



Sanctuary Health and Risk Assessment Updates



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*NOAA Fisheries' Marine Mammal Health and
Stranding Response Program*





1^o Members of the Team



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Professional photographer, experienced drone pilot... (16 years)





Update Topics



1. Highlights and examples from past season (Fluke catalog, our vessel contact and entanglement updates, and a collaboration that has set the stage for our even greater use of drones)
2. Our preparations and initiatives for the upcoming season



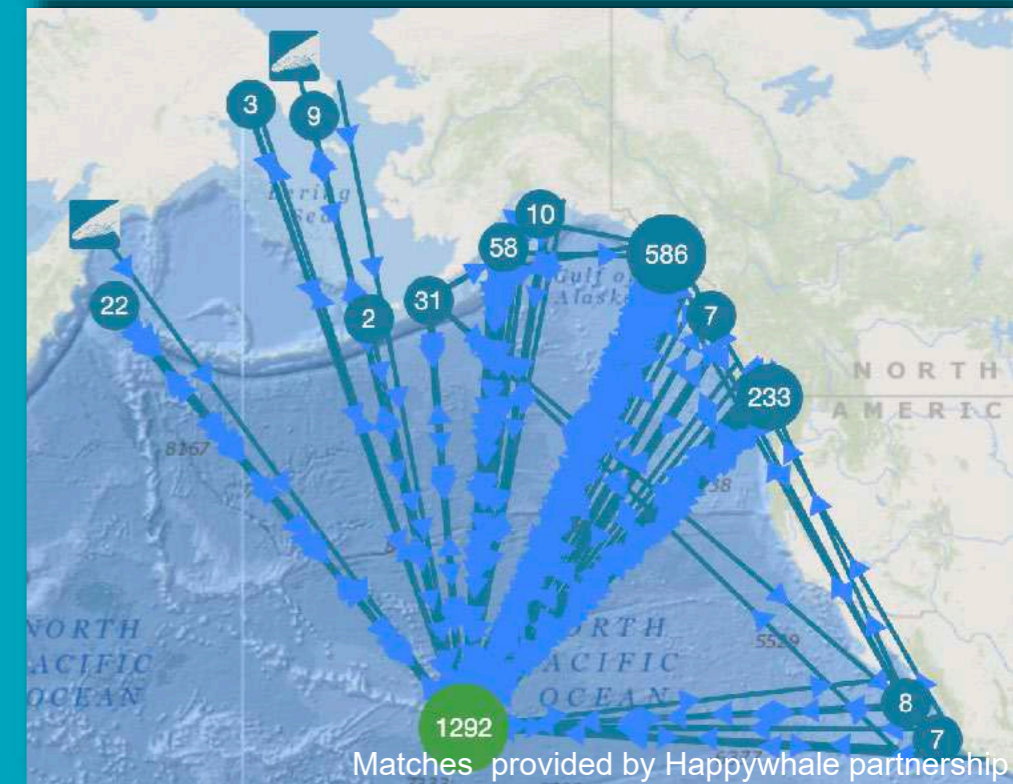
Many of these efforts involve the broader sanctuary (e.g., research and education), a large number of partners, collaborators, and the assistance and engagement of the on-water community



Fluke catalog



- Sanctuary has been compiling flukes in our catalog since 2002 (> 3000 unique individuals)
- Partnering with Happywhale since 2017 (MOA on 2019)
- Broader partnership under North Pacific Humpback Whale Photo_ID Collaboration (2019)
- Resulted in numerous collaborations on papers and reports on movement patterns, population estimates and survivorship/ impact from risk factors
- Most recent paper provides annual population estimates of humpback whales for the North Pacific, but also Hawai'i



Vessel contacts (strikes)

2023 Season update:

- 6 reported cases (non-incidentals)
- 50% of the reports involved calves
- 3 cases were self-reported
- 1 case during a directed approach
- 1 animal “hit” vessel
- 3 of the cases considered “serious”
- All known vessels < 65’
- All reported speeds were 15 kts or less (15, 11, 9)

