State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

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

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

I

On November 21, 2022, I evaluated entanglement risk for the commercial Dungeness crab fishery pursuant to Section 132.8(b). I provided the California Dungeness Crab Fishing Gear Working Group (Working Group) and the Whale Safe Fisheries email listserv with notice of the risk assessment and all non-confidential data under consideration on November 16, 2022. Prior to this risk assessment and management response, Department staff consulted with the California Dungeness Crab Fishing Gear Working Group and reviewed all relevant information provided to my staff.

II

Aerial surveys undertaken by the Department on November 9, 2022, observed 39 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

NOAA-standardized data from commercial whale-watching trips in Fishing Zone 4 show continued presence of humpback whales, with the most recent weekly running average of 11.9 and a peak sighting of 22 humpback whales in Monterey Bay. Pursuant to Section 132.8(c)(2)(A)(4)(a), I must implement a Fishing Zone delay or other protective management action.

IV

Numerical triggers for marine life concentrations have been reached in Fishing Zones 3 and 4 for humpback whales. Pursuant to Section 29.80(c), I must implement a protective management action in the recreational Dungeness crab fishery. Section

29.80(c) requires that any temporary prohibition on the use of crab traps extend the general crab trap prohibition outlined in Section 29.80(c)(4).

V

There are insufficient Department approved marine life concentration survey data to inform the risk assessment in Fishing Zones 5 and 6. Pursuant to Section 29.80(c)(7)(A)(2) and Section 132.8(d), I must implement a Fishing Zone delay or other protective management action.

VI

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.

VII

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

VIII

THEREFORE, under the authority granted by Fish and Game Code Section 8276.1(b) and Sections 29.80 and 132.8 of Title 14 of the California Code of Regulations, I am implementing the following management actions:

1. Continuation of the temporary recreational trap prohibition in Fishing Zone 1 and 2 until November 28, 2022, at 9:00am. Beginning at that time, recreational crab traps will no longer be prohibited in Fishing Zones 1 and 2.

2. Continuation of the temporary recreational crab trap prohibition in Fishing Zone 3, 4, 5 and 6. The deployment and use of crab traps in any recreational fishery is temporarily prohibited in those Fishing Zones.

3. Continuation of the delay of the opening of the commercial Dungeness crab fishery in Fishing Zone 3, 4, 5 and 6. Take and possession of commercially caught Dungeness crab is prohibited in the delayed Fishing Zones.

These management actions are in effect until modified or as described above. The next risk assessment is expected to occur on or before December 7, 2022.

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.

11/21/2022 1:30 pm PT

Charlton H. Bonham, Director Date/Time

ATTACHMENT TO DIRECTOR NOVEMBER 21, 2022 DECLARATION OF FISHERY SEASON DELAY IN THE COMMERCIAL DUNGENESS CRAB FISHERY AND RECREATIONAL CRAB TRAP PROHIBITION DUE TO RISK OF MARINE LIFE ENTANGLEMENT

Information referenced in this Attachment is further described in the Final Assessment of Marine Life Entanglement Risk and Management Recommendation dated November 18, 2022, and the Available Data document dated November 16, 2022, and located at the Department's Whale Safe Fisheries website which to the Department's knowledge represents the best available science informing this risk assessment.

Based on the management considerations identified in the Available Data document and contained in the Final Assessment of Marine Life Entanglement and Management Recommendation dated November 18, 2022, the Director will continue a delay of the opening of the commercial Dungeness crab season in Fishing Zones 3 through 6, and the temporary crab trap prohibition in the recreational Dungeness crab fishery in Fishing Zones 3-6. Use of crab traps in other recreational fisheries is also temporarily prohibited pursuant to Section 29.80(c)(4) of Title 14 of the California Code of Regulations. The Director will lift the temporary trap prohibition in Fishing Zones 1 and 2 on November 28, 2022, at 9:00am.

Fishing Zones 3 and 4 reached a marine life concentration trigger for management action, while Fishing Zones 5 and 6 did not have sufficient approved data to inform this risk assessment. The unavailability of approved data triggered a management response and subsequent analysis of the management considerations under Section 132.8(d) and appropriate management response under Section 132.8(e). Those sections anticipate a broader analysis of the factors impacting entanglement risk statewide, including accounting of the annual entanglement Impact Score.

Importantly, aerial survey data and Monterey Bay Whale Watch data, showed numerous aggregations of humpback whales that could be at risk of entanglement with recreational and commercial crab traps in Fishing Zones 3 and 4. Distribution of humpback whales changes based on foraging behavior so a depth restriction on fishing activity would likely be ineffective in reducing entanglement risk as whales migrate to their winter breeding grounds. Additionally, given the high volume of traps anticipated to be set during a season opener, it was determined that a trap reduction would not sufficiently reduce entanglement risk. Therefore, a season delay is the most protective management action given existing whale presence.

At this time, the only management response available for the recreational fishery is a trap prohibition in Fishing Zones 3 and 4 while entanglement risk remains elevated in

those areas. Available data indicate abundance of humpback whales is now below the specified triggers in Zone 1 and 2, and further actions to restrict use of recreational crab traps in those Fishing Zones is no longer warranted.

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

Date: November 21, 2022

A preliminary assessment and a preliminary recommendation were developed by California Department of Fish and Wildlife (CDFW) Marine Region staff for consideration by the California Dungeness Crab Fishing Gear Working Group for the Risk Assessment Mitigation Program (RAMP; Section 132.8, Title 14, California Code of Regulations) regarding Management Actions to address marine life entanglement risk in the commercial Dungeness crab fishery as well as Section 29.80, Title 14, California Code of Regulations (Gear Restrictions for Recreational Take of Saltwater Crustaceans).

A. Confirmed Entanglements and Marine Life Concentrations Triggers for Management Action, RAMP subsection (c)

In-season Confirmed Entanglement accounting is not available because the fishery is not currently open. The current Impact Score for calendar year 2022 is 4.15 for humpback whales. The Impact Score for calendar year 2021 was 1.89 for humpback whales, as a result CDFW anticipates a running 3-year average Impact Score of at least 2.01 for humpback whales at the start of 2023.

- Confirmed Entanglements in California Commercial Dungeness Crab Gear during the current calendar year equal three humpback whales.
- Confirmed Entanglements in Unknown Fishing Gear reported from California during the current calendar year equal eight humpback whales (two additional entanglements are under review).

Marine Life Concentrations Surveys for Fishing Zones 3 and 4 documented aggregations of humpback whales. Marine Life Concentration triggers for each Fishing Zone based on an aerial survey and whale watch data are as follows:

- Fishing Zone 3 = 39 humpback whales
- Fishing Zone 4 = 22 humpback whales and weekly average was 11.9 humpback whales

No triggers were reached for Fishing Zones 1 and 2. Fishing Zones 5 and 6 had insufficient data to inform this risk assessment. Only a partial survey of Zone 5 was conducted prior to this assessment and humpback whales remain in areas north of Zone 5 and 6.

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

Recreational Fishery:

- **Crab Trap Prohibition (continued): Fishing Zones 3, 4, 5 and 6**
- **Lift crab trap prohibition for Zones 1 and 2 on November 28, 2022, at 9:00am**

Commercial Fishery:

- **Season Delay (continued): Fishing Zones 3, 4, 5 and 6 (no delay Fishing Zones 1-2)**

Fishing Zones 1 and 2

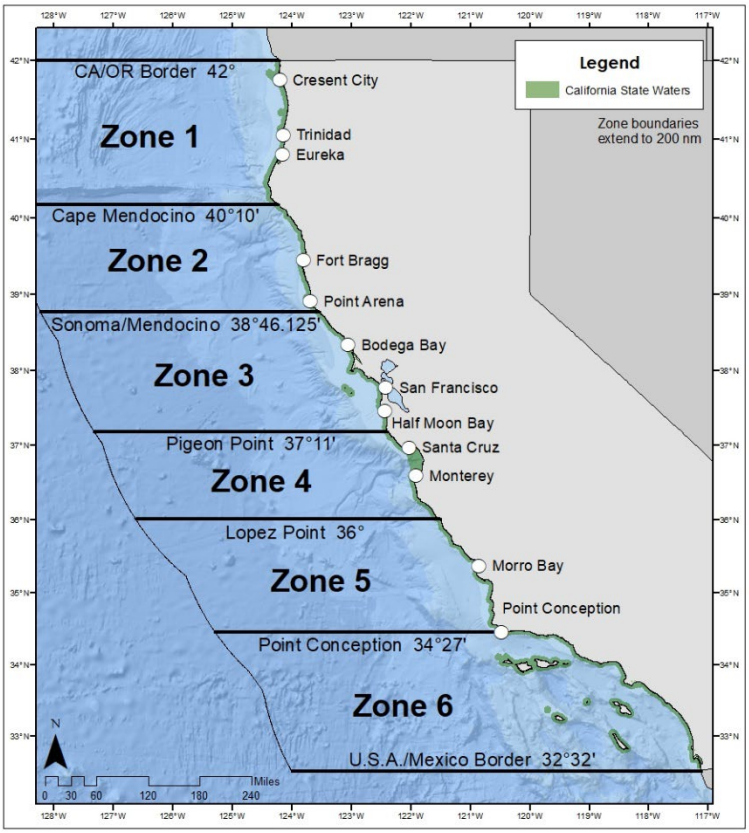
CDFW Marine Region staff's final recommendation for Fishing Zones 1 and 2 is to lift the recreational trap prohibition on November 28, 2022, at 9:00 am. CDFW acknowledges that the Working Group recommends a continued trap prohibition for the recreational fishery. Staff understand concerns regarding unidentified entanglements impacting the commercial fishery, however, pursuant to subsection 29.80(c)(7), the Director shall evaluate entanglement risk based on marine life concentrations as defined in subsection 132.8(a)(10) consistent with the acceptable data and numerical triggers specified in subsection 132.8(c)(2). Available data indicate abundance of humpback whales is now below the specified triggers in Zone 1 and 2, and further actions to restrict use of recreational crab traps is no longer warranted. Therefore, staff recommend lifting the trap prohibition. CDFW is committed to working with NOAA, Oregon, Washington and the fleet to reduce the occurrence of unidentified entanglements by improving gear marking for all fisheries, including the commercial Dungeness crab fishery.

CDFW Marine Region staff's final recommendation for the commercial fishery would be to allow the season to open in these Zones due to reduced entanglement risk. However, the commercial fishery opener in Fishing Zones 1 and 2 will be delayed pursuant to Fish and Game Code Section 8672.2 due to quality testing results until at least Dec 16, 2022.

Fishing Zones 3, 4, 5, and 6

CDFW Marine Region staff's final recommendation for Fishing Zones 3 through 6 is continuation of the delay for the commercial fishery and recreational crab trap prohibition until the next risk assessment (expected to occur on or before Dec. 7). This recommendation is based on exceedance of Marine Life Concentration data triggers for humpback whales in Fishing Zones 3 and 4, and insufficient available data in Fishing Zones 5 and 6. Aerial surveys indicated large aggregations of humpback

whales in Fishing Zone 3 which is further supported by sightings data from Point Blue around the Farallon Islands. Monterey Bay Whale Watch data (standardized by NOAA) indicate above average sightings in Fishing Zone 4. Foraging activity by humpback whales poses a risk of entanglement with vertical lines and surface gear from recreational and commercial crab traps. In addition, given the current calendar year entanglement Impact Score, a precautionary management approach is warranted to further minimize entanglement risk until a majority of the whales have migrated out of or across these remaining Fishing Zones.



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

Working Group Discussion Date: November 18, 2022

Working Group Recommendation

The Working Group recommended a continuation of the recreational trap prohibition in Fishing Zones 1 and 2 until the next risk assessment. The Working Group acknowledged that there is low documented presence of humpback whales in these two Fishing Zones. However, Working Group members expressed concern about the high number of entanglements during 2022 calendar year and current Impact Score for the commercial Dungeness crab fishery. Given the potential for entanglements in recreational crab traps to be classified as occurring in unidentified gear, therefore impacting future fishing opportunity for the commercial sector, the Working Group recommends CDFW maintain the current recreational trap restriction in these Fishing Zones.

The recommendation received broad support from Working Group members, but was opposed by recreational representatives.

2022-23 Risk Assessment: Available Data

Last updated: ~~November 16, 2022~~ November 18, 2022 (see Addendum)

Contents

Items with updated information are followed by an *.

TRIGGERS REQUIRING MANAGEMENT ACTION

Confirmed Entanglements: §132.8(c)(1)

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

There have been no new entanglements of Actionable Species reported to NMFS West Coast Region since the last risk assessment, and CDFW has not yet assigned impact scores for 20221008Mn and 20221010Mn. See the October 25, 2022 Available Data document for additional details.

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

Data provided by: US Coast Guard, California Department of Fish and Wildlife, Monterey Bay Whale Watch (processed by Karin Forney, NOAA), Scott Benson (NOAA/SWFSC, in collaboration with Upwell.org)

Table 1. Summary of available CDFW-approved survey data for marine life concentrations for each Fishing Zone, 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	USCG/CDFW Aerial Survey, CDFW Aerial Survey	No
Zone 2	CDFW Aerial Survey	No
Zone 3	CDFW Aerial Survey	Yes
Zone 4	MBWW	Yes
Zone 5	NA	Yes – no data
Zone 6	NA	Yes – no data

USCG/CDFW Aerial Survey

USCG and CDFW flew a joint aerial survey on November 7, 2022 between Eureka and the Oregon border (Fishing Zone 1). No large whales were observed.

CDFW Aerial Survey *(Fishing Zones 1-3)*

On November 9, 2022 CDFW flew an aerial survey between the Farallon Islands (Fishing Zone 3) and the Oregon border (Fishing Zone 1; Figure 1). No whales were observed in Fishing Zone 1, three humpback whales were observed in Fishing Zone 2, and 39 humpback whales were observed in Fishing Zone 3. In Fishing Zone 2, the whales were located in the northern portion of the Fishing Zone and in waters between 30-50 meters (16-27 fathoms). In Fishing Zone 3, whales were sighted throughout the surveyed area within the same depth range 30-50 meters (16-27 fathoms) and were particularly abundant between Point Reyes and the Farallon Islands.

