# 2020-21 Risk Assessment Mitigation Program - Available Data

# Last updated: May 17, 2021 – Updated Section 132.8(d)(11)

# TRIGGERS REQUIRING MANAGEMENT ACTION

### Section 132.8(c)(1): Confirmed Entanglements

Data provided by: Lauren Saez and Dan Lawson, National Marine Fisheries Service (NMFS) and evaluated by the California Department of Fish and Wildlife (CDFW)

### Entanglement Summary for Actionable Species covered by RAMP (by NMFS)

Fishing Zone: All Zones

- Humpback whales: 1 confirmed entanglement, unidentified gear (Fishing Zone 6)
- Blue whales: 0 confirmed entanglements
- Leatherback sea turtles: 0 confirmed entanglements

### All entanglement reports are subject to further review.

Supplemental Information: Please refer to the <u>April 29, 2021 Available Data</u> package for the latest information on confirmed 2021 entanglements.

# Evaluation of Entanglement Triggers (by CDFW)

Total number of Confirmed Entanglements in California Commercial Dungeness Crab Gear

- During the current Fishing Season: 0
- During the current calendar year: 0

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

- During the current Fishing Season: 1
- During the current calendar year: 1

#### Section 132.8(c)(2): Marine Life Concentrations

Data provided by: Monterey Bay Whale Watch (MBWW) (processed by Karin Forney, NMFS), John Calambokidis (Cascadia Research, SR3, and The Marine Mammal Center)

### Monterey Bay Whale Watch (Fishing Zone 4)

- Monterey Bay Whale Watch (MBWW) was able to conduct trips on 13 of the last 14 days, with a maximum of 40 whales observed on each of two separate trips on May 3, 2021. The 14-day average number of Humpback whales-per-half-day-trip (for April 24-May 6) was 5.9; and the 7-day average (for May 1-6) was 8.1. These numbers represent an increase from the previous 14-day and 7-day averages of 1.8 and 1.0, respectively.
- No Blue whales have been observed by MBWW since December 24, when a single whale was seen.

#### Cascadia Research, SR3, and The Marine Mammal Center (Fishing Zone 1)

- Surveys were completed between May 5-6, 2021 to gather more detailed information from whales present between Crescent City and Eureka. The primary goal of this survey was to conduct photo IDs, estimated numbers, and behavior. Searches were conducted in different depths of 50-m, 100-m and 200-m depths (Figure 1).
- Conditions were variable and often poor due to low visibility but also wind and waves at different points in the two survey days, which decreased the effectiveness of detecting sightings, especially in the northern half of the area covered.
- There were 29 sightings of an estimated 56 whales with 22 sightings of 45 confirmed Humpback whales, while the others are suspected to be Humpback whales. The first survey day observed 30 of these confirmed Humpback whales and the remaining 15 were observed the next day.
- Good photographic identifications of an estimated 35 Humpback whales were obtained.
- Sightings were documented at water depths ranging from 72-m to 166-m with most sightings at the 100-m depth.
- Prey type was difficult to determine and could not be confirmed since there were indications consistent with fish (some association of fish eating birds) and krill (more broad layers as opposed to patches of prey).



Figure 1. Vessel-based survey from R/V Robustus on May 5-6, 2021 showing vessel track and observations of large whales from Crescent City to Eureka. Note: Depths are in fathoms on this chart map.

# MANAGEMENT CONSIDERATIONS

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

No additional information was shared.

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

 Economic analysis currently available is reflected in the landings data. See management consideration (d)(7) for available information on fishing activity to date during the 2020-21 fishing season.

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

Data provided by: Monterey Bay Whale Watch (processed by Karin Forney, NMFS)

### Monterey Bay Whale Watch (Fishing Zone 4)

- The 14-day average Humpback whales-per-half-day-trip has increased markedly from below average to only slightly lower than the 2003-2021 average during the most recent period (Figure 2). Humpback whale abundance in the Monterey Bay region thus appears to be similar to average historical levels for this time of year.
- The absence of Blue whales is consistent with their historical seasonal migration patterns, although sightings expected to be increasingly likely during the coming weeks/months (Figure 3).



Figure 2. 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 (1<sup>st</sup>- 15<sup>th</sup>, 16<sup>th</sup>- 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

25<sup>th</sup> -75<sup>th</sup> 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 3. 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 25<sup>th</sup> -75<sup>th</sup> 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.

