Entanglements of Large Whales Along the U.S. West Coast

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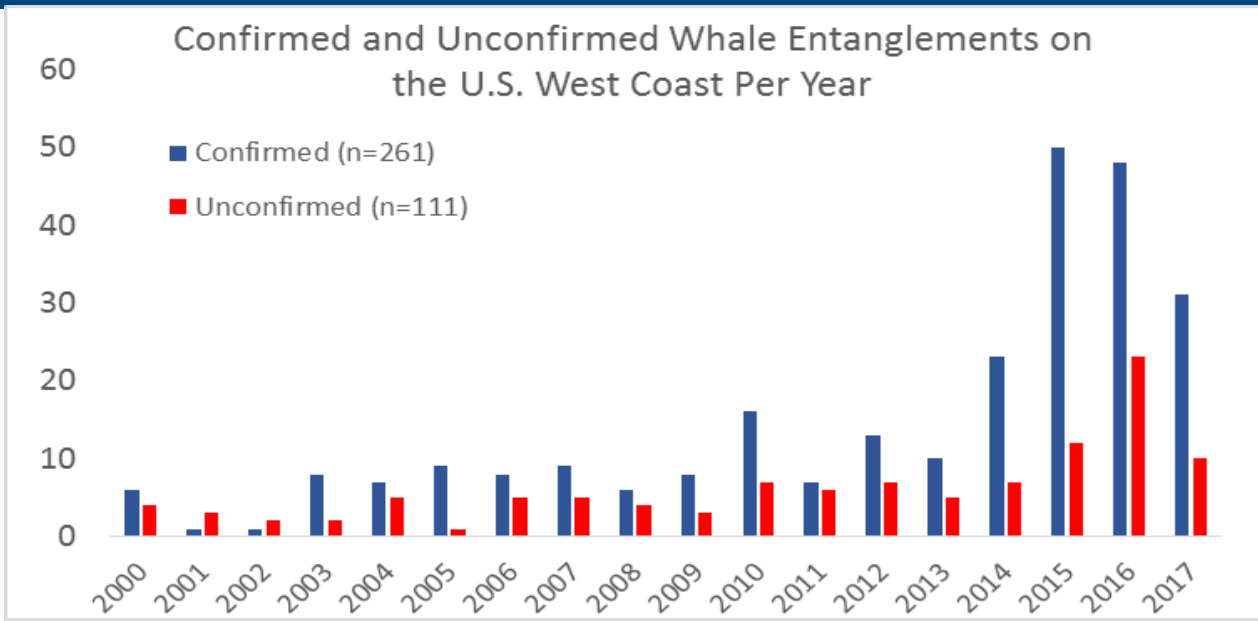
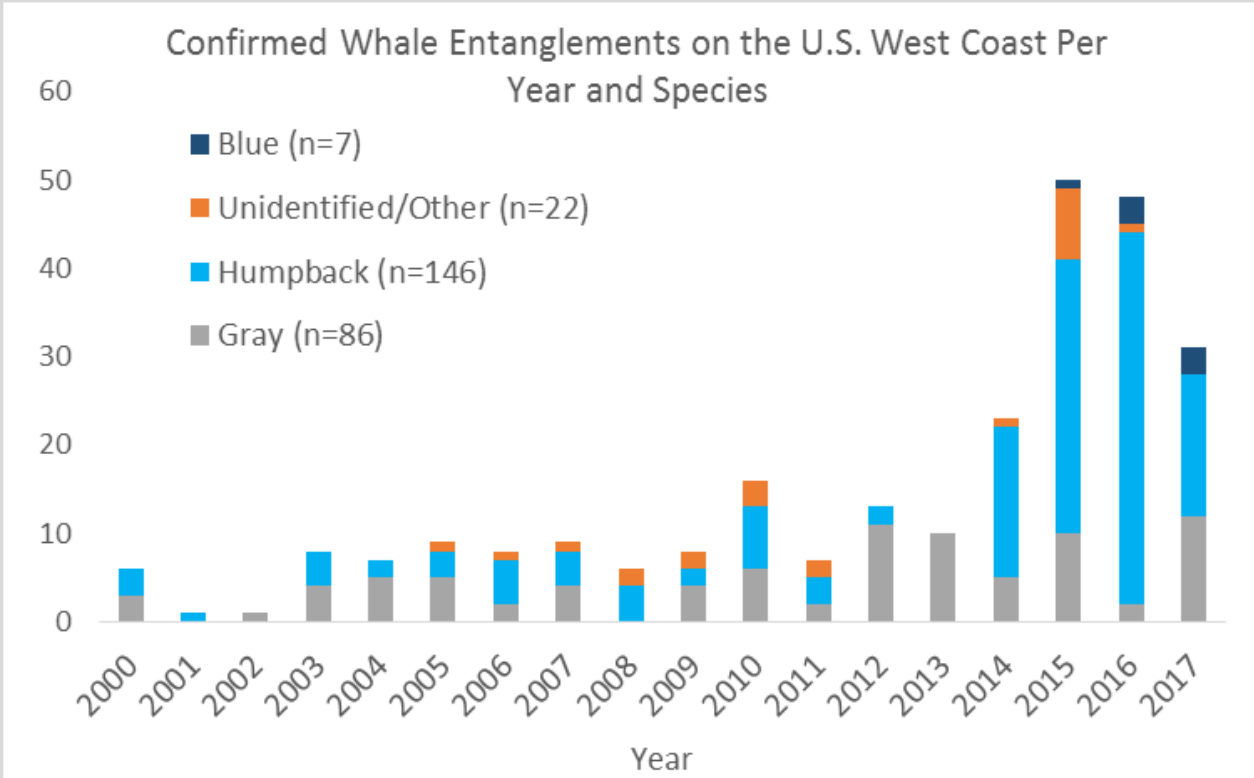
WCR Whale Entanglements