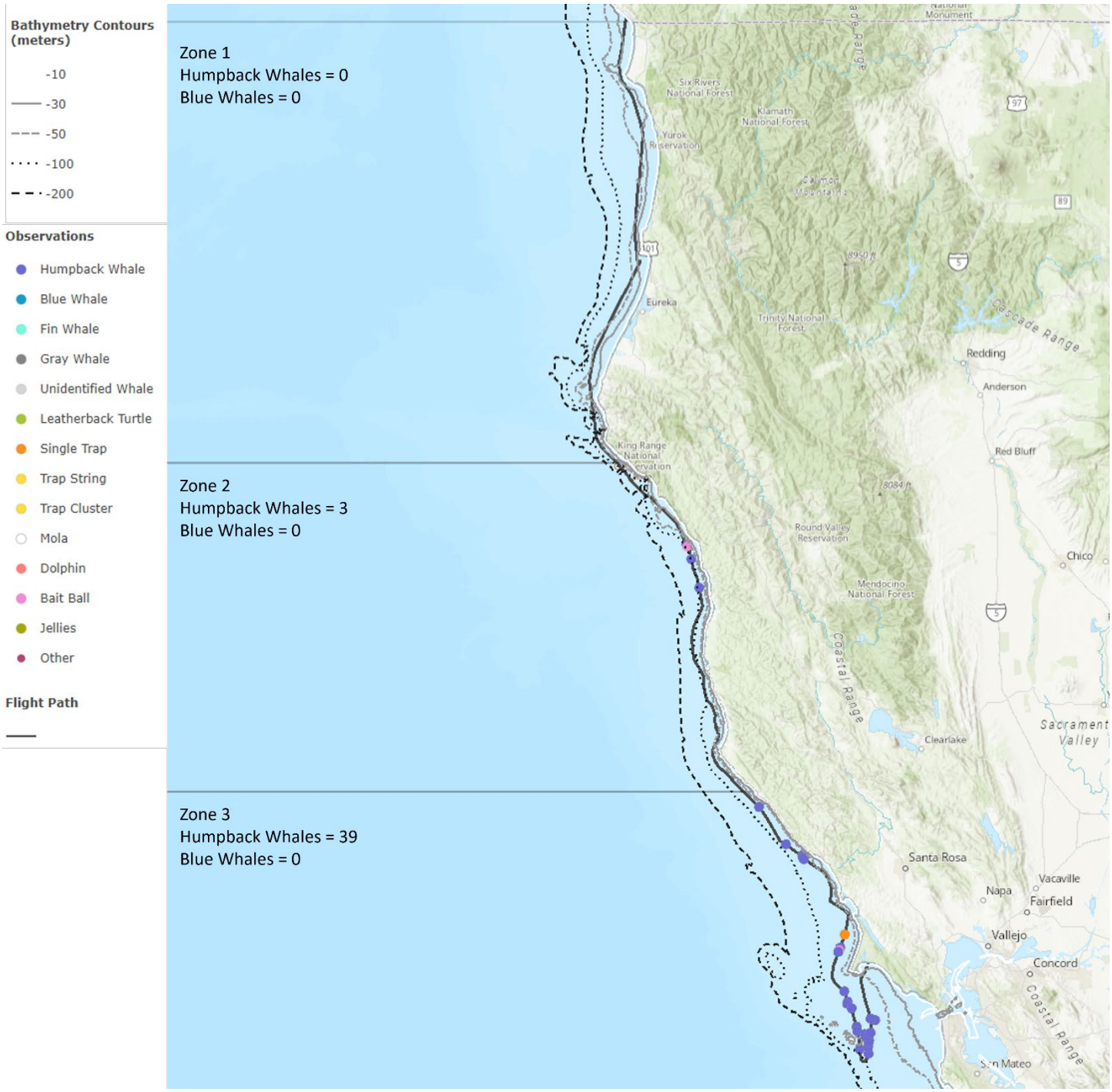


Figure 1. Map showing track lines and observations from CDFW aerial survey of Fishing Zones 1-3 on November 9, 2022. Survey information is overlaid onto contours showing the 10m, 30m, 50m, 100m, and 200m bathymetry lines.

Monterey Bay Whale Watch *(Fishing Zone 4)*

- Monterey Bay Whale Watch conducted whale-watching trips in southern Monterey Bay on five of seven days during the week of November 5-11, 2022.
- The average number of humpback whales-per-trip during the last seven days (November 5-11, 2022) was 11.9, with a peak of 22 whales observed on a single half-day trip on November 6, 2022 (Figure 2).
- Two blue whales were observed by Monterey Bay Whale Watch on November 3, 2022, but otherwise no blue whales have been observed since September 20, 2022.

The average number of blue whales-per-trip during the last seven days (November 5-11, 2022) was 0.1.

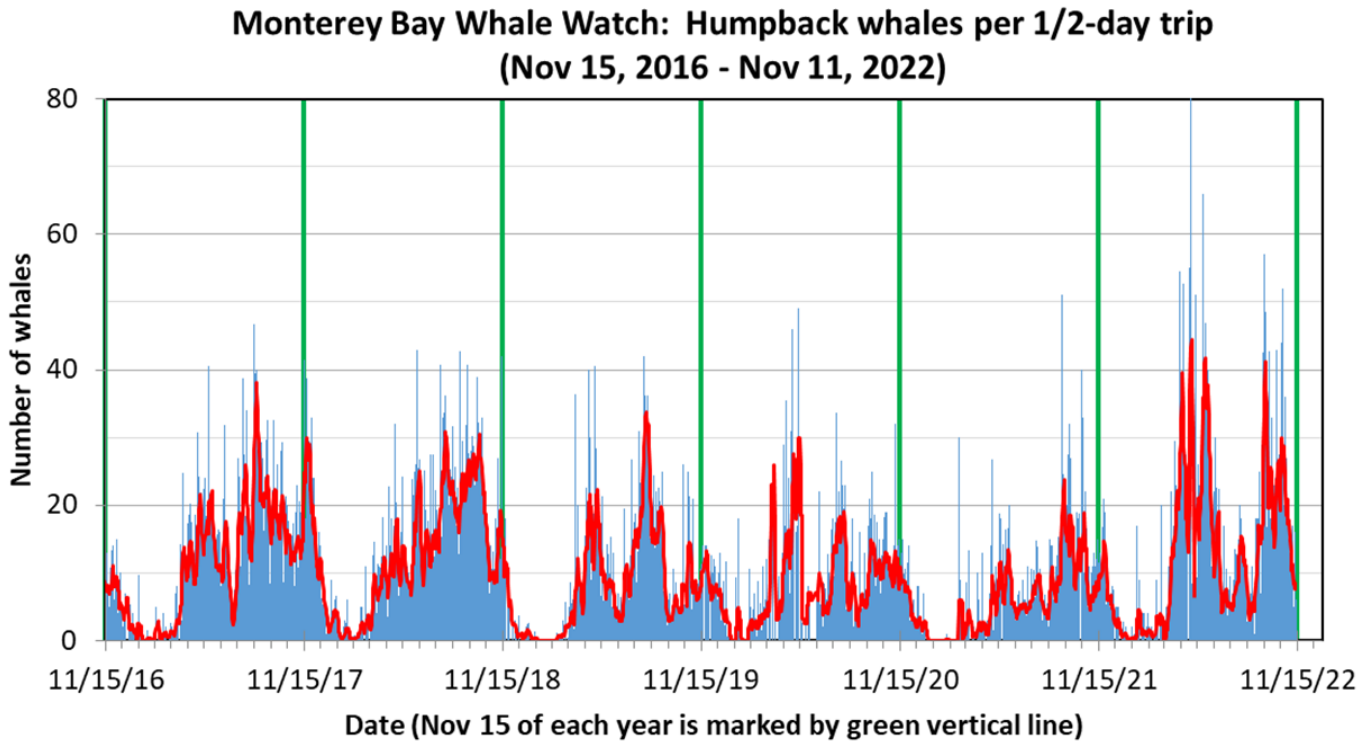


Figure 2. Standardized number of humpback whale sightings for Monterey Bay Whale Watch from November 15, 2016 to November 11, 2022. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns a bit easier to see. A vertical green line has been added at November 15 of each year for reference. Each tick mark is one month.

Leatherback Sea Turtle Telemetry

Two adult male leatherback turtles that were captured 7-10 miles west of the San Francisco Peninsula and tagged with satellite-linked transmitters on September 15 and 16, 2022 are approximately 275 miles WSW of Point Arguello, CA and 440 miles ESE of Hawaii, respectively. Both turtles are migrating in a southwest direction toward western Pacific nesting beaches in offshore water. No new leatherback sightings have been reported off California since the last risk assessment.

MANAGEMENT CONSIDERATIONS

Information from NOAA: §132.8(d)(2)

No additional information was provided for this risk assessment.

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

Data provided by: California Department of Fish and Wildlife

Given the high number of confirmed entanglements which have occurred during 2022, avoidance of any additional entanglements is a priority for CDFW. The selected management measure must limit the potential for interactions between humpback whales and commercial Dungeness crab gear, therefore issuance of a Fleet Advisory would not provide adequate protection from risk of entanglement. Foraging humpback

whales often move between shallow and deep-water areas in pursuit of prey, and aerial surveys documented humpback whales in depths of 30-50 meters (16-27 fathoms) so a depth constraint will not offer adequate protection as humpbacks whales leave the foraging grounds for winter breeding grounds. Opening the commercial fishery under a gear reduction would still allow vertical lines to be deployed in areas where humpback whales are present, posing a risk of entanglement. Alternative Gear can only be authorized after April 1st. Therefore, a continued commercial fishery delay in Fishing Zones 3-6 is the most effective management action.

Actions taken in the recreational fishery are limited to a recreational trap restriction. For the reasons described above, allowing harvest with recreational crab traps poses risk of entanglement. The only effective management action is to continue the recreational trap restriction in Fishing Zones 3-6.

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

Data provided by: California Department of Fish and Wildlife

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 has not identified any other management measure that would equivalently reduce entanglement risk.

However, CDFW notes that holiday markets are traditionally an important component of the Dungeness crab fishery. CDFW anticipates that a delay until December 15 would allow product to be landed, processed, and sold for the Christmas and New Year holidays.

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)

Monterey Bay Whale Watch *(Fishing Zone 4)*

- The semi-monthly average number of humpback whales-per-half-day-trip is high compared to historical patterns for this time of the year (Figure 3), but the seven-day running average has been decreasing steadily since about mid-October (Figure 1), which is consistent with expected seasonal migration patterns.
- The low presence of blue whales is largely consistent with their historical seasonal southward migration patterns.

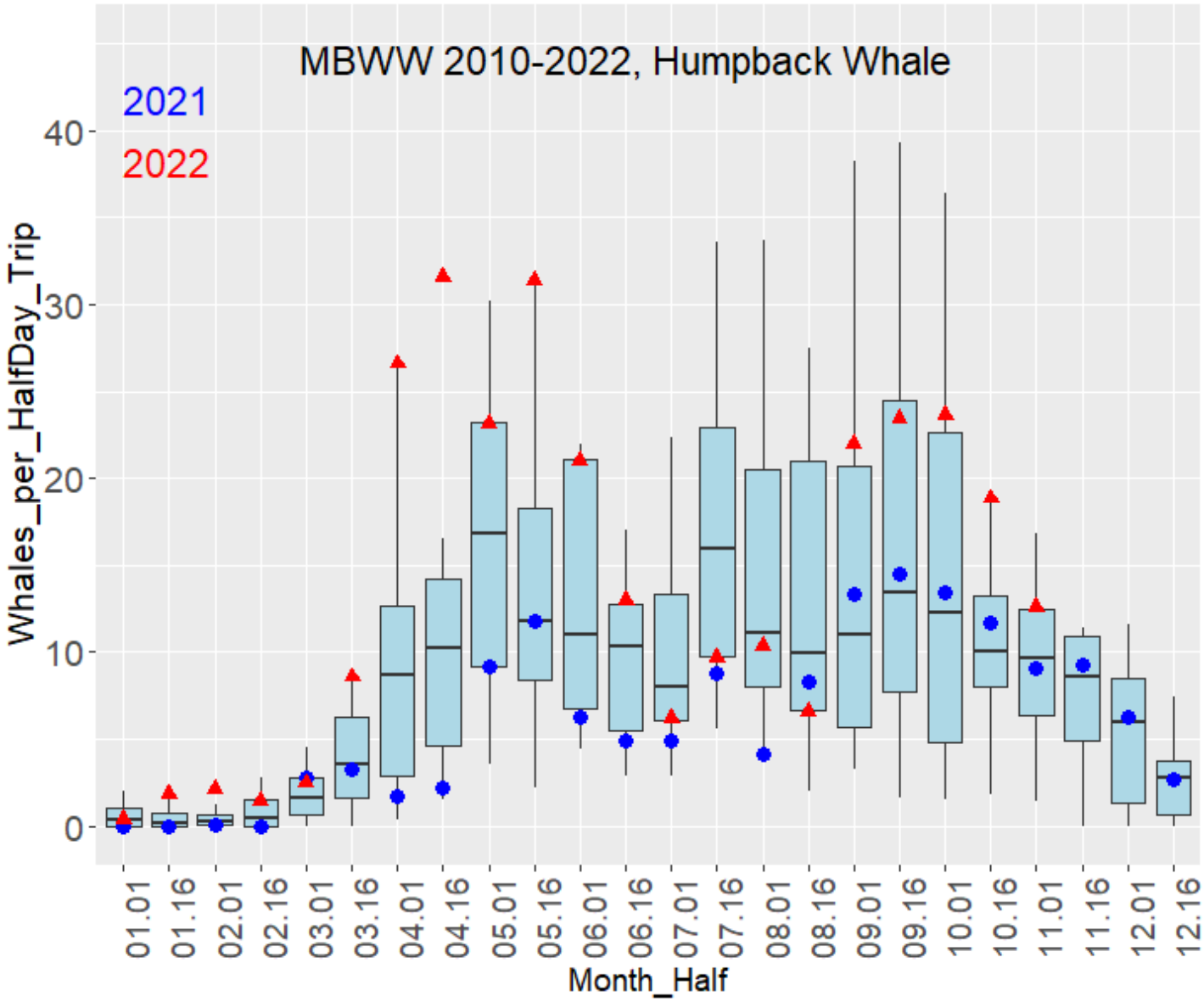


Figure 3. Historical Monterey Bay Whale Watch data for 2010-2022, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2021 (large blue dots) and 2022 (red triangles) and are provided for reference, placing recent whale numbers in a historical context. [NOTE: To account for population growth of these recovering whale populations, the historical reference period has been modified to include only the more recent period of 2010-2022, rather than 2003-2022 as in previous plots. This provides a more relevant comparison to the current conditions].

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

During the seven-day period ending November 15, 2022 trained observers at the Farallon Islands reported 122 humpback whale sightings within Fishing Zone 3, and trained naturalists from the Channel Islands National Marine Sanctuary and National Park Service reported 40 humpback whale sightings and one blue whale sighting within Fishing Zone 6 (Figure 4).

