

## 2020-21 Risk Assessment: Available Data

Last updated: November 24<sup>1</sup>, 2020

### TRIGGERS REQUIRING MANAGEMENT ACTION

Section 132.8(c)(1): Confirmed Entanglements

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

#### **Evaluation of RAMP Triggers (by CDFW)**

Total number of Confirmed Entanglements in California Commercial Dungeness Crab Gear:

- During the current Fishing Season: NA
- During the current calendar year: 1 Humpback whale

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

- During the current Fishing Season: NA
- During the current calendar year: 3 Humpback whales

#### **Summary of All West Coast 2020 Entanglements (by NMFS)**

Total entanglements for calendar year 2020:

- 16 confirmed (10 Humpback whales, 5 Gray whales, and 1 Sperm whale)
- 9 unconfirmed (3 Humpback whales, 4 Gray whales, and 2 unidentified whales)

Total entanglements for calendar year 2020 (January 1 to November 13) by species:

- Humpback whales: 10 confirmed entanglements
  - o One confirmed Humpback whale entanglement involved California commercial Dungeness crab gear; the gear was set in Zone 3 (Bodega Bay to Point Reyes, 38-45 fathoms) and reported in Zone 4
- Blue whales: 0 confirmed entanglements
- Leatherback sea turtles: 0 confirmed entanglements

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<sup>1</sup> Updates were made following the Working Group discussion on November 23 to incorporate additional survey information.

Additional details regarding confirmed Humpback whale entanglements (all entanglement reports are subject to further review):

- Feb 14, 2020: reported off San Diego (Zone 6), entangled with gillnet
- Feb 28, 2020: reported off Monterey (Zone 4), entangled with unidentified gear (line only)
- April 13, 2020: reported off Santa Barbara (Zone 6), entangled with CA spot prawn gear
- April 15, 2020: reported off Orange county (Zone 6), entangled with gillnet
- May 16, 2020: reported off Monterey (Zone 4), entangled with CA commercial Dungeness crab gear (set in Zone 3)
- June 13, 2020: dead stranding in Marin county (Zone 3), entangled with OR commercial Dungeness crab gear
- July 3, 2020: reported off Monterey (Zone 4), entangled with unidentified gear (line only)
- July 30, 2020: reported off Oregon, entangled with unidentified gear (line + buoys)
- Aug 31, 2020: reported off Washington, entangled with unidentified gear (line only)
- Oct 13, 2020: reported off Monterey (Zone 4), entangled with unidentified gear (line only)

#### [Section 132.8\(c\)\(2\): Marine Life Concentrations](#)

*Data provided by: Scott Benson (NOAA), Monterey Bay Whale Watch (processed by Karin Forney, NOAA), John Calambokidis (Cascadia Research), California Department of Fish and Wildlife*

#### [Leatherback Sea Turtle Observations and Satellite Telemetry – Fishing Zone 7](#)

- No new data are available; see [Available Data](#) prepared for the November 3, 2020 Working Group discussion for the most recent summary.

#### [Monterey Bay Whale Watch – Fishing Zone 4](#)

- Commercial MBWW whale-watching trips have been conducted from Monterey throughout the summer and fall. Karin Forney has standardized these research trips to the same ‘whales per half-day-trip’ unit used in previous summaries.
- The number of documented Humpback whales has been variable during the summer and early fall (Figure 1). The two most recent 7-day averages are 14.6 whales per half-day-trip during Nov 1-7 and 9.7 whales per half-day-trip during Nov 8-14. The 14-day average of 12.2 is similar to the previous 11.4 whales during Oct 14 – 27.
- There have been no documented sightings of Blue whales since Oct 9-10.

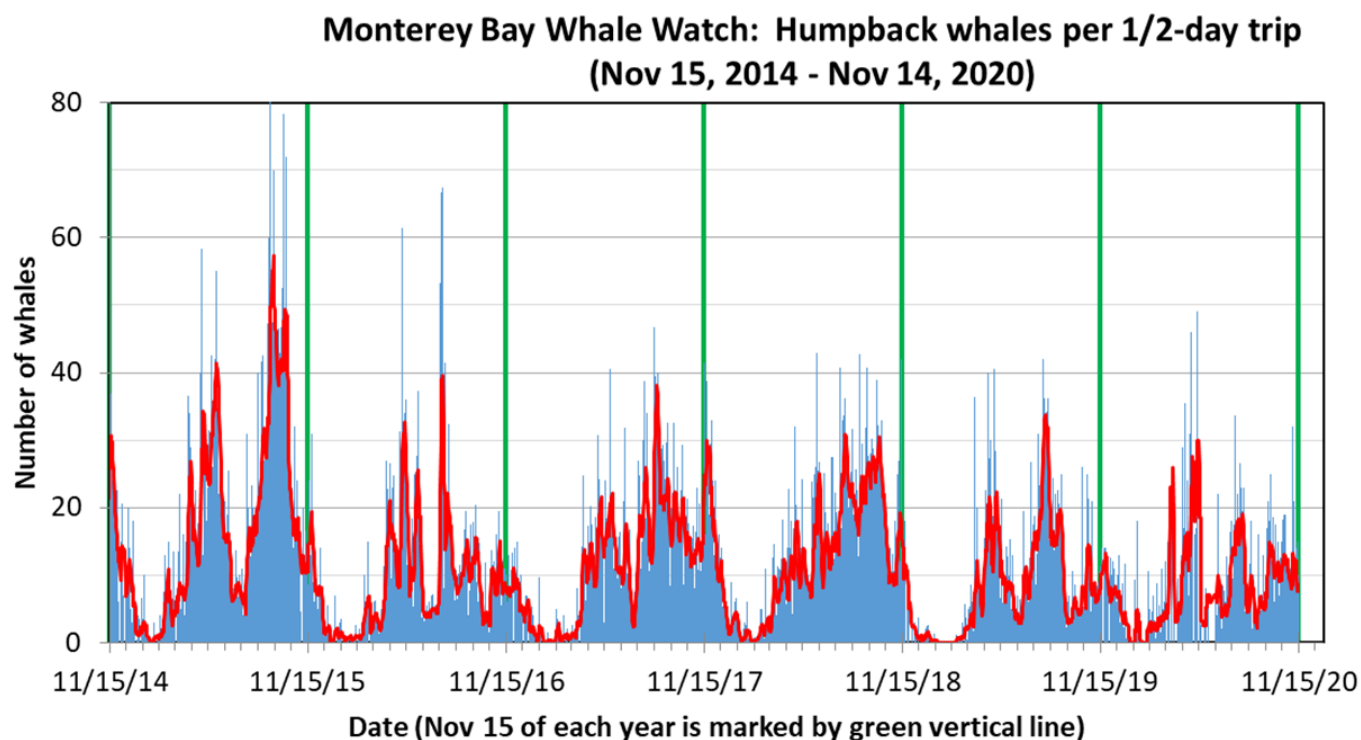


Figure 1. Standardized number of Humpback whale sightings from 15 November 2014 – 14 Nov 2020 for Monterey Bay Whale Watch. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns a 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.

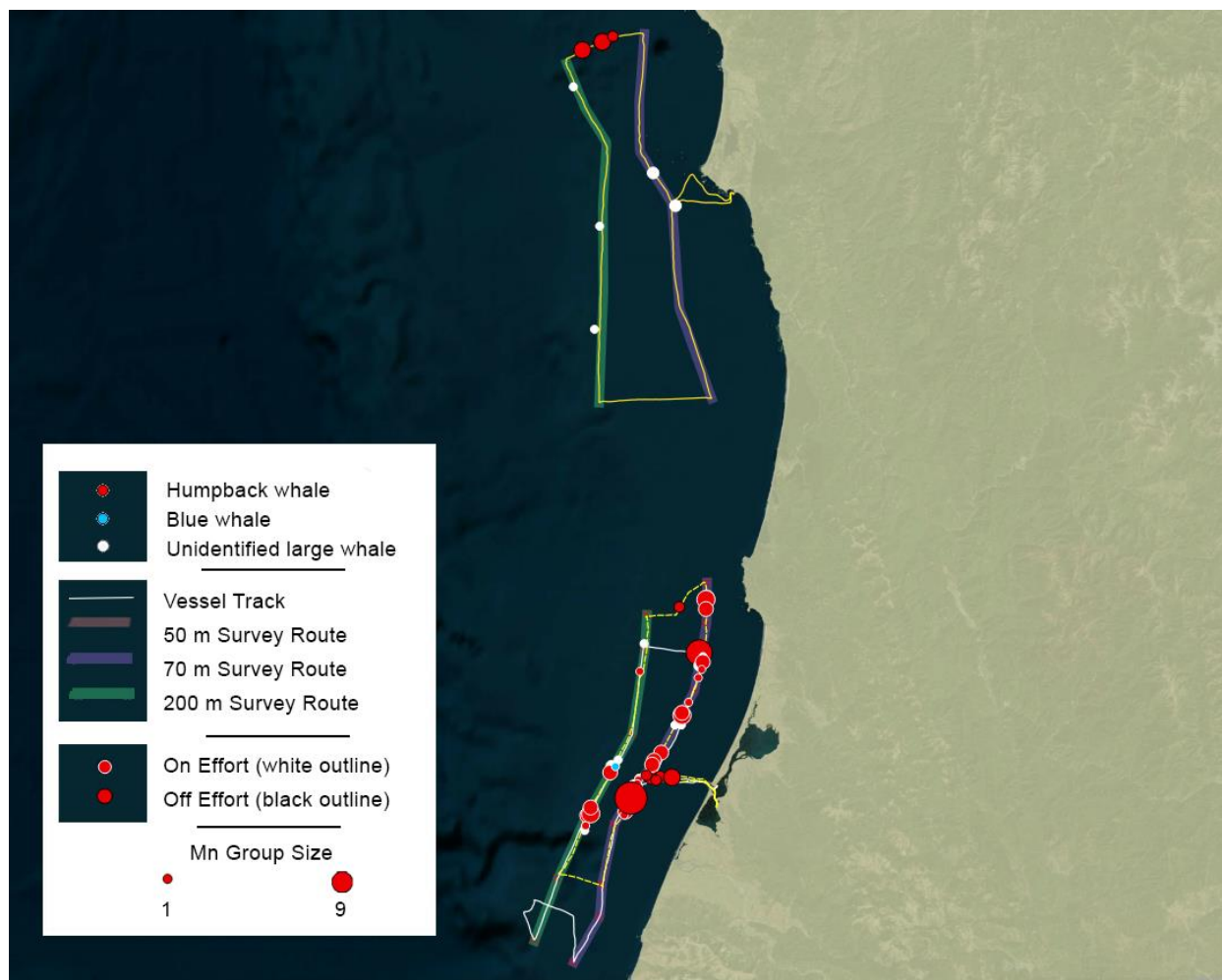
Cascadia Research, SR3 and The Marine Mammal Center – *Fishing Zones 1, 3 and 4*

## Fishing Zone 1

- Small boat surveys were conducted out of Eureka on November 1-2 covering mostly transect effort along the 70 and 200m depth from just north of Eel River Canyon up to north of Patrick's Point. Small boat surveys were conducted out of Crescent City on November 3 covering from just south of the Klamath River up to near the Oregon Border. Fog and lowered visibility hampered many sections of the effort, so coverage was not complete.
- There were frequent sightings of Humpback whales during both surveys out of Eureka; sightings were primarily near the 70m depth contour but also at other depths (Figure 2). An estimated 78 Humpback whales and 3 Blue whales were seen during these two days of surveys, with an additional 19 unidentified whales (Table 1).
- Sightings out of Crescent City were more limited. The highest concentration of Humpback whales was near the Oregon border, though swell was a limiting factor.
- Humpback whales are suspected to be primarily feeding on fish, consistent with the higher sighting rate along the 70m depth out of Eureka.
- Some photo-identification was completed for both Humpback and Blue whales.