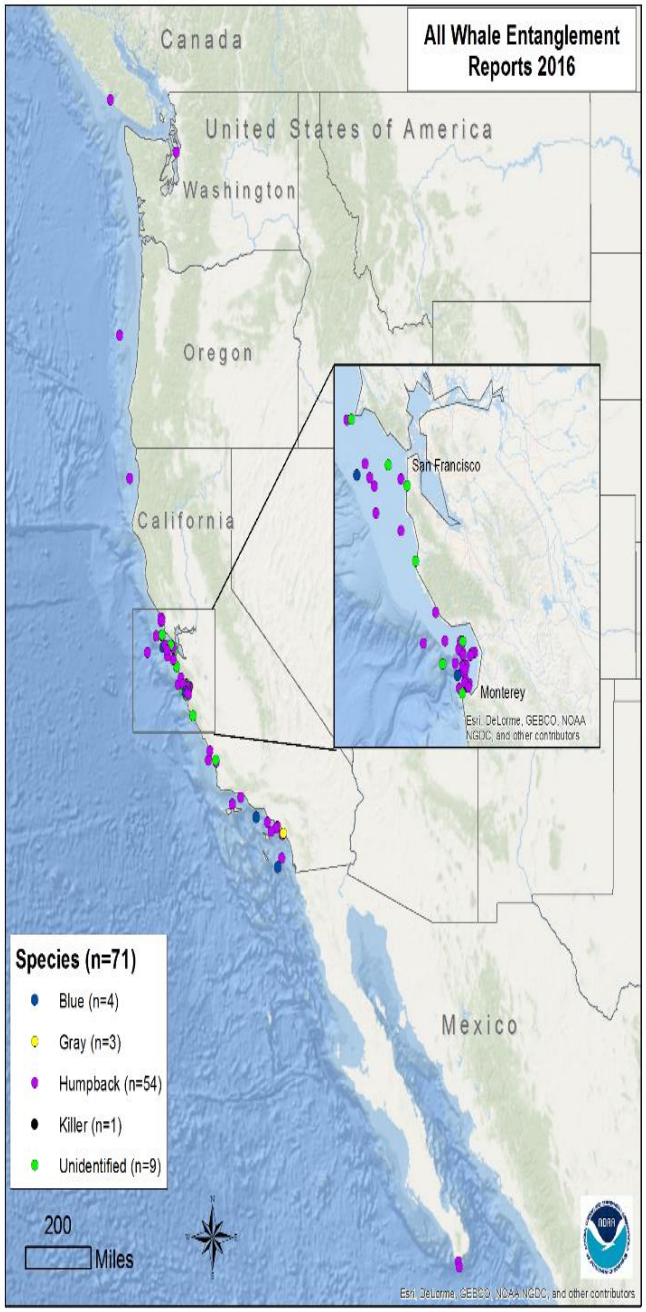
- Dramatic increase in reports since 2014
- Driven by humpback whales, but now including blue whales
- High demand for updates and evaluation of incoming data
- Quality of reporting improving

