

Collaborative Approaches to Addressing Whale Entanglement



Marine Mammal Commission 2025 Annual Meeting

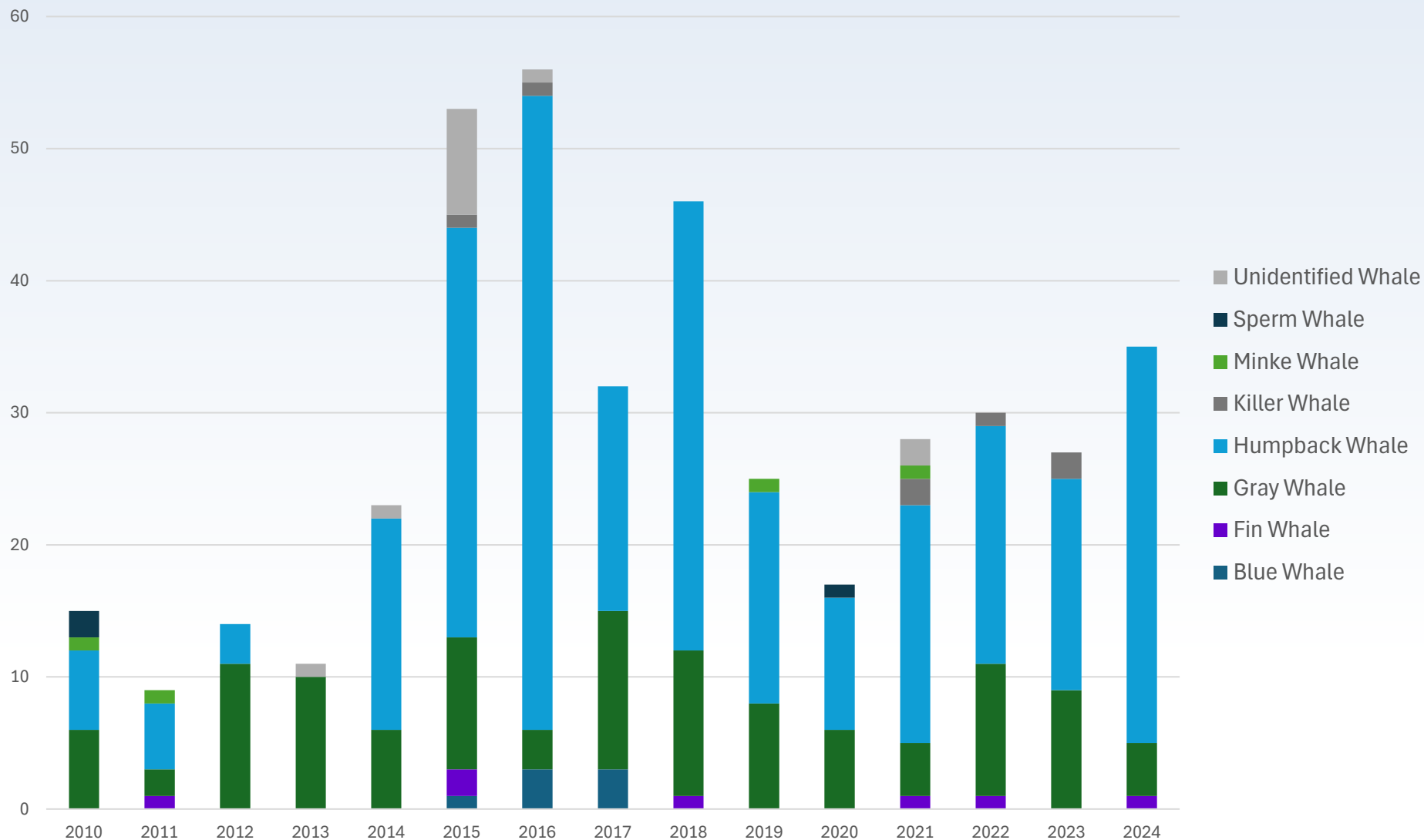
Ryan Bartling
Senior Environmental Scientist
Marine Region
California Department of Fish and Wildlife





