

2023-2024 Risk Assessment Preliminary Assessment and Available Data for Risk Assessment Mitigation Program

Last updated: April 29, 2024

PRELIMINARY ASSESSMENT

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 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.

Recommended Management Actions

Commercial Fishery:

- Fishing Zones 1 and 2: Continue Depth Constraint (30-Fathom) and Fleet Advisory

Recreational Fishery:

- Fishing Zones 3, 4, and 5: Continue Crab Trap Prohibition
- All Fishing Zones: Continue Fleet Advisory

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Table 1. Fishing Zones and current management status in the California commercial and recreational Dungeness crab fishery.

Fishing Zone	Commercial Fishery: Current Management Status	Commercial Fishery: Proposed Management Status	Recreational Fishery: Current Management Status	Recreational Fishery: Proposed Management Status
1	30-Fathom Depth Constraint; Fleet Advisory	30-Fathom Depth Constraint; Fleet Advisory	Fleet Advisory	Fleet Advisory
2	30-Fathom Depth Constraint; Fleet Advisory	30-Fathom Depth Constraint; Fleet Advisory	Fleet Advisory	Fleet Advisory
3	Season Closure	Season Closure	Crab Trap Prohibition; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory
4	Season Closure	Season Closure	Crab Trap Prohibition; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory
5	Season Closure	Season Closure	Crab Trap Prohibition; Fleet Advisory	Crab Trap Prohibition; Fleet Advisory
6	Season Closure	Season Closure	Fleet Advisory	Fleet Advisory

I. Management Recommendation Summary Rationale

Entanglements: No new entanglements of Actionable Species have been reported since the last Risk Assessment on April 17, 2024. Confirmed humpback whale entanglements in California commercial Dungeness crab fishing gear and Unknown Fishing Gear bring the three-year rolling average Impact Score to 3.39. Additionally, the three-year rolling average Impact Score for leatherback sea turtles is 0.33. For more information, please see the [RAMP Entanglement History](#) document.

Marine Life Concentrations: CDFW scheduled an aerial survey on April 23, 2024, but was unable to complete the survey due to heavy cloud cover across Fishing Zones 1 and 2. Oregon State University (OSU) conducted a vessel survey in Fishing Zones 1 on April 18-19, 2024, and observed a total of six humpback whales and eight unidentified whales. NOAA Southwest Fisheries Science Center (SWFSC) conducted an aerial survey on April 18, 2024, in Fishing Zones 1-2 and partially Fishing Zone 3, but no Actionable Species were observed. Monterey Bay Whale Watch data observed a weekly average of 7.7 whales per half-day trip, and a peak of 18 whales observed during half-day trips on April 18, 2024, in Fishing Zone 4.

Marine Region’s preliminary recommendation is for the Director to continue the Management Actions currently in place for both the commercial and recreational fisheries, including the 30-fathom Depth Constraint in Fishing Zones 1-2 for the commercial

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fishery and the Crab Trap Prohibition in Fishing Zones 3, 4 and 5 for the recreational fishery. The Depth Constraint and Crab Trap Prohibition went into effect on April 8, 2024, at 6:00pm. A Fleet Advisory would also be maintained for all open Fishing Zones for both the commercial and recreational fisheries.

Due to low numbers of humpback whales, Marine Region staff do not recommend additional Management Actions for Fishing Zones 1 and 2 for the commercial or recreational fisheries. The commercial fishery is closed in Fishing Zones 3-6 and recreational traps have been prohibited in Fishing Zones 3-5 until the season closure on June 30, 2024. Based on historical migration patterns, humpback whale sightings are expected to increase into all Fishing Zones over the coming weeks. The 30-fathom Depth Constraint currently in place for the commercial fishery will minimize overlap with foraging humpback whales and limited recreational trap fishing in Fishing Zones 1 and 2 does not present an elevated risk at this time. The total number of commercial traps in Fishing Zones 1 and 2 has decreased since the last Risk Assessment from 30,824 traps on April 1, 2024, to 24,709 as of the last bi-weekly reporting period. The number of reporting permits decreased from 215 active permits on April 1, 2024 to 155 permits as of the last bi-weekly reporting period. In addition, the Depth Constraint will also help mitigate entanglement risk due to high habitat compression, as modeled by the Habitat Compression Index, by limiting fishing activity to nearshore, shallower depths.

Extending the current Management Actions will allow for continued fishing opportunities in Fishing Zones 1 and 2 while mitigating entanglement risk until the next Risk Assessment in mid-May. This preliminary recommendation is based on the historical migration patterns, current Entanglement Impact Score and observed Marine Life Concentrations.

For additional details, see the Entanglement and Marine Life Concentration sections of this Available Data document.