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

Data provided by: California Department of Fish and Wildlife; Accessed from CDFW's Marine Landings Data System (MLDS) on May 7, 2021, Automatic Licensing Data System (ALDS) on May 7, 2021, Bi-Weekly Reporting Database on May 10, 2021, and PowerBI landings report

Database on May 7, 2021. Solar Logger Pilot Project provided by Kathi George (The Marine Mammal Center).

# Marine Landings Data System (All Fishing Zones)

- CDFW data presented in this section is preliminary and subject to revision.
- The commercial Dungeness crab fishery opened statewide on December 23, 2020. Due to ongoing price negotiations, most vessels did not begin fishing until January 11, 2021.
- As of May 4, 2021, there have been 3,472 daily vessel landings of Dungeness crab with a total volume of 3,576,736 pounds and with a total Ex-Vessel Value of \$18,695,427.
  Average unit price for these landings was \$6.02 with a maximum of \$14.00 and minimum of \$2.00 (excluding receipts with unit price of \$0 reported). A total of 359 vessels have made at least one landing during the 2020-21 season.
- Cumulative daily landings by vessel each week by CDFW Fishing Zones (aggregated CDFW Fishing Blocks used to report catch location) are shown in Figure 4 with 19 complete weeks of landings to summarize from the start date of December 23, 2020 to May 4, 2021. The highest number of daily landings statewide occurred in week 5. The highest weekly landings for Fishing Zone 3, where the most activity originated, occurred in week 4. By week 19, total statewide daily landings represent an 84% decline from the high daily landings in week 5.
- Of the 359 vessels, 356 could be tied to a Dungeness crab vessel permit and are organized in the trap tiers as follows and represent a total of 117,525 traps:
  - o Tier 1: 45 vessels
  - o Tier 2: 44 vessels
  - Tier 3: 44 vessels
  - Tier 4: 39 vessels
  - Tier 5: 36 vessels
  - Tier 6: 97 vessels
  - Tier 7: 51 vessels
- The maximum potential traps, represented by the number of vessels that made at least one landing each week and the overall traps in their vessel permit tier, is summarized each week by CDFW Fishing Zones (Figure 5). Week 5 shows the highest number of aggregated maximum potential traps, estimated at a total of 94,675 traps deployed. Fishing Zone 3

shows the highest proportion (47%) of total maximum potential traps, followed by Zone 1 (40%). By week 19, the total maximum potential trap numbers decreased to an estimated 16,750 traps.

- For the past 3 weeks (Weeks 17-19), the average weekly price per pound by port complex ranged between \$7.21 and \$12.00 each week (Figure 6). There is a demarcation in average price between the two management areas for this time period, with higher average price at the central ports (\$7.45-\$12.00) and lower average price at the northern ports (\$7.21-\$9.00).
- Two figures showing number of vessels (Figure 7) and the maximum potential trap number they represent (Figure 8) between the years of 2014 and 2021 are being provided to compare with the current low Dungeness crab season (2021 panel). This information is being summarized based on landings activity by port complex over five bi-weekly periods between March 1 and updated to include up to May 9. Data are current as of May 7, 2021.
- For time periods between March 1 and April 25 in 2021, the maximum potential traps for the port of Bodega Bay remains above the 2014-2020 (removing 2016) average. However by the last time period of April 26 - May 9, all port complexes remain below the 2014-2020 (removing 2016 and 2019) average.
- For the current season (2021 panel), the following maximum potential traps for the last period of April 26- May 9 by port complex are as follows:
  - Crescent City: 1,900
  - Trinidad: 1,975
  - o Eureka: 3,375
  - Fort Bragg: 1,325
  - Bodega Bay: 3,900
  - San Francisco: 5,375
  - Half Moon Bay: 1,975
  - o Monterey: 1,875
  - Morro Bay: 1,125



Figure 4. Unique, cumulative Dungeness crab daily vessel landings by week and Fishing Zone. Accessed from CDFW's MLDS on May 7, 2021. All data are preliminary and subject to change.