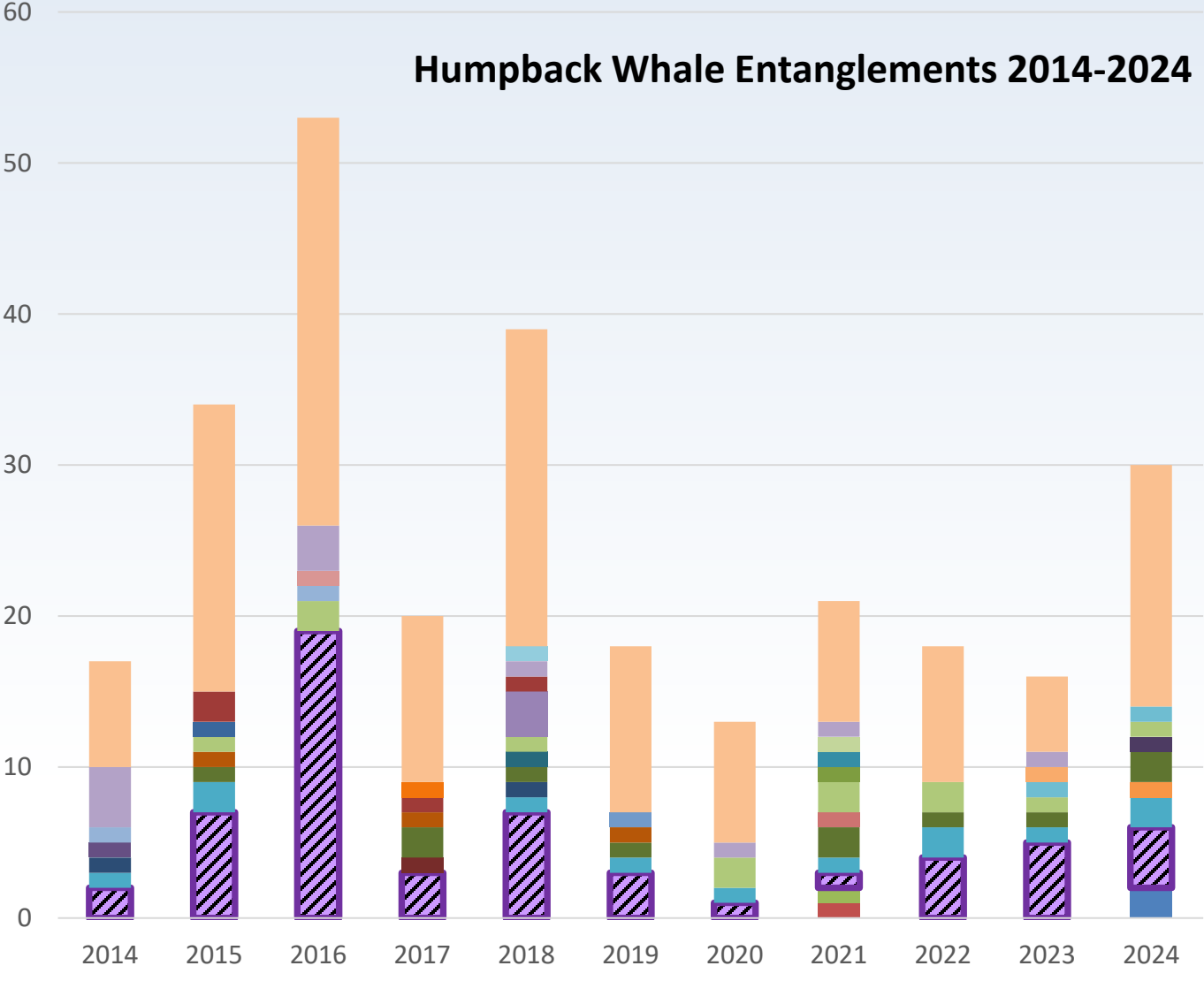
West Coast Whale Entanglements

West Coast Whale Entanglements 2010-2024 - All Fishing Gear





Humpback Whale Entanglements



- Unidentified
- Spot prawn recreational, CA
- Spot prawn commercial, CA
- Spiny lobster commercial, CA
- Sablefish pot commercial, state unknown
- Sablefish pot commercial, OR
- Sablefish pot commercial, CA and Coonstripe shrimp commercial, CA
- Recreational hook and line
- Other
- OPEN ACCESS FIXED GEAR HOOK AND LINE
- Net
- Lobster commercial, CA
- Halibut longline + Sablefish pot
- Groundfish trawl
- Gillnet tribal, WA
- Gillnet
- Experimental Commercial Box crab, CA
- Dungeness crab, unknown, and rock crab commercial, CA
- Dungeness crab recreational, CA
- Dungeness crab commercial, WA and tribal
- Dungeness crab commercial, WA and other gear
- Dungeness crab commercial, WA
- Dungeness crab commercial, tribal
- Dungeness crab commercial, state unknown
- Dungeness crab commercial, OR/WA
- Dungeness crab commercial, OR
- Dungeness crab commercial, CA
- Drift Gillnet, CA
- Drift gillnet
- Coonstripe shrimp, commercial

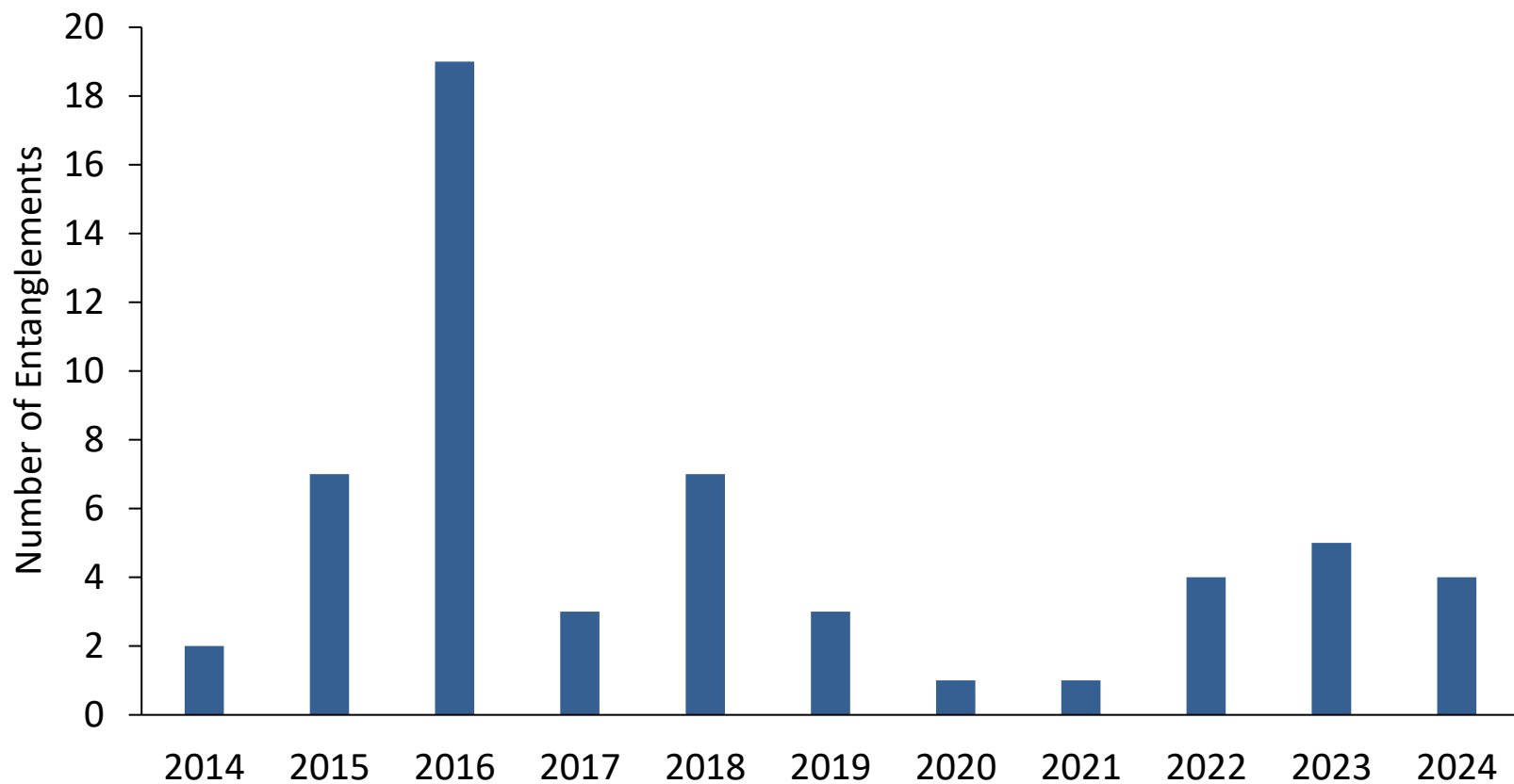


Entanglements: Commercial Dungeness Crab



Credit: NOAA NMFS

**Confirmed CA Commercial Dcrab Entanglements:
Humpback Whales (2014-2024)**



NMFS WCRO Whale Entanglement Response Database (as of 1/10/25)



