

**California Dungeness Crab Fishing Gear Working Group
2018-19 Risk Assessment and Mitigation Program (RAMP)
Mid-season Risk Assessment—Key Highlights and Next Steps
February 2019**

On February 14, 2019, the California Dungeness Crab Fishing Gear Working Group (Working Group) convened to discuss the relative risk of whale entanglements as the 2018-19 California Dungeness crab fishing season progresses and reaches the midpoint. This assessment was conducted as part of the 2018-19 Risk Assessment and Mitigation Program (RAMP), a program that is designed to identify, where possible provide an outlook ahead, and be responsive to elevated entanglement risk in the California Dungeness crab fishery. For more information about the RAMP and this effort, visit www.opc.ca.gov/whale-entanglement-working-group.

The following provides key highlights and next steps from the risk assessment process. This summary is publicly available via the Working Group’s webpage and has been circulated via the Working Group email list, the Dungeness Crab Task Force (DCTF) email list, the California Department of Fish and Wildlife (CDFW) Dungeness crab listserv, and posted to the CDFW Dungeness crab webpage. To be added to these email lists and/or receive updates on the progress of the RAMP and the Working Group’s efforts, please contact info@cawhalegroup.com.

Key Highlights, 2018-19 RAMP Mid-season Risk Assessment

The Working Group discussed available information for each factor (entanglements, forage/ocean conditions, whale concentrations, and fishing dynamics) and arrived at consensus-based agreements for each regarding relative midseason entanglement risk. Each factor was reviewed and discussed for both humpback whales and blue whales, as both species are being considered during the 2018-19 RAMP. Efforts were made by the Working Group to consider the relationships between/across factors with the recognition that each are inherently connected to one another. Two tables summarizing the information shared with the group are included on pages 8-9 of this document.

The Working Group recognizes that February is a transitional time for whale migration patterns, forage and ocean conditions, and fishing dynamics. With this in mind, the Working Group identified a risk evaluation across factors for both current conditions and provided an outlook for relative risk in anticipation of the spring months. The agencies, in partnership with the Working Group, will closely track each factor over the coming weeks. The Working Group is planning to convene again in March to continue to evaluate risk levels for factors during the spring/summer months.

Mid-season Risk Assessment for Humpback Whales

The Working Group discussed the current conditions and provided an outlook of the relative risk of each factor for humpback whales as we look to the 2018-19 spring fishing season. Based on available information, which for some factors was limited, the Working Group identified the following:

Humpback Whales, 2018-19 Mid-season Risk Assessment		
Risk Factors	Current Entanglement Risk Assessment (February 14, 2019)	Entanglement Risk Assessment Outlook (March/April 2019)
Entanglements	LOW	MODERATE
Forage/ocean conditions	MODERATE	MODERATE
Whale concentrations	LOW	MODERATE
Fishing dynamics	LOW	LOW TO MODERATE

Details of how and why each factor was scored for current/outlook conditions, as well as next steps related to each factor, are listed below.

- **Entanglements in California Dungeness crab fishing gear**

Mid-season risk level, current (February 14, 2019): Low

Mid-season risk level, outlook (March/April 2019): Moderate

Guiding Questions: *Have there been 5 or more humpback whale entanglements confirmed by NMFS and suspected/reported with CA Dungeness crab gear during the 2018-19 fishing season, including offseason?*

Data source: *NMFS unofficial 2018 entanglement summary ([here](#)), December 21, 2018*

Since the 2018-19 preseason risk assessment conducted by the Working Group in October/November 2018, the National Marine Fisheries Service (NMFS) reported there has been 1 confirmed entanglement of an unidentified whale species in California Dungeness crab commercial fishing gear in December 2018. There have been no entanglements reported off the U.S. West Coast since the beginning of 2019, which is not unusual for this time of year.

The Working Group agreed that based on the report from NMFS the current relative risk of humpback whale entanglements is low. Looking ahead to the spring months, and reflecting on the increased number of entanglements in California Dungeness crab fishing gear (and other fishing gear) that were reported during May-August 2018 (and other recent years), the Working Group arrived at a moderate entanglement risk level in March and April. The group emphasized the need to continue monitoring this factor closely heading into spring when historically the risk of entanglements has been higher.

