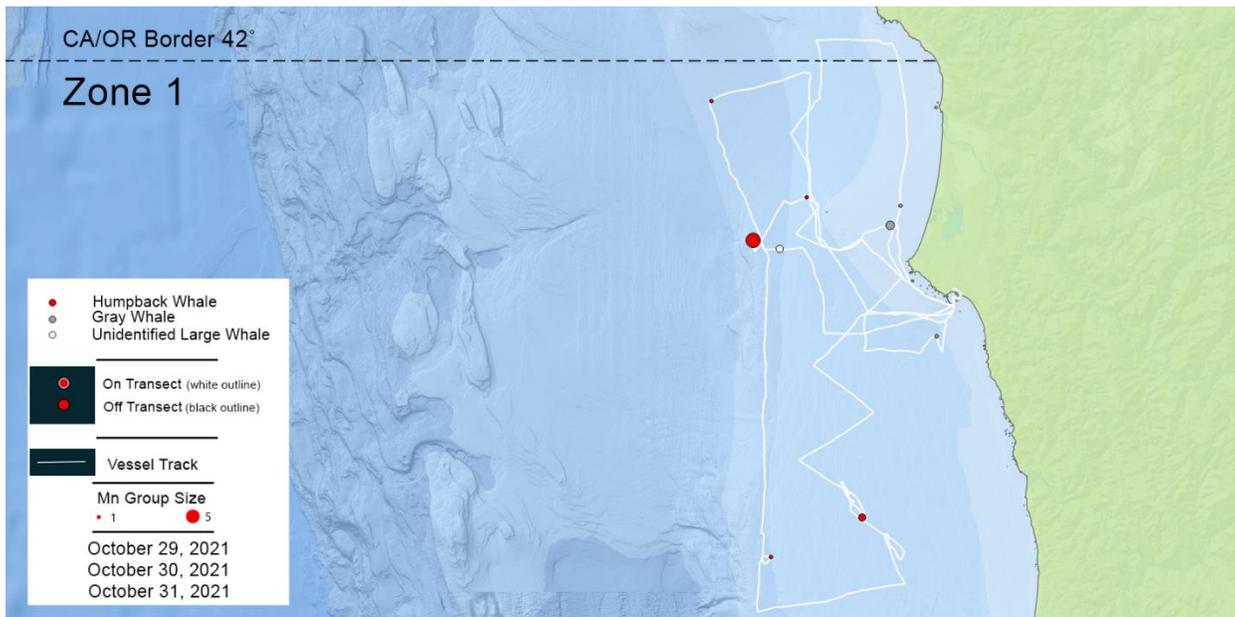


Figure 1. Small boat surveys (white lines) and whale sightings in Fishing Zone 1 (N California) on October 29-31, 2021.

- Within Fishing Zone 3, three surveys were conducted out of Half Moon Bay, San Francisco, and coming north from Moss Landing on October 30-31, 2021 in mostly good to excellent conditions (Figure 2). Intermediate concentrations of humpback whales were present, with a total of 79 humpback whales encountered across the two days (Table 4). Humpback whales were distributed widely both inshore and offshore. Along the 50 and 70m transect lines, there were 0.4-0.5 humpback whales per nautical mile. Preliminary photo ID work indicates a minimum of 38 unique whales were seen during these two days, with an estimated total of around 200 whales.

- Within Fishing Zone 4, two surveys were conducted on October 30-31, 2021 out of Moss Landing and coming south out of Half-Moon Bay in mostly good to excellent conditions (Figure 2). Intermediate concentrations of humpback whales were present, with a total of 20 humpback whales encountered across the two days (Table 4). Humpback whales were distributed widely both inshore and offshore. Along the 70m transect line, there were 0.2 humpback whales per nautical mile. An additional survey conducted in early November included a single sighting of five humpback whales.