CA Dungeness Crab Fishing Gear Working Group

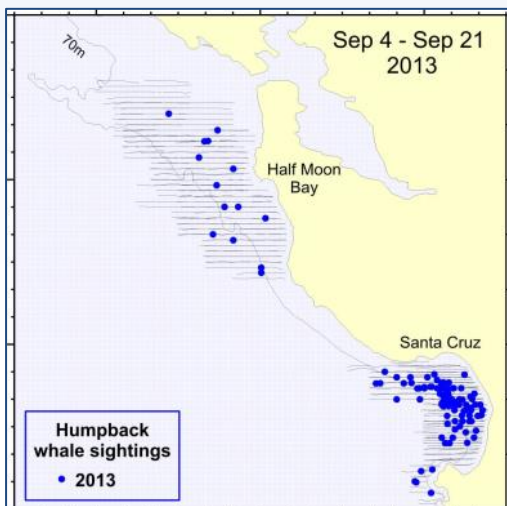


- **Established** - 2015
- **Stakeholder Group** – multiple interests represented
- **Goal** - thriving whale populations and Dungeness crab fishery
- **Initial Work** - RAMP Pilot and Gear Modifications, Best Fishing Practices
- **Ongoing** – Risk Assessments and Gear Recovery



Working Group Supported RAMP Pilot

- Entanglement history
- Species abundance and distribution
- Forage species/oceanography
- Fishing dynamics



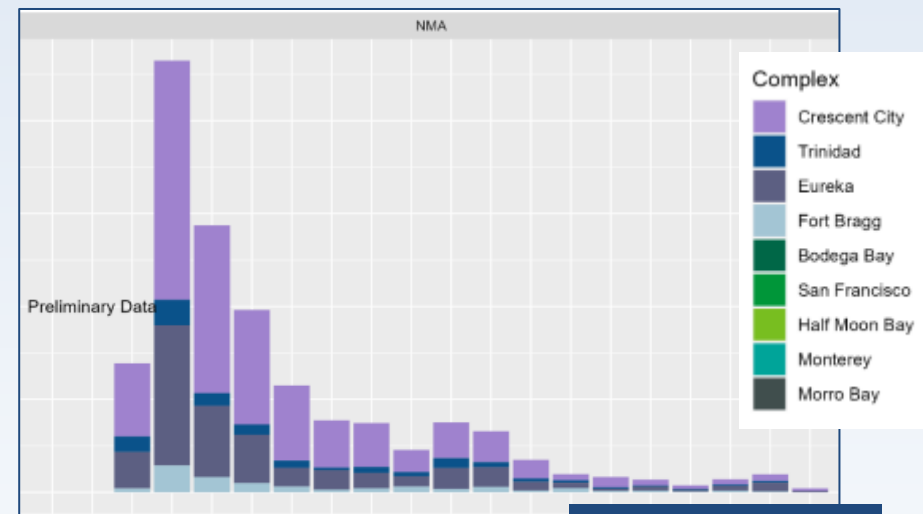
Marine mammal sightings

Source: Karin Forney



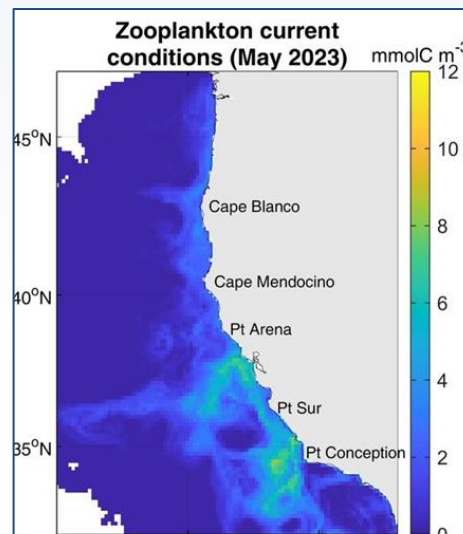
Entanglement history

Credit: NOAA NMFS



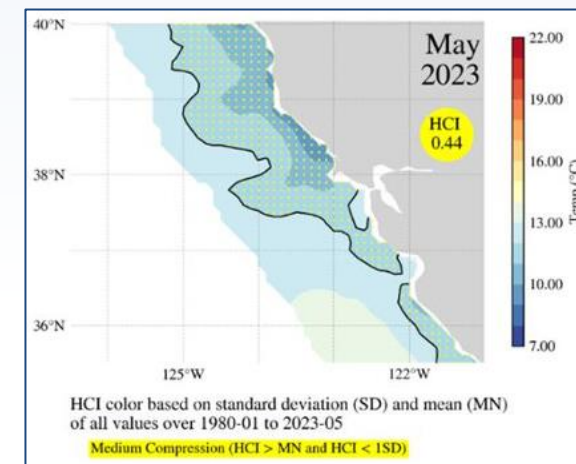
Fishing dynamics

Source: CDFW



Forage species & Oceanography

Sources: MBARI, NOAA NMFS





Working Group Collaboration

- Other Collaborative Projects
 - Development of Best Practices Guides
 - Disentanglement trainings & reporting
 - Whale and crab gear distribution surveys
 - Electronic monitoring pilot