II. Alternative Management Actions for the Commercial Fishery

Alternatives Considered but Rejected

- Alternative Gear- can be authorized after April 1st, but no gear is currently authorized for the commercial Dungeness crab fishery.
- Gear Reduction – considered for Fishing Zones 1 and 2 but not recommended at this time due to declining fishing effort (based on bi-weekly reporting) but will be evaluated again at the next Risk Assessment.

AVAILABLE DATA

III. Triggers Requiring Management Action

I. Confirmed Entanglements: §132.8(c)(1)

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

No entanglements have been reported in 2024. For recent entanglement information please see the CDFW [RAMP Entanglement History](#) document. See "[FAQ: Impact Scoring for the Risk Assessment and Mitigation Program](#)" for information about the RAMP Impact Score.

Table 2. Impact Score Calculations based on Confirmed Entanglements in California commercial Dungeness crab gear and Confirmed Entanglements in Unknown Fishing Gear reported off California.

Actionable Species	Current Fishing Season Impact Score (2023-24)	Current Calendar Year Impact Score (2024)	3-Year Rolling Average
Humpback whales	0	0	3.39
Leatherback sea turtle	0	0	0.33

As of April 29, 2024, there have been zero Confirmed Entanglements of humpback whales, blue whales or leatherback sea turtles during the 2023-2024 season.

II. Marine Life Concentrations: §132.8(c)(2)

Data provided by: Karin Forney (NOAA SWFSC), John Calambokidis (Cascadia Research Collective data courtesy of Oregon State University MOSAIC project), Scott Benson (NOAA SWFSC, data courtesy of The Nature Conservancy Solomon Islands), and Monterey Bay Whale Watch (processed by Karin Forney, NOAA SWFSC)

Aerial and vessel survey data from April 19th, 2024 to April 26, 2024 available online with the [Arc Map Viewer](#). Past Risk Assessment survey data have been combined in a [2023-2024 Season RAMP Survey Map](#).

For assistance with using Arc Map Viewer, please see the [How to Guide](#).

According to the RAMP regulations for the period of March 1 until the Fishing Season closes statewide a trigger has been met when:

- The number of humpback whales is greater than or equal to 10, or there is a running average of five or more animals over a one-week period within a single Fishing Zone.
- The number of blue whales is greater than or equal to three, or there is a running average of three or more animals over a one-week period within a single Fishing Zone

- The number of Pacific leatherback sea turtle is greater than or equal to one within any Fishing Zone

Table 31. 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	CRC/OSU Vessel Survey, NOAA SWFSC Aerial Survey	No
Zone 2	NOAA SWFSC Aerial Survey	No
Zone 3*	NOAA SWFSC Aerial Survey**	Season closed
Zone 4*	CRC/OSU Vessel Survey, MBWW	Season closed
Zone 5*	None	Season closed
Zone 6*	None	Season closed

*Fishing Zone is closed for the commercial fishery for the remainder of the statutory season

** Partial Fishing Zone coverage

A. CDFW Surveys

CDFW scheduled an aerial survey on April 23, 2024, but was unable to complete the survey due to heavy cloud cover throughout Fishing Zones 1 and 2.

B. NOAA SWFSC Surveys (Fishing Zones 1-3)

NOAA SWFSC conducted an aerial survey on April 18, 2024, within Fishing Zones 1-2 and part of Fishing Zone 3, covering zig-zag transect lines from the coast to the 50-fathom isobath between the Russian River and the CA/OR border. No Actionable Species were observed during the flight (Figure 1). Observations included harbor porpoises, Pacific white-sided dolphins, Risso’s dolphins, and one group of two gray whales.