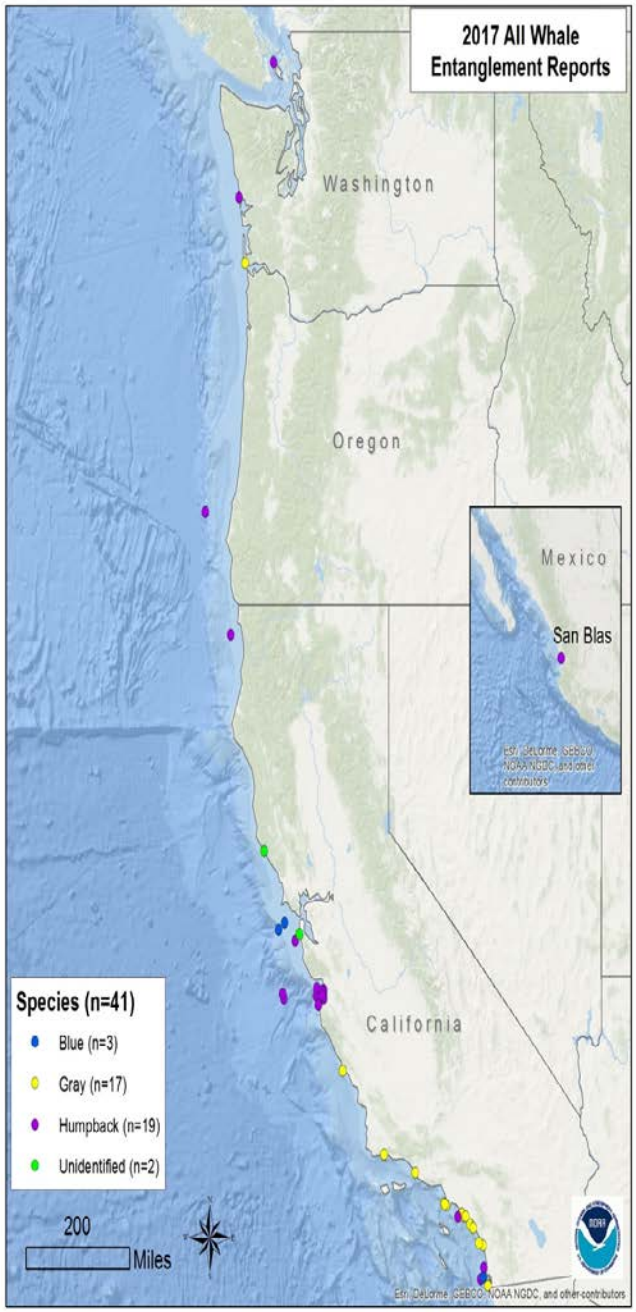




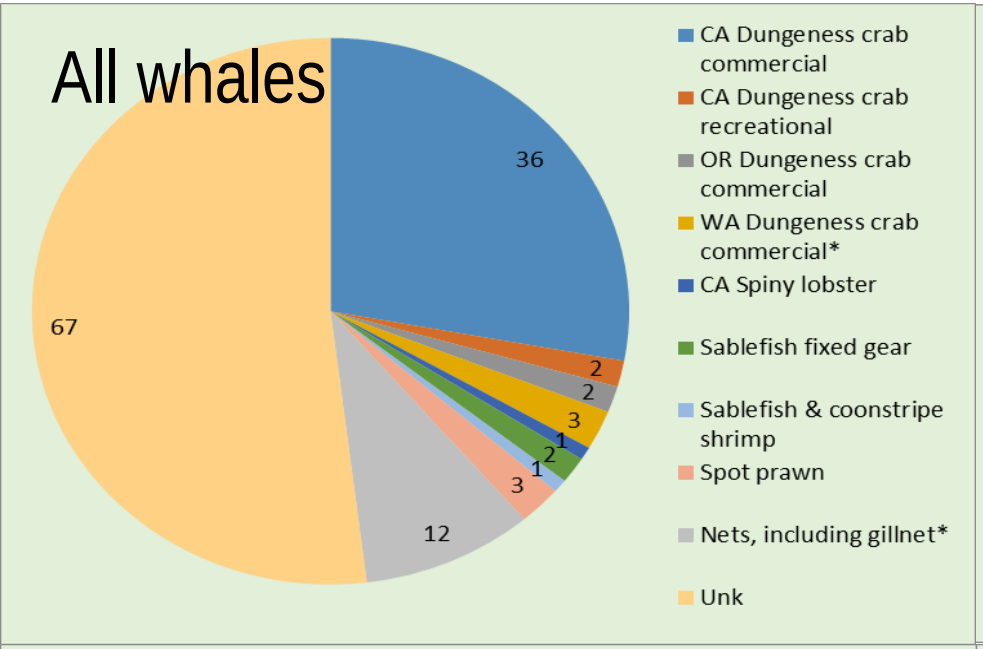
NOAA FISHERIES

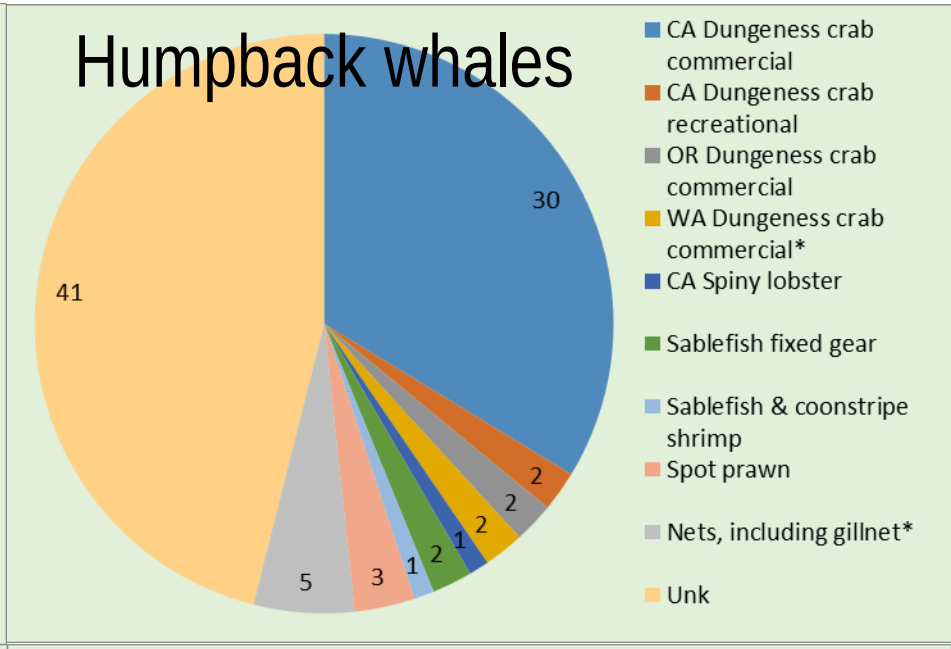

All Whale Entanglement Reports 2015
Washington
Oregon
California
Species
BLUE WHALE (n=1)
FIN WHALE (n=2)
GRAY WHALE (n=12)
HUMPBACK WHALE (n=35)
KILLER WHALE (n=1)
UNIDENTIFIED WHALE (n=11)
200
Miles
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