Credit: Kathi George


BEST PRACTICES GUIDE

FOR AVOIDING MARINE LIFE ENTANGLEMENT
IN THE DUNGENESS CRAB FISHERY

Last updated October 2023




Surface Gear Length



Best Practices For All Crab Trap Fisheries

- **Minimize** knots, leads and scope
- **Reduce** slack surface line and keep vertical lines taut
- **Avoid** setting gear in the vicinity of whales and sea turtles
- **Communicate** locations of high whale activity to other fishing boats
- **Promptly remove** gear not being actively fished
- **Maintain** gear to ensure lines and buoys are in good condition so they do not break and get lost
- **Frequently check** traps and remove traps when whales are foraging in the area




Best Practices for the Commercial Trap Fishery

Water Depth	Best Practices Surface Gear Length
< 30 fathoms	Shortest possible - 3 fa max (18 ft)
30-50 fathoms	Shortest possible - 4 fa max (24 ft)
> 50 fathoms	Shortest possible - 5 fa max (30 ft)

Commercial Trap Fishery Regulatory Requirements

- Up to two trailer buoys and one end marker buoy
- End marker buoy attached to ≤ 3 feet of line

Water Depth	Regulation Surface Gear Length
< 35 fathoms	≤ 4 fa (24 ft)
≥ 35 fathoms	≤ 6 fa (36 ft)

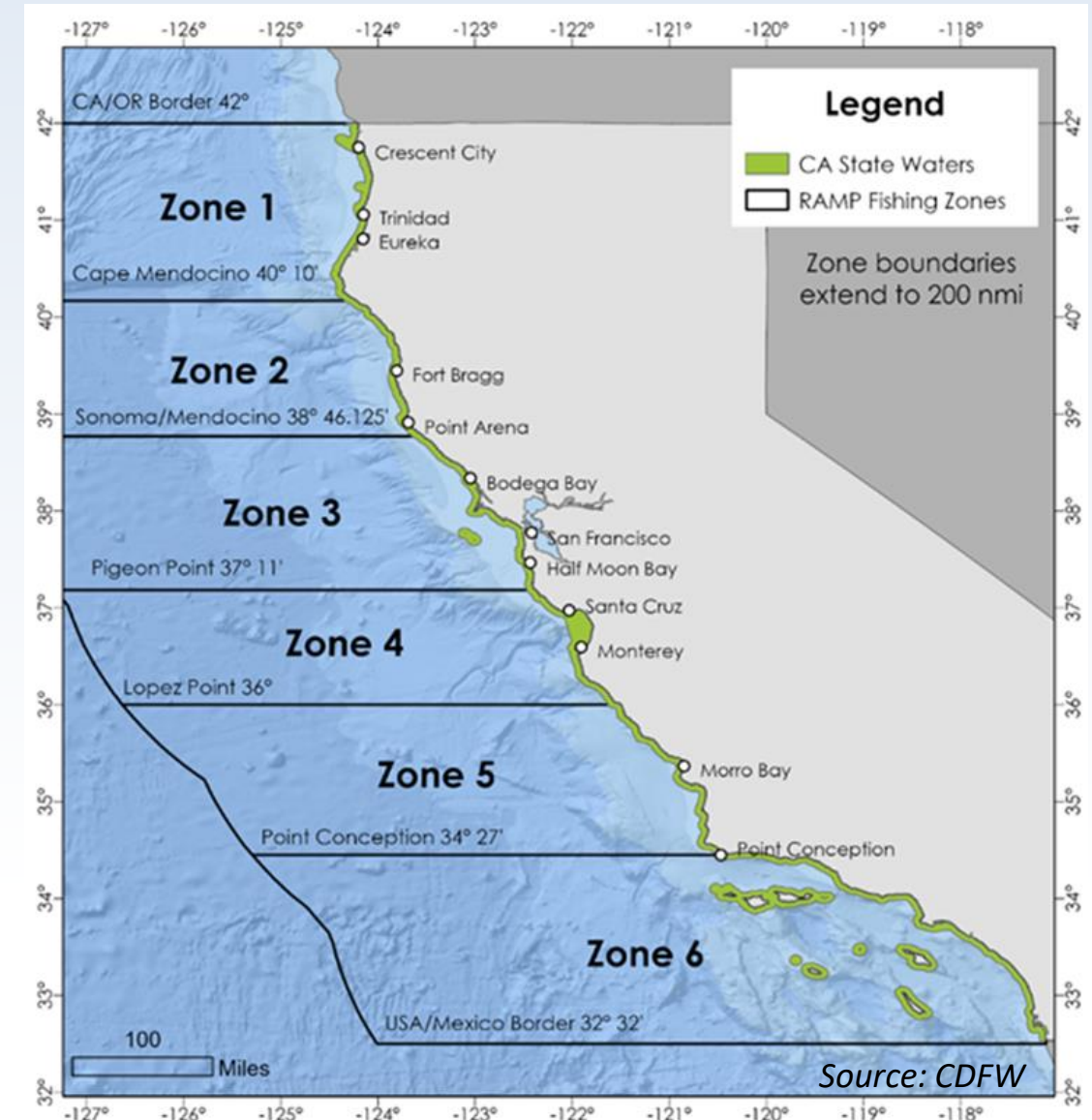


Initially developed by the California Department of Fish and Wildlife (CDFW) and National Marine Fisheries Service (NMFS) in collaboration with the California Dungeness Crab Fishing Gear Working Group and Ocean Protection Council.