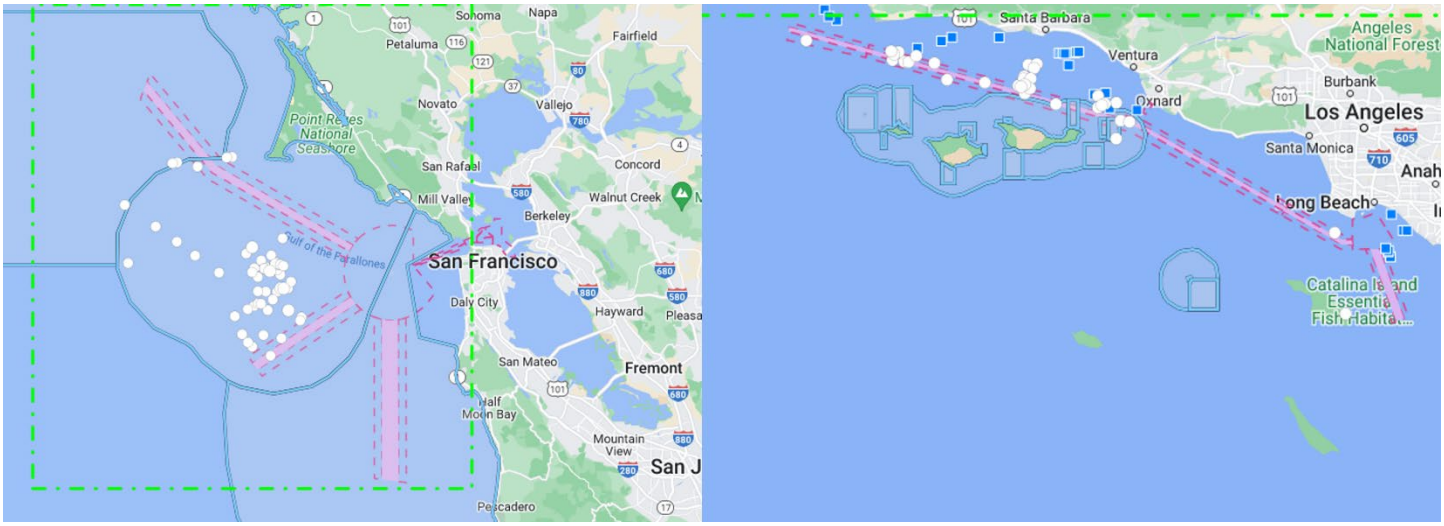


Figure 4. Locations of humpback whale sightings within Fishing Zones 3 and 6. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals. Fishing Zone boundaries are represented by the dashed green line.

WhaleWatch 2.0 *(All Fishing Zones)*

Compared to predictions for October 18, 2022 (see the October 25, 2022 Available Data document), blue whale habitat predictions for November 11, 2022 indicate lower habitat suitability along most of the central and northern California coast (Figure 5). Moderate to high habitat suitability remains between Point Reyes and Point Arena, and within the Southern California Bight.

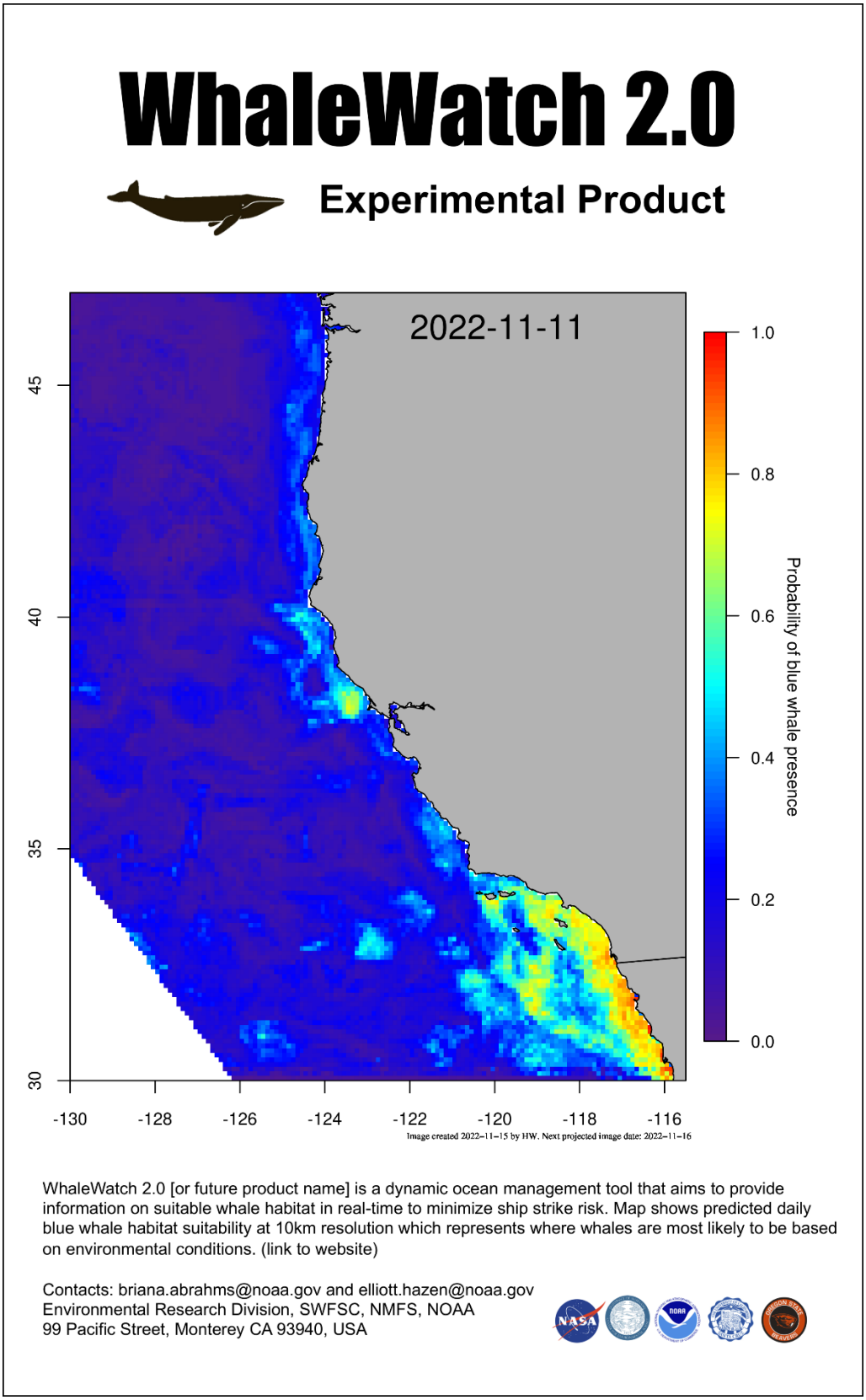


Figure 5. WhaleWatch 2.0 map for November 11, 2022. View a current map.

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

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

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

Domoic Acid and Quality Testing

- Quality test results for crab collected on November 10, 2022 from the three northern ports (Crescent City, Trinidad, and Eureka) were below the Tri-State meat quality criteria of 24% (no rounding). Meat quality was 18.7% in Crescent City, 19.5% in Eureka, and 20.4% in Trinidad. Under the Tri-State agreement, Fishing Zones 1 and 2 are therefore subject to a quality delay and will open no sooner than December 16, 2022. Additional quality testing will be conducted in early December.
- As of November 9, 2022 domoic acid results are available for all port areas and all crabs are below the federal action level (Figure 6). On October 31, 2022 CDPH collected mussels from Humboldt Bay that exceeded domoic acid concentration levels for bivalves (Figure 7). CDFW is working in partnership with the California Department of Public Health to conduct additional testing of crab collected from sites in the Eureka port area during quality testing to confirm there have been no changes in domoic acid levels following the first pre-season sampling conducted in early October. Results are expected within a week of when samples were submitted to CDPH on November 14, 2022.

CDPH SUMMARY OF DOMOIC ACID LEVELS IN CRABS **JULY 01, 2022 - NOVEMBER 09, 2022**

PORT	COLLECTION SITE	SAMPLE COLLECTION DATE	CRAB TYPE VISCERA	INDIVIDUAL SAMPLE RESULTS (FDA ACTION LEVEL >30 PPM)						AVERAGE LEVEL (Information Only)	PERCENT OF SAMPLES EXCEEDING ACTION LEVEL
Crescent City	George Reef	10/9/2022	Dungeness Crab	<2.5	4.1	9.5	<2.5	<2.5	<2.5	2.3 ppm	0%
Crescent City	Klamath River	10/9/2022	Dungeness Crab	<2.5	<2.5	4.2	3.0	<2.5	<2.5	1.2 ppm	0%
Trinidad	Lagoons	9/11/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Trinidad	Trinidad Head	9/11/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Eureka	LP Eureka	10/9/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Eureka	Eel River	10/9/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Fort Bragg	Usal	10/16/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Fort Bragg	Manchester Beach	11/4/2022	Dungeness Crab	4.4	<2.5	<2.5	<2.5	11	<2.5	2.6 ppm	0%
Bodega Bay	Salt Point	10/3/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Bodega Bay	Russian River	10/3/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	3.3	<2.5	0.6 ppm	0%
Bodega Bay	Bodega Head	10/3/2022	Dungeness Crab	<2.5	12	<2.5	<2.5	<2.5	<2.5	2 ppm	0%
Bodega Bay	Point Reyes	10/3/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Half Moon Bay/ San Francisco	Duxbury Reef	9/22/2022	Dungeness Crab	4.4	<2.5	<2.5	<2.5	<2.5	<2.5	0.7 ppm	0%
Half Moon Bay/ San Francisco	Pillar Point	9/24/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Half Moon Bay/ San Francisco	Pigeon Point	9/25/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Monterey	Monterey Bay	9/24/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	16	<2.5	2.7 ppm	0%
Monterey	Monterey Bay	9/24/2022	Rock Crab	<2.5	3.0	12	<2.5	<2.5	<2.5	2.5 ppm	0%
Morro Bay	Avila Beach	10/7/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
NA	CDFW Block 745	9/29/2022	Box Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
NA	CDFW Block 745	9/29/2022	King Crab	<2.5	<2.5	<2.5	<2.5	<2.5	NA	Non-Detect	0%
NA	CDFW Block 652	9/28/2022	Rock Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%

1 SET = 6 SAMPLES

Figure 6. California Department of Public Health domoic acid test results for crab, updated November 9, 2022.

California Department of Public Health 11/10/2022
Bivalve Shellfish Marine Biotoxin Monitoring Results
Paralytic Shellfish Poisoning Toxins (PSP) & Domoic Acid (DA)

Date Collected	Sample Site	Sample Type	PSP* (ug/100g)		DA** (ppm)	Approximate Latitude	Approximate Longitude
County: Del Norte							
10/24/2022	Hunter Rock, north	Sea Mussel, wild	n		3.0	41.96	-124.21
11/04/2022	Wilson Creek	Sea Mussel, wild	n		< 2.5	41.60	-124.10
County: Humboldt							
10/17/2022	Humboldt Bay, Indian Is. Ch.	Sea Mussel, Sentinel	n		< 2.5	40.81	-124.16
10/17/2022	Humboldt Bay, East Bay 1-2	Pacific Oyster, cultured	X		< 2.5	40.82	-124.14
10/17/2022	Humboldt Bay, Ch Marker #13	Sea Mussel, Sentinel		68	< 2.5	40.77	-124.22
10/24/2022	Trinidad Head	Sea Mussel, wild	n		< 2.5	41.05	-124.15
10/24/2022	Humboldt Bay, Indian Is. Ch.	Sea Mussel, Sentinel		39		40.81	-124.16
10/24/2022	Humboldt Bay, Ch Marker #13	Sea Mussel, Sentinel		**91**	4.6	40.77	-124.22
10/31/2022	Humboldt Bay, Indian Is. Ch.	Sea Mussel, Sentinel	n		**20.0**	40.81	-124.16
10/31/2022	Humboldt Bay, Ch Marker #13	Sea Mussel, Sentinel		56	**45.0**	40.77	-124.22
11/01/2022	Humboldt Bay, WQ #27	Pacific Oyster, cultured	X		< 2.5	40.87	-124.15
11/02/2022	Humboldt Bay, Mad River 7-2	Kumamoto Oyster, cultured	X		< 2.5	40.85	-124.14
11/02/2022	Humboldt Bay, East Bay 1-2	Kumamoto Oyster, cultured	<	34	< 2.5	40.82	-124.14
11/02/2022	Humboldt Bay, WQ #26	Kumamoto Oyster, cultured	X		< 2.5	40.85	-124.15
11/07/2022	Humboldt Bay, Indian Is. Ch.	Sea Mussel, Sentinel		41	< 2.5	40.81	-124.16
11/07/2022	Humboldt Bay, East Bay 1-2	Kumamoto Oyster, cultured	<	35	< 2.5	40.82	-124.14
11/07/2022	Humboldt Bay, WQ #33	Pacific Oyster, cultured	<	34	< 2.5	40.84	-124.12
11/07/2022	Humboldt Bay, Ch Marker #13	Sea Mussel, Sentinel		70	5.1	40.77	-124.22
County: Mendocino							
10/24/2022	Westport, Bruhel Pt.	Sea Mussel, wild	n		< 2.5	39.60	-123.79
10/24/2022	MacKerricher SP, Ward Ave	Sea Mussel, wild	n			39.50	-123.79

* PSP alert level: >= 80 micrograms per 100 grams. Tested via qualitative test and/or PSP Assay. "n" = non-detect on qualitative test. Not all samples tested with qualitative test.
** DA alert level: >= 20 parts per million. Tested via HPLC.
"X" or blank = Not tested.

Page 1

Figure 7. Resulting concentrations of both domoic acid (DA) and paralytic shellfish poisoning (PSP) neurotoxins for bivalves tested by CDPH for biotoxin monitoring in the state by county. Table only shows complete results of Del Norte and Humboldt counties for the last 30 days from November 10, 2022. Table was accessed on November 15, 2022 from the CPDH website.

Recreational Crab Fishery

The recreational crab fishery opened statewide under a trap restriction on November 5, 2022. Use of crab traps is prohibited; however recreational anglers can harvest crabs with snares and hoop nets.

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

Updated information was not available for this risk assessment.

Ocean conditions: §132.8(d)(9)*

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

Habitat Compression Index

The most recent Habitat Compression Index values are for October 2022, during which there was high compression between 35.5 and 40°N (Figure 8). Habitat compression has been high during November in seven of the last ten years, and moderate during the other three (Figure 9).