#### Maximum Potential Traps, by Week and RAMP Zone, 2020-21 Season

. 12 (Dec 23{Dec 30-(Jan 6-(Jan 13{Jan 20{Jan 27-(Feb 3-(Feb 10(Feb 17(Feb 24-(Mar 3-(Mar 10{Mar 17(Mar 124{Mar 31-(Apr 7-(Apr 14(Apr 21{Apr 28-29) Jan 5) 12) 19) 26) Feb 2) 9) 16) 23) Mar 2) 9) 16) 23) 30) Apr 6) 13) 20) 27) May 4) Season Week (Date Range)

Figure 5. Maximum potential traps by week and Fishing Zone, based on landings data and Dungeness crab vessel permit tier information. Accessed from CDFW's MLDS and ALDS on May 7, 2021. All data are preliminary and subject to change.



Figure 6. Average price per pound by week and port complex (removing receipts that reported \$0 unit price). Northern management area ports are designated by circles while central management area ports are designated by triangles. Accessed from CDFW's MLDS on May 7, 2021. All data are preliminary and subject to change.



Number of Active Vessels During March 1 to May 9, 2014-2021

Figure 7. Panels showing number of active Dungeness crab vessels each year between 2014 to 2021 by port complex over each bi-weekly period between March 1 and May 9. Accessed from CDFW's custom PowerBi report with last data refresh on May 7, 2021. All data are preliminary and subject to change.



Maximum Potential Traps During March 1 to May 9, 2014-2021

Figure 8. Panels showing number of maximum potential traps based on active Dungeness crab vessels each year between 2014 to 2021 by port complex over each bi-weekly period between March 1 and May 9. Accessed from CDFW's custom PowerBi report with last data refresh on May 7, 2021. All data are preliminary and subject to change.

### Bi-Weekly Fishing Activity Reports (All Fishing Zones)

- CDFW data presented in this section is preliminary and subject to revision.
- CDFW has received bi-weekly reports since the first reporting period of January 1, 2021 through the most recent reporting period of May 1, 2021. Although total reports for each period may not reflect all permitted vessels participating in the fishery, summaries are being provided for the following periods: April 16, 2021 (Table 1) and May 1, 2021 (Table 2).
- For the May 1 reporting period, covers fishery participation from April 16-30, about 17,130 traps are estimated to be deployed statewide with just under half of these located within Fishing Zone 3. Based on reports received by May 10, 2021, just over 7,000 traps have been removed from Fishing Zone 3 between April 16 and May 1.

Table 1. Summary of information provided for the April 16, 2021 bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on May 10, 2021. NR-C refers to data withheld due to confidentiality and all data are preliminary and subject to change.

Fishing	Permits	Average	Total	Average	Average	Max.	Final	Number
Zone	Reporting	Trap	Traps	Min.	Max.	Reported	Report	of Lost
		Number		Depth	Depth	Depth		Traps
				(fathoms)	(fathoms)	(fathoms)		
Zone 1	27	267	7,196	13	27	65	2	5
Zone 2	16	194	3,110	15	31	75	1	3
Zone 3	81	188	15,216	16	35	120	17	157
Zone 4	7	139	970	12	21	60	3	5
Zone 5	5	160	800	18	40	55	1	1
Zone 6	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C
Totals	136		27,292				24	171

Table 2. Summary of information provided for the May 1, 2021 bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on May 10, 2021. NR-C refers to data withheld due to confidentiality and all data are preliminary and subject to change.

Fishing	Permits	Average	Total	Average	Average	Max.	Final	Number
Zone	Reporting	Trap	Traps	Min.	Max.	Reported	Report	of Lost
		Number		Depth	Depth	Depth		Traps
				(fathoms)	(fathoms)	(fathoms)		
Zone 1	20	253	5,052	11	22	35	3	1
Zone 2	13	151	1,968	16	25	39	1	0
Zone 3	49	171	8,387	17	34	80	12	57
Zone 4	5	185	923	10	25	60	2	7
Zone 5	4	200	800	21	49	51	0	0
Zone 6	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C	NR-C
Totals	91		17,130				18	65

Solar Loggers (Fishing Zones 1, 2, 3, and 5)

The vessel track data provided by the solar logger pilot project is shown for the April 26-May 10, 2021 period. The following maps show vessel activity in 1) the entire coast of California, 2) Fishing Zone 1 (Figure 9), 3) Fishing Zones 2 and 3, and 4) Fishing Zone 5 (Figure 10). From vessel participation in the project (and not necessarily representative of the entire fishery), Fishing Zone 3 showed the most activity. Some vessels participating in the pilot with track lines shown may no longer be participating in the fishery or have vessel tracks included from participation in other fisheries, also vessel tracks are not shown for those that are fishing outside of California this season. A summary of cumulative fishing trips every one to two weeks since January 1, 2021 is provided in Table 3. Table 3. Summary of individual fishing trips based on data provided by the solar logger project (and not necessarily representative of the entire fishery) between different time periods since January 1, 2021 until May 10, 2021.