Risk Assessment Mitigation Program (RAMP)

- Adaptive management to assess entanglement risk
- Near real time assessments
- Utilizes best available science
- Coordinate with a network of collaborators





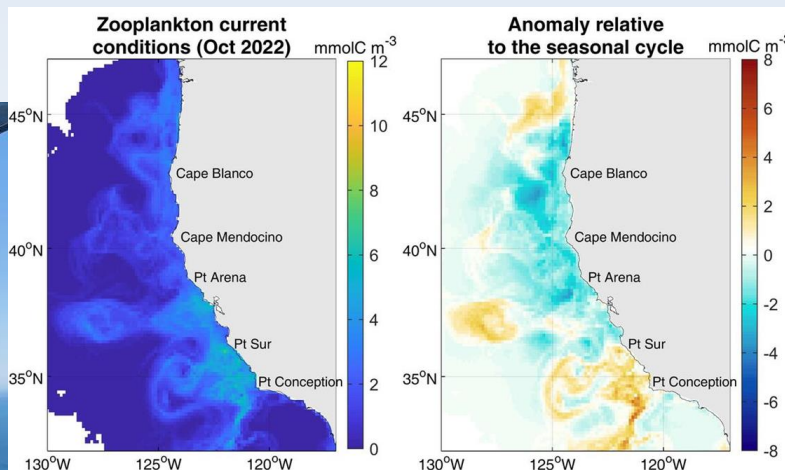
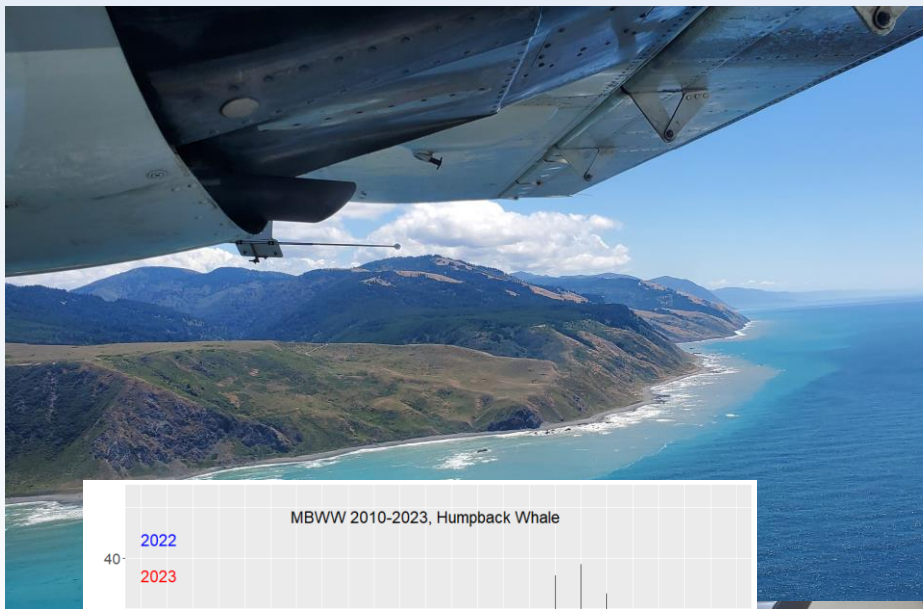
Science Driven Management Process

- NOAA Entanglement Reports
- Cascadia Research vessel surveys
- CDFW marine landings data
- CDFW bi-weekly Fishing Activity Reports
- NOAA/UCSC Oceanographic and forage data
- Monterey Bay Whale Watch
- Point Blue Conservation Science Observations
- CDFW Aerial Surveys
- NOAA Aerial Surveys
- USCG Aerial Surveys
- NOAA Leatherback sea turtle tagging and telemetry data
- Vessel monitoring data
- Working Group recommendation
- Information from NOAA
- Effectiveness of management measure(s)
- Economics
- Data availability
- Historic migration
- Fishing season dynamics
- Forage indices
- Ocean conditions
- Entanglement Impact score
- Marine life distribution

DATA INPUTS

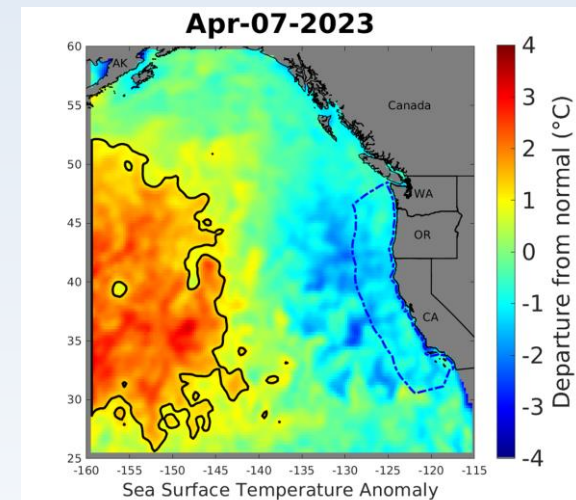


Data Collection & Analysis

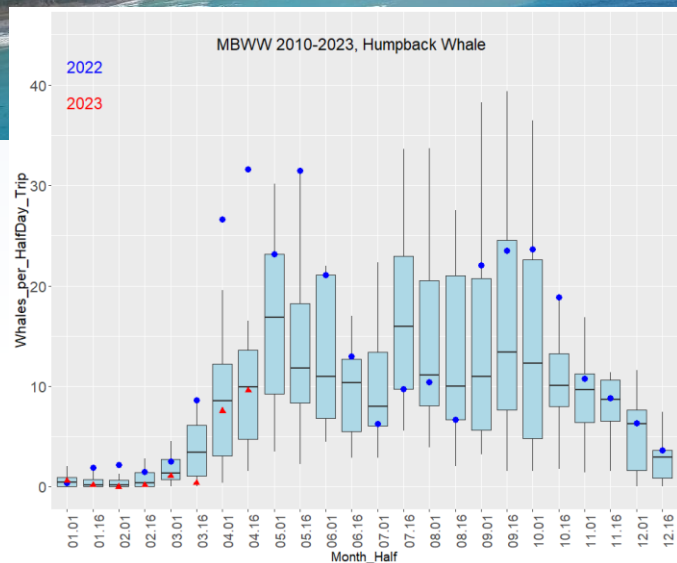


Source: MBARI

CDFW



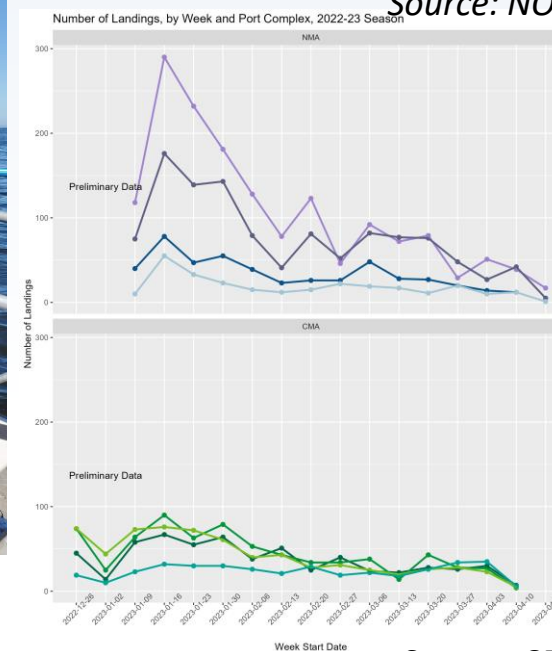
Source: NOAA



Source: Karin Forney



CDFW



Source: CDFW



Marine Life Concentration Aerial Surveys

Bathymetry Contours (meters)