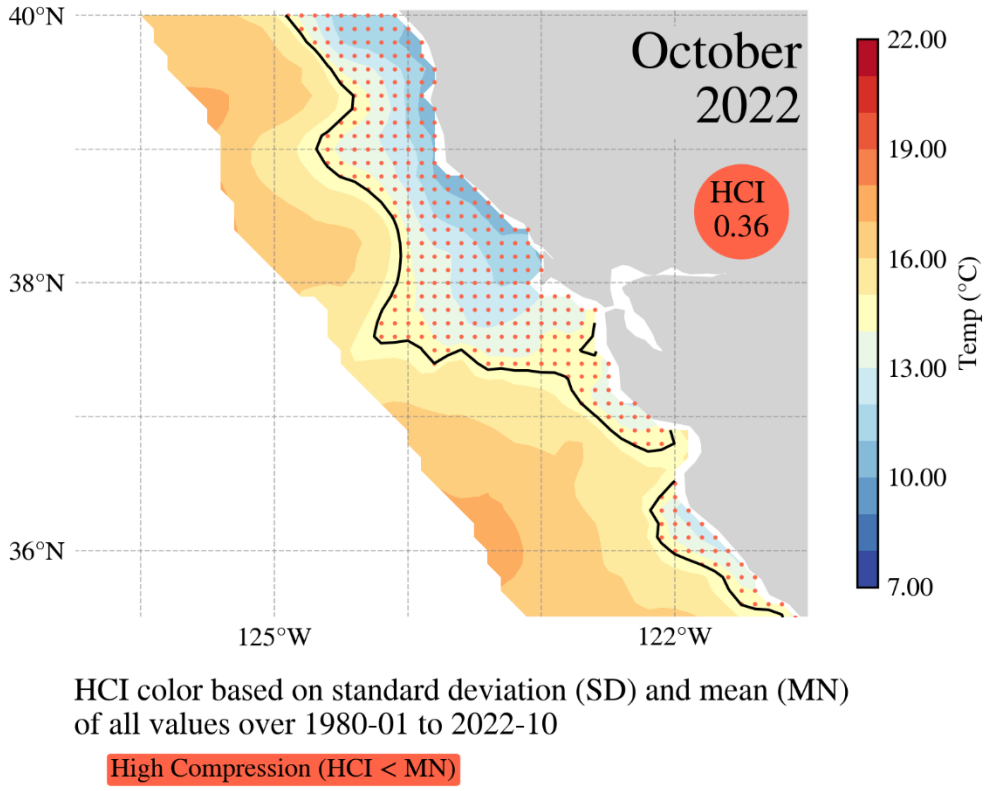


Figure 8. Map of October 2022 sea surface temperature and location of the Habitat Compression Index boundary (thin black line).

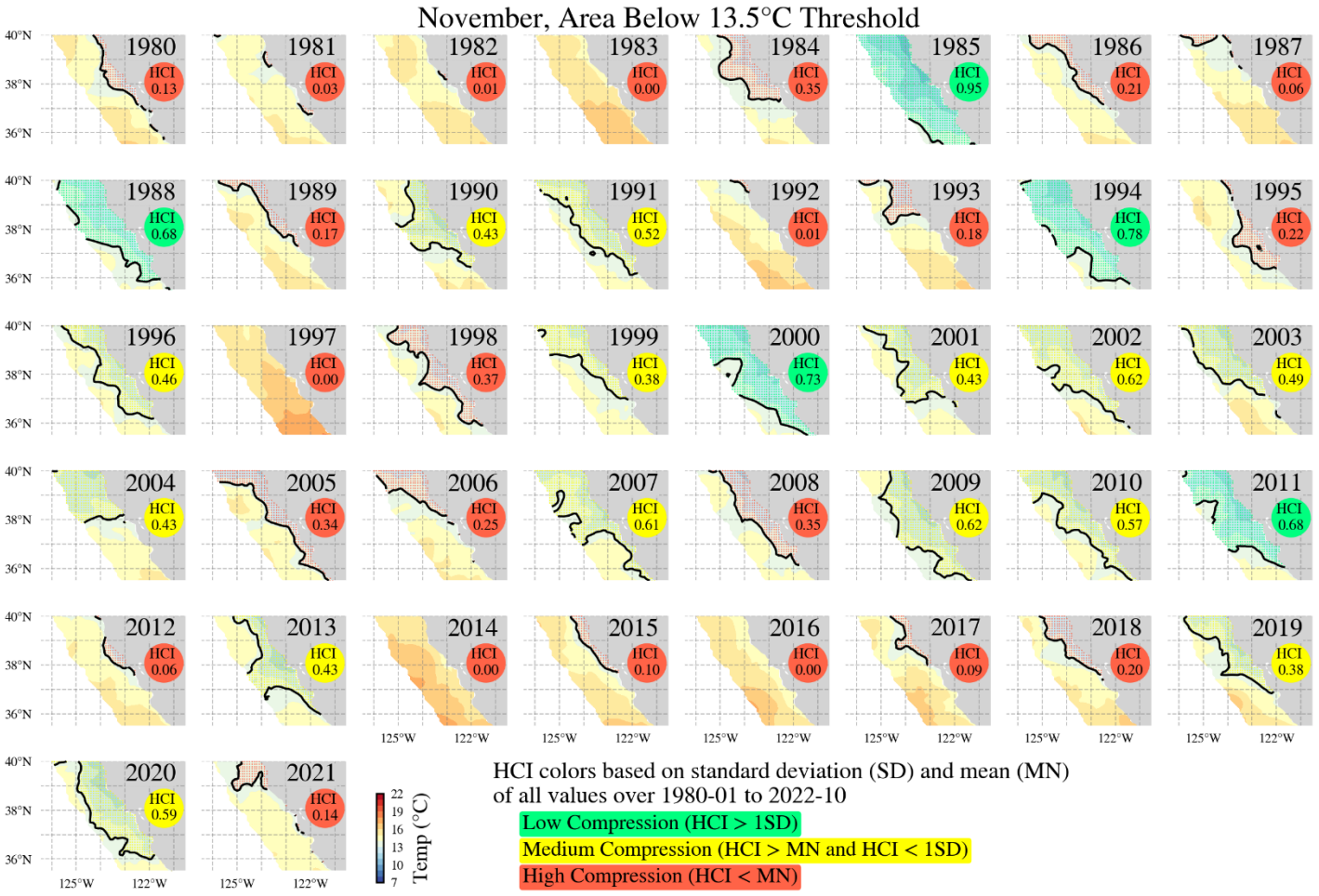


Figure 9. Maps of historical November sea surface temperature and location of the Habitat Compression Index boundary (thin black line) between 1980 and 2021.

ENSO Diagnostic

As of November 10, 2022 there is a 76% chance of La Niña during December 2022 – February 2023, with a 57% chance of transition to ENSO-neutral for February – April 2023.

Large Marine Heatwave Tracker

As of October 17, the CCIEA program was continuing to track the NEP22A large marine heatwave, which has resided fairly close to shore for most of August-October 2022 and encompassed much of the coastline, although small patches of cool water remain in various locations and times due to local upwelling. For the past several weeks, more than 50% of the US west coast EEZ has been in heatwave status (Figure 10). Also notable is the increase in heatwave intensity (how much warmer the water is compared to normal) over the past several weeks in the far offshore region of the northern Northeast Pacific. This indicates that NEP22A may still be gathering strength, rather than dissipating, as most heatwaves do in the fall.

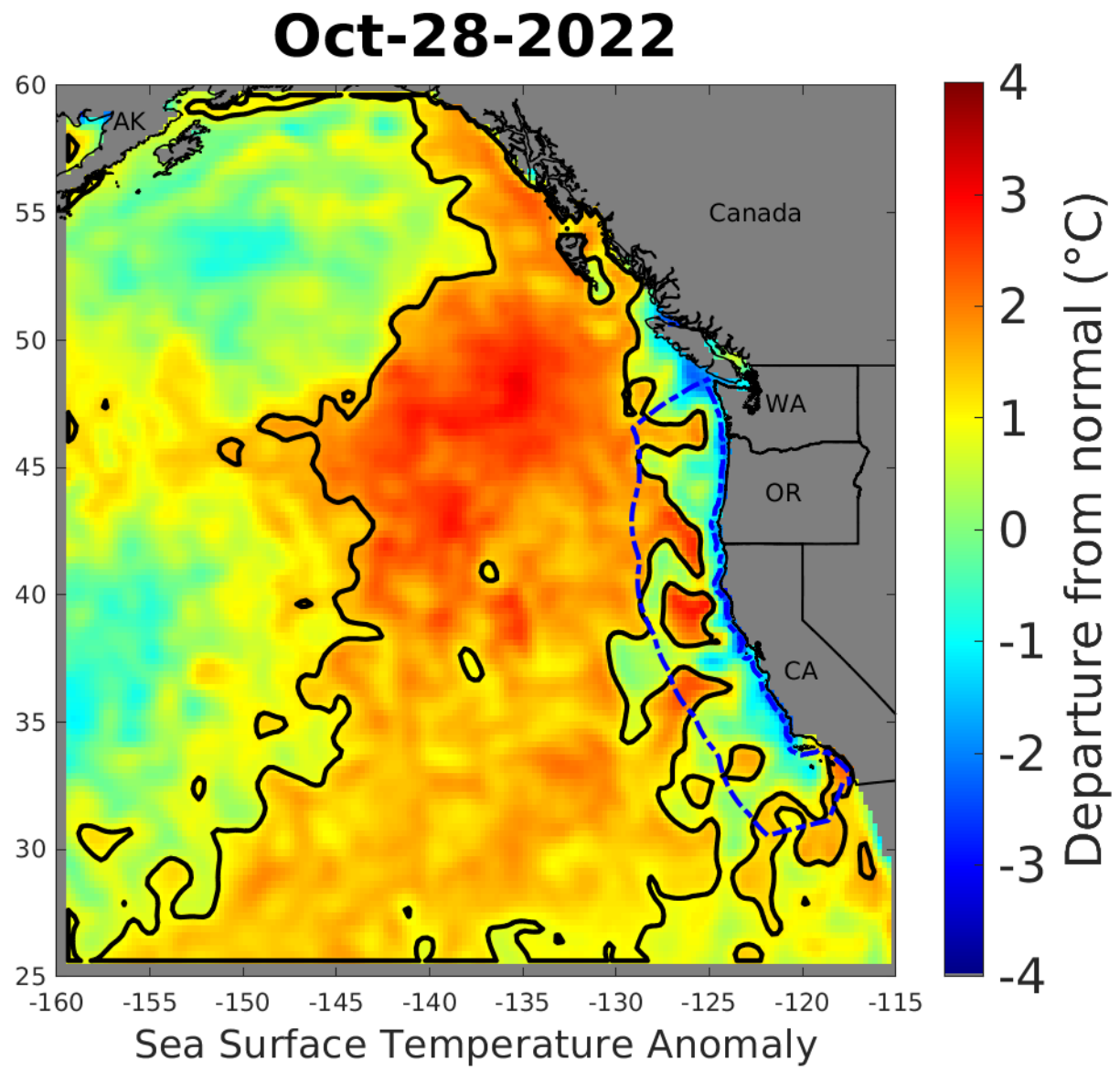


Figure 10. Science-quality (delayed 3-weeks), daily interpolated standardized sea surface temperature anomalies (SSTa) in the California Current ecosystem available for analysis of MHW presence. Dark outline shows the current extent of MHW conditions, as delineated by values of the normalized SST + 1.29 SD from normal. Blue dashed line represents the US West Coast EEZ. SST data from NOAA's Optimum interpolation Sea Surface Temperature analysis 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: California Department of Fish and Wildlife

Pursuant to the Risk Assessment and Mitigation Program (Section 132.8, Title 14, CCR), Impact Scores 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 (2022-23) and calendar year (2022) are provided in Table 2 above. Impact Score totals for calendar year 2021 are provided in Table 3 above.

Addendum: November 18, 2022

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

Additional Data provided by: John Calambokidis and TMMC

Table 1 [Revised]. Summary of available CDFW-approved survey data for marine life concentrations for each Fishing Zone, 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	USCG/CDFW Aerial Survey, CDFW Aerial Survey	No
Zone 2	CDFW Aerial Survey	No
Zone 3	CDFW Aerial Survey, Cascadia/TMMC Survey	Yes
Zone 4	MBWW, Cascadia/TMMC Survey	Yes
Zone 5	Cascadia/TMMC Survey	No
Zone 6	NA	Yes – no data

Cascadia/TMMC Vessel Surveys

Three surveys were conducted in the last week (November 10-16, 2022) in Fishing Zones 3, 4 and 5 and are summarized below in Table 2 and Figures 11-13. Surveys in Fishing Zones 3 and 4 each revealed much lower numbers than surveys in October 2022 but still documenting over a dozen humpback whales along the tracks surveyed with sightings along both the shallow water and shelf-edge areas. The survey in Fishing Zone 5 did not sight any whales.

Table 2. Summary of vessel surveys conducted 10-16 November 2022 in Zones 3 and 4 by Cascadia Research and The Marine Mammal Center.

Date	Vessel	Zone	Area	Hump. Whales (Total)	Unident. Whales (Total)	Comments
10-Nov-22	MUS	4	Monterey Bay & N	14	0	NA
11-Nov-22	TMMC	3	Gulf of the Farallones	21	1	1 gray whale seen
16-Nov-22	MUS	5	Moro Bay area	0	0	No whale sightings

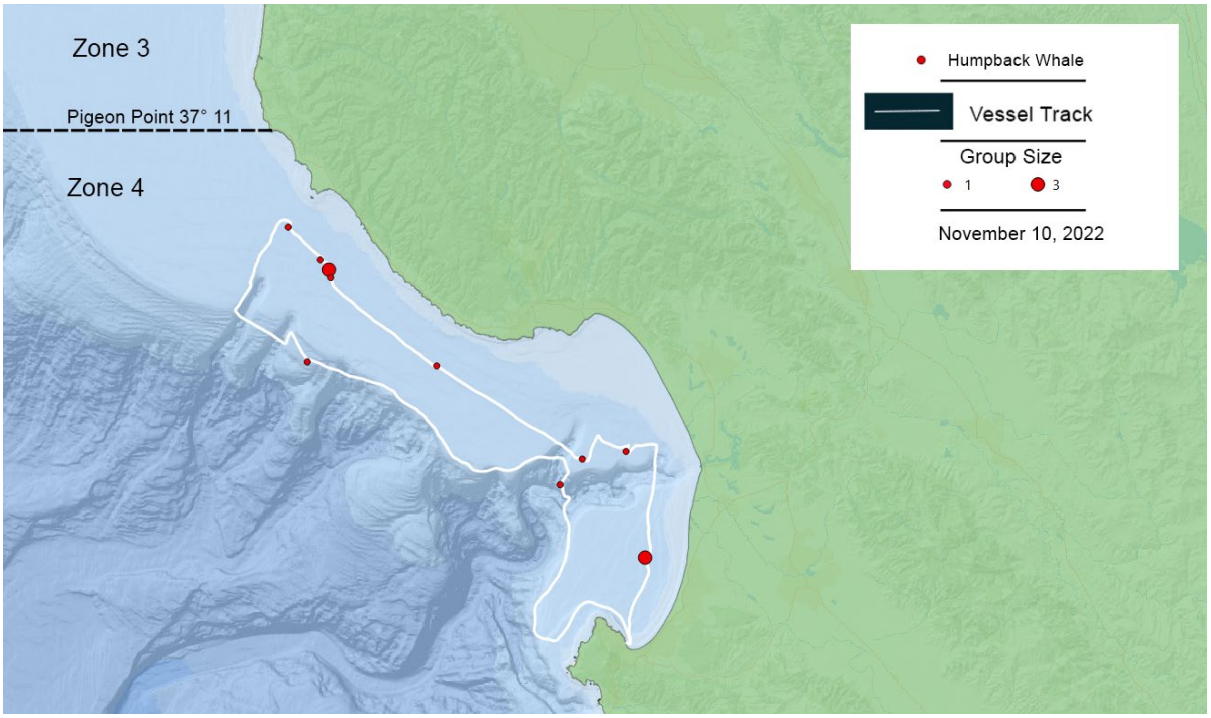


Figure 11. Track and sightings from survey by MUS in Monterey Bay area (Fishing Zone 4) on November 10, 2022.