The Working Group discussed upcoming NOAA Disentanglement Response trainings that are being to offered to increase the ability of responders, including Working Group participants and others, to address whale entanglements. Additional information on the trainings will be circulated to the Working Group as it becomes available.

Entanglements of humpbacks will continue to be tracked by NMFS and updates will be shared with the Working Group, CDFW, and the broader fleet. An Evaluation Team will be convened if 2 or more humpback entanglements suspected/reported with California Dungeness crab gear are confirmed by NMFS in a month or 5 or more humpback whale entanglements are confirmed by NMFS and suspected/reported with California Dungeness crab gear during the 2018-19 fishing season.

- **Forage/ocean conditions**

Mid-season risk level, current (February 14, 2019): Moderate

Mid-season risk level, outlook (March/April 2019): Moderate

Guiding question: *Are there indications of anomalous forage/ocean conditions occurring in anticipation of the 2018-19 spring/summer fishing season?*

Data sources: *Ocean conditions analysis conducted by Pieter Folkens ([here](#)), NOAA's ENSO advisory ([here](#))*

Pieter Folkens, NOAA's West Coast Large Whale Entanglement Response Network member and Working Group advisor, presented available information on ocean conditions. While weak El Niño conditions currently exist, current trends are shifting towards neutral El Niño conditions based on information across four national and international agencies. This is an update since the start of the fishing season when Jarrod Santora (Working Group Advisor) reported that atmospheric and oceanic models indicated an 80% chance of a weak El Niño form in winter 2018-19, with a 55-60% change in late spring ([here](#)). As of February 14, NOAA's El Niño Southern Oscillation (ENSO) diagnostic indicates a 55% chance of weak El

Niño conditions expected to persist in Spring, with other data sources indicating this as a less than 50% change. The blob of warm water that sat off the Pacific Northwest in 2018 has dissipated, which has also contributed to the change in El Niño forecast confidence.

The Working Group discussed how current ocean conditions and trends compare to the spring/summer months during the 2017-18 season. Last season, mild La Niña conditions fell from the cooler side of moderate to ENSO neutral while this season conditions are falling from the warmer side of moderate to ENSO neutral. The Working Group discussed whether the slight warming trend will continue into the spring and summer, and how these anticipated ENSO neutral ocean conditions relate to forage conditions. Fishermen on the Working Group reported that anchovies have been showing up in San Francisco Bay in average numbers and concentrations, while patchy distributions have been seen in other areas as well. In the Central Management Area (south of the Mendocino/Sonoma County border), fishermen are seeing slight El Niño effects including not much upwelling and warmer ocean conditions. However, fishermen in the Northern Management Area (Mendocino/Sonoma County border north to the CA/OR border) reported the water was clear and green at about 53 to 55 degrees, which is average for winter.

The Working Group acknowledged the limited forage information available, including the expert opinion to help interpret connections between current ocean conditions and expected forage distribution over the coming months. The group identified the need for additional forage data and requested the agencies seek out available acoustic trawl survey data and other sources in the near-term and beyond. There remains, however, a continued need for the interpretation of that data to effectively inform this factor. The Working Group discussed the challenge of fulfilling this need and the goal of having additional data to inform this factor by the Working Group's next meeting in March.

Based on similar relatively moderate ocean and forage conditions when compared to the 2017-18 season, including the increased number of entanglements in California Dungeness crab fishing gear (and other fishing gear) that were reported during May-August 2018, and limited available forage data and expert opinion the Working Group agreed to a precautionary approach and arrived at a moderate risk level for current and anticipated forage/ocean conditions. The Working Group, together with the agencies, will continue to track this factor closely and proactively heading into spring months. The Working Group will communicate any changes in the forage/ocean conditions to the fleet following their next meeting in March 2019.

- **Whale concentrations**

Mid-season risk level, current (February 14, 2019): Low

Mid-season risk level, outlook (March/April 2019): Moderate

Guiding question: *Are humpback whale concentrations moderate to high as of February 14, 2019? Are humpback whale concentrations forecasted to be in moderate to high concentrations looking ahead to the spring/summer months?*

Data source: *Monterey Bay Whale Watch data and Oceanic Society data ([here](#)), Fishermen's reported observations*

Karin Forney, Research Biologist with the Southwest Fisheries Science Center and Working Group advisor, provided a snapshot of seasonal humpback whale distribution information since 2012. This information can serve as an indicator for humpback whales' seasonal migration and anticipated arrival to California feeding grounds. As of February 12, 2019, the 7-day composite running average of whale sightings in the southern Monterey Bay area is below 5 whales, which is within the low concentration range. Current reports from breeding grounds in Mexico and Central America indicate that the humpback whale migration is not in full swing and whales are expected to start arriving in greater

numbers in April/May. Observations of low humpback whale concentrations were confirmed by on-the-water reports by fishermen.