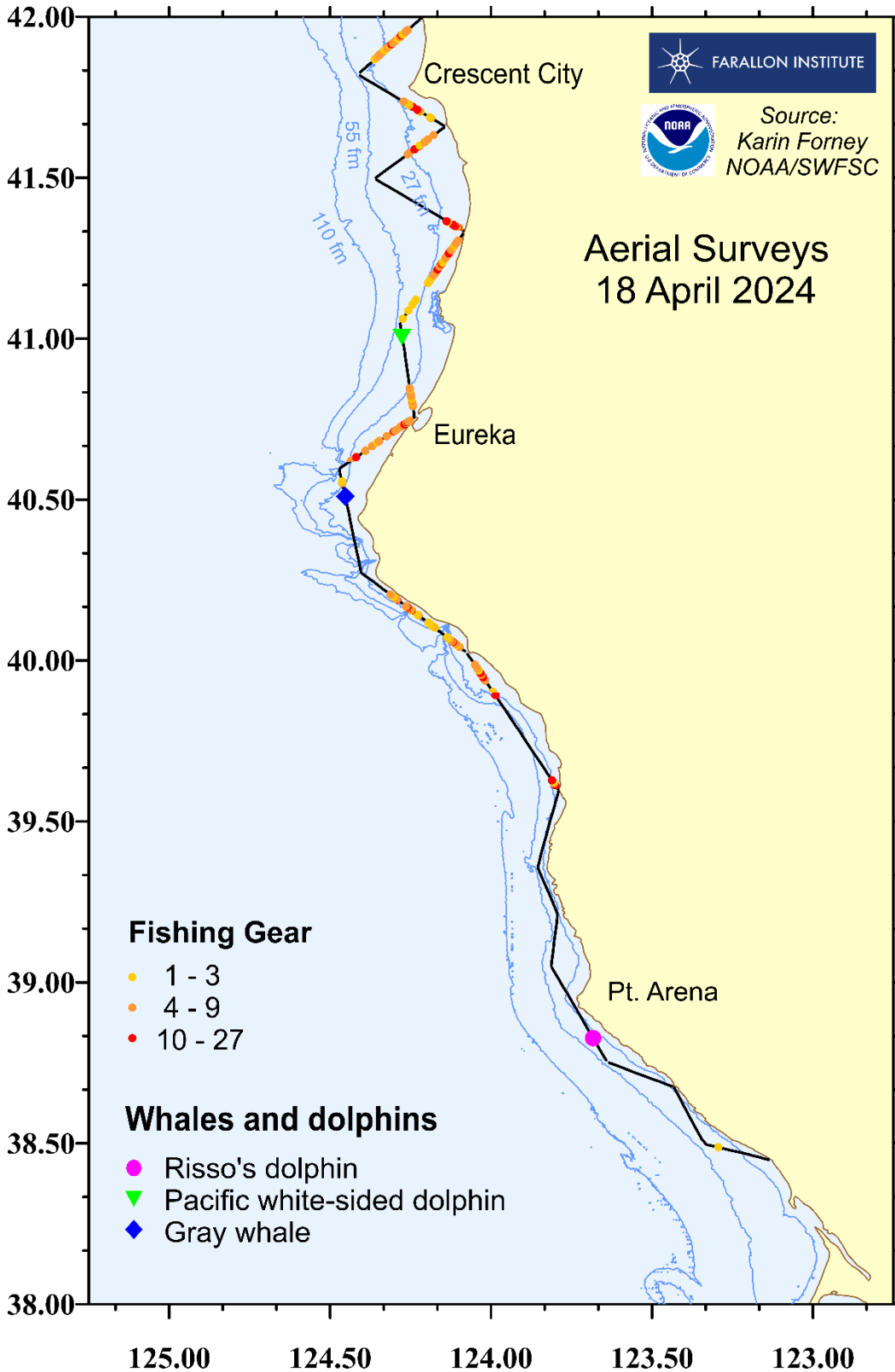


Figure 1. Plot for the aerial surveys conducted 18 April 2024, showing transects lines flown (black lines), whale and dolphin sighting locations, and recorded fishing gear. The depth contours shown are 50 m (~27 fathoms), 100 m (~55 fathoms), and 200 m (~110 fathoms).

C. Cascadia Research Survey (Fishing Zones 1, 4)

On April 18th, 2024, Oregon State University's (OSU) MOSAIC project team conducted a vessel survey in Northern California (Fishing Zone 1). Five humpback whales and one unidentified whale were observed.

On April 19th, 2024, the OSU-MOSAIC project team continued their vessel survey in Fishing Zone 1. One humpback whale and seven unidentified whales in deeper offshore waters were observed.

On April 24th, 2024, Cascadia Research Collective (CRC) conducted a vessel survey in the central Monterey Bay area (Fishing Zone 4). They observed 14 humpback whales and zero unidentified whales.

Table 4. Summary of Cascadia Research and Oregon State University vessel surveys in Fishing Zones 1 and 4 on April 18, 19, and 24, 2024.

Date	Organization	Fishing Zone	Humpback whale sightings	# of humpback whales sighted	Unidentified whale sightings	# of unidentified whales sighted
4/18/24	OSU-MOSAIC	1	4	5	1	1
4/19/24	OSU-MOSAIC	1	1	1	6	7
4/24/24	CRC	4	9	14	0	0

D. NMFS Leatherback Surveys (All Fishing Zones)

The post-nesting female leatherback sea turtle was tagged with a satellite linked transmitter by the Nature Conservancy at a beach in the Solomon Islands on June 7, 2023. The turtle completed a trans-Pacific crossing by early March 2024 and engaged in foraging behavior in deep waters off the coast of northern Baja California, Mexico.