**Table 1. Summary of effort and sightings during small boat survey off northern California on November 1-3 2020.**

Date	Region	Trans/O pp	Humpbacks			Blue whales			Unident. Whales	
			Sight	Anim	Photo- IDs	Sight	Anim	Photo- IDs	Sight	Anim
01-Nov-20	Eureka area	70m	24	43		1	2	1	10	12
01-Nov-20	Eureka area	200m	4	8		1	1		5	6
01-Nov-20	Eureka area	Opp	7	17	4					
02-Nov-20	Eureka area	200m	3	4					1	1
02-Nov-20	Eureka area	Opp	1	6	1					
03-Nov-20	Crescent City area	70m							2	4
03-Nov-20	Crescent City area	200m							3	3
03-Nov-20	Crescent City area	Opp	4	7					3	3
Grand Total			43	85	5	2	3	1	24	29



**Figure 2. Map of effort and sightings from small boat surveys on 1-3 November 2020 off Northern California.**

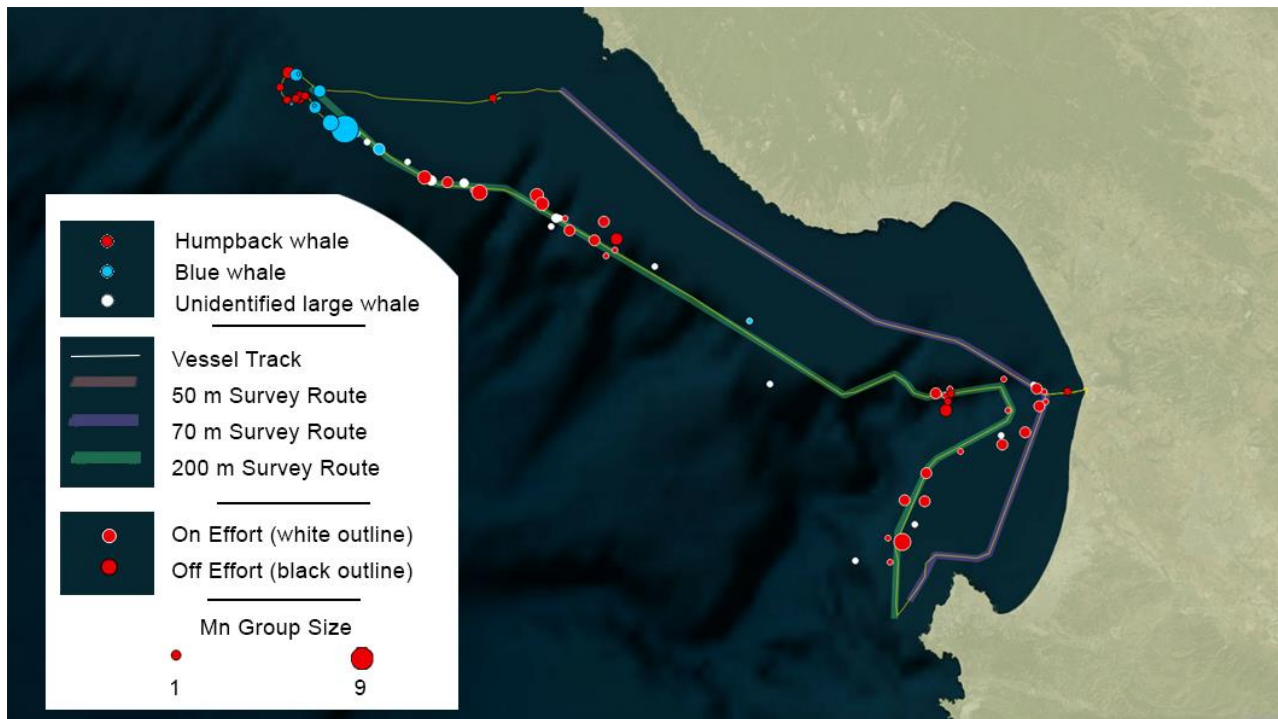
### Fishing Zones 3 and 4

The November 13 survey covered transect effort along the 70m and 200m line within Fishing Zone 4 from west of Año Nuevo down to a little south of Monterey Bay (see Table 2 and Figure 3). Humpback whales were sighted along a broad area of the survey route with animals both to the northwest of and in Monterey Bay.

- Humpback whales were more concentrated closer to the 200m depth contour than the 70m. This represents a shift from the surveys in October ([see Available Data from 11/3/2020](#)) when they were not as concentrated near the 200m shelf edge.
- A concentration of Blue and Humpback whales was found near the shelf edge west of Año Nuevo. This is similar to what was seen in October and represents an area of persistent occurrence.
- There was greater evidence of Humpback whales feeding on krill than in previous surveys. However it appeared fish feeding was still occurring in some areas, especially inside Monterey Bay.

**Table 2. Effort and sightings from survey by Nova in Monterey Bay area on November 13 2020.**

Trans/Opp	Transect Nmi	Humpbacks			Blue whales			Unident. Whales	
		Sight	Anim	Photo-IDs	Sight	Anim	Photo-IDs	Sight	Anim
70m	48	5	8	0	0	0	0	2	2
200m	58	25	47	7	3	4	0	11	15
Opp		15	19	14	8	19	9	1	2
		45	74	21	11	23	9	14	19



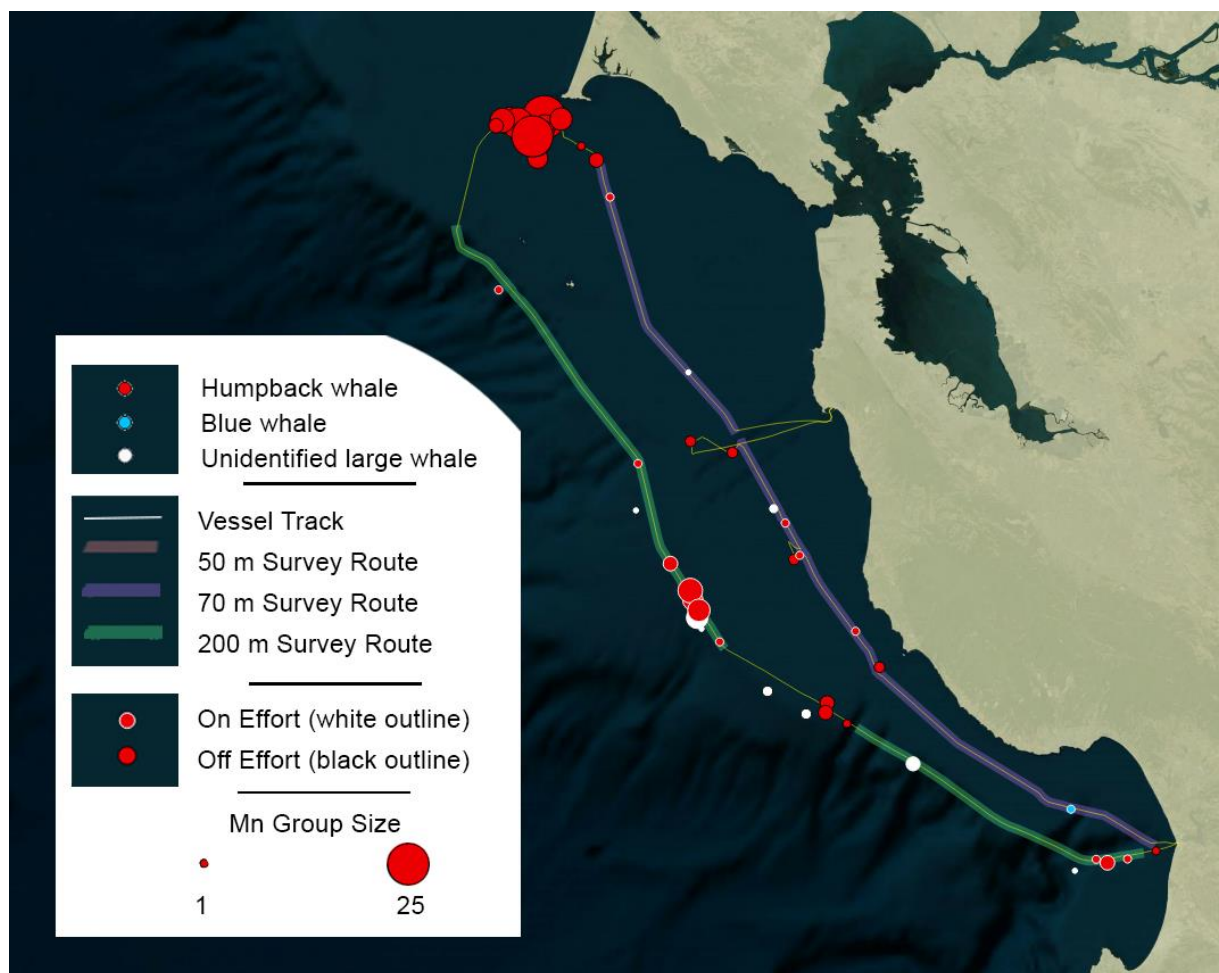
**Figure 3. Survey from Nova on November 13 2020.**

An additional survey on November 20 and 21 covered transect effort within Fishing Zones 3 and 4 along the 70m and 200m transects between Moss Landing and Point Reyes (see Table 3 and Figure 4).