Based on seasonal migration trends of humpback whales, and in an effort to help inform the fleet as we look ahead to the spring/summer months, the Working Group agreed to identify whale concentrations at moderate risk level looking ahead to March and April 2019. Reflecting on lessons learned from the 2017-18 season, the group discussed the need to be extra vigilant about monitoring when humpback whales return to their traditional feeding grounds in as real-time as possible. This is anticipated for sometime in April when the water typically becomes more biologically rich.

The Working Group requested that Karin Forney develop bi-weekly reports of the MBWW and Oceanic Society data so they can more closely track changes in humpback whale concentrations as the season progresses. There was also discussion about bringing in information from other more real-time data sources, including [HappyWhale](#) and [Whale Alert](#). Aerial surveys are also planned for February through May (weather dependent) and historical whale concentration data may be made available to help inform the Working Group's continued tracking of this factor in March and throughout the remainder of the 2018-19 season.

- **Fishing Dynamics**

Mid-season risk level, current (February 14, 2019): Low

Mid-season risk level, outlook (March/April 2019): Low to Moderate

Guiding question: *How has the impact of the Northern delay affected fishing behavior? How will pricing/markets/salmon or shrimp season/etc. influence the anticipated abundance and distribution of CA Dungeness crab fishing gear this spring?*

Data source: *Fishermen's reported observations, February 14, 2019*

Fishermen on the Working Group who have been fishing in the Central Management Area reported observing less commercial and sport/recreational gear in the water than typical at this time in the fishing season. Many boats in Half Moon Bay have stopped fishing and gear is continuing to come out of the water due to limited product at this time of year. Additional reports out of Morro Bay indicate there are only a few boats still fishing, however, due to a rising prices per pound (\$3-\$3.50) the boats are able to sustain themselves. In the Northern Management Area, several traveling boats have not made the trip south and have kept their gear on the docks. Fishermen on the Working Group agreed that it has been a good and profitable crab season so far despite there being less gear in the water at this time compared to 2018 and despite terrible weather, which has also contributed to a reduced fishing effort.

During the preseason assessment, it helped to discuss the Central and Northern Management areas separately, primarily due to the delayed opener of a portion of the Northern Management Area. The Working Group decided this delineation was not necessary for the mid-season assessment.

The Working Group discussed how February tends to be a transition period as fishermen look ahead to the spring months. Some fishermen are preparing for shrimp season, which starts April 1, and others are closely tracking how the salmon season is shaping up. The group considered whether there may be an influx of crab in the Central Management Area that may lead fishermen who are pulling their gear out and/or are already done fishing to return to fishing Dungeness crab during the spring months. The fishermen stated it's too early to tell at this point and impossible to predict whether the crabs will support this. There was also discussion about how windy weather in spring could hamper fishing.

The Working Group discussed how aerial surveys have been the main source of information for observing gear concentrations. While this tool provides valuable information, aerial surveys are

unreliable due to relying on good weather conditions. In addition, landings information hasn't been available in real-time, but this could change looking ahead to the 2019-20 fishing season with E-Tix mandatory as of July 1, 2019. The Working Group also received a brief update on the status of the 2018-2020 solar logger project ([here](#)). Kathi George, project coordinator and Working Group participant, anticipates solar logger data will start to be available to the Working Group in March.

The Working Group discussed the possibility of having fishermen declare when they are finished fishing Dungeness crab, which is what occurs in Oregon. This could be helpful in determining how much of a spring fishing effort could materialize. CDFW agreed to look into this and follow back up with the Working Group on how to potentially coordinate this type of effort in an organized and systematic way.

Based on the current status of fishing throughout the geographic range of the fishery, the Working Group agreed that the current entanglement risk level due to fishing dynamics is low. Due to the uncertainty of price, availability of other fisheries to move into, and the possibility of fishermen returning to fishing Dungeness crab in the spring months, the Working Group provided an outlook of a risk level of low to moderate. The Working Group requested that, as available, additional fishing information be brought forward during the March meeting which could be gathered by aerial surveys that are planned for February through May.