The transmitter last reported on April 15, 2024, approximately 150 km WSW of Ensenada, Mexico. The cause of cessation of transmissions is unknown, however it is likely that the batteries have expired after 10 months of transmissions.

Past telemetry data indicate that leatherback sea turtles often enter US West Coast waters off southern California before turning northward and moving up the coast to central California during late spring/early summer.

E. Monterey Bay Whale Watch Surveys (Fishing Zone 4)

Monterey Bay Whale Watch conducted whale watching trips in southern Monterey Bay on all seven days during the week of April 18-24, 2024. The seven-day average number of humpback whales per half day trip was 7.7 (Figure 2), with a peak of 18 humpback whales observed during an all-day trip on April 18, 2024.

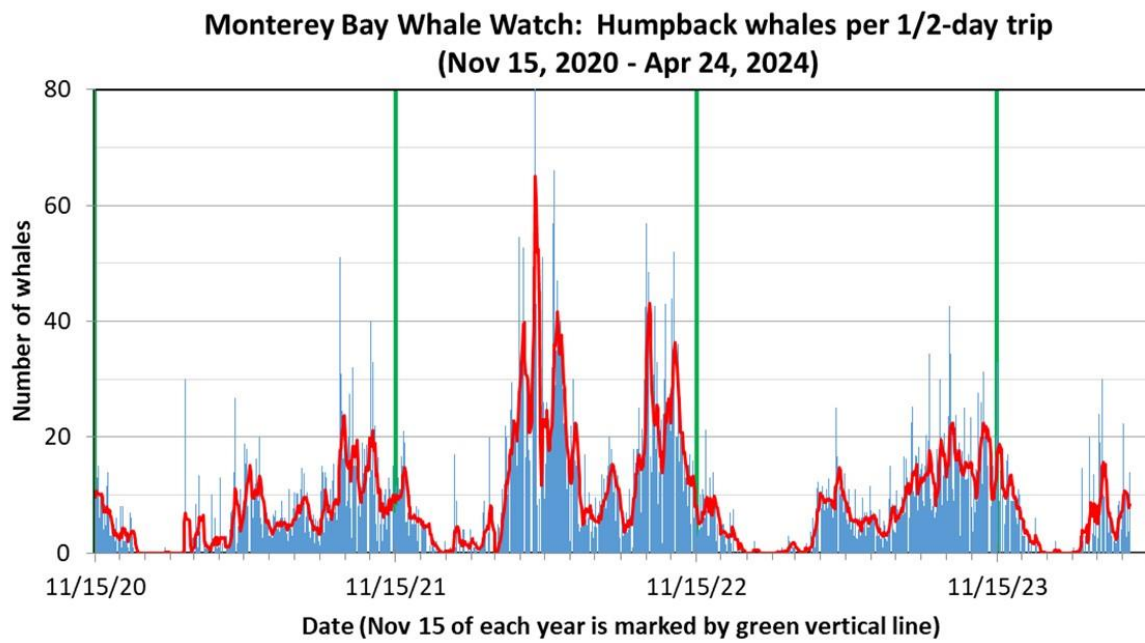


Figure 2. Standardized number of humpback whale sightings for Monterey Bay Whale Watch from November 15, 2020 – April 24, 2024. The y-axis is the number of whales per half-day trip; the thin blue bars are the average daily whale numbers, and the red line is a 7-day running average to make the patterns 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.

IV. Management Considerations

I. Information from NOAA: § 132.8(d)(2)

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

No entanglements for Actionable Species have been reported since the Risk Assessment on April 17, 2024. For more entanglement information please see the CDFW [RAMP Entanglement History](#) document.

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

Data provided by: Point Blue Conservation Science and Monterey Bay Whale Watch (processed by Karin Forney NOAA SWFSC)

A. Point Blue Conservation Science (Fishing Zones 3, 4, and 6)

For current observation data please see the [Point Blue Whale Alert map](#).

Table 5. Summary of available humpback and blue whale recorded reported via Point Blue Conservation Science in Fishing Zones 3, 4, and 6 during the seven-day period ending April 26, 2024.

Fishing Zone	Number of humpback whales sighted	Number of blue whales sighted
Zone 3	5	0
Zone 4	1	0
Zone 6	18	5

B. Monterey Bay Whale Watch (Fishing Zone 4)

The semi-monthly average number of humpback whales per half day trip in southern Monterey Bay during the second half of April 2024 was slightly less than the historical average for that time period (Figure 3).