**Table 3. Effort and sightings from survey on November 20 and 21, 2020.**

				Humpbacks			Blue whales			Unident. Whale	
		Trans /Opp	Trans Nmi	Sight	Anim	Photo- IDs	Sight	Anim	Photo- IDs	Sight	Anim
Date	Region										
By day and type of effort											
20-Nov-2020	Moss Landing to HMB	70m	57	3	3	1	1	1	0	1	1
20-Nov-2020	Moss Landing to HMB	Opp		4	4	3	0	0	0	1	1
21-Nov-2020	HMB-Pt Reyes-Moss Landing	70m	30	1	1	0	0	0	0	1	1
21-Nov-2020	HMB-Pt Reyes-Moss Landing	200m	79	10	24	0	0	0	0	5	10
21-Nov-2020	HMB-Pt Reyes-Moss Landing	Opp		23	119	45	0	0	0	2	15
	Totals			41	151	49	1	1	0	10	28
By Zone											
20-21-Nov-2020	Zone 3 (N of 37 11'N)			31	138	48	0	0	0	5	9
20-21-Nov-2020	Zone 4 (S of 37 11'N)			10	13	1	1	1	0	5	19
	Totals			41	151	49	1	1	0	10	28



**Figure 4. Map of effort and sightings from small boat surveys on November 20-21 2020 in Central California.**

### CDFW Aerial Survey – Fishing Zones 2 and 3

CDFW staff conducted aerial surveys beginning at Tomales Point and flew north to Cape Mendocino on November 16, 2020. No whales were observed in Fishing Zone 2. Humpback whales were observed in an area north of the Russian River. Fog and low clouds were

encountered at Cape Mendocino. The survey crew then flew back to Point Reyes to cover the east/west transect lines from Point Reyes to Pigeon Point. Humpback whales were observed in an area south of Point Reyes toward the Farallon Islands. In Fishing Zone 3, there were 15 observations of Humpback whales, with a total of count 29 and 1 observation of an unidentified large whale (Figure 5).

CDFW staff conducted a limited aerial survey from Bodega Bay to Point Pinos on November 19, 2020. Most of the survey area was obscured due to fog or wind waves resulting in very limited observation of Fishing Zones 3 and 4. Due to the poor survey conditions, results cannot be used to inform the November 23 risk assessment.

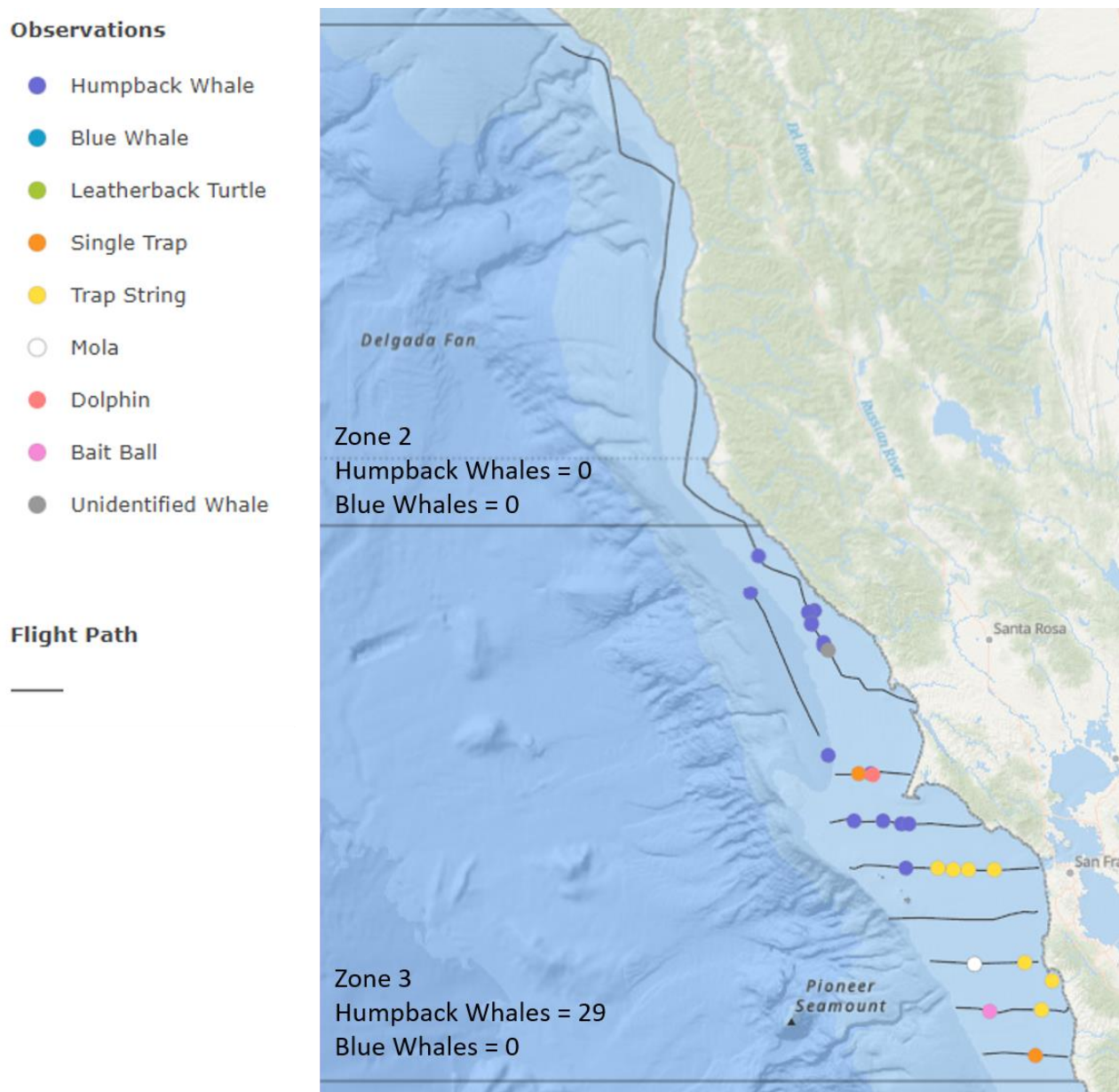


Figure 5. Flight path and observations during CDFW aerial survey in Fishing Zones 2 and 3 on November 16, 2020. Fishing Zone 3 = 29 Humpback whales and 0 Blue whales. No large whales were observed in Fishing Zone 2.

## 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

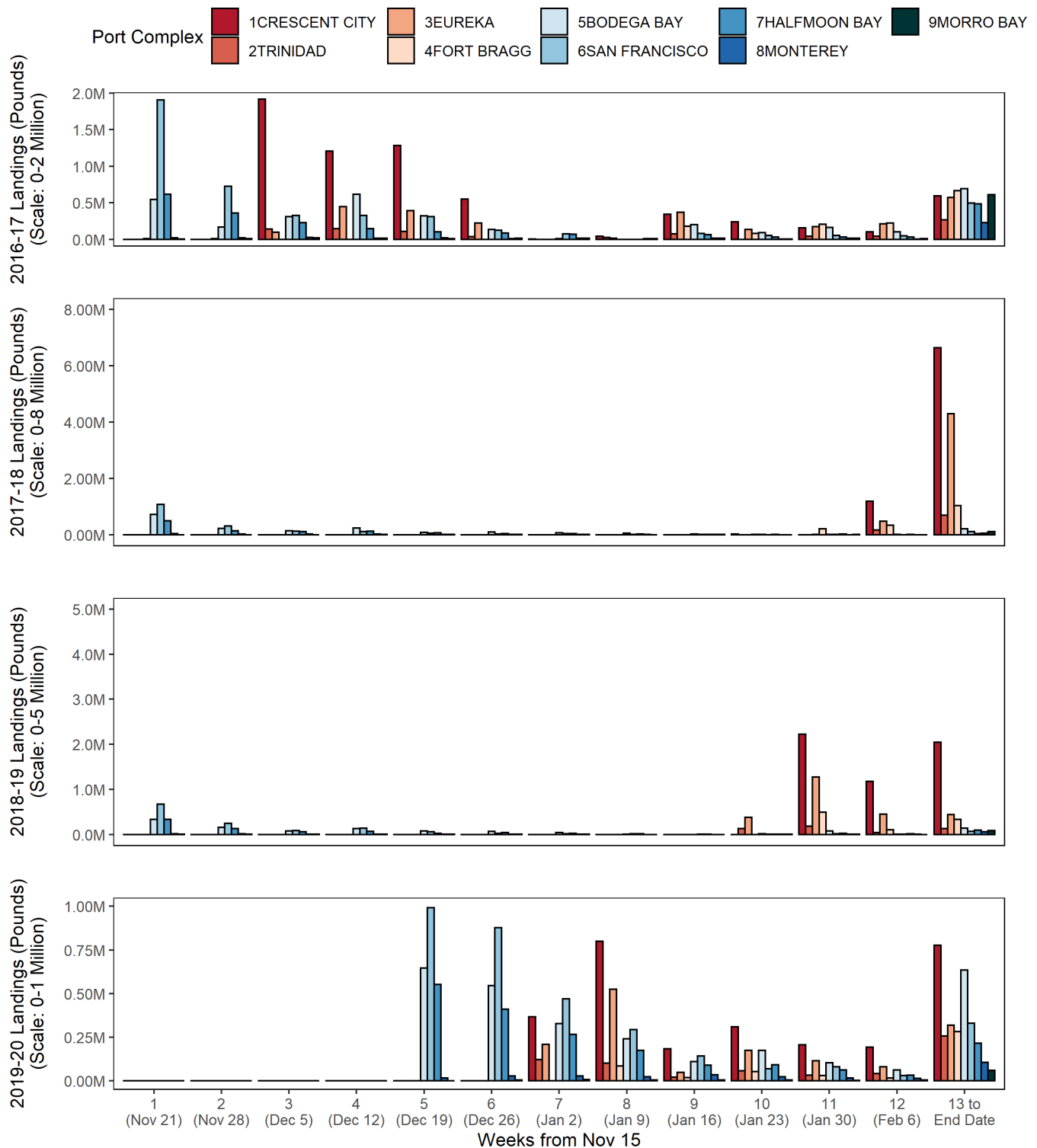
*Data provided by: California Department of Fish and Wildlife*

The following summaries of the nine port complexes (Figures 6-8) are being provided by request from members of the Working Group to understand how total landings, total value and average price change each week from the scheduled season start date of November 15 for the recent four seasons of the fishery from 2016-2017 to 2019-2020. In addition, summary tables of total landings, total value and average price (Tables 4-6) by season for each management area and statewide are being provided as reference to understand how the seasons used in the analysis compare to one another.