Preseason Risk Assessment for Blue Whales

Similar to humpback whales, The Working Group discussed the current conditions and provided an outlook of the relative risk of each factor for blue whales* as we look to the 2018-19 spring fishing season. Based on available information, which for some factors was limited, the Working Group identified the following:

Blue Whales, 2018-19 Mid-season Risk Assessment		
Risk Factors	Current Entanglement Risk Assessment (February 14, 2019)	Entanglement Risk Assessment Outlook (April/May 2019)
Entanglements	LOW	MODERATE
Forage/ocean conditions	LOW	MODERATE
Whale concentrations	LOW	MODERATE
Fishing dynamics	LOW	LOW TO MODERATE

*The objective criteria for each of the factors for blue whales is currently under development by the agencies, Whales Project Team, and other Working Group advisors.

Details of how and why each factor was scored for current/outlook conditions, as well as next steps related to each factor, are listed below.

- Entanglements in California Dungeness crab fishing gear**
Mid-season risk level, current (February 14, 2019): Low
Mid-season risk level, outlook (April/May 2019): Moderate
Guiding Questions: *Were there 1 or more blue entanglements confirmed by NMFS and suspected/reported with CA Dungeness crab gear during the 2018-19 fishing season, including offseason?*

NMFS confirmed there have been no blue whale entanglements in California Dungeness crab fishing gear have been reported during the 2018-19 season. It was noted that during the 2017-18 season, one blue whale was reported off Sonoma County in July 2018 trailing two main line buoys, but this entanglement report was not confirmed. While this factor was determined to be low risk as of February 14, 2019, the Working Group agreed it should be tracked closely in late April and May when blue whales typically return and identified a moderate risk in anticipation of this timing. Entanglements of blue whales will continue to be tracked by NMFS and updates will be shared with the Working Group, CDFW, and the broader fleet. An Evaluation Team will be convened if 1 or more blue whale entanglements are confirmed by NMFS and suspected/reported with CA Dungeness crab gear in the 2018-19 fishing season.

- **Forage/ocean conditions**

Mid-season risk level, current (February 14, 2019): Low

Mid-season risk level, outlook (April/May 2019): Moderate

Guiding question: Currently under development

Data source: Information shared by John Calambokidis and Pieter Folkens

Informed by the forage/ocean conditions discussion during the humpback whale review, the Working Group discussed the positive lag effect that good krill years have on subsequent years. While 2019 ocean temperatures may be a little warmer than in 2018 at this time, and potentially less favorable for krill, given that 2018 was a healthy krill year the group anticipates an average amount of krill this year.

The Working Group determined the current level of risk for this factor to be low and identified a moderate risk level heading into May when krill populations historically increase. Forage/ocean conditions will continue to be tracked and any changes in conditions will be shared with the Working Group. The Working Group will reassess this factor in May 2019 to help understand relative entanglement risk during the spring and summer.

- **Whale concentrations**

Mid-season risk level, current (February 14, 2019): Low

Mid-season risk level, outlook (April/May 2019): Moderate

Guiding question: Currently under development by the Whales Project Team

Data source: Monterey Bay Whale Watch data and Oceanic Society Data ([here](#))

Karin Forney provided a snapshot of seasonal blue whale distribution information since 2012. As of February 14, 2019, the 7-day composite running average of whale sightings in the Monterey Bay area and Gulf of the Farallones was less than 5 whales, which is within the low concentration range. John Calambokidis, founder of Cascadia Research and Working Group advisor, confirmed that this low level of blue whale concentrations is typical for this time of year. Normally, blue whales return to Southern California in May and June and then move north. However, blue whales can travel great distances in a short amount of time and can be unpredictable. While the Working Group determined the level of risk for this factor to be low at this time, members identified a moderate risk level in April and May when blue whales typically start returning to California. This factor will continue to be tracked by the agencies and any updated information related to blue whales, including information gathered via aerial surveys scheduled for the spring/summer, will be shared with the Working Group.