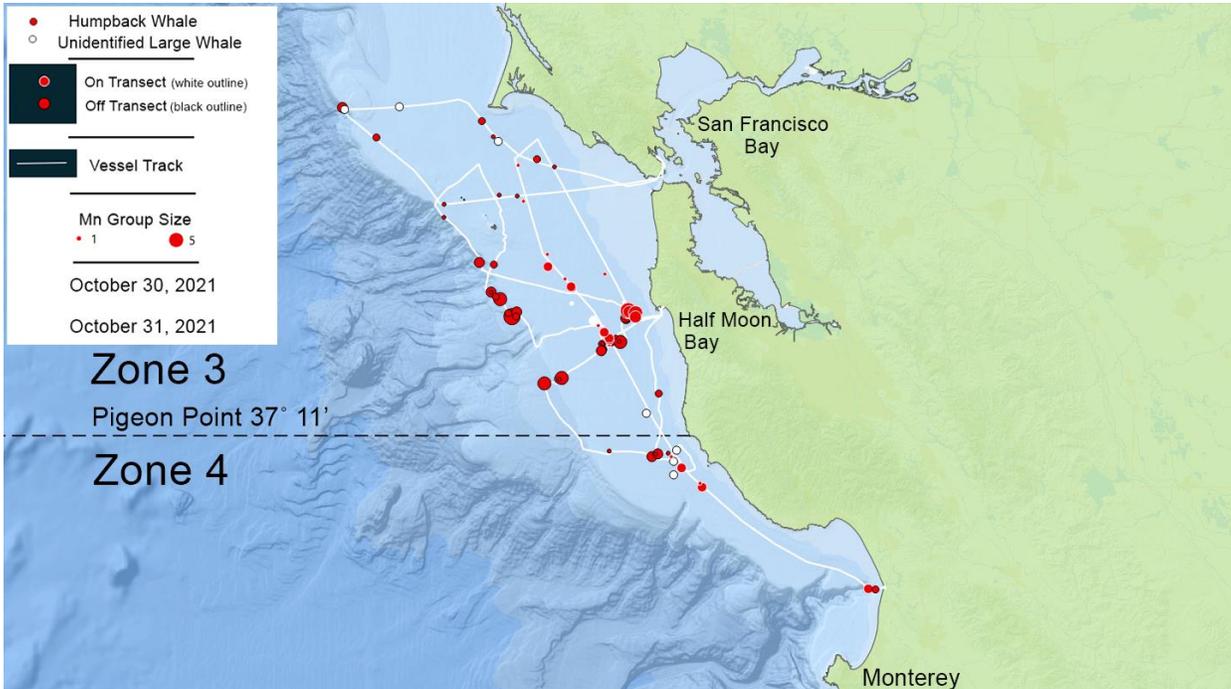


Figure 2. Small boat surveys (white lines) and whale sightings in Fishing Zones 3 and 4 (Gulf of Farallones region to Monterey Bay) on October 30-31, 2021.

An additional survey on November 8, 2021 between Monterey Bay and Point Sur involved a single sighting of five humpback whales, which were seen just south of Monterey Bay traveling south.

NOAA and Upwell Aerial Survey (Fishing Zones 3 and 4)

- Aerial surveys were conducted from Gualala to Monterey, on November 10 and 11, in a Partenavia P68 Observer aircraft. The completed transects included 408 nautical miles of effort on east-west lines spaced every 6 naut. miles between the coast and an approximately 200 m (110 fm) water depth (Figure 3).
- Humpback whales appeared less abundant than in October, but were observed scattered throughout the survey area. There were 18 sightings of 32 humpback whales during the systematic east-west transect lines, and an additional 21 sightings of 57 humpback whales during transits between lines and when traveling northbound through the study area. The total of 39 sightings of 89 whales may have included a few re-sighted individuals across the two survey days. Three additional sightings of five unidentified whales that probably were humpback whales were also recorded.
- No blue whales or leatherback sea turtles were observed.