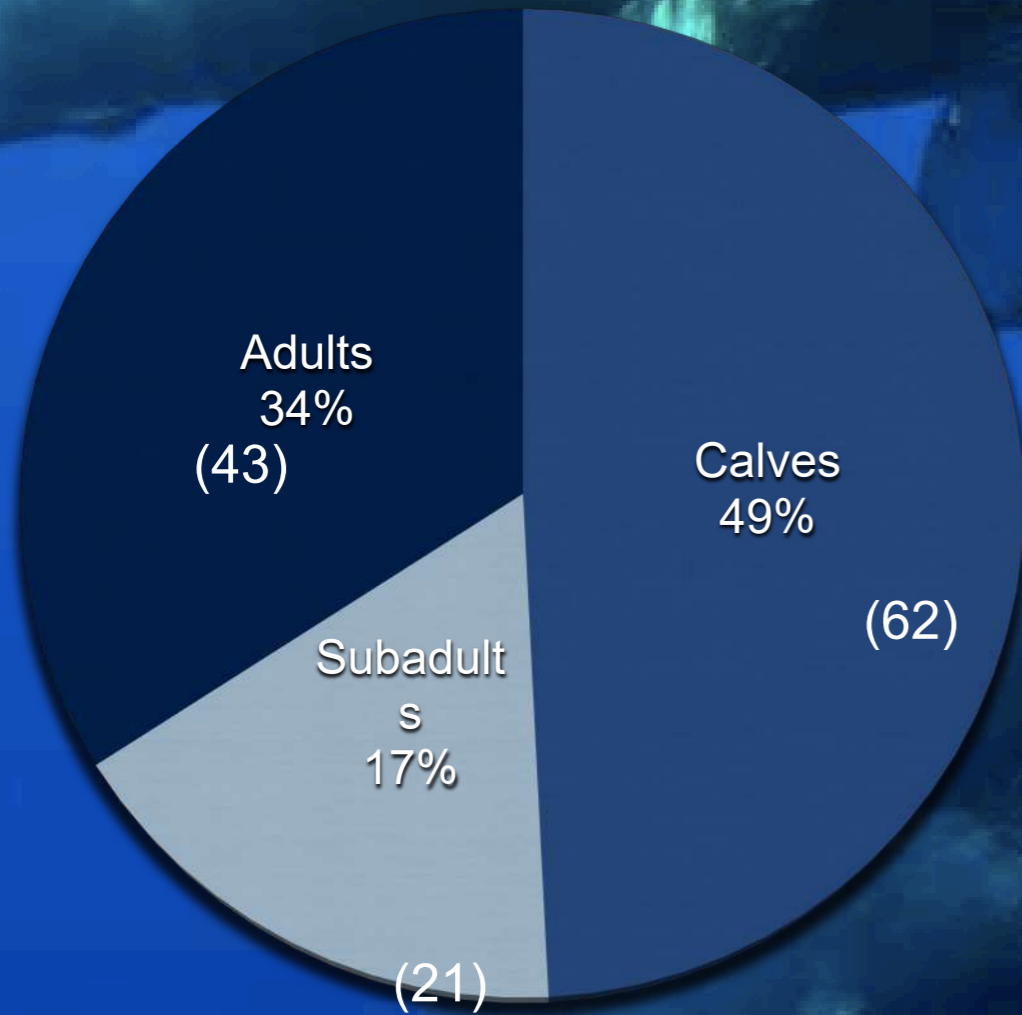


Vessel contacts (strikes)