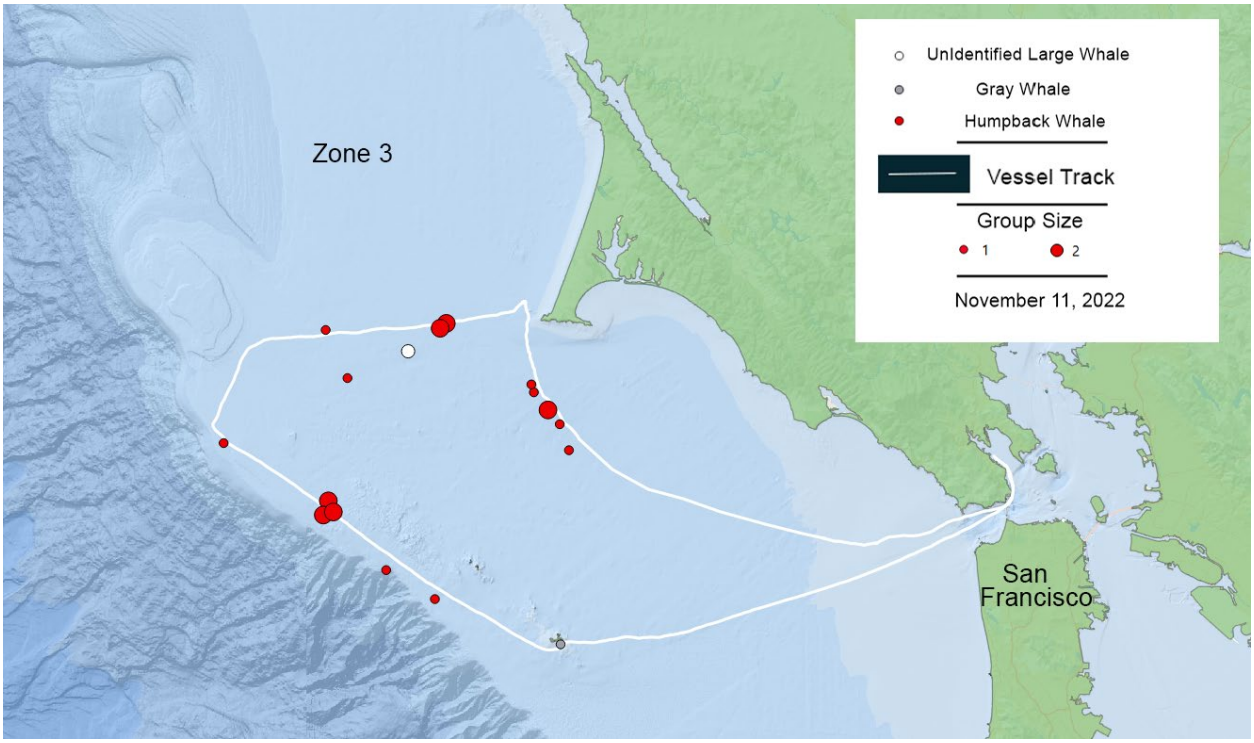


Figure 12. Track and sightings from survey by TMMC in Gulf of the Farallones (Fishing Zone 3) on November 11, 2022.

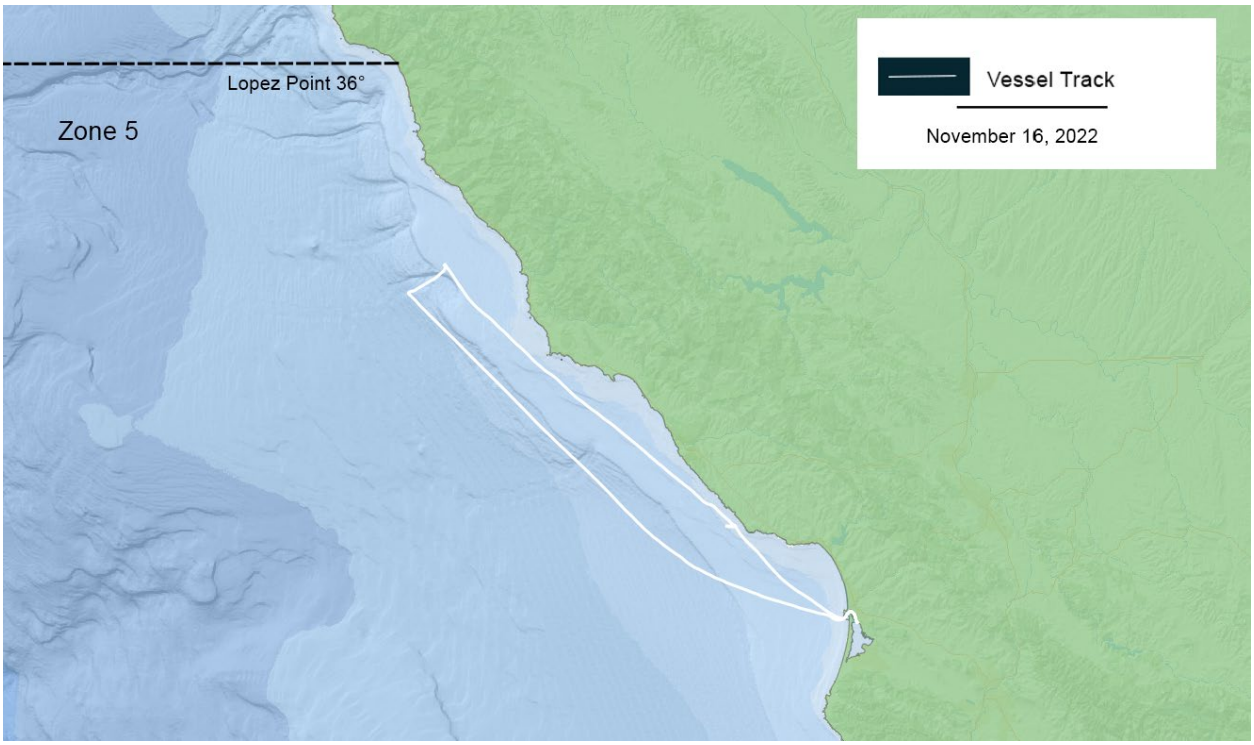


Figure 13. Track from survey by MUS out of Morro Bay area (Fishing Zone 5) on November 16, 2022. There were no large whale sightings.

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

Data provided by: John Calambokidis

Collaborators working with Cascadia Research in Mexico have documented whales already there from California. In one area along more than 60 humpback whales have been individually identified with the vast majority of these being whales previously identified in California confirming the migration to southern wintering areas is well underway.

California Department of Fish and Wildlife Initial Assessment and Preliminary Management Recommendation for the Risk Assessment Mitigation Program

Date: November 16, 2022

This preliminary assessment and management recommendation has been developed by California Department of Fish and Wildlife (CDFW) Marine Region staff for consideration by the California Dungeness Crab Fishing Gear Working Group (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 and recreational Dungeness crab fishery. CDFW will prepare a Final Assessment and Management Recommendation after review of the Working Group Recommendation and other relevant data. See the Available Data document prepared on the Whale Safe Fisheries Webpage under the Risk Assessment tab for more information.

A. Confirmed Entanglements and Marine Life Concentrations Triggers for Management Action, RAMP subsection (c)

In-season Confirmed Entanglement accounting is not available because the fishery is not currently open. The current Impact Score for calendar year 2022 is 4.15 for humpback whales. The Impact Score for calendar year 2021 was 1.89 for humpback whales, as a result CDFW anticipates a running 3-year average Impact Score of at least 2.01 for humpback whales at the start of 2023.

- Confirmed Entanglements in California Commercial Dungeness Crab Gear during the current calendar year equal three humpback whales.
- Confirmed Entanglements in Unknown Fishing Gear reported from California during the current calendar year equal eight humpback whales (two additional entanglements are under review).

Marine Life Concentrations Surveys for Fishing Zones 3 and 4 documented aggregations of humpback whales. Marine Life Concentration triggers for each Fishing Zone based on an aerial survey and whale watch data are as follows:

- Fishing Zone 3 = 39 humpback whales
- Fishing Zone 4 = 22 humpback whales and weekly average was 11.9 humpback whales

No triggers were reached for Fishing Zones 1 and 2. Fishing Zones 5 and 6 had no new data available to inform this risk assessment.

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

Recreational Fishery:

- **Crab Trap Prohibition (continued): Fishing Zones 3, 4, 5 and 6 (lift for Zones 1 and 2)**

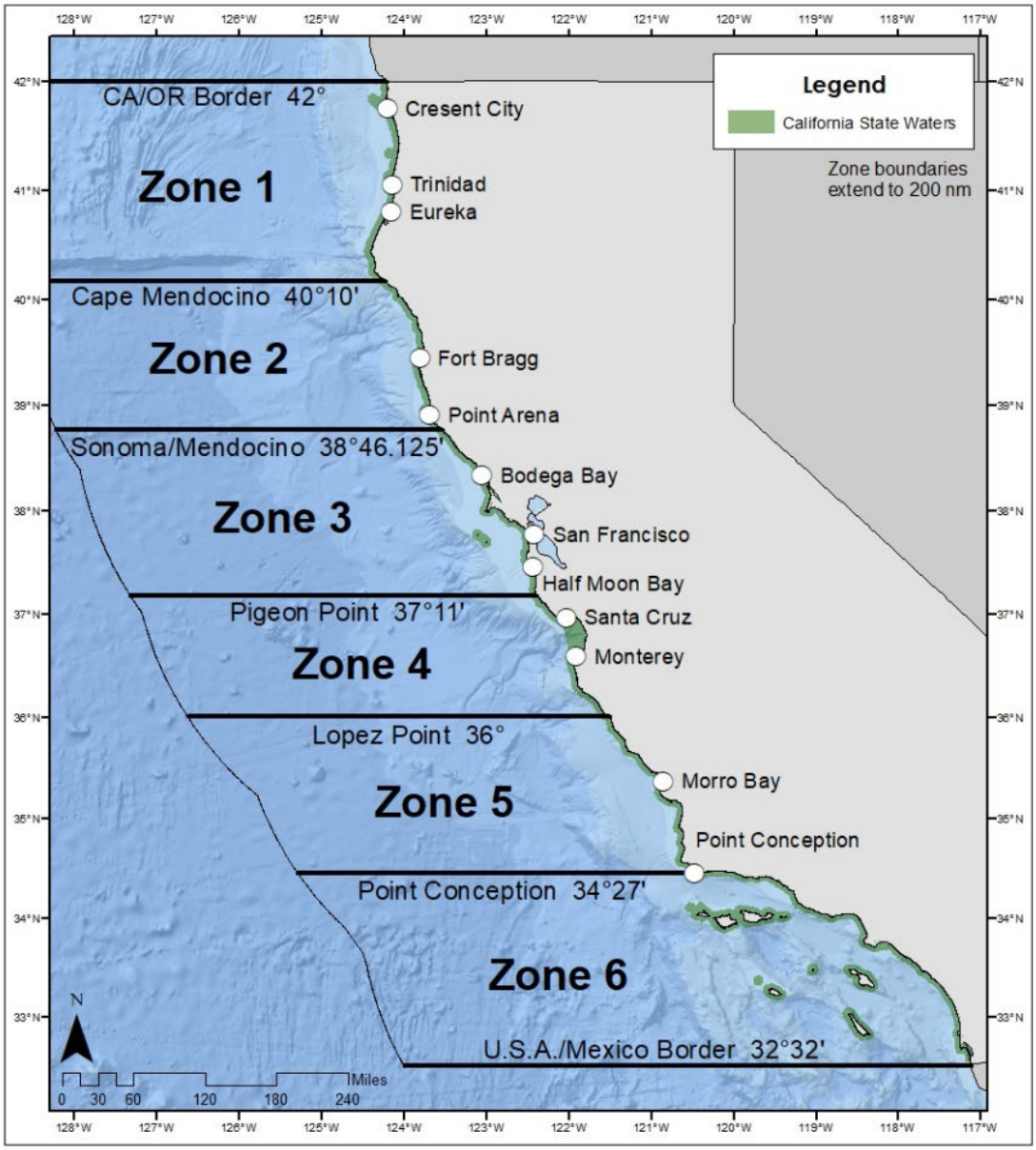
Commercial Fishery:

- **Season Delay (continued): Fishing Zones 3, 4, 5 and 6 (no delay Fishing Zones 1-2)**

CDFW Marine Region staff's preliminary recommendation for Fishing Zones 1 and 2 is to lift the recreational trap prohibition and to not delay the commercial fishery due to reduced entanglement risk. Note, the commercial fishery in Fishing Zones 1 and 2 may be delayed however due to quality testing results.

CDFW Marine Region staff's preliminary recommendation for Fishing Zones 3 through 6 is continuation of the delay for the commercial fisheries and recreational crab trap prohibition until the next risk assessment (expected to occur on or before Dec. 7). This recommendation is based on exceedance of Marine Life Concentration data triggers for humpback whales in Fishing Zones 3 and 4, and lack of available data in Fishing Zones 5 and 6. Aerial surveys indicated large aggregations of humpback whales in Fishing Zone 3 which is further supported by sightings data from Point Blue around the Farallon Islands. Monterey Bay Whale Watch data indicate above average sightings in Fishing Zone 4. Foraging activity by humpback whales poses a risk of entanglement with vertical lines and surface gear from recreational and commercial crab traps. In addition, given the current calendar year entanglement Impact Score, a precautionary management approach is warranted to further minimize entanglement risk until a majority of the whales have migrated out of these remaining Fishing Zones.

A Fleet Advisory, Depth Constraint or Vertical Line/Gear Reduction (Management Actions under RAMP) would not minimize entanglement risk due to whale distribution and high historical fishing effort during the season opener for the commercial fishery. Management action in the recreational fishery is limited to a trap prohibition when numerical triggers (Marine Life Concentrations) are reached in RAMP. Combined fishing effort across both fisheries and the significant number of recent entanglements during and after the 2021-22 fishing season suggest that the most protective management actions are warranted.