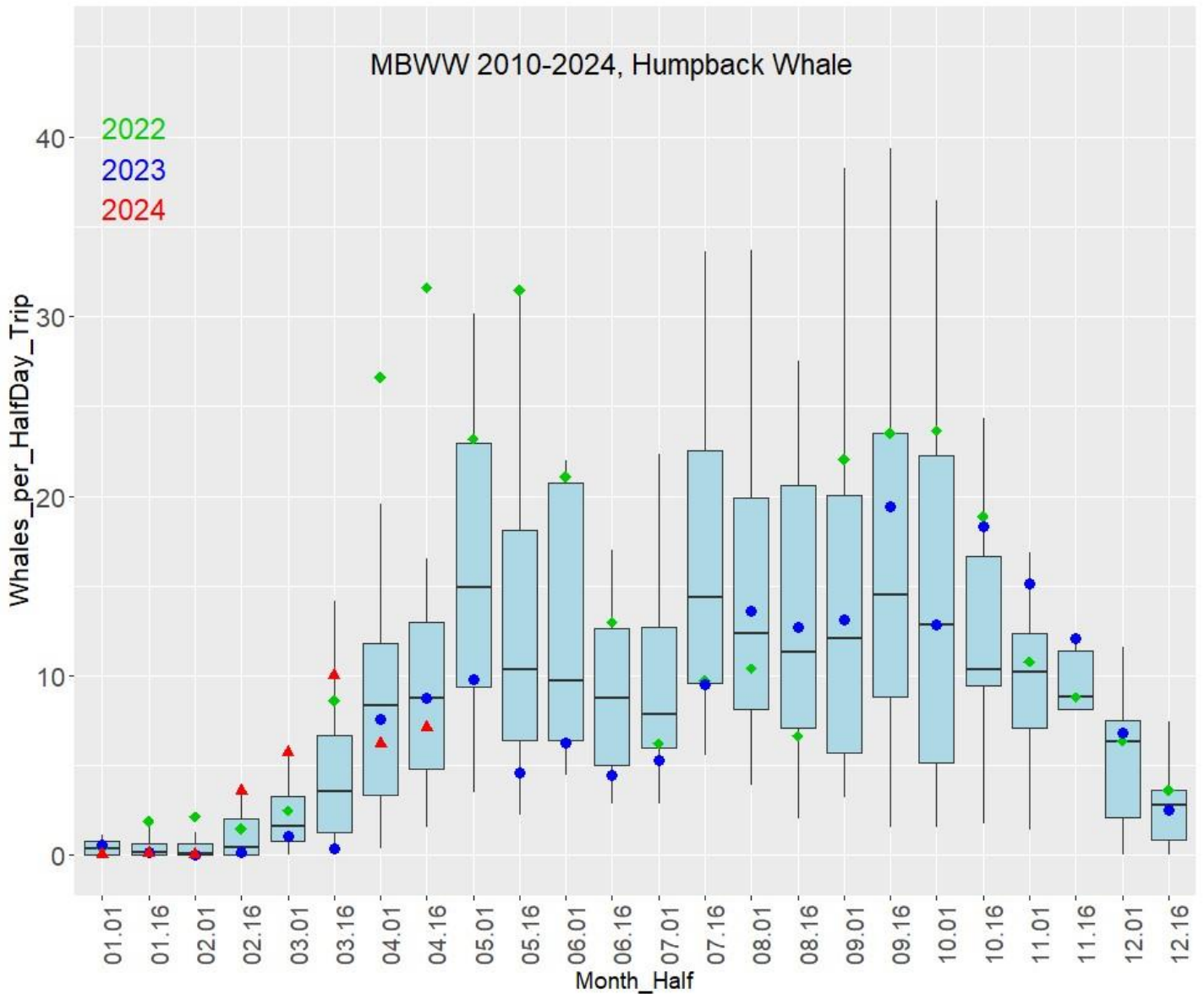


Figure 3. Historical Monterey Bay Whale Watch data for 2010-2024, summarizing the average and variation in the number of humpback whales per half-day trip on a semi-monthly basis (1st- 15th, 16th- end of month). This boxplot follows standard statistical practice in that the black horizontal line is the 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 2022 (green diamonds), 2023 (blue dots) and 2024 (red triangles) and are provided for reference, placing recent whale numbers in a historical context.

C. Whale Watch 2.0 (All Fishing Zones)

No new data. Please see the [April 12, 2024, Available Data and Preliminary Assessment document](#). More information can be access at the [NOAA Coastwatch Habitat Suitability Map](#).

III. Fishing Season dynamics: §132.8(d)(7)

Data provided by: California Department of Fish and Wildlife. *CDFW data presented in this section is preliminary and subject to revision.

A. Marine Landings Data System (All Fishing Zones)

The commercial fishery is currently open in Fishing Zones 1 and 2 under a 30-Fathom Depth Constraint and all other Fishing Zones are closed. A summary of landings from all Fishing Zones is provided below (Table 6).