of reported animals impacted by whale-vessel contacts over time



Demographics



- Calves represents 49.2% (n=62) of known contact reports

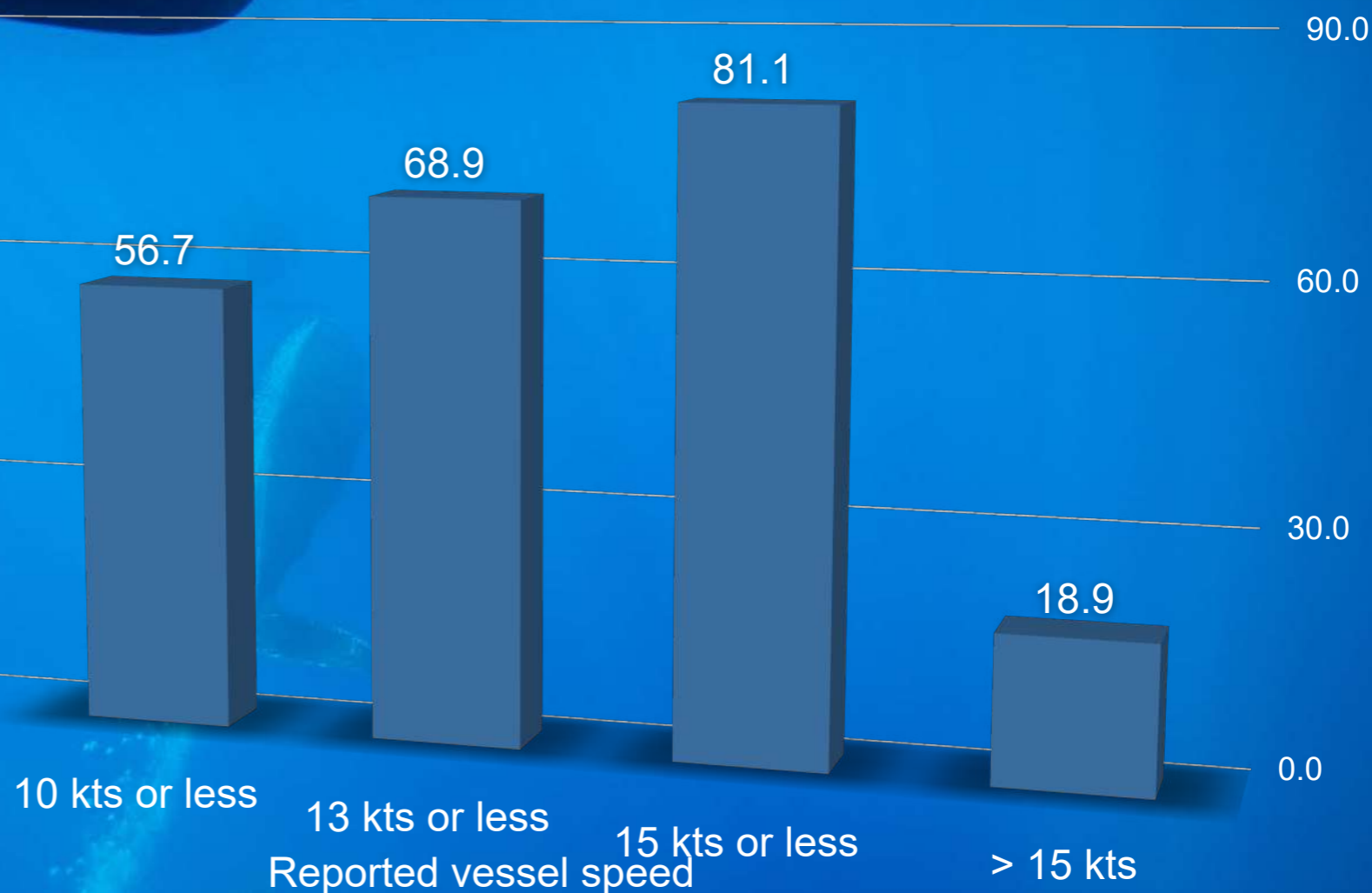
(n) = # of reports



“Reported” Speeds Hawaii: 1979 - Present



- 90 cases in which speed is known/ reported
- Average reported speed = 10.5 kts
- 56.7% of reported contacts 10 kts or less
- Reported speeds ranged from 0 - 26 kts
- 82.6% occurring while vessel transiting



We really do not know the speeds involved



Additional recommendations regarding reducing contacts between vessels and whales



Guidance based on science/data acquired from sanctuary, Pacific Whale Foundation, and others:

- Under directed approaches, reduce vessel speed to 6 knots or less when within 400 yards.
- While transiting during whale season (November - May; the shallow waters where whales are more likely to be found) maintain speed at 15 kts or less (or minimum planing speed)
- Remain vigilant during whale season

Represents a collaborative effort between Pacific Whale Foundation, State of Hawaii Dept. of Land and Natural Resources, NOAA Fisheries - Pacific Islands Region, and Hawaiian Islands Humpback Whale National Marine Sanctuary

GO SLOW – WHALES BELOW
Regulations and Best Practices for Whale Watching in Hawaiian Waters [in depths less than 100 fathoms (600 feet)]

Humpback whales are protected by law. This prohibits an approach of less than 100 yards by any on-water vessel.