Legend
California State Waters
Zone boundaries extend to 200 nm
CA/OR Border 42°
Zone 1
Cape Mendocino 40°10'
Zone 2
Sonoma/Mendocino 38°46.125'
Zone 3
Pigeon Point 37°11'
Zone 4
Lopez Point 36°
Zone 5
Point Conception 34°27'
Zone 6
U.S.A./Mexico Border 32°32'
Cresent City
Trinidad
Eureka
Fort Bragg
Point Arena
Bodega Bay
San Francisco
Half Moon Bay
Santa Cruz
Monterey
Morro Bay
Point Conception
N
Miles
0 30 60 120 180 240

2022-23 Risk Assessment: Available Data

Last updated: November 16, 2022

Contents

Items with updated information are followed by an *.

TRIGGERS REQUIRING MANAGEMENT ACTION

Confirmed Entanglements: §132.8(c)(1)

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

There have been no new entanglements of Actionable Species reported to NMFS West Coast Region since the last risk assessment, and CDFW has not yet assigned impact scores for 20221008Mn and 20221010Mn. See the October 25, 2022 Available Data document for additional details.

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

Data provided by: US Coast Guard, California Department of Fish and Wildlife, Monterey Bay Whale Watch (processed by Karin Forney, NOAA), Scott Benson (NOAA/SWFSC, in collaboration with Upwell.org)

Table 11. Summary of available CDFW-approved survey data for marine life concentrations for each Fishing Zone, 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	USCG/CDFW Aerial Survey, CDFW Aerial Survey	No
Zone 2	CDFW Aerial Survey	No
Zone 3	CDFW Aerial Survey	Yes
Zone 4	MBWW	Yes
Zone 5	NA	Yes – no data
Zone 6	NA	Yes – no data

USCG/CDFW Aerial Survey

USCG and CDFW flew a joint aerial survey on November 7, 2022 between Eureka and the Oregon border (Fishing Zone 1). No large whales were observed.

CDFW Aerial Survey *(Fishing Zones 1-3)*

On November 9, 2022 CDFW flew an aerial survey between the Farallon Islands (Fishing Zone 3) and the Oregon border (Fishing Zone 1; Figure 1). No whales were observed in Fishing Zone 1, three humpback whales were observed in Fishing Zone 2, and 39 humpback whales were observed in Fishing Zone 3. In Fishing Zone 2, the whales were located in the northern portion of the Fishing Zone and in waters between 30-50 meters (16-27 fathoms). In Fishing Zone 3, whales were sighted throughout the surveyed area within the same depth range 30-50 meters (16-27 fathoms) and were particularly abundant between Point Reyes and the Farallon Islands.

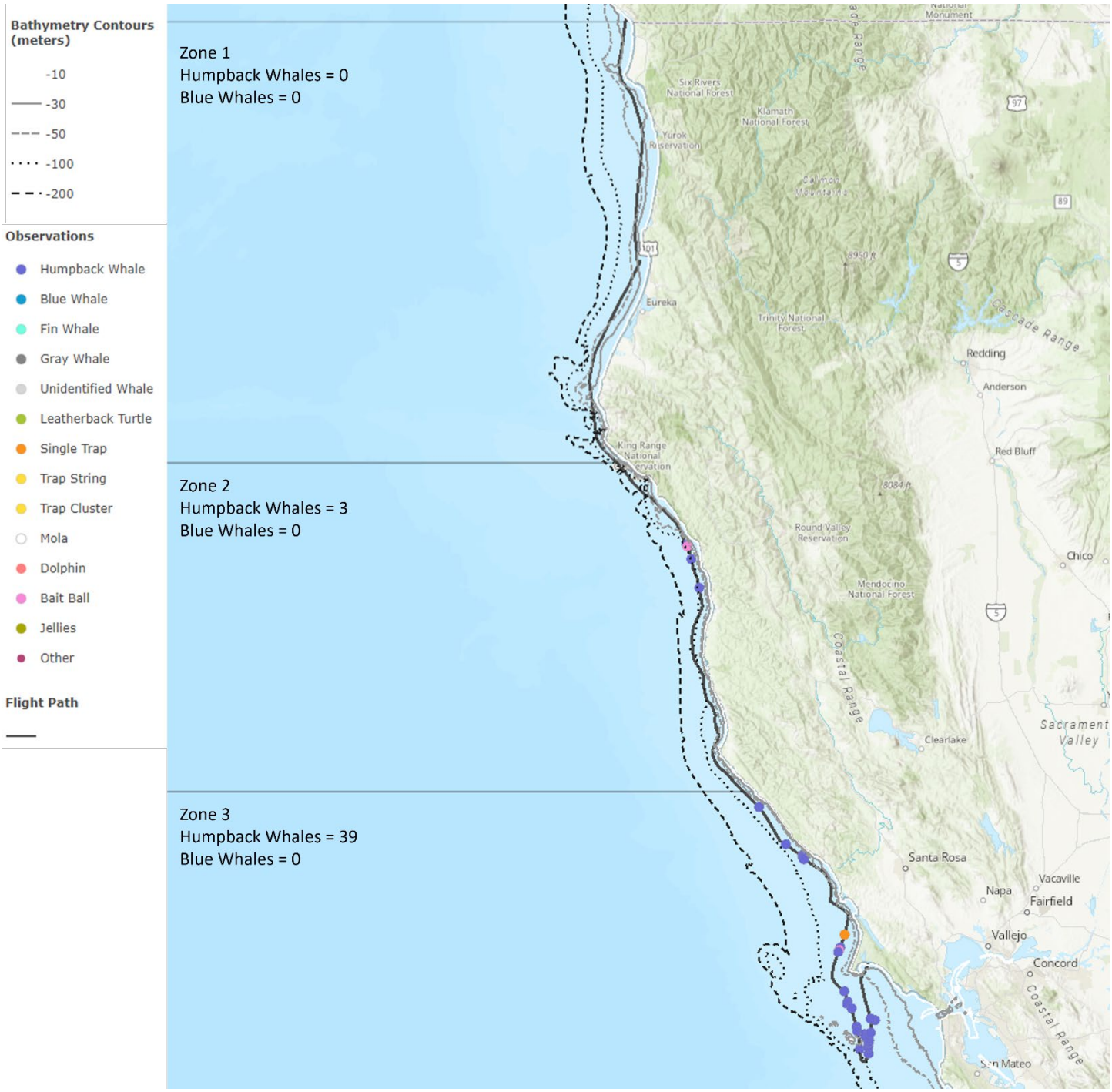


Figure 1. Map showing track lines and observations from CDFW aerial survey of Fishing Zones 1-3 on November 9, 2022. Survey information is overlaid onto contours showing the 10m, 30m, 50m, 100m, and 200m bathymetry lines.

Monterey Bay Whale Watch *(Fishing Zone 4)*

- Monterey Bay Whale Watch conducted whale-watching trips in southern Monterey Bay on five of seven days during the week of November 5-11, 2022.
- The average number of humpback whales-per-trip during the last seven days (November 5-11, 2022) was 11.9, with a peak of 22 whales observed on a single half-day trip on November 6, 2022 (Figure 2).
- Two blue whales were observed by Monterey Bay Whale Watch on November 3, 2022, but otherwise no blue whales have been observed since September 20, 2022.

The average number of blue whales-per-trip during the last seven days (November 5-11, 2022) was 0.1.

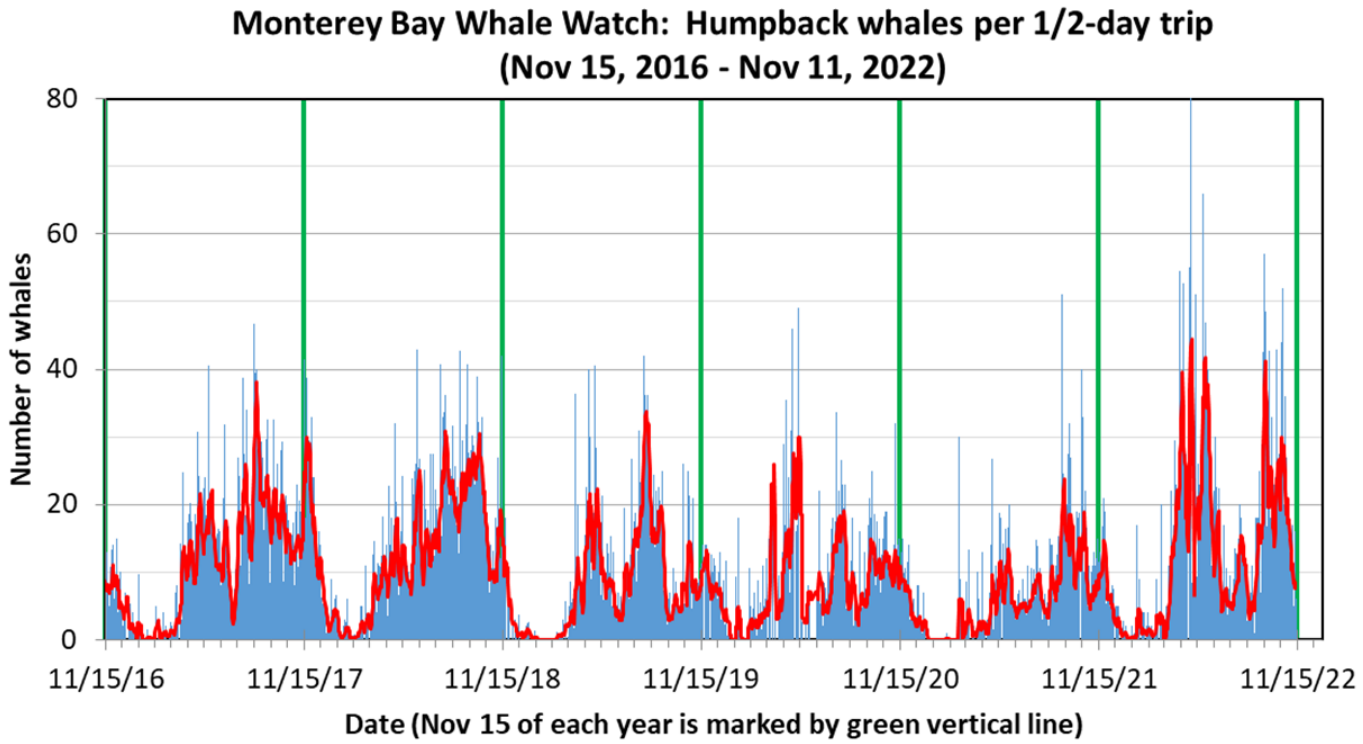


Figure 2. Standardized number of humpback whale sightings for Monterey Bay Whale Watch from November 15, 2016 to November 11, 2022. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns a bit easier to see. A vertical green line has been added at November 15 of each year for reference. Each tick mark is one month.

Leatherback Sea Turtle Telemetry

Two adult male leatherback turtles that were captured 7-10 miles west of the San Francisco Peninsula and tagged with satellite-linked transmitters on September 15 and 16, 2022 are approximately 275 miles WSW of Point Arguello, CA and 440 miles ESE of Hawaii, respectively. Both turtles are migrating in a southwest direction toward western Pacific nesting beaches in offshore water. No new leatherback sightings have been reported off California since the last risk assessment.

MANAGEMENT CONSIDERATIONS

Information from NOAA: §132.8(d)(2)

No additional information was provided for this risk assessment.

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

Data provided by: California Department of Fish and Wildlife

Given the high number of confirmed entanglements which have occurred during 2022, avoidance of any additional entanglements is a priority for CDFW. The selected management measure must limit the potential for interactions between humpback whales and commercial Dungeness crab gear, therefore issuance of a Fleet Advisory would not provide adequate protection from risk of entanglement. Foraging humpback whales often move between shallow and deep-water areas in pursuit of prey, and aerial

surveys documented humpback whales in depths of 30-50 meters (16-27 fathoms) so a depth constraint will not offer adequate protection as humpbacks whales leave the foraging grounds for winter breeding grounds. Opening the commercial fishery under a gear reduction would still allow vertical lines to be deployed in areas where humpback whales are present, posing a risk of entanglement. Alternative Gear can only be authorized after April 1st. Therefore, a continued commercial fishery delay in Fishing Zones 3-6 is the most effective management action.

Actions taken in the recreational fishery are limited to a recreational trap restriction. For the reasons described above, allowing harvest with recreational crab traps poses risk of entanglement. The only effective management action is to continue the recreational trap restriction in Fishing Zones 3-6.

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

Data provided by: California Department of Fish and Wildlife

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 has not identified any other management measure that would equivalently reduce entanglement risk.

However, CDFW notes that holiday markets are traditionally an important component of the Dungeness crab fishery. CDFW anticipates that a delay until December 15 would allow product to be landed, processed, and sold for the Christmas and New Year holidays.

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)

Monterey Bay Whale Watch *(Fishing Zone 4)*

- The semi-monthly average number of humpback whales-per-half-day-trip is high compared to historical patterns for this time of the year (Figure 3), but the seven-day running average has been decreasing steadily since about mid-October (Figure 1), which is consistent with expected seasonal migration patterns.
- The low presence of blue whales is largely consistent with their historical seasonal southward migration patterns.