Table 6. Summary of fishing season dynamics information for the commercial fishery, as of April 25, 2024.

Metric	Metric	Additional Info
Season status	NA	Fishing Zones 3-6 are closed
Number of landings	5,434	NA
Total volume (pounds)	13,633,272	NA
Total Ex-Vessel Value	\$46,591,460	NA
Average unit price	\$3.69	NA
Maximum number of active permits to date	345	NA
Maximum potential traps (based on maximum active permits to date)	81,725 *Note: estimated maximum potential traps reflects the 50% Gear Reduction in Fishing Zones 3-6	Estimates are also provided in the Bi-Weekly Fishing Activity Reports Subsection

Total volume (pounds) peaked during the week of January 19, 2024, at just over 4 million pounds and has since been decreasing (Figure 4). Fishing Zone 3 shows the highest landings over the course of the season at 8.4 million pounds, followed by Fishing Zone 1 at 4.4 million pounds.

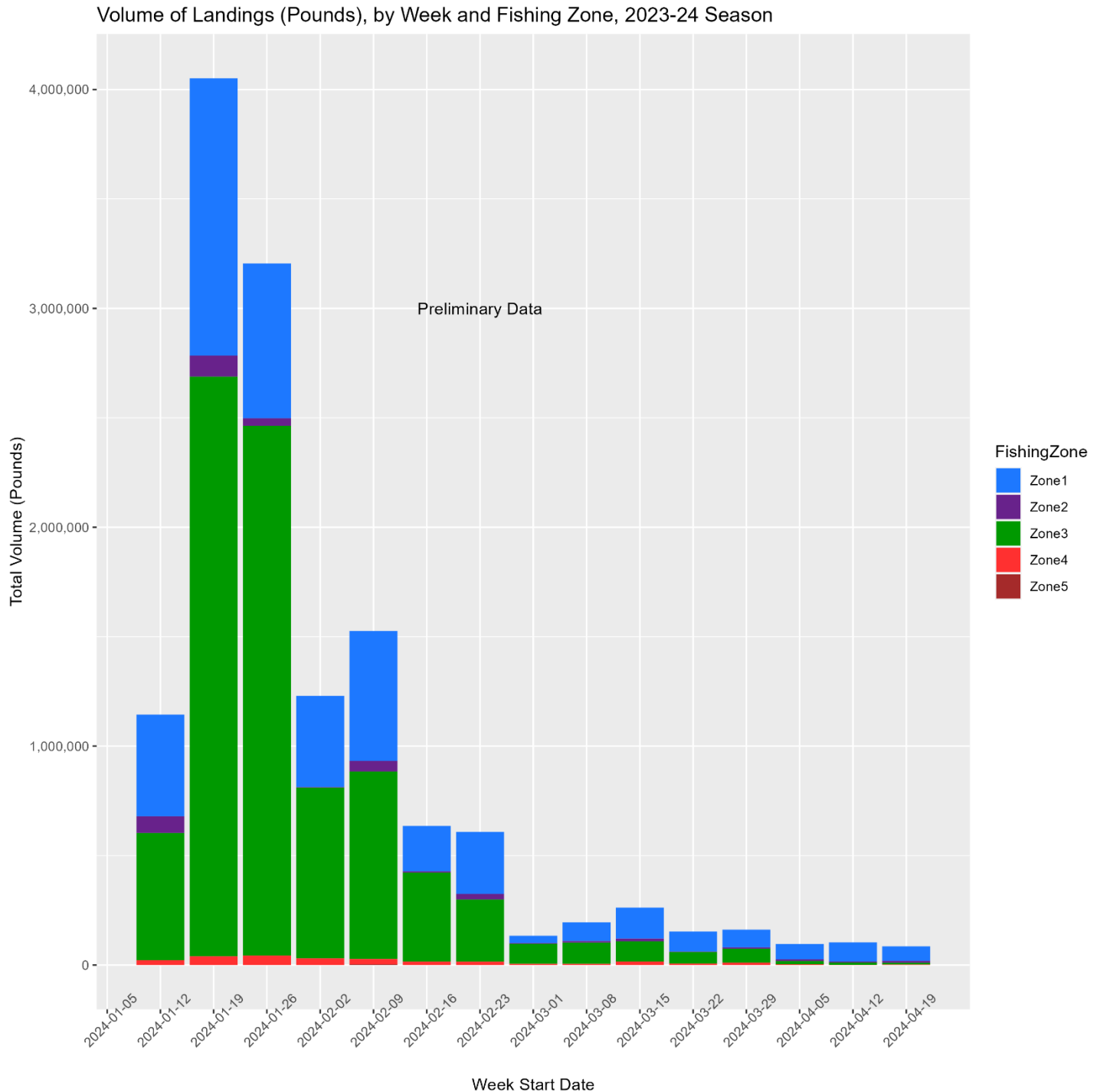


Figure 4. Cumulative volume (pounds) landed by week and Fishing Zone. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, January 5, 2024. All data are preliminary and subject to change. Certain week-Fishing Zone combinations are withheld due to confidentiality constraints.