SLOW DOWN, WHALES AROUND
Speed increases the risk of a collision.

- Travel below 15 knots (or minimal planing speed) during whale season (November through May).
- Reduce vessel speed to 5 knots or less when approaching within 400 yards of a whale.
- Minimize sudden, unnecessary maneuvers or speed changes in the vicinity of whales.

APPROACHING & WATCHING WHALES

- Do not approach whales within 100 yards. It's the law.
- Do not leap-frog ahead or cut in front of a whale's path.
- Vessels should operate in a direction parallel and to the side rear of a whale's travel direction.
- Always stay at your helm and post an observer to spot whales while underway.
- Be aware that cumulative impacts may also occur. Your vessel may not be the only one to have approached the same whales.

LISTED REGULATIONS AND GUIDELINES APPLY TO ALL WATERCRAFT INCLUDING PADDLEBOARDS, KAYAKS, BOATS, JET SKIS, EFOILS, AND CANOES.

Call the NOAA Hotline if involved in a collision at 1-888-256-9840, or to report an entangled or distressed marine mammal. To report a VIOLATION OF THE APPROACH RULE, or other human related disturbance, call NOAA Enforcement: 1-800-853-1964.

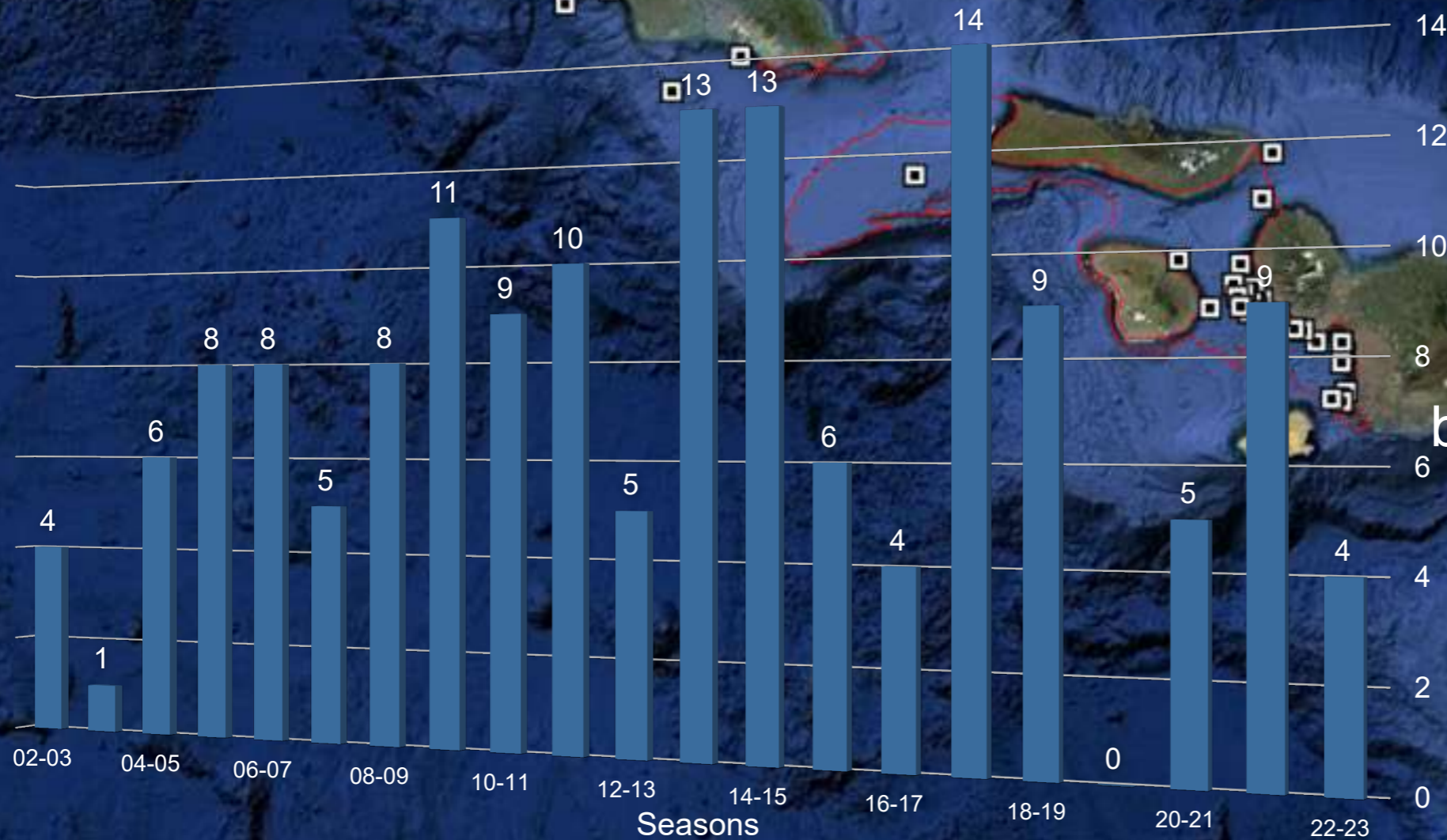
Scan for more information

<https://dlnr.hawaii.gov/dobor/boating-with-whales/>

Our other guidance and regulations still apply