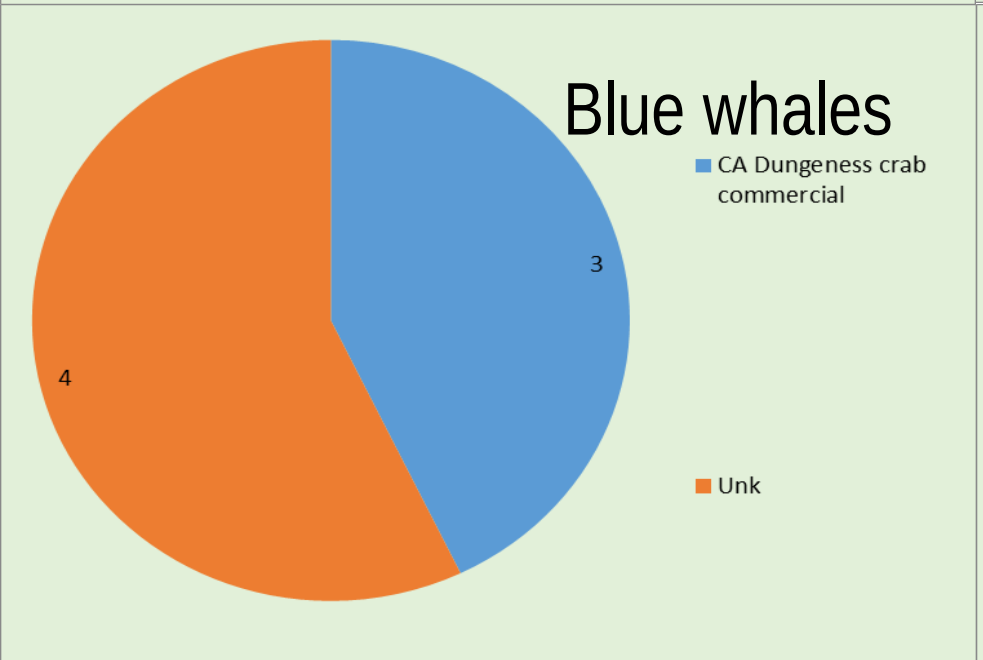

All Whale Entanglement Reports 2016
Canada
United States of America
Washington
Oregon
California
Mexico
San Francisco
Monterey
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors
Species (n=71)
Blue (n=4)
Gray (n=3)
Humpback (n=54)
Killer (n=1)
Unidentified (n=9)
200
Miles
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