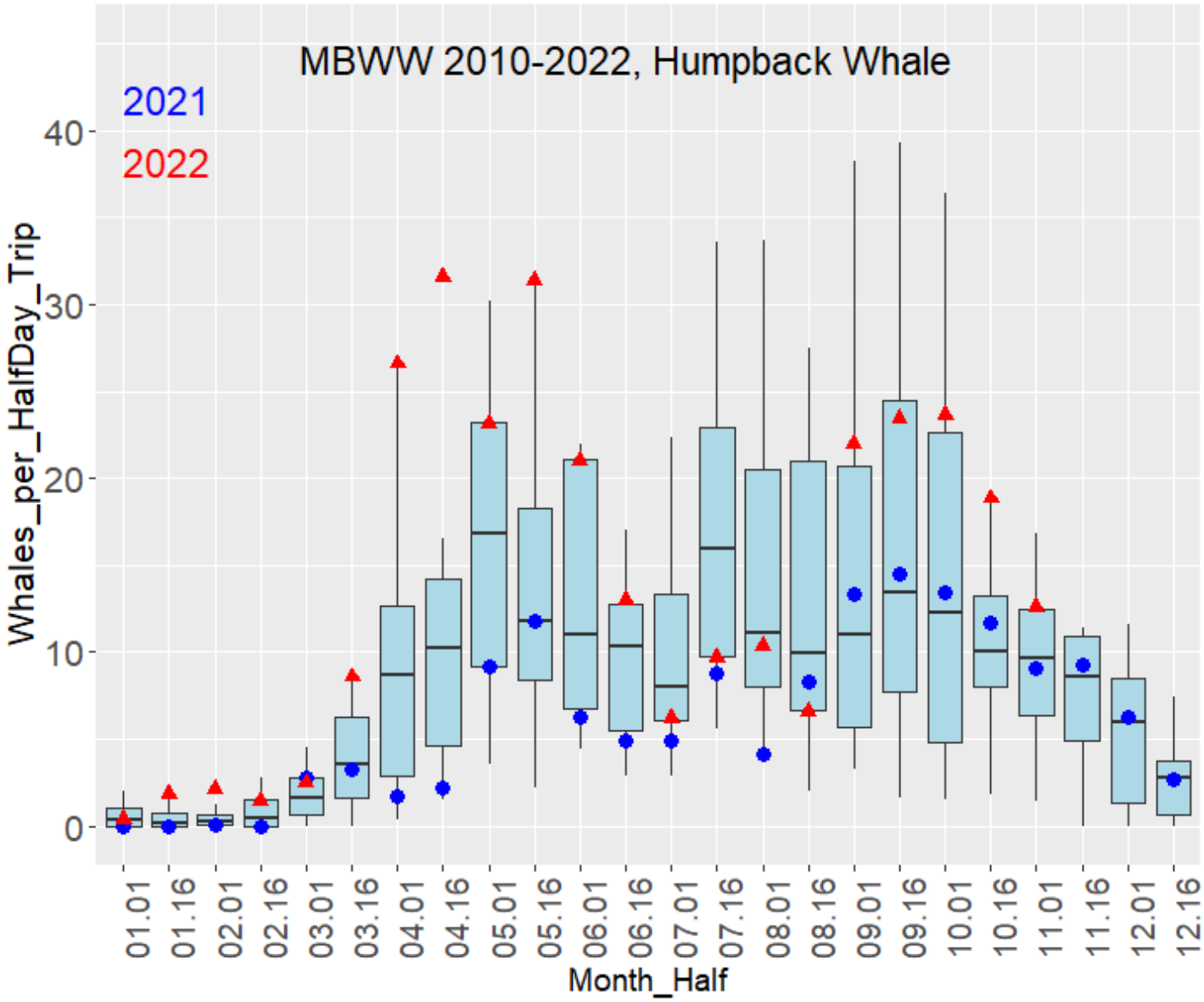


Figure 3. Historical Monterey Bay Whale Watch data for 2010-2022, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2021 (large blue dots) and 2022 (red triangles) and are provided for reference, placing recent whale numbers in a historical context. [NOTE: To account for population growth of these recovering whale populations, the historical reference period has been modified to include only the more recent period of 2010-2022, rather than 2003-2022 as in previous plots. This provides a more relevant comparison to the current conditions].

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

During the seven-day period ending November 15, 2022 trained observers at the Farallon Islands reported 122 humpback whale sightings within Fishing Zone 3, and trained naturalists from the Channel Islands National Marine Sanctuary and National Park Service reported 40 humpback whale sightings and one blue whale sighting within Fishing Zone 6 (Figure 4).

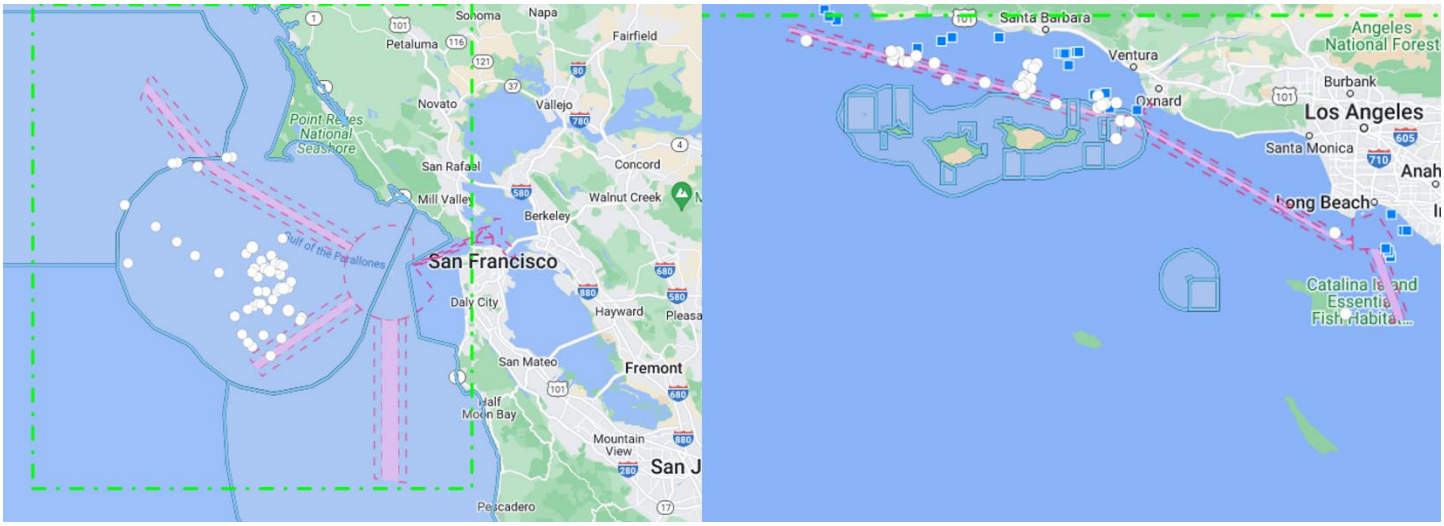


Figure 4. Locations of humpback whale sightings within Fishing Zones 3 and 6. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals. Fishing Zone boundaries are represented by the dashed green line.

WhaleWatch 2.0 *(All Fishing Zones)*

Compared to predictions for October 18, 2022 (see the October 25, 2022 Available Data document), blue whale habitat predictions for November 11, 2022 indicate lower habitat suitability along most of the central and northern California coast (Figure 5). Moderate to high habitat suitability remains between Point Reyes and Point Arena, and within the Southern California Bight.

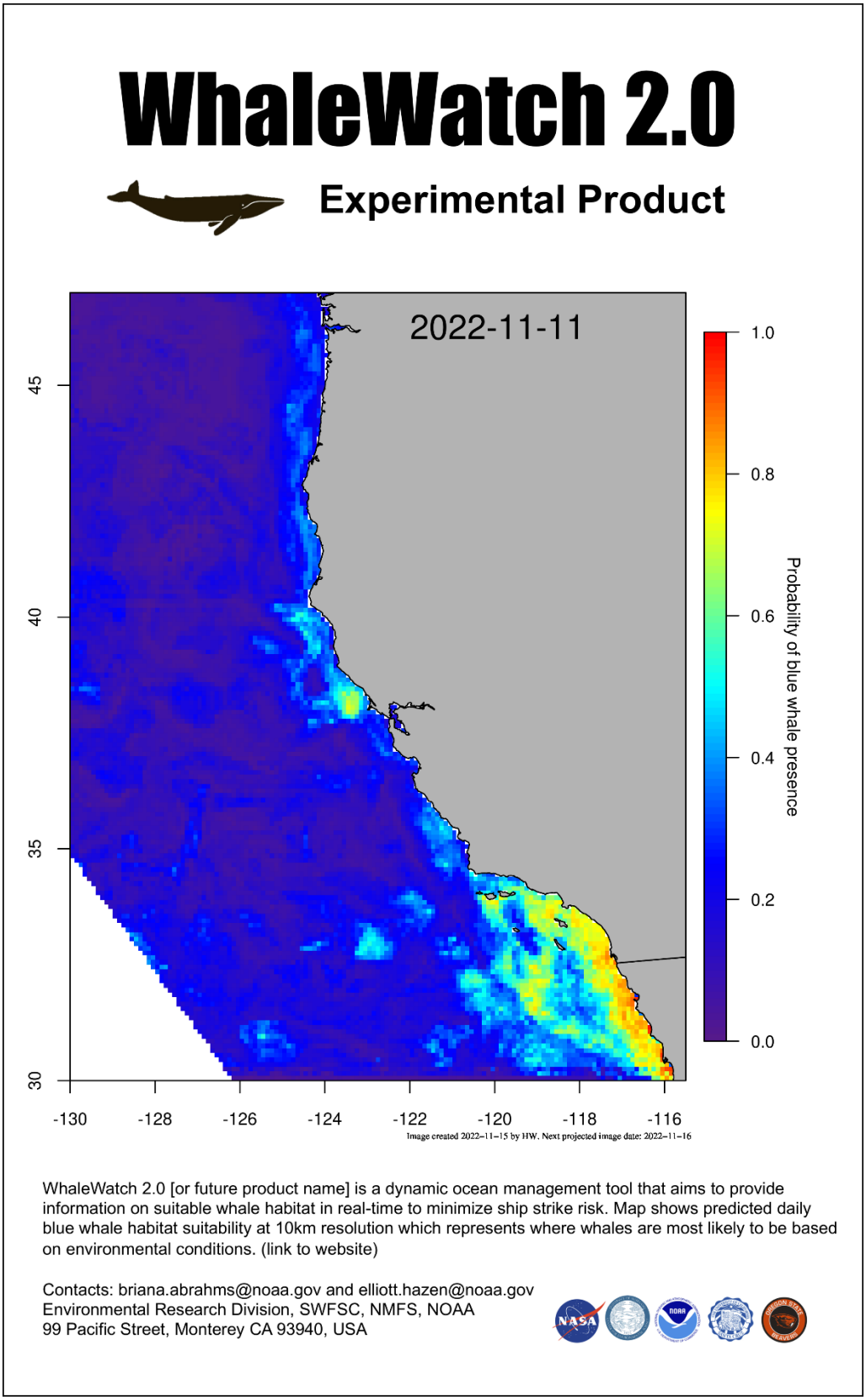


Figure 5. WhaleWatch 2.0 map for November 11, 2022. View a current map.

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

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

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

Domoic Acid and Quality Testing

- Quality test results for crab collected on November 10, 2022 from the three northern ports (Crescent City, Trinidad, and Eureka) were below the Tri-State meat quality criteria of 24% (no rounding). Meat quality was 18.7% in Crescent City, 19.5% in Eureka, and 20.4% in Trinidad. Under the Tri-State agreement, Fishing Zones 1 and 2 are therefore subject to a quality delay and will open no sooner than December 16, 2022. Additional quality testing will be conducted in early December.
- As of November 9, 2022 domoic acid results are available for all port areas and all crabs are below the federal action level (Figure 6). On October 31, 2022 CDPH collected mussels from Humboldt Bay that exceeded domoic acid concentration levels for bivalves (Figure 7). CDFW is working in partnership with the California Department of Public Health to conduct additional testing of crab collected from sites in the Eureka port area during quality testing to confirm there have been no changes in domoic acid levels following the first pre-season sampling conducted in early October. Results are expected within a week of when samples were submitted to CDPH on November 14, 2022.

CDPH SUMMARY OF DOMOIC ACID LEVELS IN CRABS **JULY 01, 2022 - NOVEMBER 09, 2022**

PORT	COLLECTION SITE	SAMPLE COLLECTION DATE	CRAB TYPE VISCERA	INDIVIDUAL SAMPLE RESULTS (FDA ACTION LEVEL >30 PPM)						AVERAGE LEVEL (Information Only)	PERCENT OF SAMPLES EXCEEDING ACTION LEVEL
Crescent City	George Reef	10/9/2022	Dungeness Crab	<2.5	4.1	9.5	<2.5	<2.5	<2.5	2.3 ppm	0%
Crescent City	Klamath River	10/9/2022	Dungeness Crab	<2.5	<2.5	4.2	3.0	<2.5	<2.5	1.2 ppm	0%
Trinidad	Lagoons	9/11/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Trinidad	Trinidad Head	9/11/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Eureka	LP Eureka	10/9/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Eureka	Eel River	10/9/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Fort Bragg	Usal	10/16/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Fort Bragg	Manchester Beach	11/4/2022	Dungeness Crab	4.4	<2.5	<2.5	<2.5	11	<2.5	2.6 ppm	0%
Bodega Bay	Salt Point	10/3/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Bodega Bay	Russian River	10/3/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	3.3	<2.5	0.6 ppm	0%
Bodega Bay	Bodega Head	10/3/2022	Dungeness Crab	<2.5	12	<2.5	<2.5	<2.5	<2.5	2 ppm	0%
Bodega Bay	Point Reyes	10/3/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Half Moon Bay/ San Francisco	Duxbury Reef	9/22/2022	Dungeness Crab	4.4	<2.5	<2.5	<2.5	<2.5	<2.5	0.7 ppm	0%
Half Moon Bay/ San Francisco	Pillar Point	9/24/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Half Moon Bay/ San Francisco	Pigeon Point	9/25/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
Monterey	Monterey Bay	9/24/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	16	<2.5	2.7 ppm	0%
Monterey	Monterey Bay	9/24/2022	Rock Crab	<2.5	3.0	12	<2.5	<2.5	<2.5	2.5 ppm	0%
Morro Bay	Avila Beach	10/7/2022	Dungeness Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
NA	CDFW Block 745	9/29/2022	Box Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%
NA	CDFW Block 745	9/29/2022	King Crab	<2.5	<2.5	<2.5	<2.5	<2.5	NA	Non-Detect	0%
NA	CDFW Block 652	9/28/2022	Rock Crab	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detect	0%

1 SET = 6 SAMPLES

Figure 6. California Department of Public Health domoic acid test results for crab, updated November 9, 2022.