Fishing Zone 3 shows the highest number of active vessels throughout the majority of the fishing season to date with a high of 170 active vessels, followed by Fishing Zone 1 with a high of 116 vessels (Figure 5). The number of active vessels peaked in late January and has been trending downward since the opening. Note that fishing activity in Fishing Zones 3-6 that occurred after the closure on April 8, 2024 is due to Experimental Fishing Permit landings.

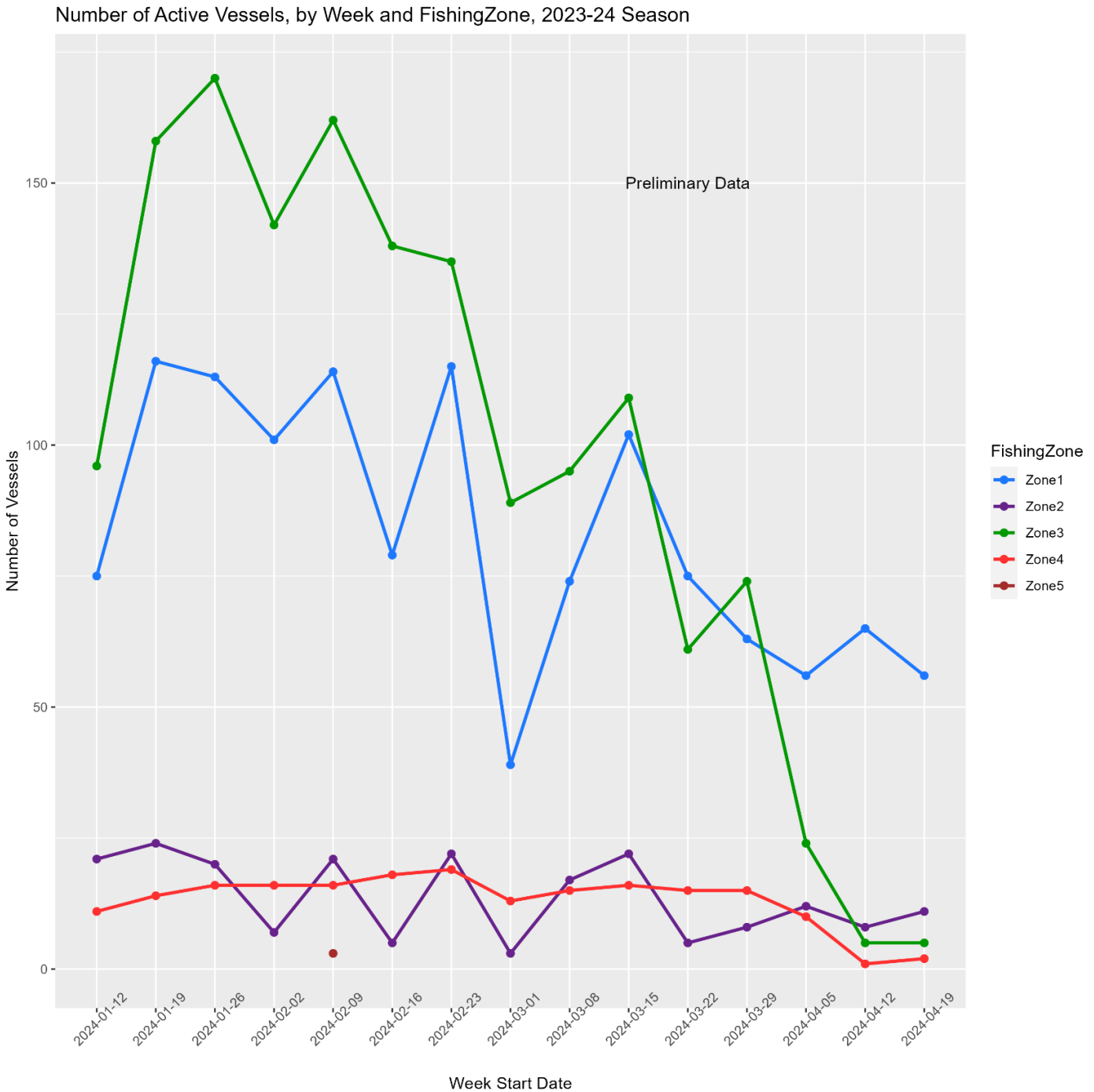


Figure 5. Number of active vessels by week and Fishing Zone. Week 1 starts with the first day the commercial Dungeness crab fishery was open in any area, January 5, 2024. All data are preliminary and subject to change. Some week- Fishing Zone combinations are withheld due to confidentiality constraints. Note that fishing activity in Fishing Zones 3-6 that occurred after the closure on April 8, 2024 is due to Experimental Fishing Permit landings.