- **Fishing Dynamics**

Mid-season risk level, current (February 14, 2019): Low

Mid-season risk level, outlook (April/May 2019): Low to Moderate

Guiding question: Currently under development

Data source: Fishermen's reported observations, February 14, 2019

Based on the evaluation of the other factors and the information shared regarding fleet dynamics when considering humpback whales, the Working Group agreed that the risk level for fishing dynamics is low at this time. Due to the uncertainty of the spring/summer price for crab and the ability for a fisherman to transition to another fishery (salmon, shrimp), the Working Group identified a low to moderate risk looking ahead to April and May when blue whales are anticipated to return to seasonal feeding grounds in Southern and Central California.

The Working Group discussed the spatial distribution of blue whales in relation to forage distribution and whale behavior and how this may overlap (or not) with where gear is being operated. Typically, blue whales are found in greater than 100 fathoms. The group discussed how, if there was an increase in blue whale concentrations in the future, depth restrictions for fishing activity may be a possible management measure the Working Group could consider. This requires additional information and discussion.

The Working Group also discussed the need to monitor this factor closely as spring fishing efforts become more apparent closer to the blue whales return.

Next Steps

The Working Group will meet again in March 2019 to continue to evaluate the risk factors and review additional related information as it becomes available. The group agreed there is a need to more closely track all four risk factors from now through the summer months in an effort to be responsive to the changes anticipated for whale concentrations, forage and ocean conditions, and fishing dynamics. Any indications of elevated risk identified during the remainder of the 2018-19 season will result in an Evaluation Team being convened.

Commercial and recreational fishermen and industry leaders, whale watch operators, gear manufacturers, and other interested members of the public are invited to provide feedback on all aspects of the RAMP. Ideas on how to improve the Working Group's approach to assessing risk, considerations for possible management measures, and suggestions related to new technologies are welcomed and encouraged. Information learned during the 2018-19 RAMP will be shared with CDFW, NMFS, the California Ocean Protection Council, the Fish and Game Commission, Joint Committee on Fisheries and Aquaculture, and California Dungeness Crab Task Force throughout the 2018-19 fishing season.

For more information about the 2018-19 RAMP and the Working Group's efforts, including opportunities to provide feedback and share your expertise, visit <http://www.opc.ca.gov/whale-entanglement-working-group/> or contact the Working Group at info@cawhalegroup.com.