California Department of Public Health 11/10/2022
Bivalve Shellfish Marine Biotoxin Monitoring Results
Paralytic Shellfish Poisoning Toxins (PSP) & Domoic Acid (DA)

Date Collected	Sample Site	Sample Type	PSP* (ug/100g)		DA** (ppm)	Approximate Latitude	Approximate Longitude
County: Del Norte							
10/24/2022	Hunter Rock, north	Sea Mussel, wild	n		3.0	41.96	-124.21
11/04/2022	Wilson Creek	Sea Mussel, wild	n		< 2.5	41.60	-124.10
County: Humboldt							
10/17/2022	Humboldt Bay, Indian Is. Ch.	Sea Mussel, Sentinel	n		< 2.5	40.81	-124.16
10/17/2022	Humboldt Bay, East Bay 1-2	Pacific Oyster, cultured	X		< 2.5	40.82	-124.14
10/17/2022	Humboldt Bay, Ch Marker #13	Sea Mussel, Sentinel		68	< 2.5	40.77	-124.22
10/24/2022	Trinidad Head	Sea Mussel, wild	n		< 2.5	41.05	-124.15
10/24/2022	Humboldt Bay, Indian Is. Ch.	Sea Mussel, Sentinel		39		40.81	-124.16
10/24/2022	Humboldt Bay, Ch Marker #13	Sea Mussel, Sentinel		**91**	4.6	40.77	-124.22
10/31/2022	Humboldt Bay, Indian Is. Ch.	Sea Mussel, Sentinel	n		**20.0**	40.81	-124.16
10/31/2022	Humboldt Bay, Ch Marker #13	Sea Mussel, Sentinel		56	**45.0**	40.77	-124.22
11/01/2022	Humboldt Bay, WQ #27	Pacific Oyster, cultured	X		< 2.5	40.87	-124.15
11/02/2022	Humboldt Bay, Mad River 7-2	Kumamoto Oyster, cultured	X		< 2.5	40.85	-124.14
11/02/2022	Humboldt Bay, East Bay 1-2	Kumamoto Oyster, cultured	<	34	< 2.5	40.82	-124.14
11/02/2022	Humboldt Bay, WQ #26	Kumamoto Oyster, cultured	X		< 2.5	40.85	-124.15
11/07/2022	Humboldt Bay, Indian Is. Ch.	Sea Mussel, Sentinel		41	< 2.5	40.81	-124.16
11/07/2022	Humboldt Bay, East Bay 1-2	Kumamoto Oyster, cultured	<	35	< 2.5	40.82	-124.14
11/07/2022	Humboldt Bay, WQ #33	Pacific Oyster, cultured	<	34	< 2.5	40.84	-124.12
11/07/2022	Humboldt Bay, Ch Marker #13	Sea Mussel, Sentinel		70	5.1	40.77	-124.22
County: Mendocino							
10/24/2022	Westport, Bruhel Pt.	Sea Mussel, wild	n		< 2.5	39.60	-123.79
10/24/2022	MacKerricher SP, Ward Ave	Sea Mussel, wild	n			39.50	-123.79

* PSP alert level: >= 80 micrograms per 100 grams. Tested via qualitative test and/or PSP Assay. "n" = non-detect on qualitative test. Not all samples tested with qualitative test.
** DA alert level: >= 20 parts per million. Tested via HPLC.
"X" or blank = Not tested.

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Figure 7. Resulting concentrations of both domoic acid (DA) and paralytic shellfish poisoning (PSP) neurotoxins for bivalves tested by CDPH for biotoxin monitoring in the state by county. Table only shows complete results of Del Norte and Humboldt counties for the last 30 days from November 10, 2022. Table was accessed on November 15, 2022 from the CPDH website.

Recreational Crab Fishery

The recreational crab fishery opened statewide under a trap restriction on November 5, 2022. Use of crab traps is prohibited; however recreational anglers can harvest crabs with snares and hoop nets.

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

Updated information was not available for this risk assessment.

Ocean conditions: §132.8(d)(9)*

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

Habitat Compression Index

The most recent Habitat Compression Index values are for October 2022, during which there was high compression between 35.5 and 40°N (Figure 8). Habitat compression has

been high during November in seven of the last ten years, and moderate during the other three (Figure 9).

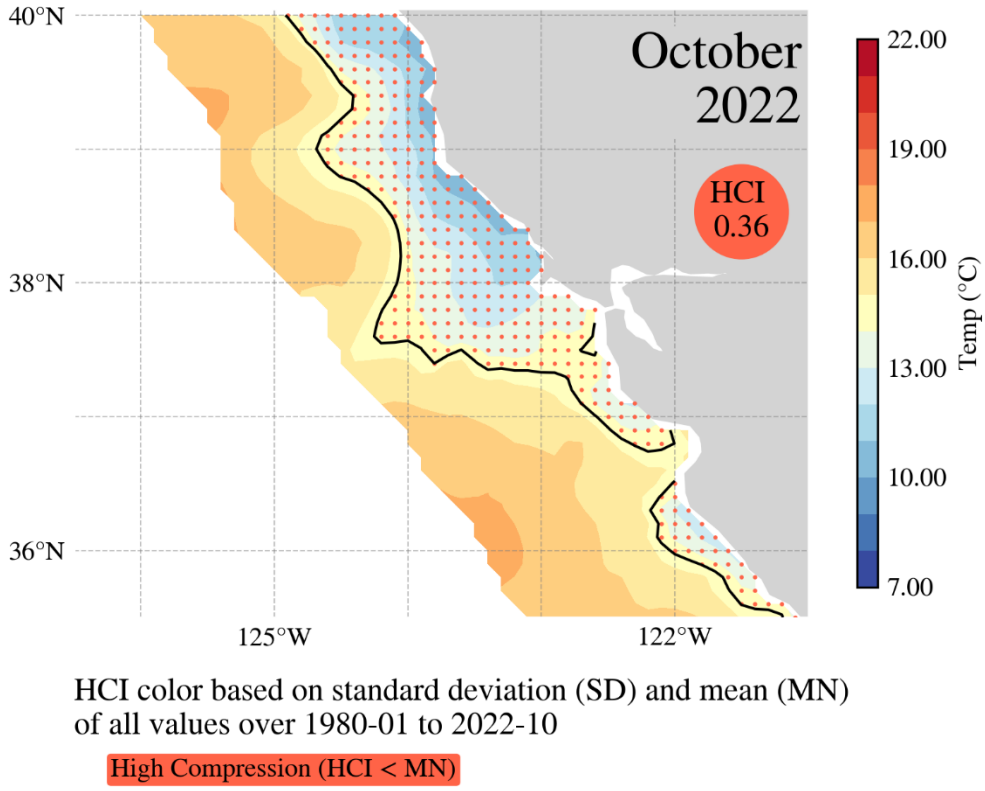

Figure 8. Map of October 2022 sea surface temperature and location of the Habitat Compression Index boundary (thin black line).

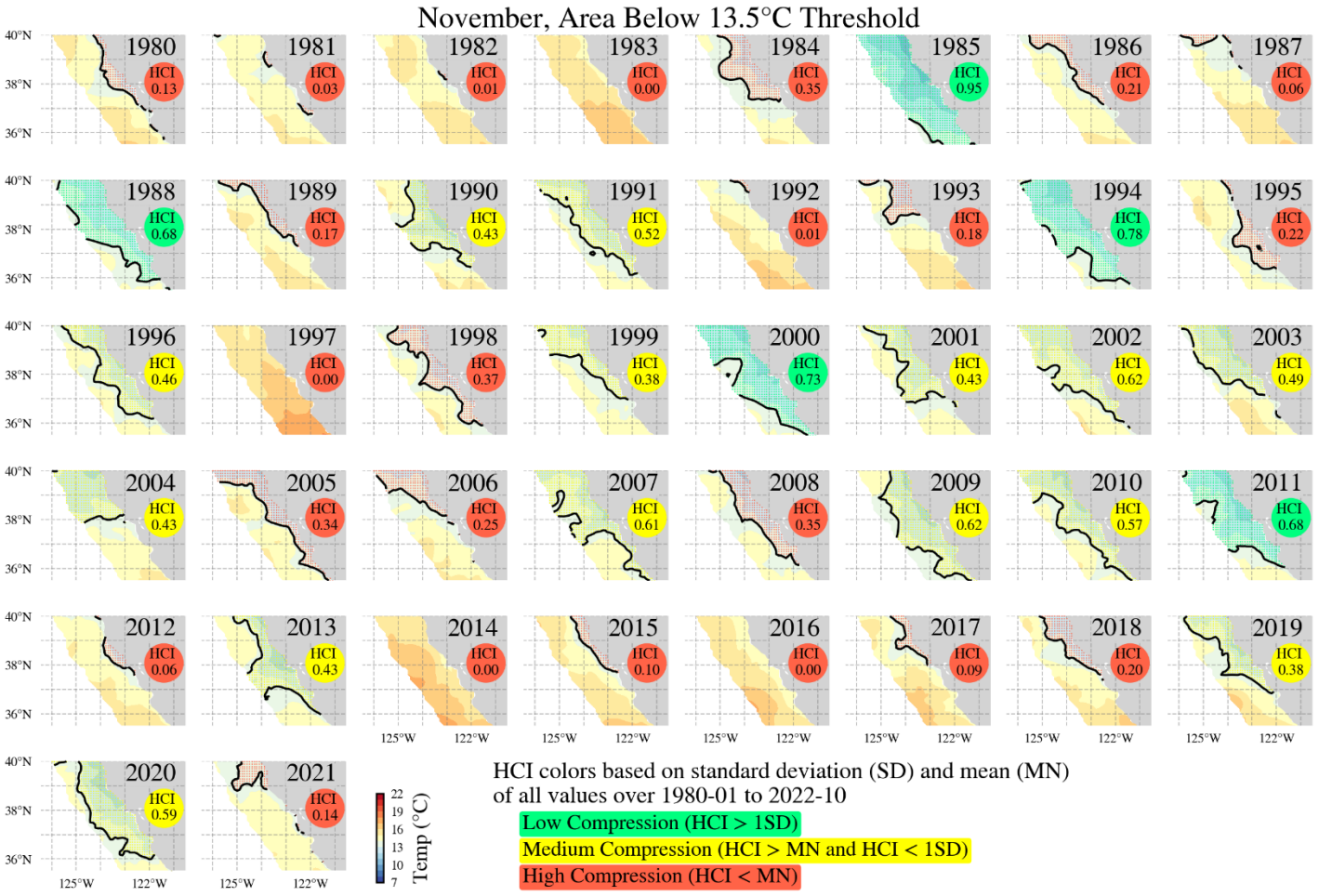

Figure 9. Maps of historical November sea surface temperature and location of the Habitat Compression Index boundary (thin black line) between 1980 and 2021.

ENSO Diagnostic

As of November 10, 2022 there is a 76% chance of La Niña during December 2022 – February 2023, with a 57% chance of transition to ENSO-neutral for February – April 2023.

Large Marine Heatwave Tracker

As of October 17, the CCIEA program was continuing to track the NEP22A large marine heatwave, which has resided fairly close to shore for most of August-October 2022 and encompassed much of the coastline, although small patches of cool water remain in various locations and times due to local upwelling. For the past several weeks, more than 50% of the US west coast EEZ has been in heatwave status (Figure 10). Also notable is the increase in heatwave intensity (how much warmer the water is compared to normal) over the past several weeks in the far offshore region of the northern Northeast Pacific. This indicates that NEP22A may still be gathering strength, rather than dissipating, as most heatwaves do in the fall.

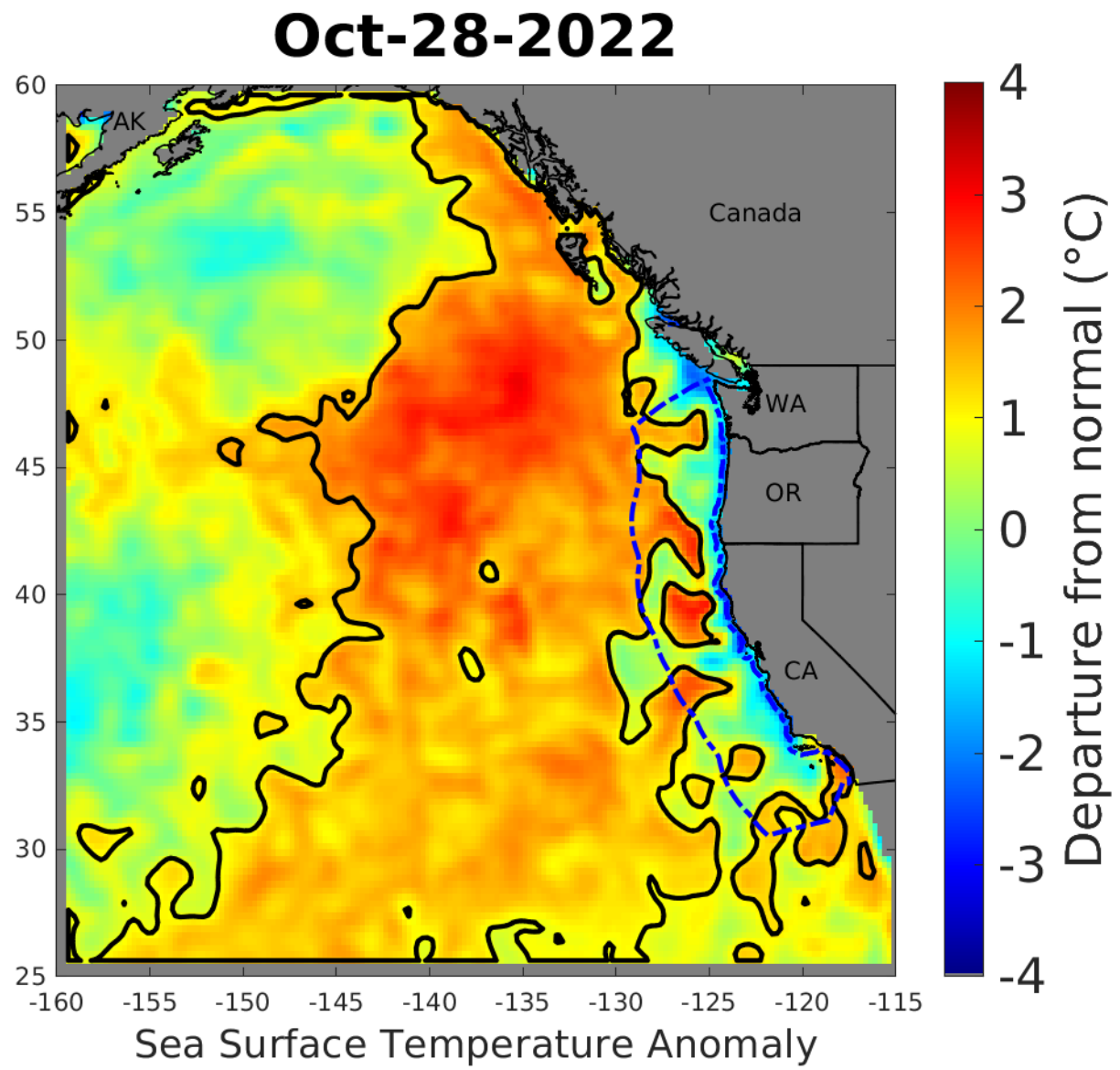

Figure 10. Science-quality (delayed 3-weeks), daily interpolated standardized sea surface temperature anomalies (SSTa) in the California Current ecosystem available for analysis of MHW presence. Dark outline shows the current extent of MHW conditions, as delineated by values of the normalized SST + 1.29 SD from normal. Blue dashed line represents the US West Coast EEZ. SST data from NOAA's Optimum interpolation Sea Surface Temperature analysis 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: California Department of Fish and Wildlife

Pursuant to the Risk Assessment and Mitigation Program (Section 132.8, Title 14, CCR), Impact Scores 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 (2022-23) and calendar year (2022) are provided in Table 2 above. Impact Score totals for calendar year 2021 are provided in Table 3 above.