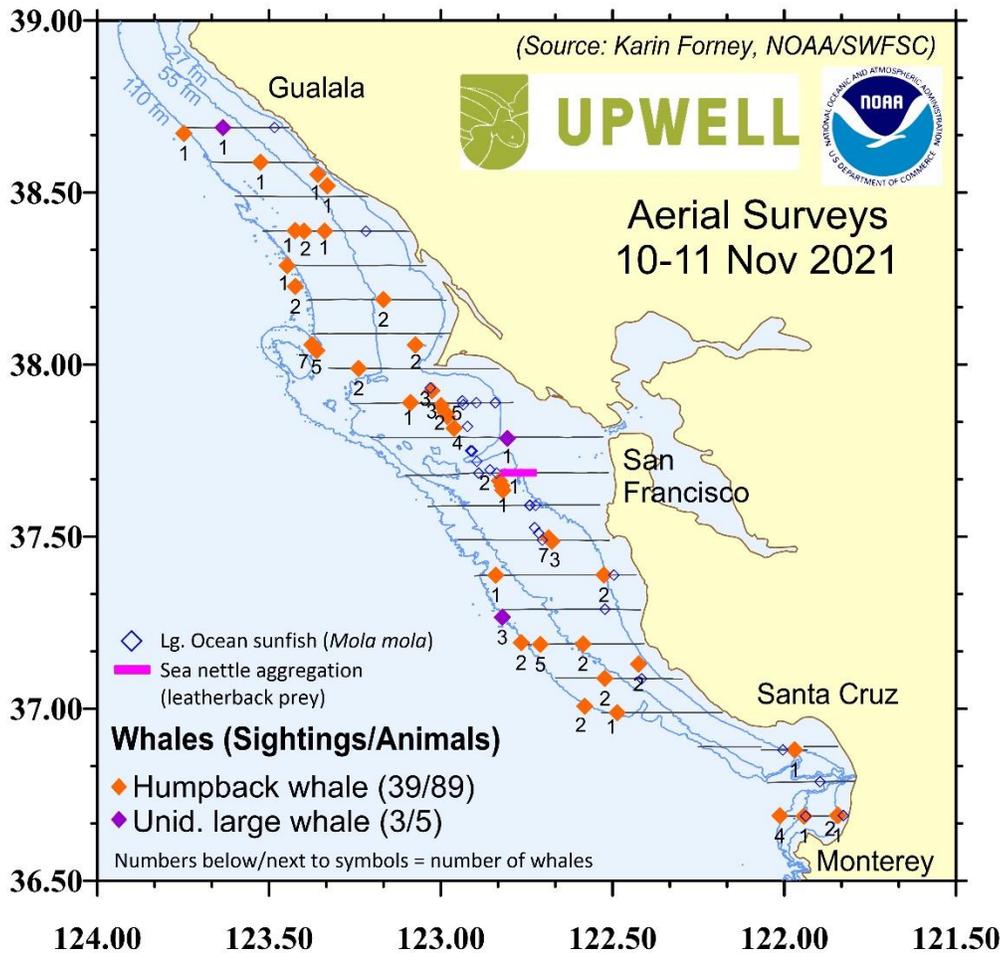


Figure 3. Upwell/NOAA aerial survey track lines and observations of humpback whales, unidentified whales, large molas (ocean sunfish), and brown sea nettles (leatherback prey) off central California in Fishing Zones 3 and 4 during Nov 10-11, 2021. Only large molas, which tend to co-occur with leatherback turtles, are shown in this figure for simplicity. The number of whales in each sighting are shown below each of the symbols at the sighting locations. Given that the survey took place over two days, it is possible that some of the humpback whale sightings may represent re-sightings of the same individuals.

US Coast Guard Aerial Surveys (*Fishing Zone 3*)

- The US Coast Guard was able to conduct a flight in an area extending from Jenner to Pigeon Point on November 13, 2021, (Figure 4). Five observations were made, with 2-4 whales within each pod, presumed to be humpback whales. Track lines are shown in green.



Figure 4. USCG aerial survey in Fishing Zone 3 (Gulf of Farallones region) on November 13, 2021.

Leatherback Sea Turtle Telemetry (*Fishing Zone 3 and 4*)

- 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 16 October 2021 has moved to deep offshore waters approximately 115 miles west of Pt. Sur in Monterey County. The turtle is moving in a southwest direction (Figure 5).

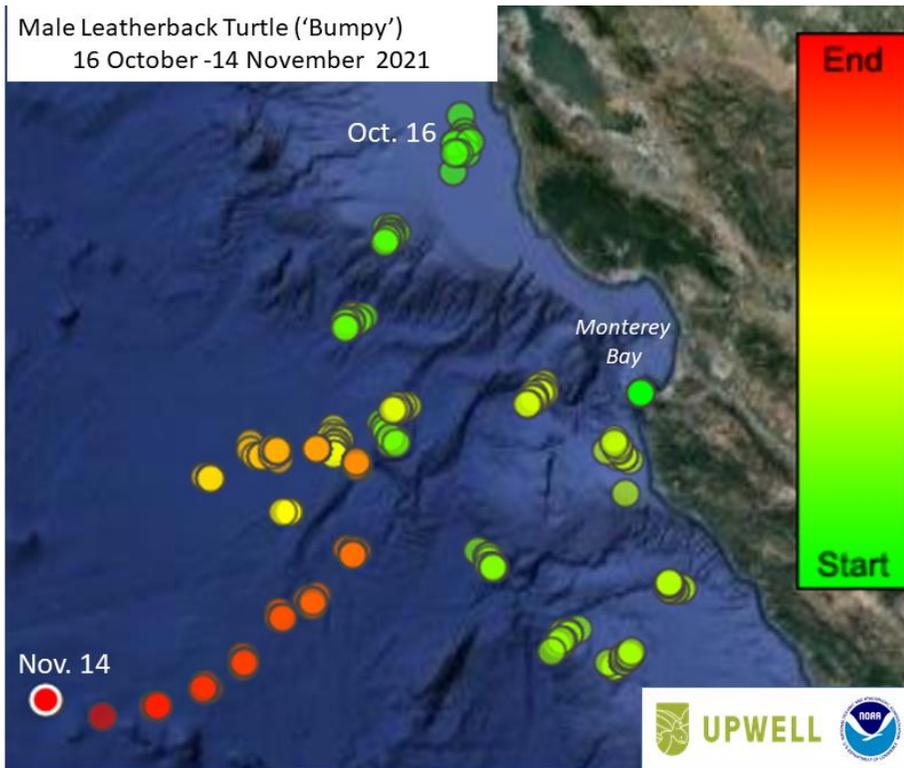


Figure 5. Leatherback sea turtle telemetry track for the period 16 October -14 November 2021 of an adult male leatherback turtle tagged off Half Moon Bay. The transmitter is reporting approximately every 24 hrs.

Monterey Bay Whale Watch (*Fishing Zone 4*)

- MBWW has regularly conducted whale-watching trips in southern Monterey Bay throughout the summer and fall. The average number of humpback whales-per-trip during the last seven days (Nov 7 - 13) was 8.7, with a peak of 15 whales observed on Nov 11.
- One blue whale was observed by MBWW on Nov 13. This is largely consistent with their historical seasonal migration patterns during late summer and fall.