Date Ranges	Fishing Trips
April 26-May 10, 2021	15
April 8-25, 2021	59
March 29 – April 7, 2021	28
March 10-28, 2021	81
March 1-9, 2021	50
February 10-28, 2021	78
February 1-9, 2021	50
January 16-31, 2021	81
January 1-15, 2021	58



Figure 9. Fishing trips from April 26 – May 10, 2021 for the entire California coast where vessels may be participating in the fishery. The map on the left represents the entire coast where vessels may be participating. The map on the right focuses on fishing activity in Fishing Zone 1.



Figure 10. Fishing trips where vessels may be participating in the fishery from April 26 – May 10, 2021. The map on the left focuses on fishing activity in Fishing Zones 2 and 3. The map on the right focuses on fishing activity in Fishing Zone 5.

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

Data provided by: Jarrod Santora and Isaac Schroeder (NMFS SWFSC and UC Santa Cruz) <u>https://www.integratedecosystemassessment.noaa.gov/regions/california-current/cc-projects-</u> whale-entanglement

# Forage Indices (All Fishing Zones)

 Krill abundance (higher offshore in the outer slope) is also anticipated to be closer to average while anchovy is still considered to be above average, given the historical record.

#### Section 132.8(d)(9): Ocean conditions

ENSO prediction accessed from <u>NOAA's Climate Prediction Center website</u> on May 11, 2021, Data provided by: Jarrod Santora and Isaac Schroeder (NMFS SWFSC and UC Santa Cruz) <u>https://oceanview.pfeg.noaa.gov/hci/</u>

# El Nino/Southern Oscillation (ENSO) Alert System Status (All Fishing Zones)

 The prediction of ENSO conditions were last updated on April 8, 2021. La Niña conditions persisted in March with an 80% chance of a transition from this condition to ENSO-neutral during May - July 2021.

# Habitat Compression Index (All Fishing Zones)

- Cool ocean temperatures and strong spring upwelling conditions continue from March to April and the Habitat Compression Index (HCI) indicates a current low compression state (Figure 11). It is anticipated that cool conditions with expanded upwelling habitat will continue with no impact of habitat compression that would otherwise result in increased concentrations and aggregations of whales and forage nearshore.
- The HCl for April 2021 indicates no risk of a high compression state and this is in stark contrast to the HCl values in April for the past 7 years between 2014 and 2020 (Figure 12). A low compression state for April has not been observed since 2013, the year just prior to the emergence of the large marine heatwave. This HCl information applies to all CDFW Fishing Zones.



Low Compression (HCI > 1SD)

Figure 11. Map of April 2021 sea surface temperature and location of Habitat compression Index (HCI) boundary (black thin line) with and HIC value indicating low compression for the month. Source: <u>https://oceanview.pfeg.noaa.gov/hci/</u>



Figure 12. Maps of historical April sea surface temperature and location of Habitat Compression Index (HCI) boundary (black thin line) between 1980 and 2021 and resulting HCI values for each time period. Source: <a href="https://oceanview.pfeg.noaa.gov/hci/">https://oceanview.pfeg.noaa.gov/hci/</a>

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

# Data provided by: California Department of Fish and Wildlife

 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. As described in Section 132.8(c)(1) above, one confirmed entanglement of a Humpback whale in unidentified gear has been reported for the current calendar year. Therefore, the Impact Score Calculation for Humpback whales is 0.38 and 0 for both 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 Data provided by: Briana Abrahms (University of Washington), Cascadia Research, SR3, The Marine Mammal Center, Kathi George (The Marine Mammal Center), Karen Grimmer (Monterey Bay National Marine Sanctuary) and Jaime Jahncke (Point Blue Conservation Science), United States Coast Guard

#### WhaleWatch 2.0 (All Fishing Zones)

 WhaleWatch habitat predictions for May 8, 2021 indicate that probability of Blue whale presence is low in Fishing Zones 1-5 and medium-high in Fishing Zone 6 (Figure 13).