Entanglement Update

- 516 reports
- 244 (47.3%) confirmed
- At least 172 animals



Majority of locations depicted show where animal was reported entangled, not where it became entangled. effort is a big part of of the distribution.

- *Reports of entanglement under-estimate threat*



Sanctuary Large Whale Entanglement Response Fluke Print

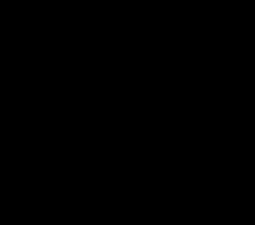


- Conducted 100s of large whale response trainings (more than 10 countries)
- Longstanding partnership with NOAA Fisheries in Alaska - Detail
- Apprenticeships
- Drafted Best Practices for US





Entanglement Reports and Papers

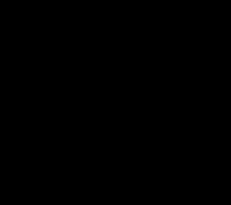
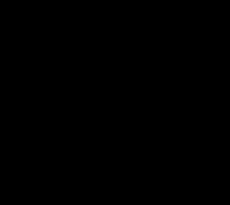




Broader use of drones: partnering effort with Ocean Alliance

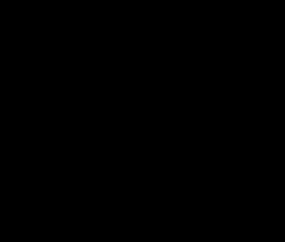
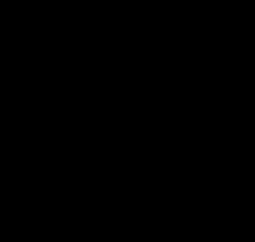


<https://whale.org/>



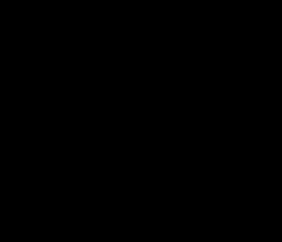
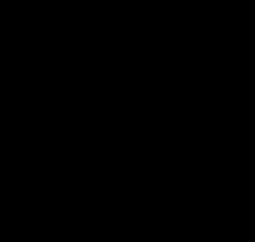


Drone-deployed suction-cup tagging



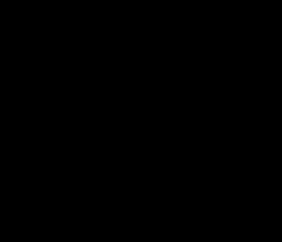
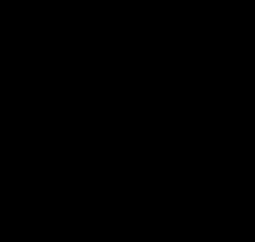


Tagging





Fish follow the calf





Contribution of whales to Ecosystem



- Feeding fish (including sharks)
- Sloughing skin (Pitman et al 2020)
- Mortalities (whalefalls)
- Placentas
- Barnacle offloading
- Defecation/ feces