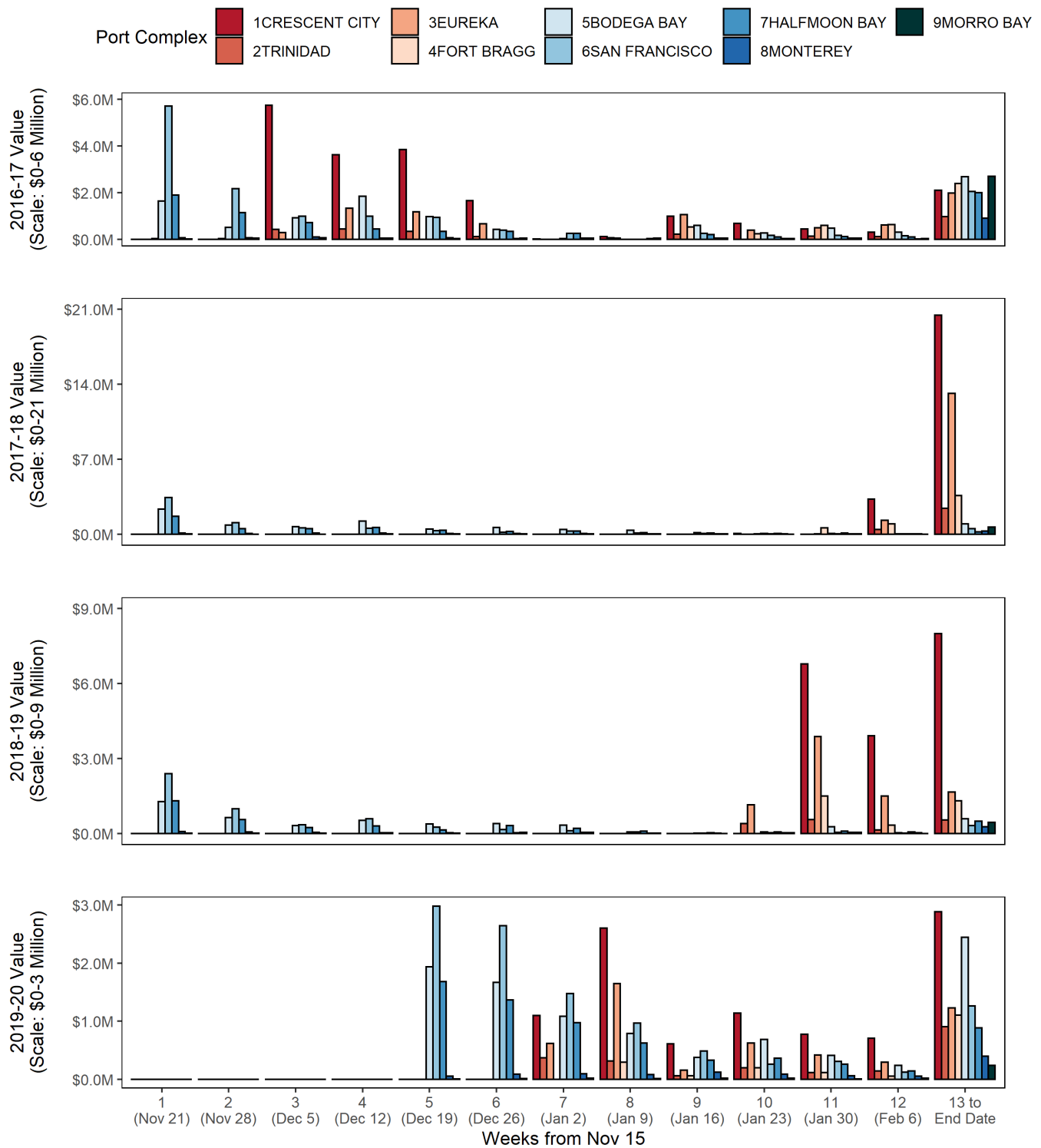
The 2016-2017 season opened on time however some smaller areas within the Central Management Area (CMA) continued to be delayed due to domoic acid with the last area opening on December 24, 2016. Areas in the Northern Management Area (NMA) continued to be delayed with the last area opening on January 16, 2017. In 2017-2018, the NMA was delayed due to quality until January 15, 2018 with the fleet voluntarily continuing to wait until crab condition improved until the first week of February. The 2018-2019 season was delayed due to domoic and quality. Most of the CMA opened on time except for one area being delayed due to domoic acid until December 8, 2018. The NMA was delayed due to quality until January 15, 2019 with one remaining area opening 10 days later on January 25, 2019 due to domoic acid. For the 2019-2020 season, the CMA was delayed due to marine life entanglement risk until December 15, 2019. The NMA was delayed due to quality until December 31, 2019. Both the 2018-2019 and 2019-2020 seasons had all or parts of the fishery closed early due to marine life entanglement risk.

The first set of four graphs (Figure 6) shows total landings in pounds for the first 12 weeks from November 15 to February 6 with the last bar graph representing the total remainder of landings until the end of the season. The chronological order of seasons is arranged with the most recent season 2019-2020 at the bottom. The next set of four graphs (Figure 7) shows total ex-vessel value and finally the last set (Figure 8) shows average price per pound. Data points that are missing were either absent or removed due to confidentiality.





**Figure 6. Total landings in pounds for each major port complex by week from Nov. 15 until Feb. 6 with the last bars representing all remaining weeks until the end date of the season. The last four seasons are shown: 2016-2017 (top panel), 2017-2018 (2nd top panel), 2018-2019 (3rd top panel), and 2019-2020 (bottom panel).**



**Figure 7. Total ex-vessel value for each major port complex by week from Nov. 15 until Feb. 6 with the last bars representing all remaining weeks until the end date of the season. The last four seasons are shown: 2016-2017 (top panel), 2017-2018 (2nd top panel), 2018-2019 (3rd top panel), and 2019-2020 (bottom panel).**

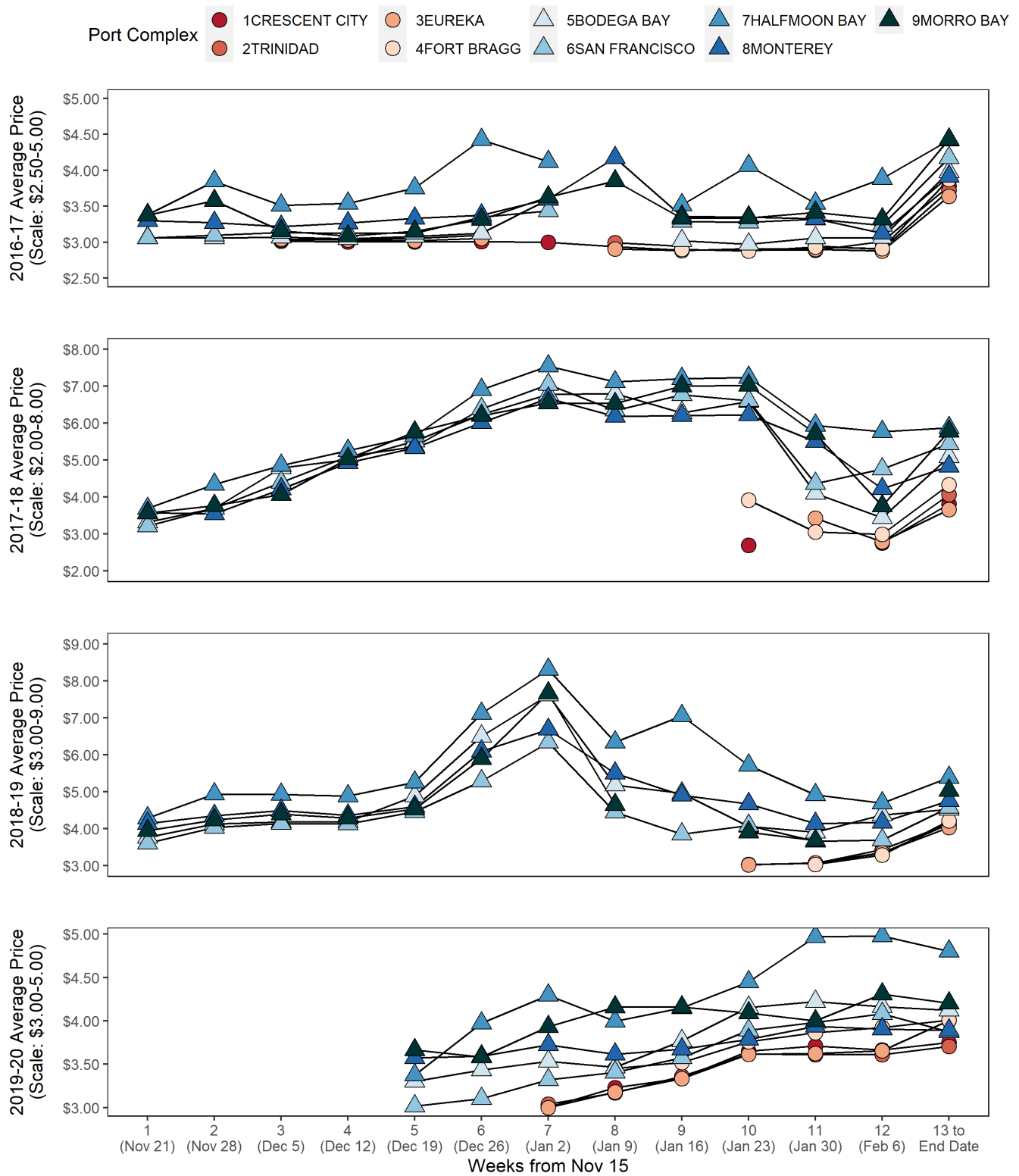


Figure 8. Average price per pound for each major port complex by week from Nov. 15 until Feb. 6 with the last bars representing all remaining weeks until the end date of the season. The last four seasons are shown: 2016-2017 (top panel), 2017-2018 (2nd top panel), 2018-2019 (3rd top panel), and 2019-2020 (bottom panel).