2018-19 RAMP Mid-season Risk Assessment for Humpback Whales

Core Factors	Mid-season Risk Assessment* - CURRENT (February 14, 2019)	Mid-season Risk Assessment* - LOOKING AHEAD (March/April 2019)	Guiding Questions (questions in blue are under development, along with objective criteria, during the 2018-19 RAMP)	Objective Criteria to Indicate Elevated Risk	Mid-season Information Used to Inform Assessment	Comments/Notes	Next Steps
Entanglements in CA Dungeness crab fishing gear	Low	Moderate	<p>Were there 5 or more humpback whale entanglements confirmed by NMFS and suspected/reported with CA Dungeness crab gear during the 2018-19 fishing season, including offseason?</p> <p>Is there an increase of entanglement activity during a month along the entire coast reported in CA involving multiple gear types (including unknown)?</p> <p>What is the relevance of postseason entanglements to risk for next fishing season?</p> <p>Is there a need to refine any of the risk factors as we look ahead to the next season?</p>	Any season/offseason where 5 or more humpback whale entanglements are confirmed by NMFS and suspected/reported with CA Dungeness crab gear, or 2 or more humpback whale entanglements confirmed by NMFS in a month suspected/reported with CA Dungeness crab gear.	<p>During the 2018-19 fishing season to date, National Marine Fisheries Service (NMFS) confirmed there has been 1 confirmed entanglement of an unconfirmed whale species in California Dungeness crab commercial fishing gear in December 2018. There have been no entanglements reported since the beginning of 2019, which is not unusual for this time of year.</p> <p>http://bit.ly/Prelim2018EntanglementNumbers</p>	<p>Discussed current and anticipated relative risk of entanglements. Current relative risk of humpback whale entanglements is low. Looking ahead to the spring months, and reflecting on the increased number of entanglements in California Dungeness crab fishing gear (and other fishing gear) that were reported during May-August 2018, the outlook for relative entanglement risk is moderate looking ahead to March and April.</p> <p>Upcoming disentanglement trainings will be offered by NOAA to increase the ability of responders, including Working Group participants and others, to help address whale entanglements.</p>	<p>Will need to continue monitoring this factor closely heading into spring when historically the risk of entanglements has been higher.</p> <p>Entanglements of humpbacks will continue to be tracked by NMFS and updates will be shared with the Working Group, CDFW, and the broader fleet.</p>
Forage/ocean conditions	Moderate	Moderate	<p>Are there indications of anomalous ocean/forage conditions occurring during the 2018-19 fishing season?</p> <p>What are the connections/relationship between ocean conditions (forage) and crab distribution?</p>	Low krill, high anchovy abundance and density; El Niño; or high diversity of species, especially if there is a delay in the season.	<p>Pieter Folkens, member of NOAA's West Coast Large Whale Entanglement Response Network and Working Group advisor, presented information on ocean conditions. As of February 14, NOAA's El Niño Southern Oscillation (ENSO) diagnostic indicates a 55% chance of weak El Niño conditions expected to persist in Spring, with other data sources indicating this as a less than 50% change. Additionally, the blob of warm water that sat off the Pacific Northwest in 2018 has dissipated.</p> <p>Fishermen reported seeing herring in southern harbors and anchovies in San Francisco Bay. The levels of these forage fish appear to be average compared to previous years. Still seeing wide distributions of anchovies and krill. Seeing a slight El Niño with water in the southern ports around 55 degrees and 49 degrees in the north. Average winter-style conditions appear to be in place.</p> <p>NMFS reported that their summer trawl surveys will give the latest information on the status/trends for forage. Preliminary data from recent Pacific Fisheries Management Council (PFMC) presentations are showing high concentrations of anchovies these surveys could also be made available to support the RAMP.</p> <p>Ocean Climate Outlook Update: http://bit.ly/Feb2019OceanClimateOutlook (includes additional data sources and references)</p> <p>ENSO Diagnostic Discussion: http://bit.ly/ENSODiagnostics</p>	<p>Discussed whether the slight warming trend of sea surface temperatures (associated with El Niño) will continue into the spring and summer, and how these anticipated ocean conditions relate to forage conditions. Discussed the positive lag effect that good krill years have on subsequent years. The group anticipates an average amount of krill this year given that 2018 was a healthy krill year, even with warmer ocean temperatures.</p> <p>Acknowledged the limited forage information available, including the expert opinion to help interpret connections between ocean conditions and forecasted forage distribution. Discussed the challenge of fulfilling this need and the goal of having additional data to inform this factor by the Working Group's next meeting in March.</p> <p>Considered current ocean and forage conditions when compared to the 2017-18 season, including the increased number of entanglements in California Dungeness crab fishing gear (and other fishing gear) reported during May-August 2018. Based on limited available forage data and expert opinion, agreement for a precautionary approach and moderate risk level for current and forage/ocean conditions looking ahead to March/April.</p>	<p>Need for additional forage data and requested the agencies seek out available acoustic trawl survey data and other sources in the near-term. There remains, however, a continued need for the interpretation of that data to effectively inform this factor.</p> <p>The Working Group, together with the agencies, will continue to track this factor closely and proactively heading into spring months. The Working Group will communicate any changes in the forage/ocean conditions to the fleet following their next meeting in March 2019.</p>
Concentrations of whales	Low	Moderate	<p>Are whale concentrations moderate to high as of February 14, 2019? (and where?)</p> <p>Are whale concentrations expected to be high in the near future (i.e., days) (and where)?</p> <p>Are whales inshore? offshore? And where?</p> <p>Are the whale concentrations identified in via the MBWW data (i.e., Monterey area) applicable to other areas along the coast?</p> <p>What stage is the migration pattern (seasonality)? What variability is occurring locally/regionally (forage driven)?</p> <p>How does fishing factor relate to whale concentrations?</p> <p>Do we have a prediction for spring/early summer outlook for whale concentrations (broaden MBWW, spatial distribution) whale/forage models?</p>	<p>The following criteria have been developed when considering relative risk of entanglements for season humpback whale migration patterns:</p> <p>High: running average >20 whales present Moderate: running average 5-20 whales present Low: running average <5 whales present</p> <p>Averages considered over sustained period of 1 week</p>	<p>Karin Forney, Research Biologist with the Southwest Fisheries Science Center and Working Group advisor, provided a snapshot of seasonal humpback whale distribution information since 2012. This information can serve as an indicator for humpback whales' seasonal migration and anticipated arrival to California feeding grounds. As of February 14, 2019, the 7-day composite running average of whale sightings in the Monterey Bay area was less than 5 whales, which is within the low concentration range.</p> <p>John Calambokidis, Founder of Cascadia Research and Working Group advisor, reported there is nothing that suggests 2019 humpback whale concentrations are shaping up any different than 2018. The upcoming spring looks like a typical year for humpbacks.</p> <p>Observations of low humpback whale concentrations were confirmed by on-the-water reports by fishermen.</p> <p>Monterey Bay Whale Watch data: http://www.montereybaywhalewatch.com/slstcurr.htm</p> <p>Worked up Monterey Bay Whale Watch data and Oceanic Society data: http://bit.ly/MidSeason2018-19WhalesData</p>	<p>Current reports from breeding grounds in Mexico and Central America indicate that the humpback whale migration is not in full swing and whales are expected to start arriving in greater numbers in April/May.</p> <p>Identified the need to bring in information from other more real-time data sources, including HappyWhale and Whale Alert, to indicate when the whales will be coming into California waters during the spring migration. Discussion of the relationship between age class of whales and probability of entanglements.</p> <p>Agreement to identifying the current whale concentrations at low relative risk and the outlook to whale concentrations at moderate risk level looking ahead to March and April 2019. Based on lessons learned from the 2017-18 season, the group discussed the need to be extra vigilant about monitoring when humpback whales return to their traditional feeding grounds in as real-time as possible. This is anticipated for sometime in April when the water typically becomes more biologically rich.</p>	<p>Requests for bi-weekly reports of the MBWW and Oceanic Society data so they can more closely track changes in humpback whale concentrations as the season progresses.</p> <p>The whales concentrations factor will continue to be monitored by the agencies. Aerial surveys are also planned for February through May (weather dependent) and historical whale concentration data may be made available to help inform the Working Group's continued tracking of this factor in March and throughout the remainder of the 2018-19 season.</p>