-10
-30
-50
-100
-200

Observations

- Humpback Whale
- Blue Whale
- Fin Whale
- Gray Whale
- Unidentified Whale
- Leatherback Turtle
- Single Trap
- Trap String
- Trap Cluster
- Mola
- Dolphin
- Bait Ball
- Jellies
- Other

Flight Path

—

Zone 2
Humpback Whales = 23
Blue Whales = 0

Zone 3
Humpback Whales = 83
Blue Whales = 0

Source: CDFW



CDFW



CDFW



CDFW



CDFW



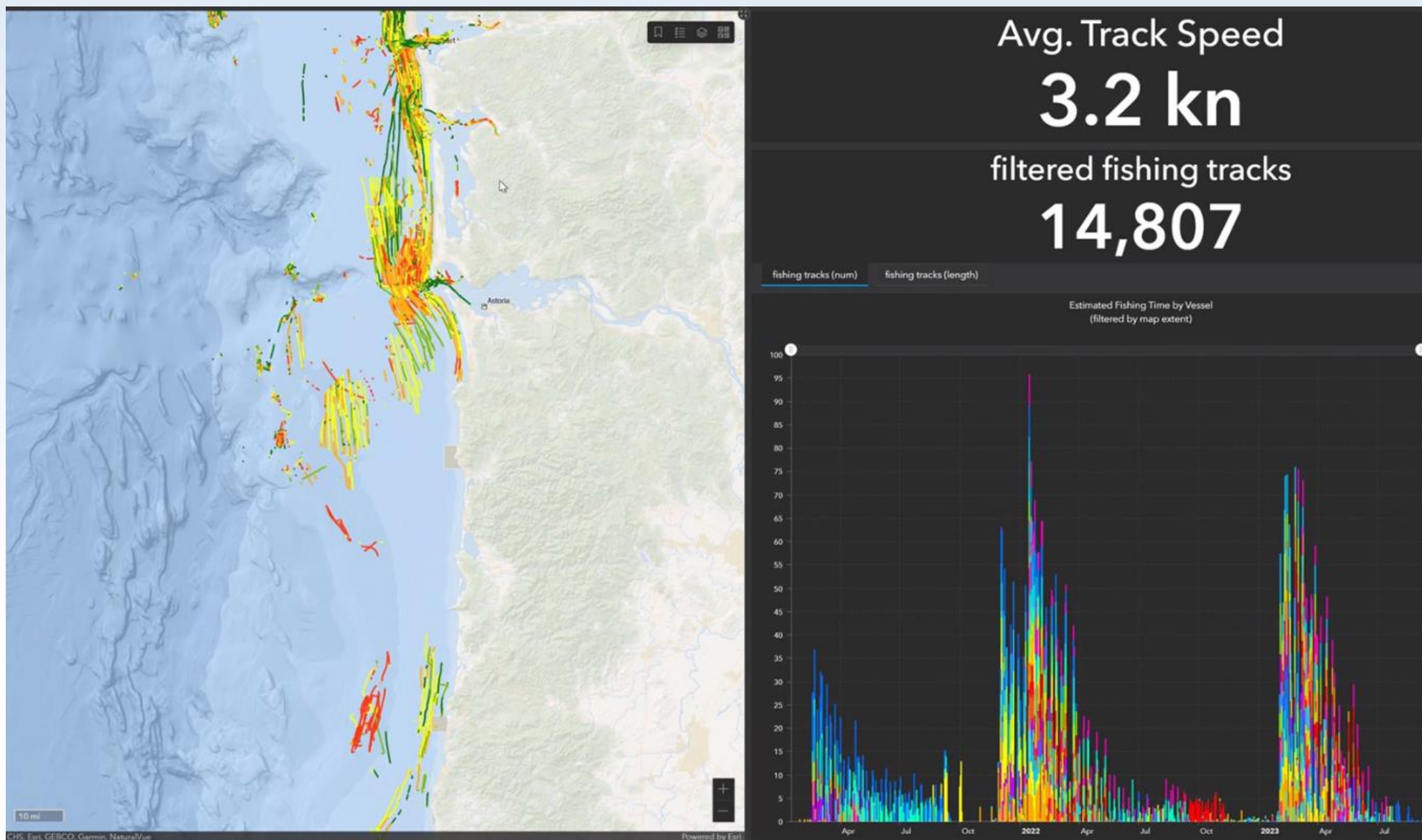
Management Actions



- Fleet advisory
- Depth constraint
- Vertical Line/Gear Reduction
- Fishery Closure
 - Fishing Zone
 - Statewide
- Alternative Gear