**Table 4. Total landings in pounds between 2016-2017 and 2019-2020 seasons.**

Season Landings (Pounds)	Northern	Central	Total Statewide
2016-2017	11,410,366	11,239,929	22,650,295
2017-2018	15,116,607	5,335,955	20,452,562
2018-2019	9,417,096	3,686,722	13,103,818
2019-2020	5,372,196	8,383,652	13,755,848

**Table 5. Total value between 2016-2017 and 2019-2020 seasons.**

Season Total Value (\$)	Northern	Central	Total Statewide
2016-2017	\$35,119,934	\$37,070,433	\$72,190,367
2017-2018	\$46,477,453	\$22,566,092	\$69,043,545
2018-2019	\$31,610,645	\$15,525,166	\$47,135,811
2019-2020	\$18,604,768	\$28,161,855	\$46,766,622

**Table 6. Average price per pound between 2016-2017 and 2019-2020 seasons.**

Season Average Price Per Pound (\$)	Northern	Central	Total Statewide
2016-2017	\$3.33	\$3.69	\$3.52
2017-2018	\$3.78	\$5.09	\$4.39
2018-2019	\$3.69	\$4.81	\$4.25
2019-2020	\$3.66	\$3.91	\$3.80

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

*Data provided by: Monterey Bay Whale Watch (processed by Karin Forney, NOAA), John Calambokidis (Cascadia Research)*

**Monterey Bay Whale Watch – Fishing Zone 4**

- Compared to historical patterns (Figure 9), the most recent Humpback whale numbers are above-average.
- There have been no documented sightings of blue whales since Oct 9-10, which is consistent with their expected late fall migration away from the California feeding grounds (Figure 10).

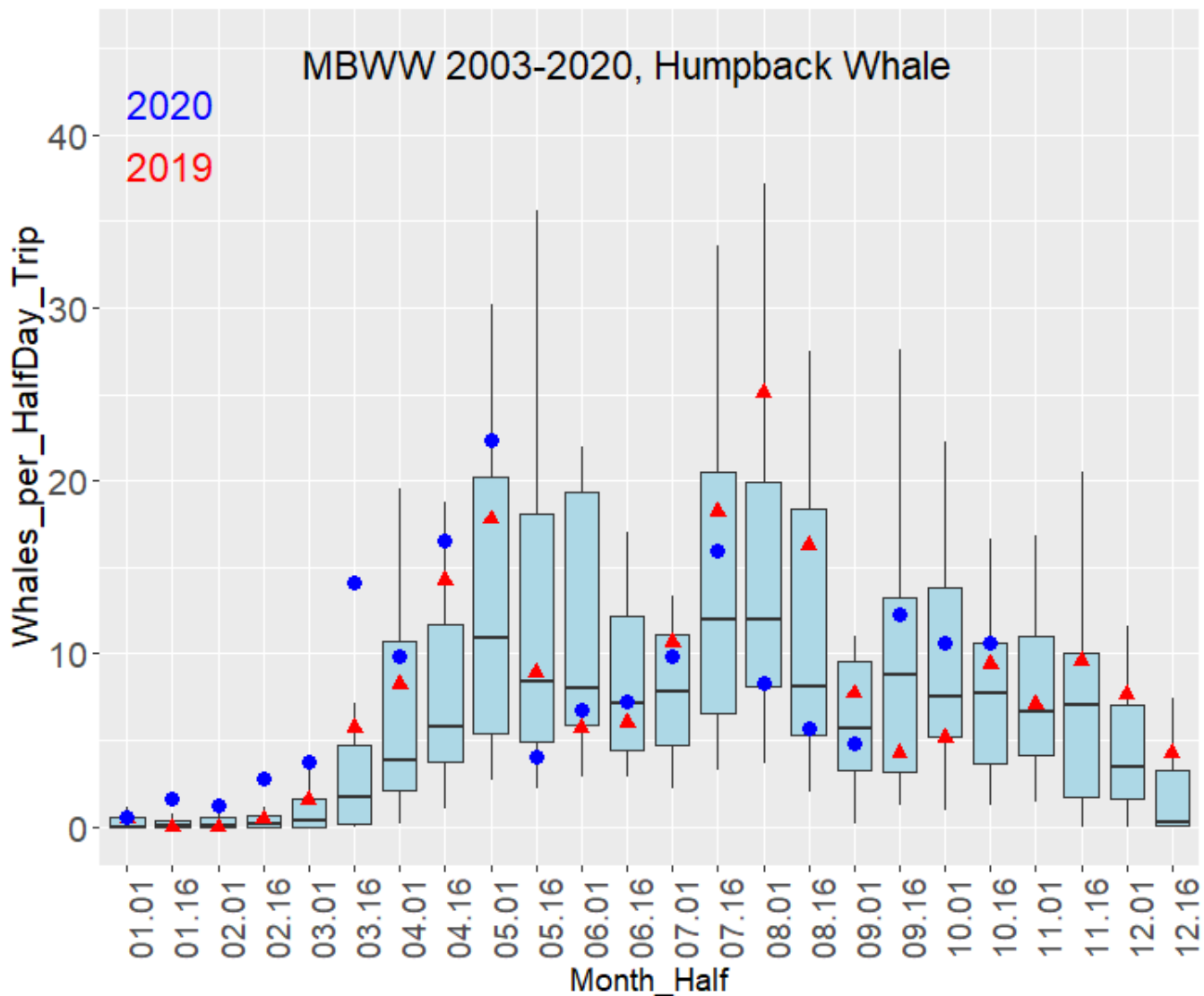


Figure 9. Historical Monterey Bay Whale Watch data for 2003-2020, summarizing the average and variation in the number of Humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2019 (red triangles) and 2020 (large blue dots) are provided for reference, placing recent whale numbers in a historical context.



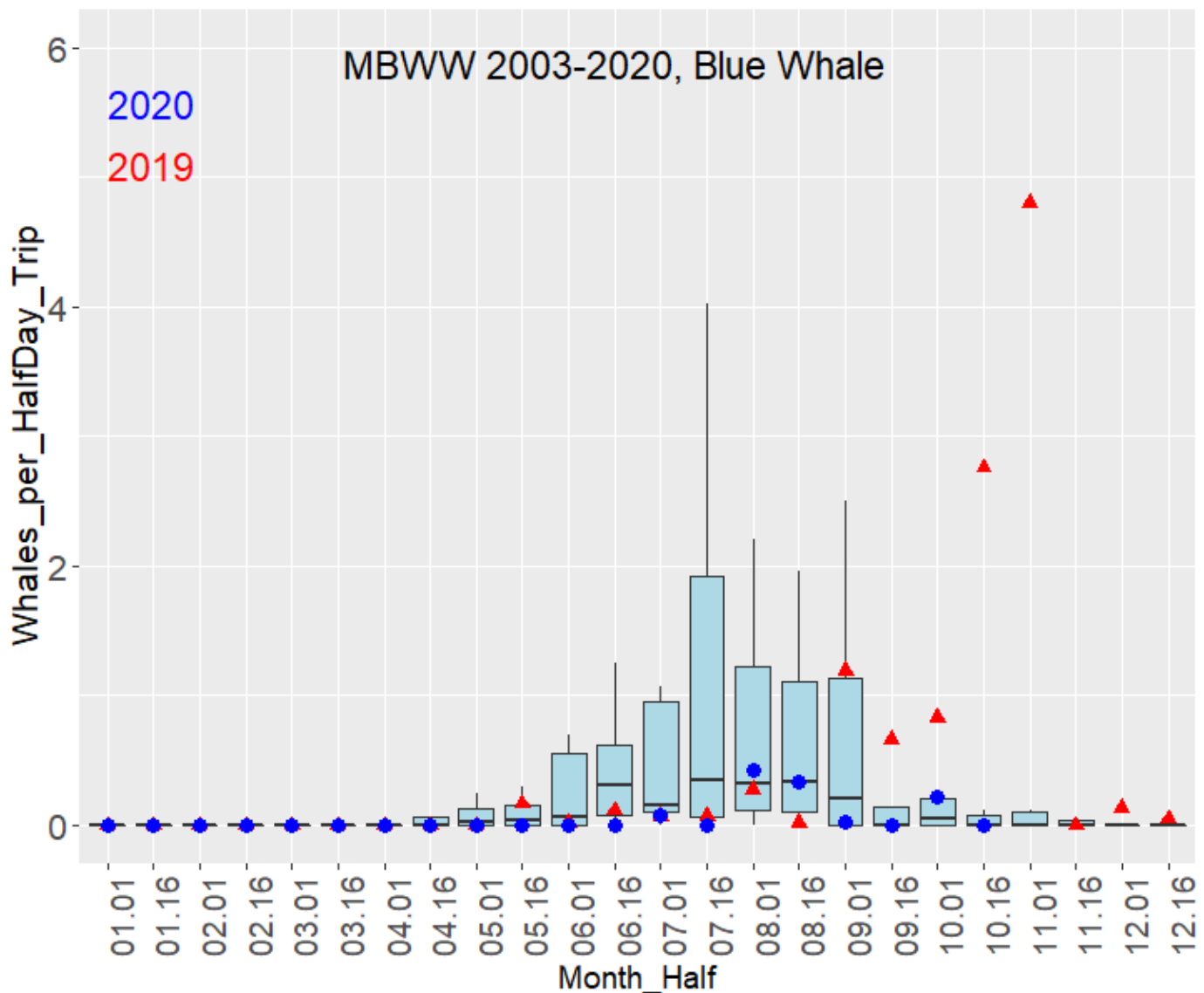


Figure 10. Historical Monterey Bay Whale Watch data for 2003-2020, summarizing the average and variation in the number of Blue whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2019 (red triangles) and 2020 (large blue dots) are provided for reference, placing recent whale numbers in a historical context.

#### Cascadia Research, SR3 and The Marine Mammal Center – *Fishing Zone 4*

Preliminary analysis of the 345 Humpback whales identified during surveys from October 27-29 off Central California revealed at least 106 unique individuals (additional animals being matched). So far only 10 of these 106 whales were identified on more than one day, which is consistent with the suspected large number in the area. Breeding areas have been identified for at least 18 of these whales and include Central America (Costa Rica and Nicaragua) and different areas of Mexico (including southern Mexico which may be part of the Central America DPS).

Data provided by: California Department of Fish and Wildlife in collaboration with industry and California Department of Public Health

### Domoic Acid Testing – Fishing Zones 1-5

All sites have passed (Figure 11).