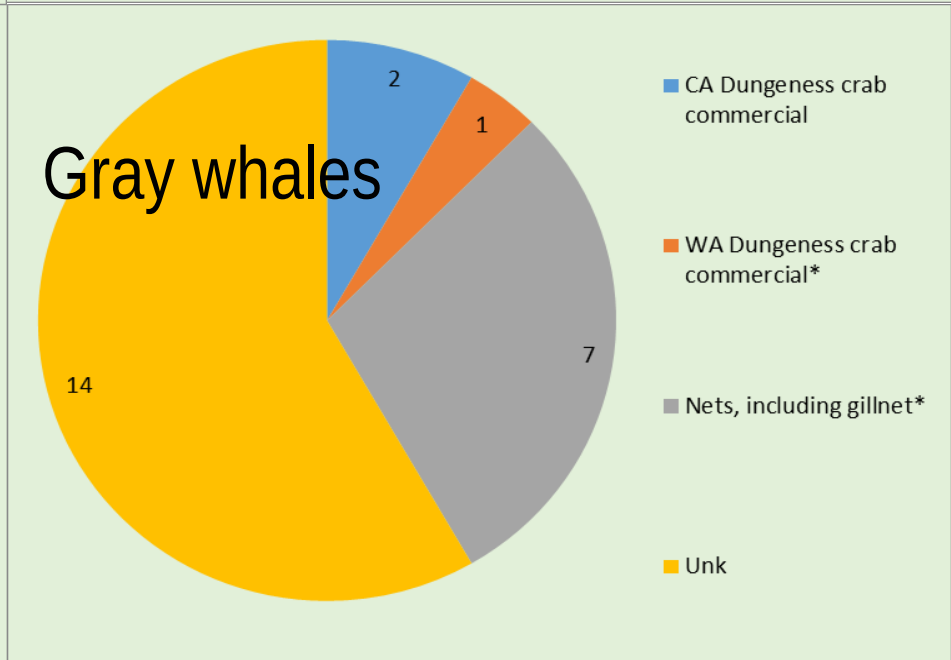

2017 All Whale Entanglement Reports
Washington
Oregon
California
Mexico
San Blas
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors
Species (n=41)
Blue (n=3)
Gray (n=17)
Humpback (n=19)
Unidentified (n=2)
200
Miles
Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors

Sources of Confirmed Whale Entanglements 2015-2017









2018 summary thus far

considered preliminary, data through 5/29/2018

- 16 confirmed entangled whales, 20 total reports
  - Gray whales: 10 confirmed, 12 total
  - Humpback whales: 5 confirmed, 6 total
  - Fin whales: 1 confirmed, 1 total
  - Unidentified: 0 confirmed, 1 total
- Confirmed fisheries associated with entanglements: 9 reports
  - Commercial Dungeness crab: 6 total
    - 3 WA (2 gray whales, 1 humpback whale)
    - 1 OR (1 gray whale)
    - 1 OR and CA (1 humpback)
    - 1 WA tribal (humpback whale)
  - Gillnet: 3 (gray whales)
- Reporting location
  - California: 10 confirmed reports, 14 unconfirmed
  - Washington: 6 confirmed reports

What we think is going on

- Complex relationship between whale distribution/abundance/behavior, environmental variability/prey distribution, fishing effort distribution, public awareness
- Better documentation and increasing response has **increased ability to identify gear (along with trap tags)**, but still limited
- **Trap/pot fisheries** identified as the majority entangling gear (when known); Dungeness crab fishery = large co-occurrence
- Whales are getting entangled every way possible, in all types/colors/arrangements of gear – not likely to be easy fix

What we don't know (data gaps)

Entanglement Data

- Identifying entanglement origins (when/where to focus research/management)
- Knowing the total # of entanglements that actually occur
- Understanding how whale behavior and gear configuration could make an interaction become an entanglement
- Understanding outcomes of entanglements (long term survival, serious injuries, impacts of reproduction)

Entanglement Mortality and Serious Injury – PRELIMINARY*

- 136 humpback whale entanglement records evaluated 2007-2016 (draft); ~94 M/SI = 69% M/SI rate

2017 draft SARs: average M/SI for 2011 - 2015	
DGN	0.02
CA spot prawn	0.15
CA Dungeness	0.65
Sablefish	0.2
Unk/unidentified	6.6
total	7.62

2016 entanglement M/SI (Carretta et al. 2018 draft)	
CA spot prawn	1.75
CA Dungeness	12.5
Sablefish	1.5
Unk/unidentified	19.75
total	35.5*

Average M/SI 2012-2016 entanglements (prelim.)	
CA spot prawn	0.5*
CA Dungeness	3.15*
Sablefish	0.5*
Unk/unidentified	9.75*
total	13.9*

- Disentanglement "saved" ~13 humpbacks 2012-2016
- Blue whales: 1 M/SI in 2015; 3.5 in 2016 (draft)

What Other Issues Are Entanglements Creating?

- Management under MMPA – Potential Biological Removal for CA/OR/WA humpback whales is 11 seriously injured or killed per year; CA/OR/WA blue whales 2.3 seriously injured or killed per year
- Humpback and blue whales are protected by the ESA
- Public perception of entanglements and associated fisheries is unpopular – market concerns
- Increased pressure on disentanglement response – inherently dangerous and not a solution

What Can We Do To Reduce Entanglements?

- Reduce the co-occurrence of whales and fishing gear (and debris)
- Improve the gear to make it less likely to entangle whales (and other things)
- Improve the gear to make entanglements less severe and/or more likely whales can escape from gear
- Deterrence and Avoidance
- Get smarter – fill in knowledge gaps (e.g., gear marking)

Ecosystem Approach?