MANAGEMENT CONSIDERATIONS

Information from NOAA: §132.8(d)(2)

- No additional information was shared.

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

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

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

Data provided by: Cascadia Research, Monterey Bay Whale Watch (processed by Karin Forney, NMFS); CDFW, Karen Grimmer (Monterey Bay National Marine Sanctuary) and Jaime Jahncke (Point Blue Conservation Science); NOAA Coast Watch; Briana Abrahms (University of Washington)

Humpback Whale Sightings in Mexico/Central America

- As of November 17, at least nine humpback whales known to forage off California have been documented on breeding grounds in Baja and mainland Mexico.

CDFW Aerial Surveys (*Fishing Zones 2, 3, 4 and 5*)

- CDFW aerial reconnaissance surveys were conducted on October 18 and 19, 2021 between Shelter Cove and Piedras Blancas. Sea conditions were generally calm with good visibility. Two flight lines were chosen to maximize airtime and coverage across Fishing Zones; an inshore flight line at approximately 1-2 miles offshore and an offshore flight line at approximately 5-6 miles offshore.
- Few humpback whales were observed between Shelter Cove and Bodega Bay (Fishing Zone 2 and the northern portion of Fishing Zone 3). Large aggregations of feeding humpback whales were observed in the area from Point Reyes down to Half Moon Bay and extending out to the Farallon Islands, with a total of 48 humpback whales observed in Fishing Zone 3. Few humpback whales were observed in Fishing Zones 4 and 5, with only a small aggregation observed in Fishing Zone 5 off the Big Sur coast.

Monterey Bay Whale Watch (*Fishing Zone 4*)

- The semi-monthly average number of humpback whales-per-half-day-trip during the first half of November is lower than during the second half of October (Figure 6). It is also lower than during the same period last year (although still slightly above average for this time of year compared to the overall 2003-2020 record).
- One blue whale was observed by MBWW on Nov 13. This is largely consistent with their historical seasonal migration patterns during late summer and fall (Figure 7).

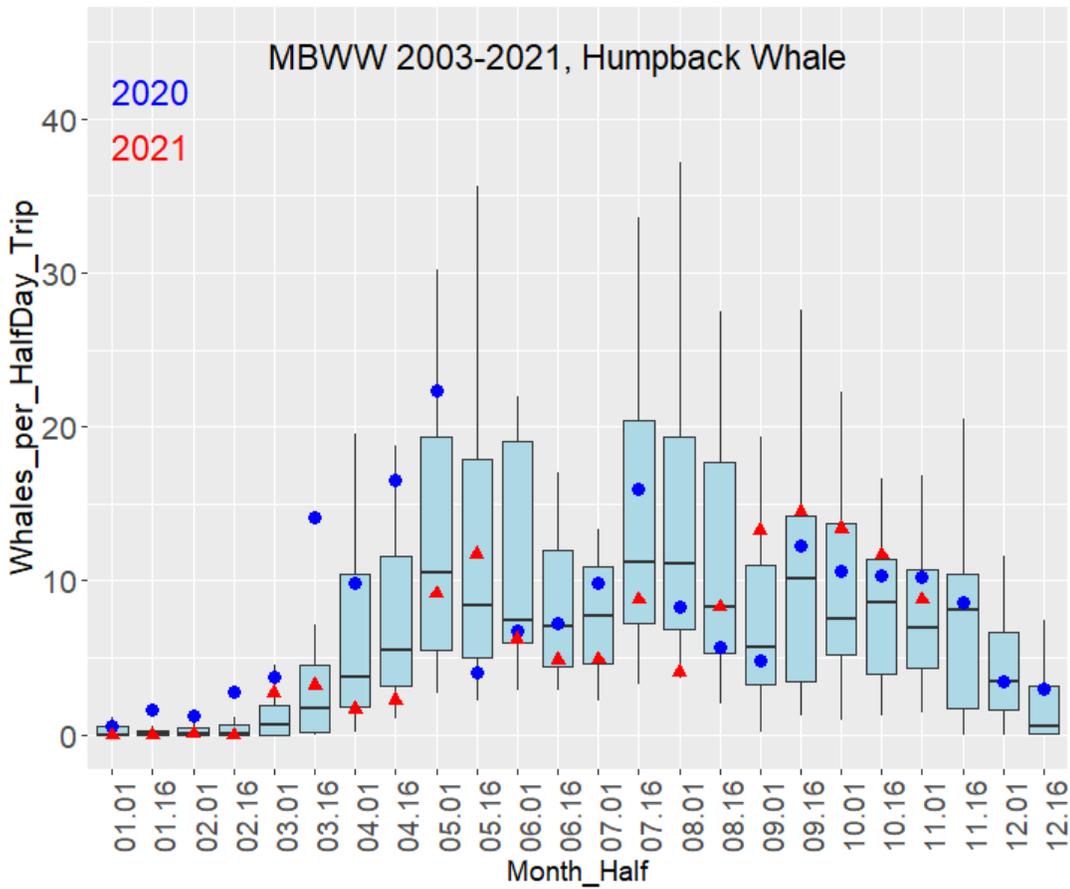


Figure 6. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average number of whales; the blue box shows the 25th-75th percentiles (i.e., half of all past whale numbers are within the blue box); the vertical lines show the range of whale numbers excluding outliers, and outliers are shown as small black dots. Values for 2020 (large blue dots) and 2021 (red triangles) are provided for reference, placing recent whale numbers in a historical context.