CDPH SUMMARY OF DOMOIC ACID LEVELS IN CRABS				JULY 1, 2020 - OCTOBER 28, 2020							
PORT	AREA	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	10/8/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	4.9	<2.5	0.8	0%
	Klamath River	10/8/2020	Dungeness	6.1	3.1	<2.5	<2.5	<2.5	<2.5	1.5	0%
Trinidad	Lagoons	9/18/2020	Dungeness	6.8	3.1	8.0	<2.5	<2.5	<2.5	3.0	0%
	Trinidad Head	9/18/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detected	0%
	LP Eureka	9/29/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	5.0	3.7	1.5	0%
Eureka	Eel River	9/29/2020	Dungeness	3.3	4.7	4.6	<2.5	<2.5	<2.5	2.1	0%
Fort Bragg	Usal	10/13/2020	Dungeness	<2.5	<2.5	2.9	<2.5	<2.5	3.1	1.0	0%
Fort Bragg	Manchester Beach	10/17/2020	Dungeness	3.6	<2.5	<2.5	<2.5	<2.5	<2.5	0.6	0%
Bodega Bay	Salt Point	9/30/2020	Dungeness	<2.5	<2.5	<2.5	19	<2.5	<2.5	3.2	0%
	Russian River	9/30/2020	Dungeness	<2.5	<2.5	<2.5	12	<2.5	18	5.0	0%
	Bodega Head	9/20/2020	Dungeness	<2.5	26	10	13	4.1	<2.5	8.9	0%
	Point Reyes	9/20/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	26	4.3	0%
Half Moon Bay/ San Francisco	Duxbury Reef	9/29/2020	Dungeness	46	<2.5	5.6	3.7	2.6	<2.5	9.7	17%
	Duxbury Reef	10/6/2020	Dungeness	4.8	9.2	<2.5	6.8	5.1	9.2	5.9	0%
	Duxbury Reef	10/14/2020	Dungeness	4.4	<2.5	2.9	<2.5	<2.5	5.8	2.2	0%
	HMB/Pillar Point	10/5/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detected	0%
	Pigeon Point	10/5/2020	Dungeness	<2.5	2.7	<2.5	<2.5	<2.5	<2.5	0.5	0%
Monterey	Monterey Bay	9/30/2020	Dungeness	5.1	13	4.6	<2.5	<2.5	8.1	5.1	0%
	Monterey Bay	9/30/2020	Rock*	9.5	27	NA	NA	NA	NA	18.3	0%
Morro Bay	Avila Beach	10/15/2020	Dungeness	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	Non-Detected	0%

\*Only 2 crabs available

1 SET = 6 SAMPLES

Figure 11. Domoic acid testing results for Dungeness and rock crab as of October 28, 2020. [See updated results.](#)

### Quality Testing – Fishing Zones 1 and 2

For initial testing results, [see Available Data from 11/3/2020](#).

An additional test occurred on November 11 and 12 at Crescent City and Eureka. The number of test pots was increased by 2/3 from the original number and still total pounds did not meet the minimum requirement, while the meat quality again yielded crab above the criteria (Figure 12). Based on insufficient test results at this time, Tri-State managers have agreed to delay the fishery within the Tri-State region that includes the Northern Management Area until December 16 based Available Data, November 23, 2020 Working Group Discussion

on the authority stated under Fish and Game Code Section 8276.2. An additional round of testing at all 3 sites will be scheduled on or around December 1 while the next call with Tri-State managers will be scheduled around December 7.

#### 2020 Preseason Coastal Dungeness crab Test Fishery Results for WA, OR and CA

\* Date is the date the pots were pulled

		Optional Early Round		Round 1		Round 2		Round 3	
Test Area	Number of pots	Date*	Meat Recovery %	Date*	Meat Recovery %	Date*	Meat Recovery %	Date*	Meat Recovery %
<b>Washington</b>									
Northern		no test	no test	no test	no test				
Westport		10/22/20	19.6%	11/9/20	21.8%				
Long Beach		10/23/20	18.7%	11/9/20	21.8%				
<b>Oregon</b>									
Astoria (50-A)	18	no test	no test	11/9/20	21.6%				
Garibaldi (50-B)	18	no test	no test	11/9/2020 **~	24.8%				
Newport North (50-C and 50-D)	36	no test	no test	11/9/20	25.1%				
Newport South (50-E and 50-F)	36	no test	no test	11/10/20	23.5%				
Coos Bay North (50-G and 50-H)	36	no test	no test	11/9/2020 ~	26.4%				
Coos Bay South (50-I and 50-J)	36	no test	no test	11/12/2020 ~	24.9%				
Port Orford (50-K)	18	no test	no test	11/9/2020 **	23.9%				
Brookings (50-L)	18	11/9/2020 ^	25.6%	11/12/2020 ^**	25.3%				
<b>California</b>									
Crescent City	36/60	10/27/2020 **	25.1%	11/12/2020 **	26.8%				
Trinidad	36	10/27/2020 **	25.2%	TBD	TBD				
Eureka	36/60	10/27/2020 **	25.6%	11/12/2020 **	24.8%				
<b>District 10 (not bound by Tri-State)</b>									
Bodega Bay	no test	no test	no test	no test	no test				
San Francisco	no test	no test	no test	no test	no test				

\*\*below 300lb minimum poundage

^ The first test (reported above in the early round column) was significantly below 150lbs allowed for a test area with 18 pots. In the re-do of this test area 45 pots were set due to the significantly low poundage.

~ less than a 24hr soak time

**Figure 12. Quality testing results for Dungeness crab as of November 17, 2020. [See updated results.](#)**

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

*Data provided by: Jarrod Santora and Isaac Schroeder (NOAA Fisheries, Southwest Fisheries Science Center and University of California Santa Cruz), John Calambokidis (Cascadia Research)*

#### NOAA Ecosystem Surveys – All Fishing Zones

NOAA Fisheries ecosystem surveys indicate significant elevated anchovy abundance in coastal and offshore waters (throughout the shelf and outer slope), Anchovy abundance and high density aggregation continue to be high for consecutive years and should be anticipated throughout winter and spring 2021. Total krill abundance is below average and likely trending to above average over the winter (Figure 13).

Recent surveys of marine life concentrations (e.g., Cascadia Research vessel surveys) indicate significant elevated abundance and aggregations of Humpback whales on the shelf, especially the mid-shelf (associated with anchovy schools). Given the Habitat Compression Index in late fall

2020 is high (low and restricted cool habitat) and anchovy concentrations are high, high density aggregations of Humpbacks whales should be anticipated. At this time, changes in anchovy distribution and abundance, or major declines, are not expected in the coming months.

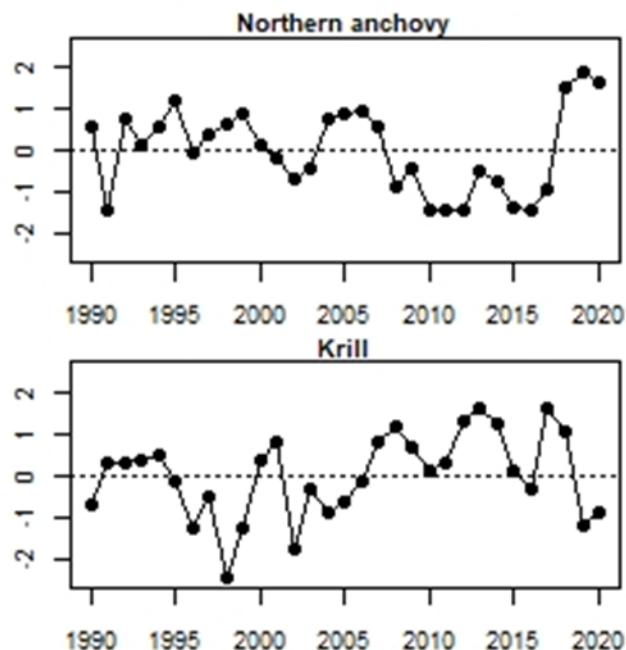
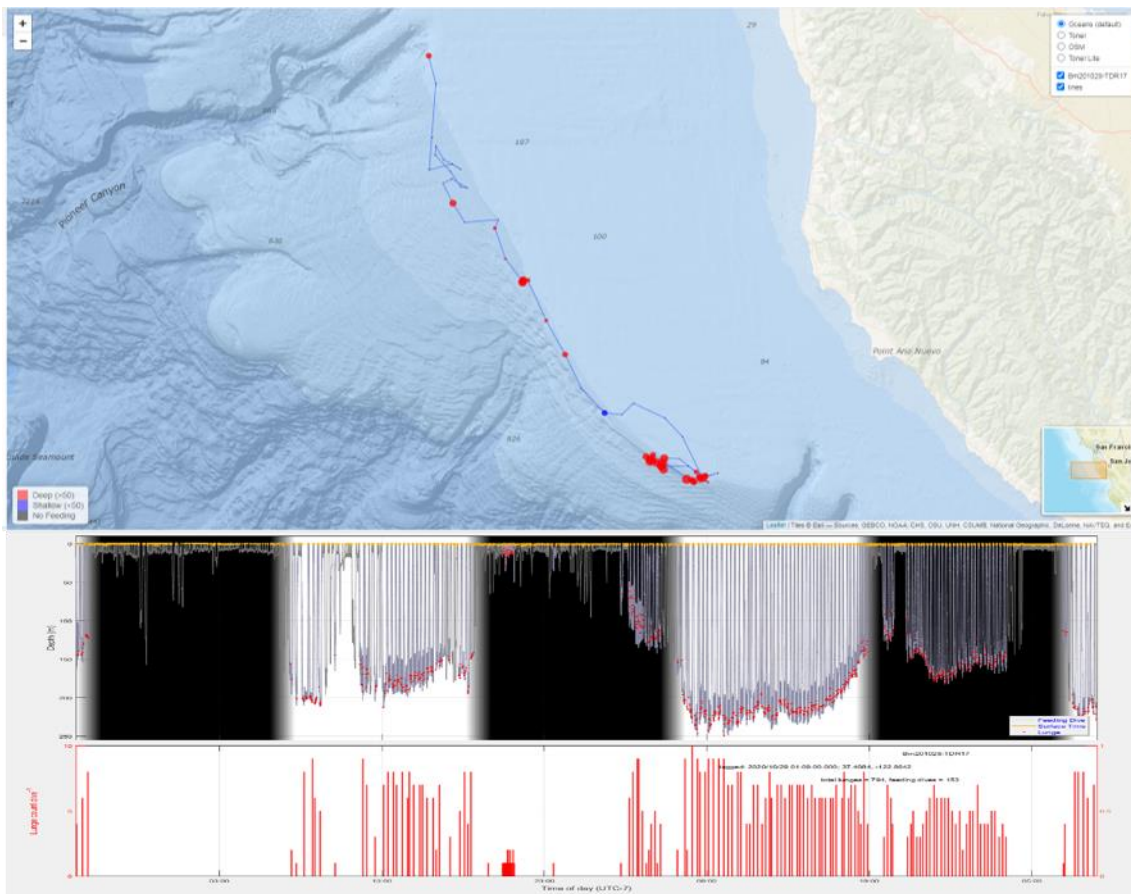


Figure 13. Updated California Current Integrated Ecosystem Assessment (CCIEA) ecosystem indicators: NOAA-NMFS Rockfish Recruitment and Ecosystem Survey (RREAS) 2020 Catch-per-unit-effort (CPUE) anomaly estimates for (top) northern anchovy and (bottom) total krill abundance, as per Santora et al. 2020 (Nature Communications).