Collaborative Approaches: Vessel Monitoring



Source: PSMFC

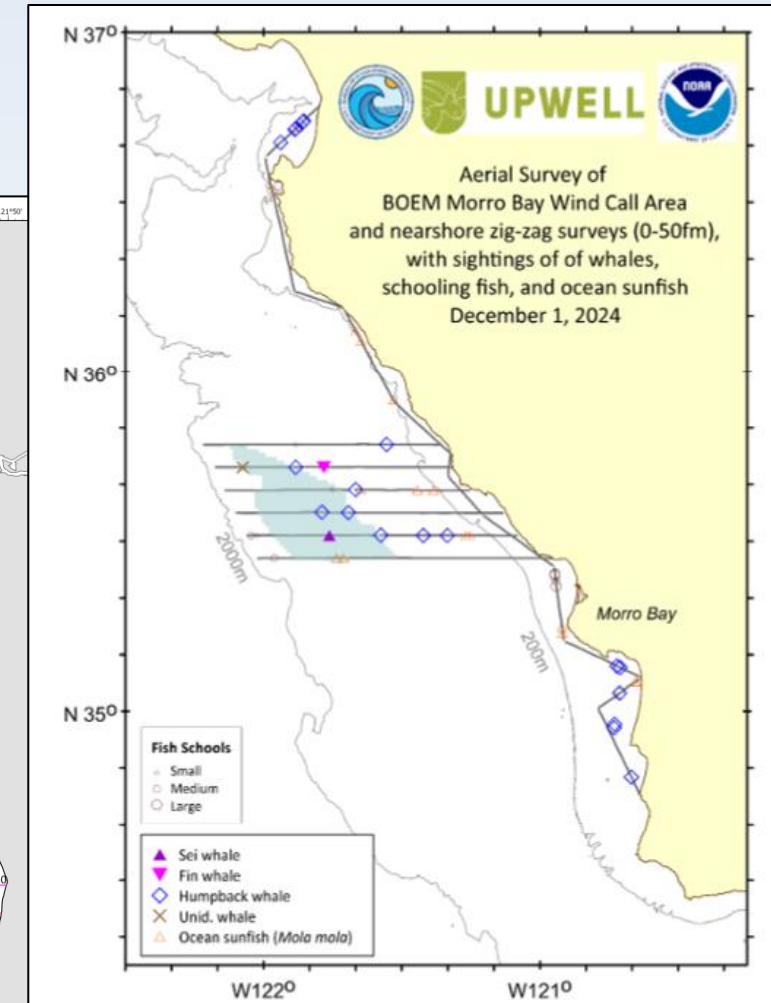
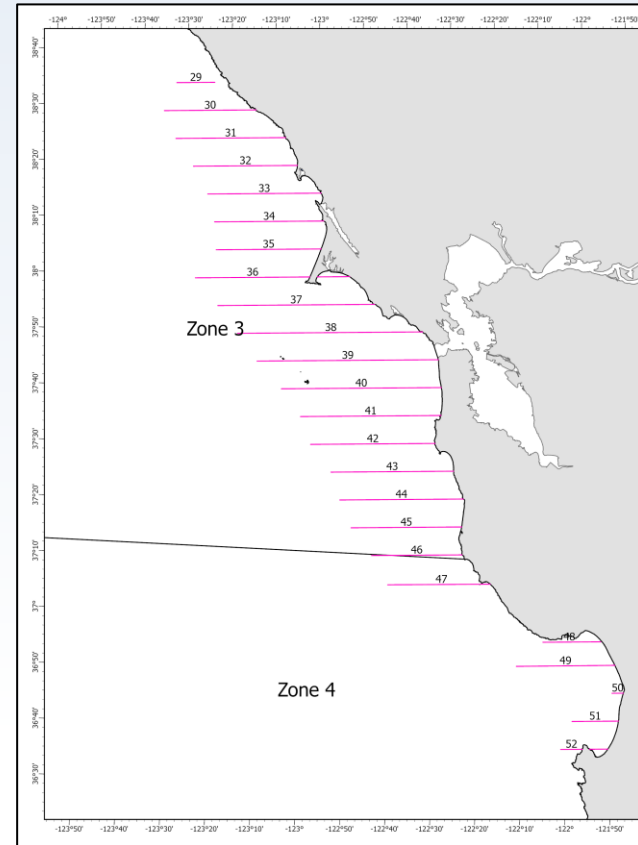
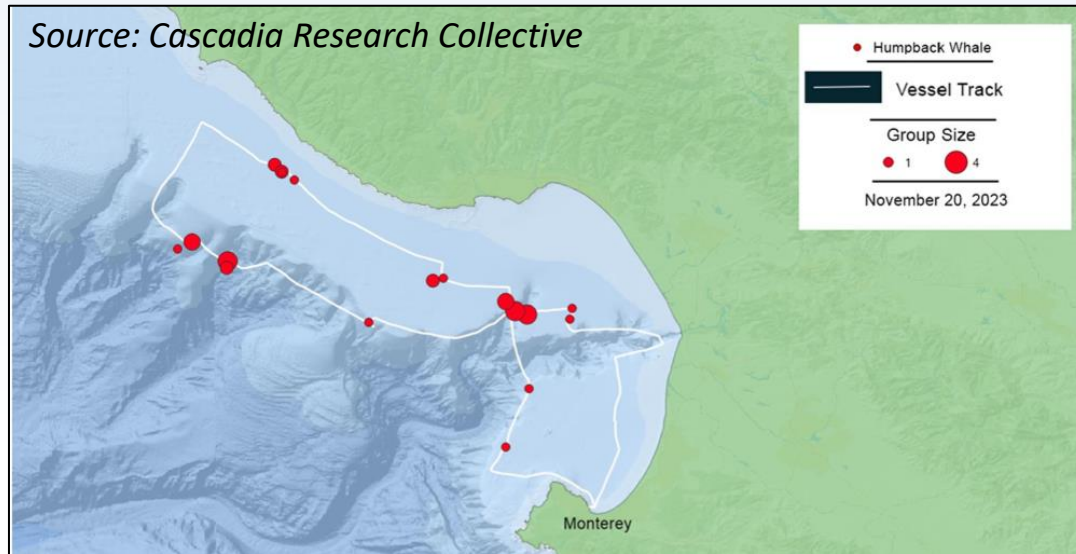


Collaborative Approaches: Vessel/Aerial Surveys

Marine Life Monitoring Surveys

- Aerial & vessel-based surveys to monitor large whale and turtles seasonally

Source: Cascadia Research Collective



Source: CDFW

Source: NMFS/Upwell





Collaborative Approaches: Line Marking



CDFW



COMMERCIAL DUNGENESS CRAB GEAR MARKING INFORMATION

It is often not possible to identify the specific fishery responsible for a whale entanglement, resulting in a high number of unidentified fishery entanglements. Fishery specific gear marking will help address this issue and supports the California Department of Fish and Wildlife's application for an Incidental Take Permit for the commercial Dungeness crab fishery.