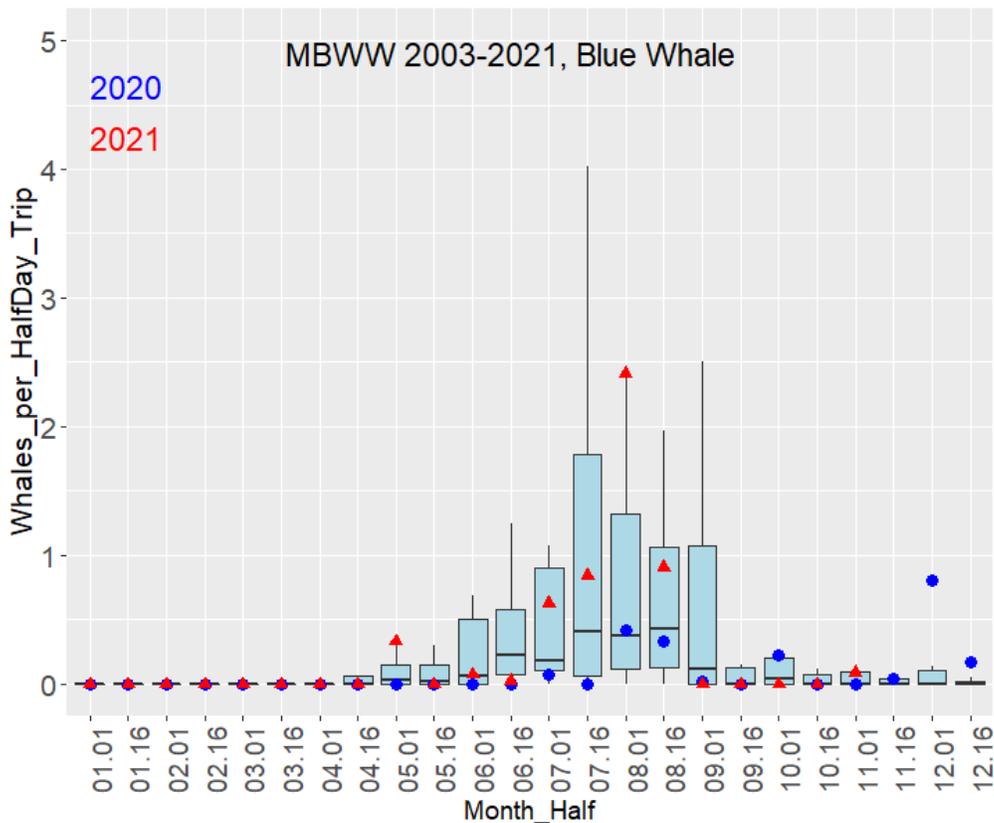


Figure 7. Historical Monterey Bay Whale Watch data for 2003-2021, summarizing the average and variation in the number of blue whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the average 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.

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

- Three humpback whale sightings were reported for Greater Farallones National Marine Sanctuary (Zone 3) (through the Spotter/Whale Alert app) over the past seven days (November 8-15, 2021) (Figure 8). No blue whales were sighted during this period. Observations were recorded by trained observers on the Farallon Islands.
- Three humpback whale sightings were reported for Monterey Bay National Marine Sanctuary (Zone 4) over the past 7 days (November 8-15, 2021) (no figure available). No blue whales were sighted during this period. Observations were reported by trained naturalists aboard Monterey Bay Whale Watch and Marine Life Studies.
- 21 humpbacks whale sightings were reported for Channel Islands National Marine Sanctuary (Zone 6) over the past 7 days (November 8-15, 2021) (Figure 9). No blue whales were sighted during this period. Observations were reported by trained naturalists from the Channel Islands National Marine Sanctuary and National Park Service.