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

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



Figure 13.WhaleWatch 2.0 map for May 8, 2021. View a current map.

### Cascadia Research, SR3, The Marine Mammal Center (Fishing Zones 1 and 4)

- A total of 30 and 15 confirmed Humpback whale observations occurred each day of the 2day survey conducted between May 5-6, 2021 in Fishing Zone 1. Most of the whale sightings were found at the 100-m depth (55 fathoms), confirming continued observations of Humpback whales in the area that were summarized in the <u>April 29, 2021 Available Data</u> package.
- A partner of the Cascadia research collective, the University of California, Santa Cruz (UCSC) conducted photo-identification and sample collection surveys between May 11-14, 2021 from Moss Landing. Two vessels were used over the 4-day survey and a total of 31 sightings of 61 Humpback whales were observed (Figure 14), some observations could be duplicate individuals.



Figure 14. A map depicting Humpback whales sightings (squares) from surveys between May 11-14, 2021 in Monterey Bay conducted by UCSC. Sightings may represent more than one individual, and some observations over the course of the survey could be duplicate individual.

Solar Loggers (Fishing Zone 4)

 Track lines from whale watching vessels participating in the solar logger pilot project (Figure 15) indicate more widespread effort across Monterey Bay during 73 trips conducted between April 26-May 10, 2021. A summary of cumulative whale watching trips every one and two weeks since January 1, 2021 is provided in Table 4.

Table 4. Summary of whale watching trips based on data provided by the solar logger project between different time periods from January 1, 2021 until May 10, 2021.

Time Periods	Whale Watching Trips
April 26 – May 10,.2021	73
April 8-25, 2021	78
March 29 – April 7, 2021	37
March 10-28, 2021	46
March 1-9, 2021	21
February 10-28, 2021	38
February 1-9, 2021	15
January 16-31, 2021	19
January 1-15, 2021	28



Figure 15. Track lines for 73 whale watch trips in Monterey Bay from April 26-May 10, 2021. Sightings, numbers and species are not reflected on this map.

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

- The Greater Farallones National Marine Sanctuary (through the Spotter/Whale Alert app) has observed two Humpback whales in Fishing Zone 3 from May 2-11, 2021 (Figure 16). No Blue whales have been observed. Observations were recorded by trained observers on the Farallon Islands.
- Monterey Bay National Marine Sanctuary has observed 81 Humpback whales from May 2-11, 2021 (Figure 17), and a total of 139 Humpback whales over the past 30 days from April 11-May 11, 2021 (Figure 18). On May 3, 2021, a total of 60 Humpback whales were reported. No Blue whales have been sighted during the past month. Observations were reported from trained naturalists aboard Monterey Bay Whale Watch and Secret Harbors Charter.
- Channel Islands National Marine Sanctuary observed 43 Humpback whales from May 2-11, 2021, and no Blue whales in Fishing Zone 6 (Figure 19). These observations are conducted by trained naturalists from the Channel Islands National Marine Sanctuary and National Park Service.



Figure 16. Location of two Humpback whale sightings in Fishing Zone 3 from May 2-11, 2021. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.



Figure 17. Location of 81 Humpback whale sightings in Fishing Zone 4 from May 2-11, 2021. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.



Figure 18. Location of 139 Humpback whale sightings in Fishing Zone 4 from the past 30 days from April 11-May 11, 2021. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.



Figure 19. Location of 43 Humpback whale sightings in Fishing Zone 6 from May 2-11, 2021. Reporting locations are represented by white circles. A given report may or may not represent multiple individuals.

United States Coast Guard (Fishing Zone 3)

A rotary flight was conducted by the United States Coast Guard (USCG) from Air Station
 San Francisco on May 8, 2021. The 1-hour flight path traveled from the shoreline to about 8 nautical miles offshore between Pigeon Point and Stinson Beach (Figure 20). Three

individual whales each traveling alone were observed and although not identified, were suspected to be Grey whales.



Figure 20. Map of USCG flight path (green line) on May 8, 2021 between Pigeon Point and Stinson Beach in RAMP Zone 3. Rectangular red marks along path are the three individual whale observations.