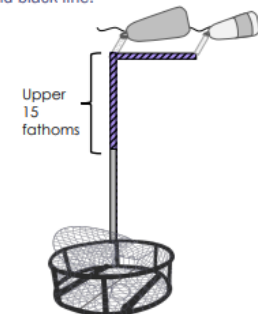
Starting November 1, 2025, phased buoy and line marking requirements will be implemented for the commercial Dungeness crab fishery (see below). Enhanced marking will help identify entanglements in California commercial Dungeness crab gear and also prevent whale entanglements in unidentified gear from being attributed to the commercial Dungeness crab fishery which can impact the season for all California commercial Dungeness crab fishermen.

Surface and Vertical Line Marking

It is anticipated that by November 2028, dual-colored purple and black line will be required for all **surface line** (excluding buoy gangions) and the **upper 15 fathoms of vertical lines** (see page 2 for information about the 20 fathom exemption). Only **California Commercial Dungeness Crab** traps will be allowed to use purple and black line.

Anticipated Timeline for marking surface gear and 15 fathoms of vertical line

- **2025 - 2026 Season**
All surface gear must be marked (see Buoy Marking section for more information)
- **2026 - 2027 Season**
Upper 15 fathoms of 25% of deployed gear and all surface lines must be marked
- **2027 - 2028 Season**
Upper 15 fathoms of 50% of deployed gear and all surface lines must be marked
- **2028 - 2029 Season**
Upper 15 fathoms of 100% of deployed gear and all surface lines must be marked

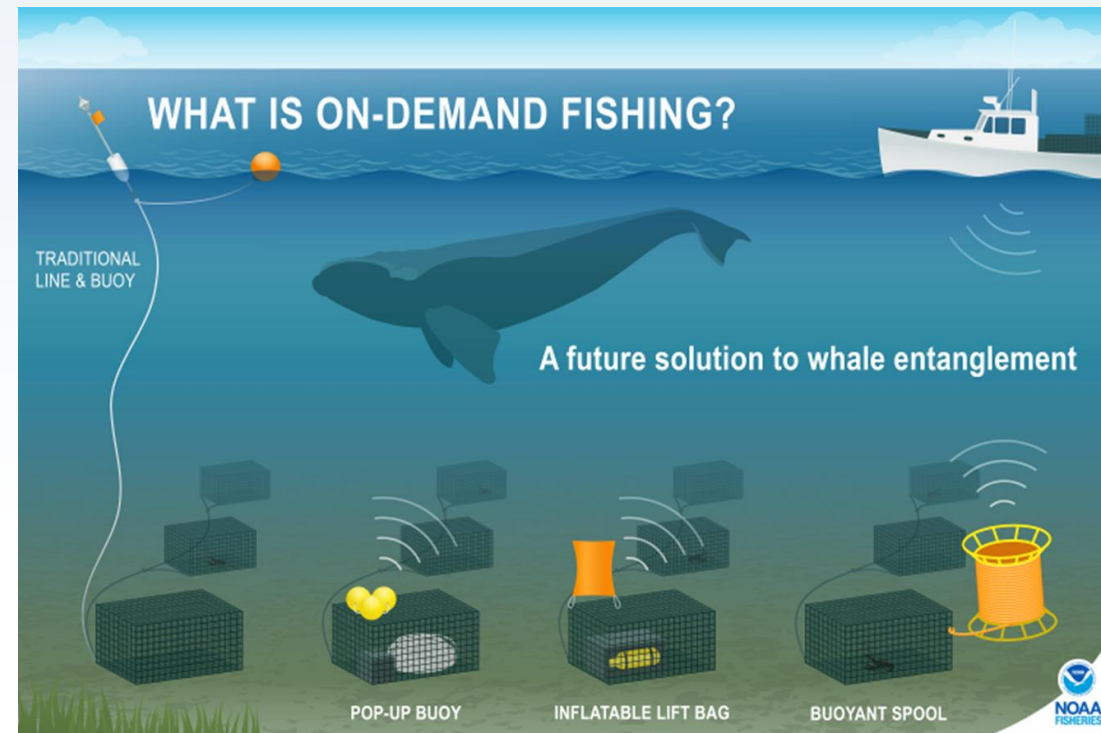


Questions? Email whalesafefisheries@wildlife.ca.gov

March 2025

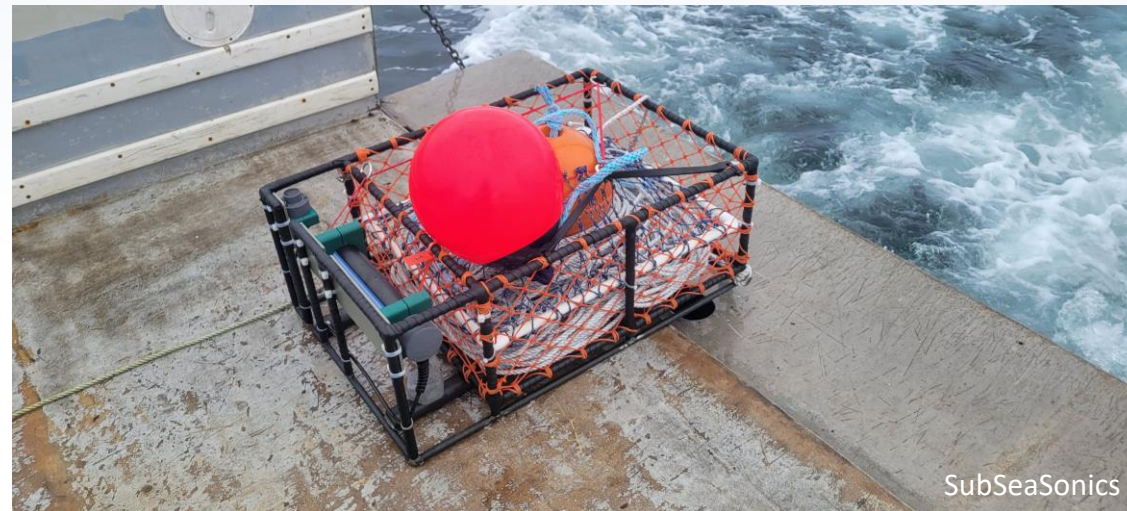


Collaborative Approaches: Experimental Gear





Collaborative Approaches: Lending Library





Ryan.Bartling@wildlife.ca.gov
CDFW Whale Safe Fisheries Project