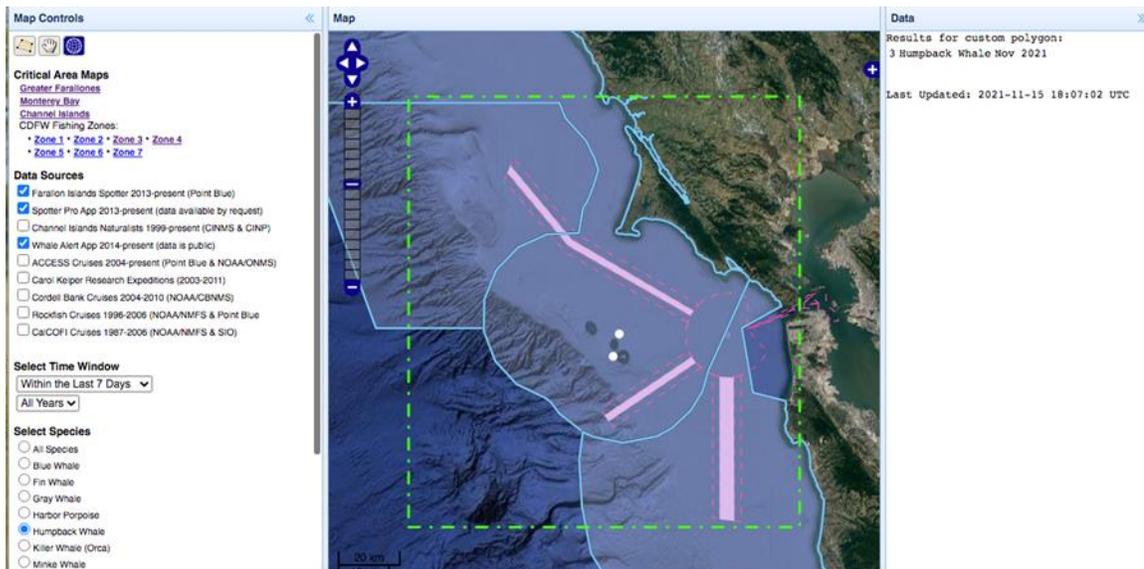


Figure 8. Location of three humpback whale sightings in Fishing Zone 3. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.

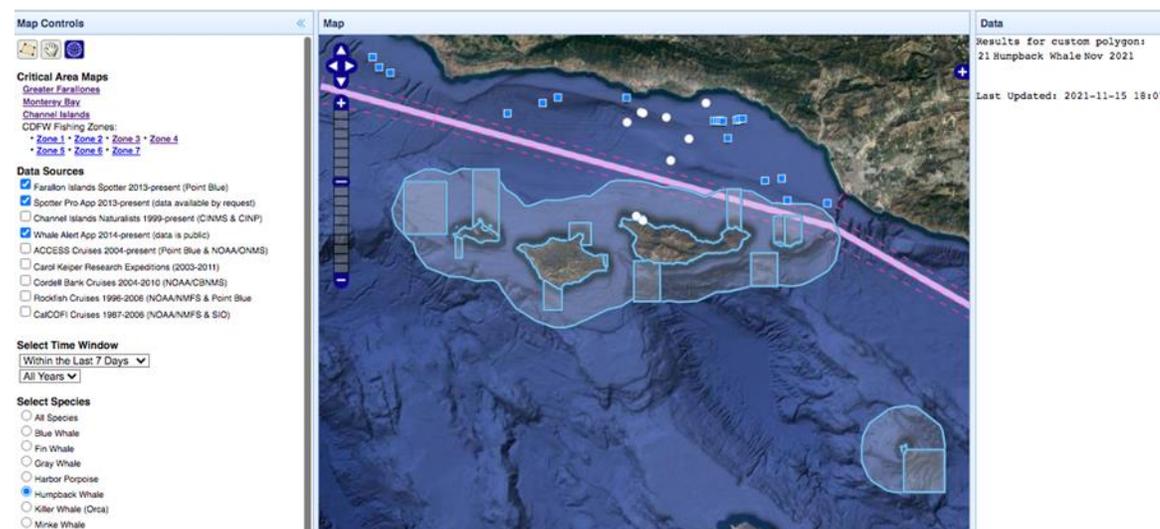


Figure 9. Location of 21 Humpback whale sightings in Fishing Zone 6. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.

WhaleWatch 2.0 All Fishing Zones

- Blue whale habitat predictions for November 12, 2021 (Figure 10) indicate the probability of blue whale presence is low-to-moderate nearshore between Oregon and Point Conception; and high in the nearshore portion of Fishing Zone 5 and throughout the Southern California Bight (Fishing Zone 6).