#### Cascadia Research, SR3 and The Marine Mammal Center – *Fishing Zone 4*

A tagged Blue whale from the October surveys moved to the area of blue whale concentration west of Año Nuevo and was feeding on deep layers of krill near the shelf edge during the day and one night (Figure 14).

For forage observations during November surveys in Fishing Zones 1 and 2, see the Marine Life Concentrations section above.



**Figure 14. Blue whale track (Oct 28-31 2020) showing deep feeding during both day and night.**

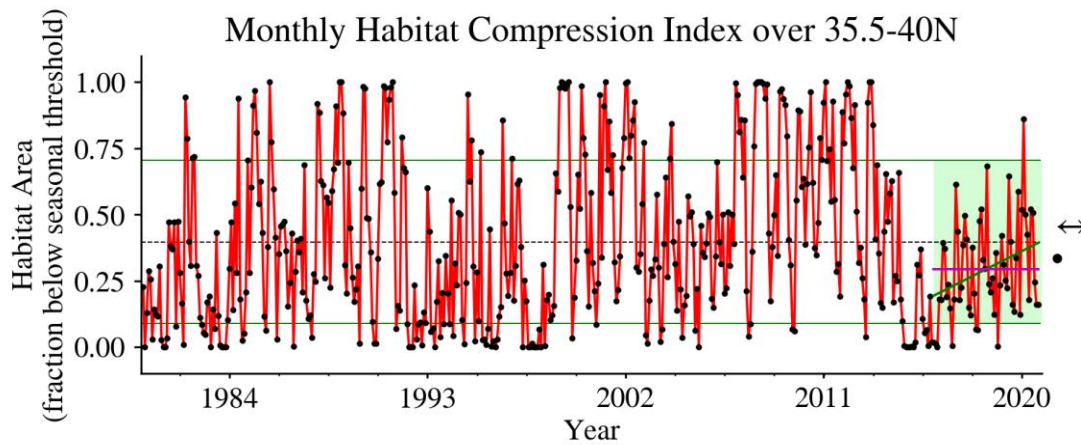
#### Section 132.8(d)(9): Ocean conditions

*Data provided by: Jarrod Santora and Isaac Schroeder (NOAA Fisheries, Southwest Fisheries Science Center and University of California Santa Cruz)*

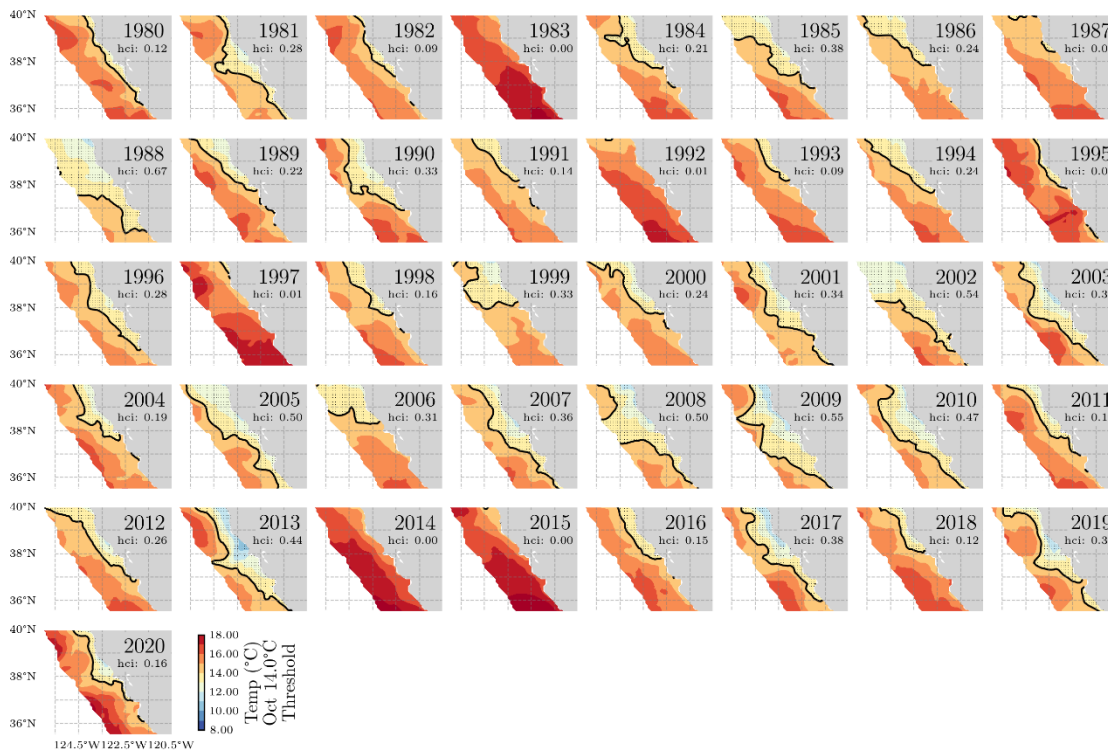
NOAA climate prediction center indicates La Niña conditions are expected for winter-spring 2021. Conditions may favor increase krill concentrations, depending on regional upwelling conditions during January-February 2021.

The monthly Habitat compression Index in October 2020 indicates a high compression state (low cool habitat area), reflecting ongoing heatwave conditions and sea surface temperatures that are warmer than average (Figures 15 and 16). Habitat compression conditions (area and temperature) in October 2020 are similar to October 2019, but not as extreme as during the previous large marine heatwave of 2014-16 (Figure 16). High compression (low cool habitat, restricted nearshore) is anticipated through December 2020.





**Figure 15. Seasonal standardized Habitat Compression Index (monthly); high compression ranges below the mean (dashed line) and indicates reduced cool upwelling habitat area on the shelf; low compression is above the mean and indicates increased cool. High compression may result in increased entanglement risk as per Santora et al. 2020 (Nature Communications). Updated through October 2020.**



**Figure 16. Habitat Compression Index (HCI): October temperature maps depicting the area of cool temperature habitat off California (40N to 35N; thin black line indicates the areal extent of cool habitat). October 2020 HCI values are lower than 2019, are similar to previous heatwave (2014-16), indicating high compression and potential increase entanglement risk as per Santora et al. 2020 (Nature Communications).**

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

*Data provided by: California Department of Fish and Wildlife*

All Confirmed Entanglements reported above occurred prior to the November 1, 2020 effective date of the Risk Assessment and Mitigation Program regulations (Section 132.8,

Title 14, California Code of Regulations). Impact Score Calculations for each Calendar Year will be assigned for Confirmed Entanglements beginning with the 2021 calendar year.

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

Data provided by: Karen Grimmer (MBNMS) and Jaime Jahncke (Point Blue Conservation Science), Briana Abrahms (University of Washington) and Elliot Hazen (NOAA Southwest Fisheries Science Center), Kathi George (The Marine Mammal Center), California Coast Crab Association

### Point Blue Conservation Science – Fishing Zones 3, 4 and 6

Current observations and additional details are available at the [Point Blue Conservation Science Data Portal](#).

### Gulf of the Farallones – Fishing Zone 3

Over the 30-day period ending on November 16, a total of 161 Humpback whales were observed on 11 days, with a daily average of 14.63 Humpback whales/day (Table 7). The general trend in daily averages over this period is declining, indicating that Humpback whales are beginning to migrate south and depart Fishing Zone 3 (Figure 17). Locations of Humpback whale observations over the 7-day period ending on November 16 are shown in Figure 18. No Blue whales were observed during this 30-day period. Days with zero observations are not included.

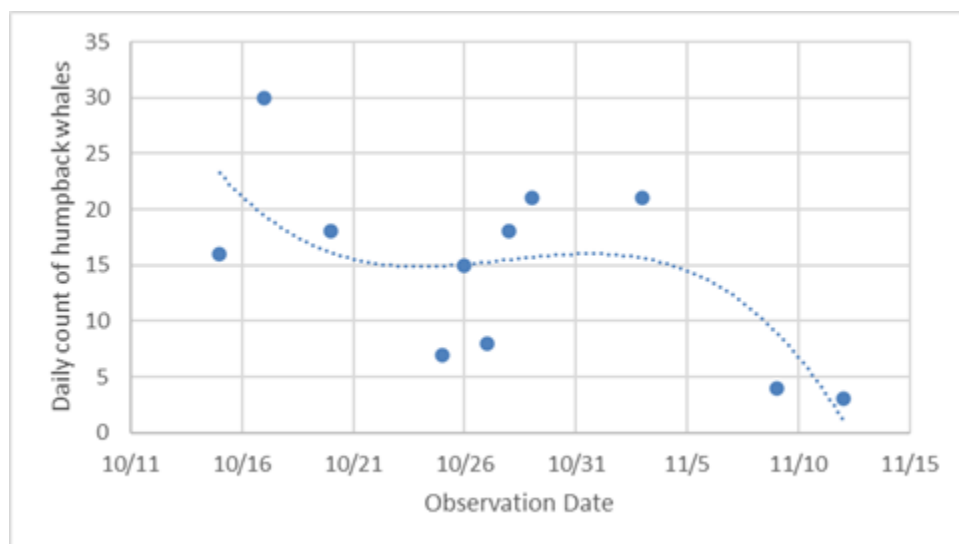
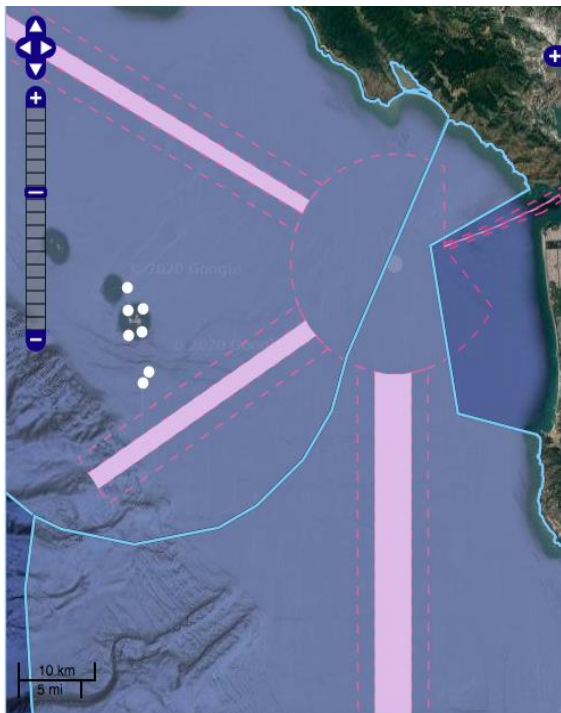


Figure 17. Daily observations of Humpback whales by trained biologists at the Farallon Islands. Dashed line indicates the trend over time.