Enhancement of tropical marine productivity through large whale migrations: Humpback whales on the Hawaiian wintering grounds

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Unlike highly productive sub-polar and temperate marine ecosystems, tropical marine ecosystems are typically oligotrophic. Under such conditions, island and atoll environments receive comparatively little nutrient input, except that derived from localized oceanographic sources within relatively small areas. Here we explore the degree to which the seasonal reproduction of humpback whales (*Megaptera novaeangliae*) brings biomass, and therefore nutrients, into the Hawaiian marine ecosystem and how it may provide a predictable and significant source of energy to the food web. Humpback whales migrate to Hawaii in the winter after spending the summer feeding on seasonally abundant krill and other small marine fauna in productive high-latitude habitats. In 1993, the best estimate for this population was 4,500 individuals. If they have increased at the recently published rate of 10%, up to 19,000 whales may use Hawaiian waters today. Using this liberal estimate and recent demographic information, we calculated there could be 1,520 parturient females in the Hawaiian region annually. With each birth a placenta is deposited into the ecosystem. Assuming the mass of a placenta is approximately 19 kg, we estimated that from this source alone about 29 metric tons of biomass are infused into the food web each year. Additionally, mortality of up to 274 neonates and 126 adults could result in 274 and 5,000 metric tons of biomass annually added to the ecosystem, respectively. While these estimates are crude, such contributions are likely not insignificant to an oligotrophic system, especially when considered along with a constantly sloughing epithelium (approximate surface area of 70 sq meters per whale), and excretion by calves and adults. Given the increasing concern for ecosystem-based management, modelers should consider this important source of energy when evaluating marine food webs for Hawaii and other similar habitats where whales migrate to breed.



Taking a look ahead: This season



Continue:

- Fluke catalog (above and below water) and partnership with Happywhale and others
- Visual health/ risk analysis
- Scar analysis
- Complementary efforts (tagging, transects)



Transect Survey App

Conducted with the On-Water Community



- 1 – 2 Observers and a recorder.
- iPhone app uses Filemaker.
- Android app new for 2023 season.

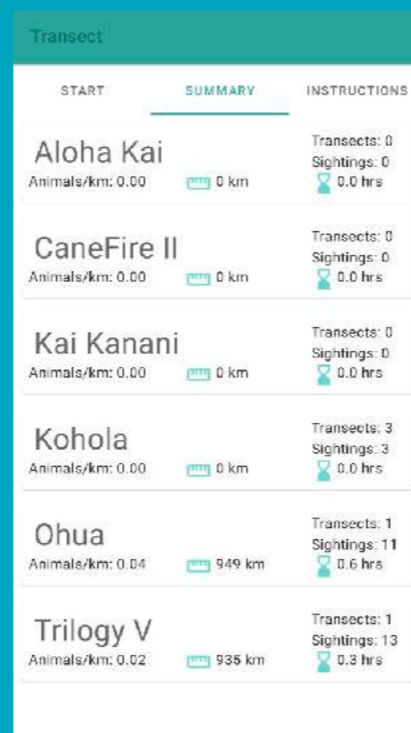
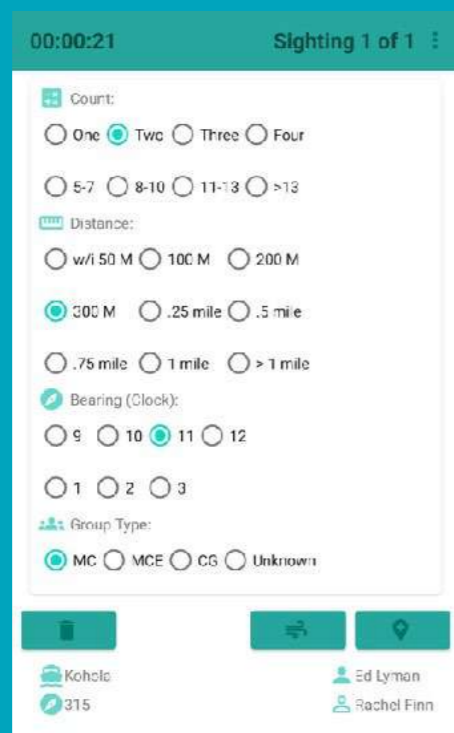
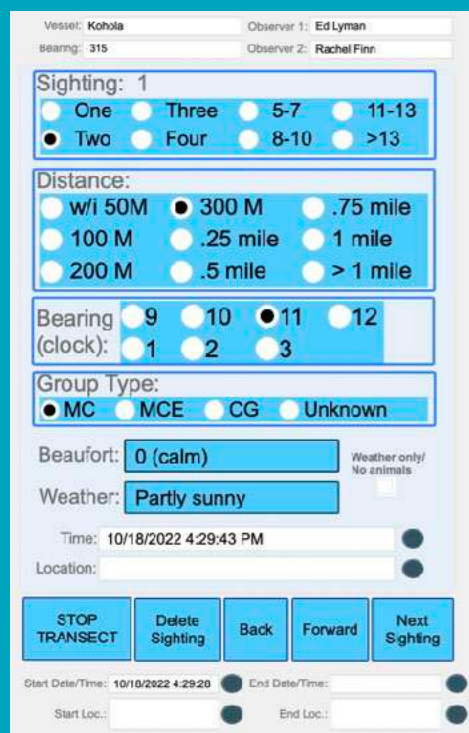
- Provides greater engagement with community

