Since 2013, there has been a large increase in the overall number of whale entanglements reported along the U.S. west coast. While ~50% of entanglement reports cannot be attributed to a specific source, Dungeness crab fishing gear is the most common source that has been identified during this period. The causes for the increase in reported entanglements are complex, and the time series of developments as presented here does not attempt to explain or account for all the important factors that are related.

Instead, this time series illustrates some of the important factors in recent years, along with the response of interested stakeholders during this time. These are highlighted by the unprecedented actions by fishery managers to address and reduce entanglement risks

entanglements in 2014

1 Other

4 Commercial

6 Unidentified

in state-managed fixed gear fisheries in 2018 and 2019. and commitments by the states of California, Oregon, and Washington to develop Conservation Plans for their Dungeness crab fisheries.

31 entanglements in 2015

1 Recreational Dungeness Crab

1 Spiny Lobster 3 Gillnet/Net

10 Commercial **Dungeness Crab**

16 Unidentified

22 Unidentified

entanglements in 2016

2 Gillnet/Net

19 Commercial Dungeness Crab

WHALE **ENTANGLEMENTS SINCE 2013**

HUMPBACK

34 entanglements in 2018

1 Recreational Spot Prawn

5 Gillnet/Net

11 Commercial Dungeness Crab

16 Unidentified

17 entanglements in 2017

1 Recreational

Dungeness Crab 1 Sablefish &

Coonstripe Shrimp 1 Gillnet/Net

6 Commercial Dungeness Crab

8 Unidentified

17 entanglements in 2019

WEST COAST REGION

1 Recreational **Dungeness Crab**

1 Dungeness & Rock Crab

5 Commercial Dungeness Crab

10 Unidentified

2013 2014 2015 2016 2017 2018 2019

NOAA West Coast Region and Northwest and Southwest Fisheries Science Centers have been directly involved in providing scientific and management expertise and support to interested stakeholders through a wide variety of interactions as these entanglements have unfolded. In particular, NOAA Fisheries works to understand the ecosystem dynamics that are contributing to entanglement

0 humpback entanglements in 2013

risk and develop the means to provide information, analysis, and advice to managers and interested stakeholders as quickly as possible.

Summer 2015 NOAA Fisheries/

California Department of Fish & Wildlife (CDFW) whale entanglement public meeting convened in response to increased entanglement reports.

Fall 2015 California **Dungeness Crab** Fishing Gear Working Group convened. (link)

ENVIRONMENT

Early 2014 to Mid 2016

California Current Ecosystem (CCE)

Large Marine Heatwave

End of 2014 to Summer 2016

Strong El Niño Conditions

MANAGEMENT ACTIONS Spring 2017

Pacific States Marine Fisheries Commission (PSMFC)/ NOAA Fisheries Workshop on **Gear Innovations** to Reduce Whale Entanglement (link)

Spring 2017 Oregon Whale Entanglement Working Group convened. (link)

Fall 2017 Washington Whale Entanglement Working Group convened. (link)

Summer 2018 PSMFC/NOAA Fisheries Whale Entanglement Forensic Review Workshop (link)

Fall 2018 CA legislation passed provides authorities to take action in commercial Dungeness crab fishery in response to entanglement issue. (link)

SCIENCE

Summer/ Fall 2018 California Current Ecosystem (CCE) Marine Mammals Survey – NOAA Fisheries survey collects data on whale population abundance, environmental monitoring, photo ID, entanglement reporting.

Spring 2019

Statewide closure of commercial CA Dungeness crab fishery in concert with litigation settlement (link)

Spring/Summer 2019 - CA, OR, and WA announce intentions to draft Conservations Plans and seek ESA permits for their commercial Dungeness crab fisheries.

Fall 2019 Washington Department of Fish & Wildlife proposes regulations in the commercial Dungeness crab fishery to take action in response to entanglement issue. (link)

Fall 2019 **CDFW Director** delays opening of commercial Dungeness crab season to avoid marine life (link)

MANAGEMENT ACTIONS

2013 Trap limit programs and buoy tags are in effect for CA/OR/WA Commercial Dungeness crab fisheries.

MANAGEMENT ACTIONS

Late 2015 to Spring 2016

Unprecedented delays in Dungeness crab seasons delayed for domoic acid concerns.

entanglement risk.

ENVIRONMENT Fall 2019 Northeast Pacific

Marine Heatwave



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