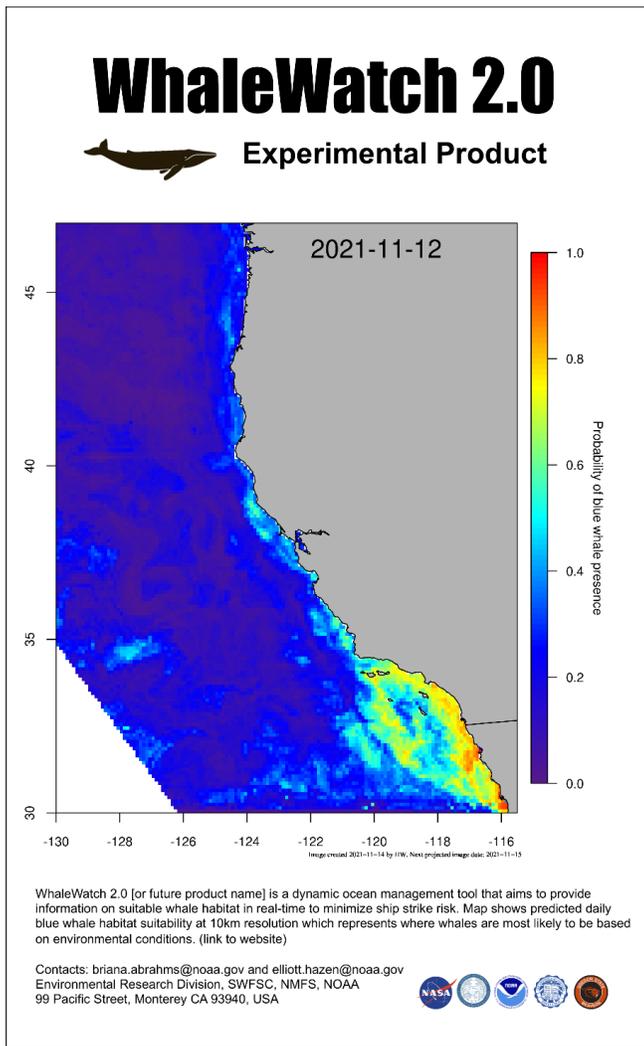


Figure 10. WhaleWatch 2.0 map for November 12, 2021. [View a current map.](#)

Fishing Season dynamics: §132.8(d)(7)

Data provided by: California Department of Public Health, California Department of Fish and Wildlife

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

Domoic Acid and Quality Testing

- One site within Zone 3, Russian River, requires more testing since results from the Oct 31 test had two crab above the action level for domoic acid. Two consecutive samples must be taken at least one week apart with all crab below the action level for the area to clear. One sample retest occurred on Thurs., Nov. 11 with another sample anticipated to occur as early as Thurs., Nov. 18. The latest results information can be found on [CDPH's Domoic acid website](#).
- Quality test results from Nov. 2 are posted on [PSMFC's crab website](#). All ports tested below the requisite 24% (no rounding) and all need to pass in order to not delay the fishery in the Northern Management Area. Another test is being scheduled for the week of Nov. 15. Results will likely be made available on or before Nov. 22 to inform the Dec. 1 conditional opener. If a delay is warranted, information will be shared via a Director memo posted on [CDFW's crab website](#) and a CDFW press release.

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

Data provided by: Cascadia Research and The Marine Mammal Center, NOAA/Southwest Fisheries Science Center and Upwell

Cascadia Research and TMMC Small Vessel Surveys (*Fishing Zones 1, 3, and 4*)

- Humpback whales in Fishing Zones 3 and 4 were foraging primarily on small fish in both inshore and offshore waters.

Upwell/NOAA Aerial Surveys (*Fishing Zones 3 and 4*)

- Few anchovy schools were observed by the aerial team, although piscivorous (fish-eating) seabirds were very abundant. Several feeding flocks were observed, and a few of the humpback whales were observed lunge-feeding on near-surface schooling fish. Based on these observations, it appears that schooling fish were mostly too deep to be seen from the air. One patch of dense sea nettles (leatherback prey) was recorded in approximately 20-40 fm water depth off San Francisco. Large ocean sunfish (*Mola mola*), a sea nettle predator that often co-occurs with leatherback turtles, were markedly less abundant than during aerial surveys in October 2021, with 28 large molas observed in water depths of about 25-40 fm between Pigeon Point and Point Reyes.

Ocean conditions: §132.8(d)(9)

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

El Niño/Southern Oscillation Diagnostic Discussion

- Synopsis: La Niña is likely to continue through the Northern Hemisphere winter 2021-22 (~90% chance) and into spring 2022 (~50% chance during March-May).

Marine Heatwave Tracker

- The NEP21A large marine heatwave began in late April 2021 and as of October 26, 2021 has begun to shrink in size and recede from the coast. The latest satellite imagery (Figure 11) suggests that the recession has been fairly rapid over the past two weeks, likely hastened by the record-breaking (in terms of rainfall) storm which impacted the entire west coast between October 23-35, 2021. Waters are cooler than normal in the nearshore portions of Fishing Zones 1-6.