2018-19 RAMP Mid-season Risk Assessment for Humpback Whales

Fleet dynamics	Low	Low to Moderate	<p>How has the impact of the Northern delay affected fishing behavior?</p> <p>How is pricing/markets affecting the spring fishery?</p> <p>Do fishermen have other fisheries to transition to this spring?</p> <p>Are there large aggregations of gear concentrations concentrated in areas?</p> <p>Where is the location of crab and the location/concentration of gear relative to whale concentrations?</p>	<p>To consider a number of factors (delays (domoic, quality, marketing), markets/pricing, movement to other fisheries, concentration of gear/crab, etc.) throughout the season that would influence/inform the concentration and/or distribution of CA Dungeness crab fishing gear. Factors include:</p>	<p>Fishermen reported observing less commercial and sport/recreational gear in the water than typical in the Central Management Area. Many boats in Half Moon Bay have stopped fishing and gear is continuing to come out of the water due to limited product at this time of year. Additional reports out of Morro Bay indicate there are only a few boats still fishing, however, due to a rising prices per pound (\$3-\$3.50) the boats are able to sustain themselves. In the Northern Management Area, several traveling boats have not made the trip south and have kept their gear on the docks.</p>	<p>Fishermen on the Working Group agreed that it has been a good and profitable crab season so far despite there being less gear in the water compared to 2018 and despite terrible weather, which has also contributed to a reduced fishing effort.</p> <p>February tends to be a transition period as fishermen look ahead to the spring months. Some fishermen are preparing for shrimp season, which starts April 1, and others are closely tracking how the salmon season is shaping up. Considered if there may be an influx of crab in the Central Management Area that could lead fishermen who are pulling their gear out and/or are already done fishing to return to fishing Dungeness crab during the spring months. It's too early to tell at this point, nor to predict whether the crabs will support this type of effort. Acknowledged that windy weather in spring could hamper fishing.</p> <p>Discussed aerial surveys as the main source of information for observing gear concentrations, which can be informative but also unreliable due to relying on good weather conditions. Landings information hasn't been available in real-time, but this could change looking ahead to the 2019-20 fishing season with E-Tix mandatory as of July 1, 2019. Data from the 2018-2020 solar logger project is anticipated to be available to the Working Group for review/use in March.</p> <p>Discussed the possibility of having fishermen declare when they are finished fishing Dungeness crab, which is what occurs in Oregon. This could be helpful in determining how much of a spring fishing effort could materialize. Based on the current status of fishing throughout the geographic range of the fishery, agreement that the current entanglement risk level due to fishing dynamics is low. Due to the uncertainty of price, availability of other fisheries to move into, and the possibility of fishermen returning to fishing Dungeness crab in the spring months, the Working Group arrived at a risk level of low to moderate when looking ahead to March/April.</p>	<p>CDFW agreed to look into options for fishermen to declare they have ended fishing for the season and follow back up with the Working Group on how to potentially coordinate this type of effort in an organized and systematic way.</p> <p>Fishing dynamics will continue to be tracked by CDFW and updates will be shared with the Working Group and the broader fleet. The Working Group requested that, as available, additional fishing information be brought forward during the March meeting which could be gathered by aerial surveys that are planned for February through May.</p>
----------------	-----	-----------------	---	--	--	--	---