- Engage volunteers to assist

- Use of vessels-of-opportunity to increase transect spatial/ temporal effort

- Increase scope of fluke ID effort

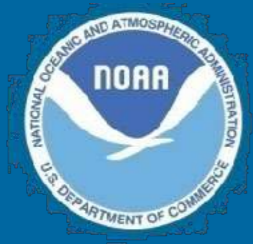
- Better quantify vessel speeds and vessel behaviors



Filemaker app on iPhone

Android app

Android app (test data)



Continue increasing the scope of our use of drones

Continue collaborations with Ocean Alliance

Continued to meet criteria of use (OEM training, additional equipment, experience)

Use drones to Assess/ document, tag, disentangle, measure and sample whales





Need for analysis



- Tagging of compromised animals for energetics, behavior (including around response)
- Breath analysis of compromised animals for stress hormones as above and looking at stress differences due to possible changes in vessel traffic
- Photogrammetry (condition)
- Biopsy (stress hormones)

Involves use of drones



PhD student Jessie Hoffman



Collaboration with Dr Kristi West



Breath and biopsy samples
also analyzed for diseases,
microbiome signatures
(health)





Contaminant analysis as result of Lahaina wildfires



- An opportunity and responsibility
- Will be keeping an eye on the in-situ monitoring on approach and throughout season
- Coordinate with other sampling
- Looking for collaborators for analysis



Collection of whale feces: Analysis of whether and on what whales might be feeding on



- Have been getting reports of whales feeding around Hawai'i since 2011
- Have had recent observation, including Marc)
- Increase in defecation
- Collect (emphasize) and pursue isotope analysis (collaboration with UH - Hilo?)



This entanglement season



- Will effort base be different (on-water community are our first responders)
- Loss of gear in Lahaina cache
- Training / prep



We will see

A Team Effort



Van Aswegen/ University of Hawaii, MMRP (NOAA permits 21476-01 and MMHSRP 19886-06)



Moore/ NOAA MMHSRP (permit# 18786-02)



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Acknowledgements

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Mahalo and Questions



- NOAA Office of Protected Resources*
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- NOAA Fisheries Pacific Islands Fisheries Science Center
- NOAA Office of Law Enforcement
- Hawaii Department of Land and Natural Resources*
- U.S. Coast Guard/ CG Aux. (D14)
- NOAA Corps
- Fishers (Commercial, sport, recreational)
- Hawaiian Islands Humpback Whale National Marine Sanctuary *
- Hawaiian Indigenous Communities
- Whale researchers (NGOs)
- Response Network members
- Commercial tour operators
- Navy
- Watermen (other ocean -users)
- Carolyn Weston Fund*
- Center for Coastal Studies *
- Happywhale
- Hawaii Marine Mammal Consortium
- Jupiter Research Foundation
- Kaho‘olawe Island Reserve Commission
- Marine Mammal Commission
- Pacific Whale Foundation
- Ocean Alliance
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