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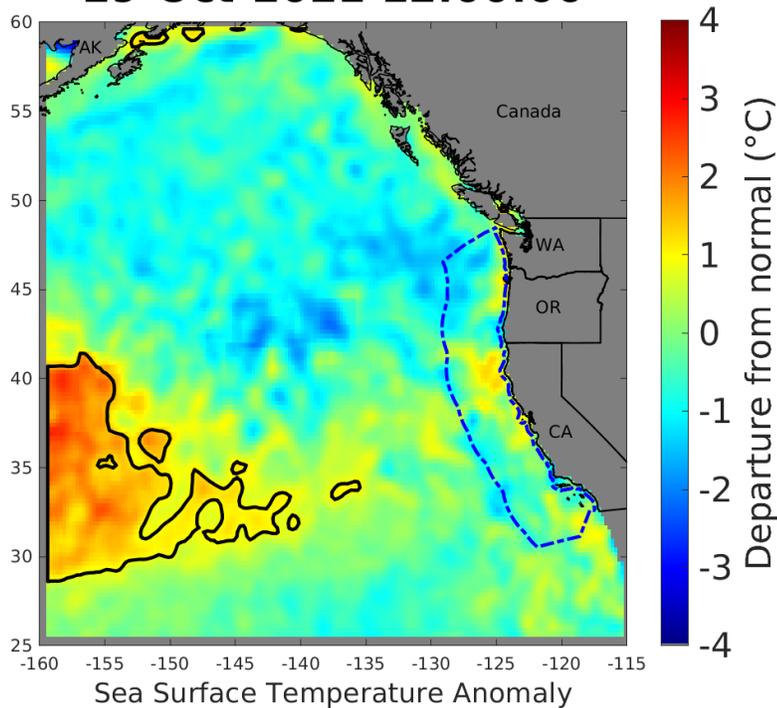
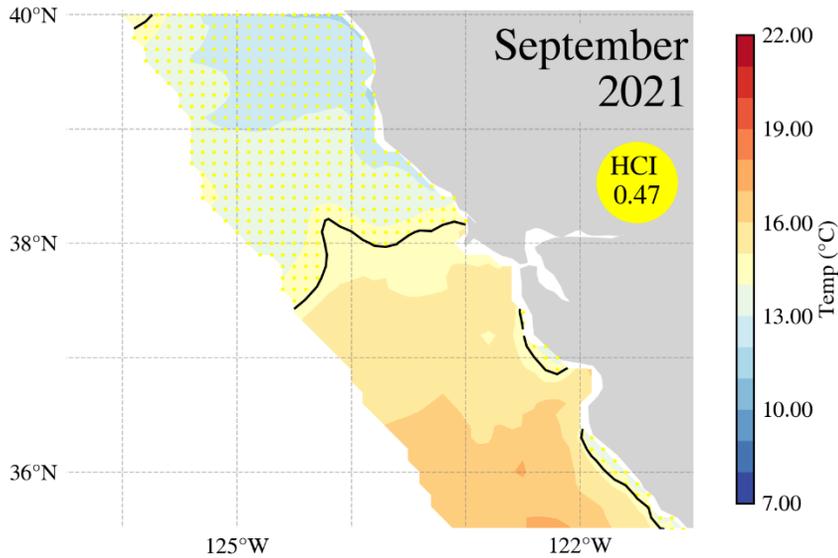


Figure 11. Science-quality (delayed 3-weeks), daily interpolated standardized sea surface temperature anomalies (SSTa) in the California Current ecosystem available for analysis of MHW presence. Dark outline shows the current extent of MHW conditions, as delineated by values of the normalized SST + 1.29 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.

Habitat Compression Index

- The most recent Habitat Compression Index values available are for September 2021 (Figure 12). At that time, there was moderate compression, with cooler water habitat available between 38 and 40°N. Compression is typically moderate or high during November (Figure 13).



HCI color based on standard deviation (SD) and mean (MN) of all values over 1980-01 to 2021-09

Medium Compression (HCI > MN and HCI < 1SD)

Figure 12. Map of September 2021 sea surface temperature and location of the Habitat Compression Index (HCI) boundary (think black line).

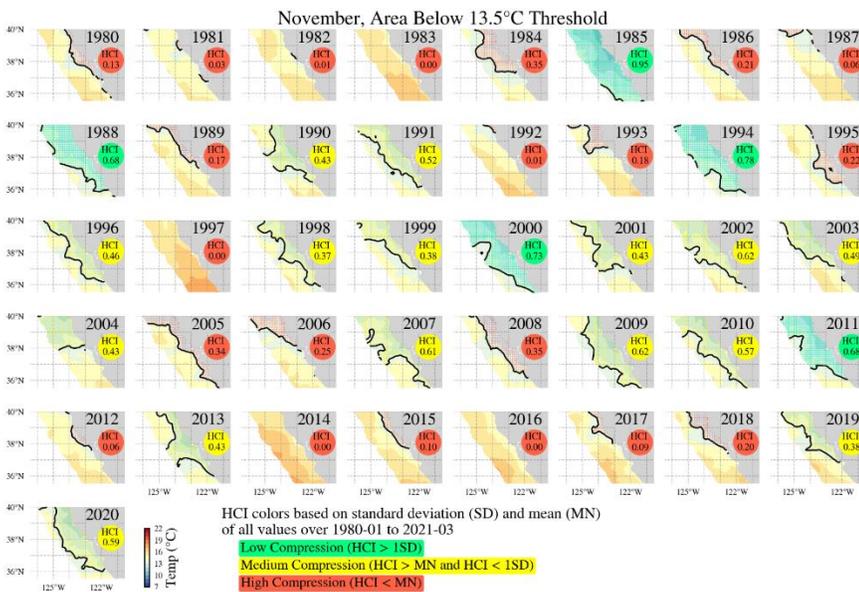


Figure 13. Maps of historical November sea surface temperatures and location of the Habitat Compression Index (HCI) boundary (think black line) between 1980 and 2020.

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).