**Table 7. Whale Alert sightings over the 30-day period ending November 16, 2020 at the Farallon Islands.**

Date	Species	Number Observed	Effort (hours)	Observer
10/15	Humpback	16	1	Farallon Island staff
10/17	Humpback	30	1	Farallon Island staff
10/20	Humpback	18	1	Farallon Island staff
10/25	Humpback	7	1	Farallon Island staff
10/26	Humpback	15	1.1	Farallon Island staff
10/27	Humpback	8	1.1	Farallon Island staff
10/28	Humpback	18	1	Farallon Island staff
10/29	Humpback	21	1	Farallon Island staff
11/3	Humpback	21	1	Farallon Island staff
11/9	Humpback	4	1	Farallon Island staff
11/12	Humpback	3	1.2	Farallon Island staff



**Figure 18. 8 Humpback whale sightings in Zone 3 during the seven-day period ending Nov 16, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals. Right hand panel shows total counts by species and time period.**

### Monterey Bay National Marine Sanctuary – *Fishing Zone 4*

In the Monterey Bay region, 37 Humpback whale sightings were reported through the Spotter/WhaleAlert app over the seven-day period ending November 16 (Figure 19). No Blue whales were reported during this period.

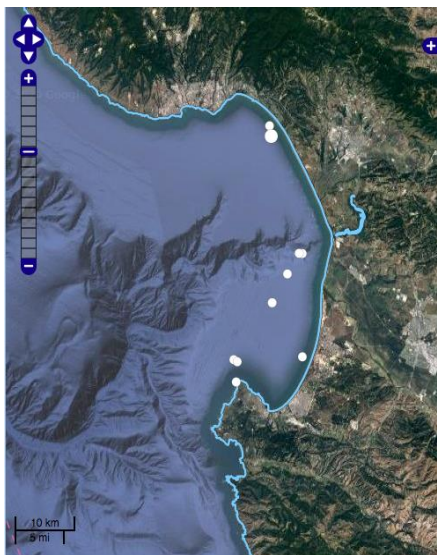


Figure 19. 37 Humpback whale sightings in Zone 4 during the seven-day period ending Nov 16, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals. Right hand panel shows total counts by species and time period.

### Channel Islands National Marine Sanctuary – *Fishing Zone 6*

11 Humpback whales (Figure 20) and 8 Blue whales were reported by trained naturalists from Channel Islands National Marine Sanctuary and the National Park Service during the seven-day period ending on November 16.

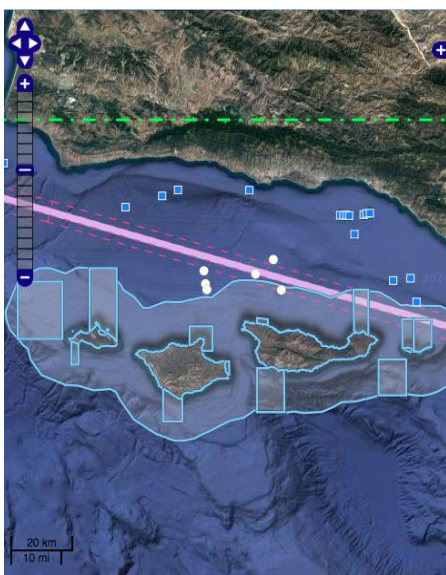


Figure 20. 11 Humpback whale sightings in Zone 6 during the seven-day period ending Nov 16, 2020. Reporting locations are represented by white circles. A given report may represent multiple individuals. Right hand panel shows total counts by species and time period.

## Whale Watch 2.0 – All Fishing Zones

The best whale habitat predictions for November 13, 2020 (Figure 21) indicate probability of blue whale presence is low in central (Pt. Conception to Mendocino) and northern California (Mendocino northward), and is moderate in parts of southern California (south of Pt. Conception).

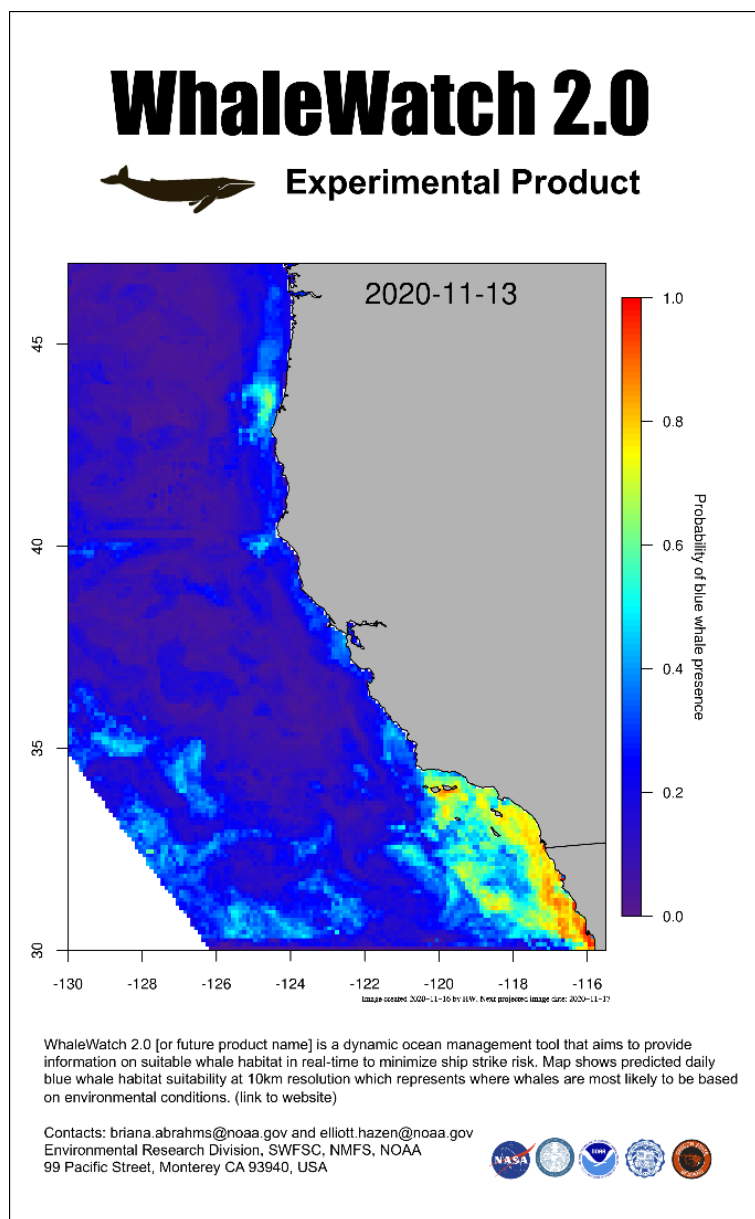


Figure 21. WhaleWatch 2.0 map for November 13, 2020.

## Whale Watching Vessel Solar Loggers –Fishing Zones 3 and 4

Track lines from whale watching vessels participating in the solar logger project indicate a high amount of effort out of Monterey and Moss Landing (Figure 22) and limited effort in San Francisco ports (Figure 23) during 42 trips between November 1 and November 16. Effort was primarily focused in the southern portion of Monterey Bay. Trips out of San Francisco targeted various locations between Bolinas and Pacifica.



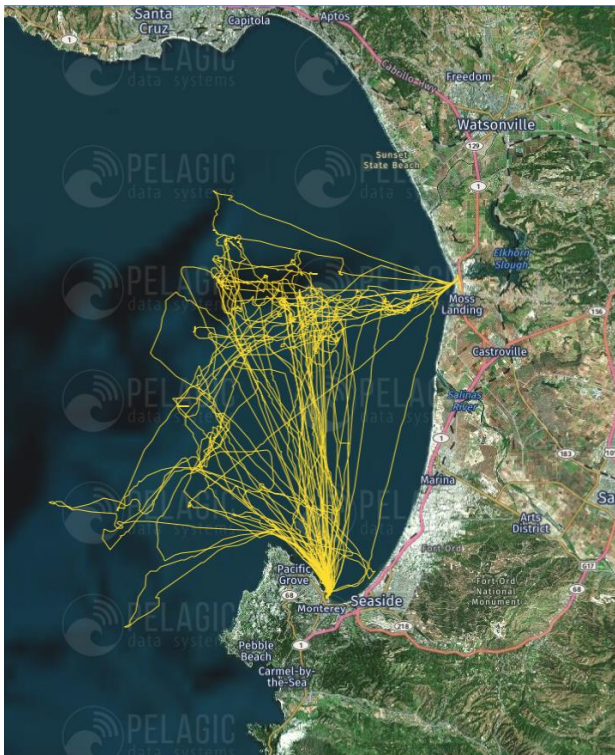


Figure 22. Track lines for all whale watch trips from November 1 – November 16, 2020, within the Monterey Bay area.

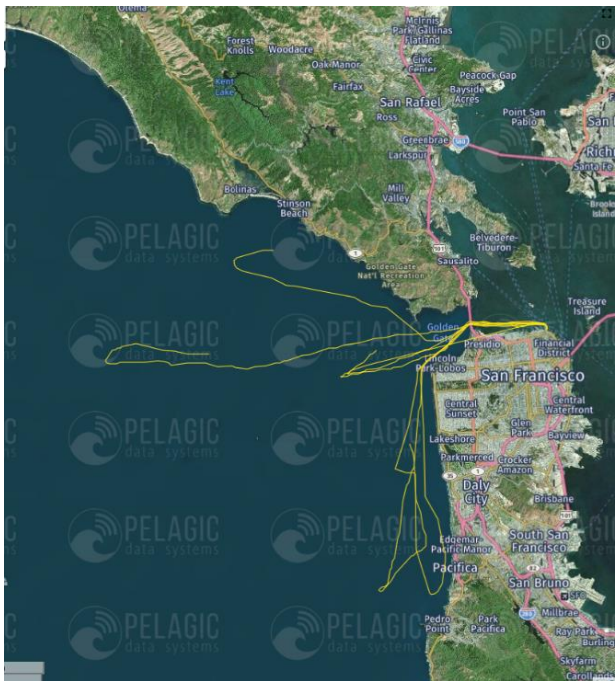


Figure 23. Track lines for all whale watch trips from November 1 – November 16, 2020, within the San Francisco Bay area.

### California Coast Crab Association Vessel Survey Pilot – *Fishing Zone 1*

This industry-led pilot effort to collect Marine Life Concentrations data surveyed an area from Cape Mendocino to the Oregon border. Limited data was collected but the survey noted aggregations of Humpback whales between Eureka and Patrick's Point as well as in an area south of Crescent City.