B. Bi-Weekly Fishing Activity Reports (All Fishing Zones)

CDFW has received bi-weekly reports since the first reporting period on January 16, 2024, through the most recent reporting period of April 16, 2024. A summary of reports received for April 16, 2024 provided in Table 7; note this summary may not reflect all permitted vessels participating in the fishery due to compliance issues. In addition, Table 8 shows the summary of total traps by Fishing Zone for the four most recent reporting periods. The April 16 report period marks the last report for those that concluded fishing by April 8 in Fishing Zones 3 and 4. A total of 823 lost traps has been reported from these two Fishing Zones.

Table 7. Summary of information provided for the April 16, 2024, bi-weekly reporting period by Fishing Zone (1-6). Accessed from CDFW's Bi-Weekly Reporting database on April 24, 2024.

Fishing Zone	Permits Reporting	Avg. Trap Number	Total Traps	Avg. Min. Depth (fa.)	Avg. Max. Depth (fa.)	Max. Depth (fa.)	Final Report	Number of Lost Traps
Zone 1	79	288	21,942	11	23	50	13	94
Zone 2	18	172	2,767	11	23	30	3	5
Zone 3	51	132	4,913	19	37	80	51	269
Zone 4	7	103	415	31	42	50	7	45
Zone 5	0	0	0	0	0	0	0	0
Zone 6	0	0	0	0	0	0	0	0
Totals	155	NA	30,037	NA	NA	NA	74	413

Table 8. Total reported traps deployed in each Fishing Zone for all seven bi-weekly reporting periods for this Fishing Season. NR-C refers to data withheld due to confidentiality and all data is preliminary and subject to change.

Fishing Zone	Jan 16 - Total Traps	Feb 1 - Total Traps	Feb 16 - Total Traps	Mar 1 - Total Traps	Mar 16 - Total Traps	Apr 1 - Total Traps	Apr 16 - Total Traps
Zone 1	20,272	37,610	37,986	39,532	29,553	24,124	21,942
Zone 2	2,857	4,654	4,497	4,720	3,614	2,582	2,767
Zone 3	18,149	25,360	23,345	21,389	15,936	10,704	4,913
Zone 4	1,344	2,425	2,907	2,721	2,523	1,263	415
Zone 5	0	0	NR-C	NR-C	NR-C	NR-C	0
Zone 6	0	0	0	0	0	0	0
Totals	42,622	70,049	68,735	68,362	51,626	38,673	30,037

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

A. MBARI Krill Model

No new data. Please see the [April 12th Available Data and Preliminary Assessment document](#) for latest information. Current information can also be accessed from the [MBARI website](#).

V. Ocean conditions: §132.8(d)(9)

A. El Niño/Southern Oscillation (ENSO) Diagnostic

As of April 11, 2024, a transition from El Niño to ENSO-neutral is likely by April-June 2024 (85% chance), with the odds of La Niña developing by June-August 2024 (60% chance). Please visit the [NOAA ENSO Diagnostic webpage](#) for more information.

B. Large Marine Heatwave Tracker

No new data. Please see the [April 12th Available Data and Preliminary Assessment document](#) for latest information. Please visit the [NOAA Marine Heatwave Tracker webpage](#) for more information.

C. Habitat Compression Index

No new data. Please see the [April 12th Available Data and Preliminary Assessment document](#) for latest information. Current information can also be accessed from the [NOAA Habitat Compression Index webpage](#).

VI. Effectiveness of management measures: §132.8(d)(3)

Data provided by: California Department of Fish and Wildlife

CDFW's effectiveness evaluation for the Management Actions specified in §132.8(e) are provided above in the Preliminary Assessment.

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

Data provided by: California Department of Fish and Wildlife

The RAMP regulations specify that, when deciding amongst multiple management measures which would equivalently reduce entanglement risk, CDFW shall consider total economic impact to the fleet and fishing communities.

VIII. Current Impact Score Calculation: §132.8(d)(10)

Data provided by: California Department of Fish and Wildlife

See Table 2 for the current fishing season and calendar year Impact Score. For more information about Impact scoring, please review the [Impact Score FAQ](#).