2018-19 RAMP Mid-season Risk Assessment for Blue Whales

Core Factors	Mid-season Risk Assessment* - CURRENT (February 14, 2019)	Mid-season Risk Assessment* - LOOKING AHEAD (April/May 2019)	Guiding Questions (questions in blue are under development, along with objective criteria, during the 2018-19 RAMP)	Objective Criteria to Indicate Elevated Risk	Mid-season Information Used to Inform Assessment	Comments/Notes	Next Steps
Entanglements in CA Dungeness crab fishing gear	Low	Moderate	Was there 1 or more blue whale entanglements confirmed by NMFS and suspected/reported with CA Dungeness crab gear during the 2018-19 fishings season, including offseason?	Any season/offseason where 1 or more blue whale entanglement is confirmed by NMFS and suspected/reported with CA Dungeness crab gear	NMFS confirmed there have been no blue whale entanglements in California Dungeness crab fishing gear have been reported during the 2018-19 season. It was noted that during the 2017-18 season, one blue whale was spotted off Sonoma County in July 2018 trailing two main line buoys, but this entanglement report was not confirmed. http://bit.ly/Prelim2018EntanglementNumbers	Discussed the need to track this factor closely in late April and May when blue whales typically return. Agreement that current entanglement risk is low and looking ahead to April/May the risk is moderate in an effort to reflect anticipated blue whale migration patterns.	Entanglements of blue whales will continue to be tracked by NMFS and updates will be shared with the Working Group, CDFW, and the broader fleet.
Forage/ocean conditions	Low	Moderate	Where are the high concentrations of krill located (inshore? offshore/canyons)? How does the location of krill relate to the concentration of whales? Fishing activity? What data do we have? What do we need?	TBD- Need to develop objective criteria for blue whales	Considered the same information shared during the humpback whale pre-season assessment. Limited information available on krill, as seasonal surveys start in the coming months. NMFS reported that their summer trawl surveys will give the latest information on the status/trends for forage. Fishermen reported still seeing wide distributions of krill. Ocean Climate Outlook Update: http://bit.ly/Feb2019OceanClimateOutlook (includes additional data sources and references) ENSO Diagnostic Discussion: http://bit.ly/ENSODiagnostics	Discussed the positive lag effect that good krill years have on subsequent years. While 2019 ocean temperatures are warmer than in 2018, and therefore less favorable for krill, given that 2018 was a healthy krill year the group anticipates an average amount of krill this year. Agreement the current level of risk for this factor is low and the outlook heading into May is at moderate risk levels when krill populations historically increase.	Need for additional forage data and requested the agencies seek out available acoustic trawl survey data and other sources in the near-term. There remains, however, a continued need for the interpretation of that data to effectively inform this factor. Forage/ocean conditions will continue to be tracked by the agencies and advisors and any changes in conditions will be shared with the Working Group. The Working Group will reassess this factor in May 2019 to help understand relative entanglement risk during the spring and summer.
Concentrations of whales	Low	Moderate	What are high/med/low concentrations of blue whales in x area? What do we know about blue whale concentrations in other geographic locations (i.e., Alaska) and how this informs CA waters? How do the ocean conditions inform where blue whales may be aggregated and how many are in West Coast waters?	TBD- Need to develop objective criteria for blue whales	Karin Forney, Research Biologist with the Southwest Fisheries Science Center and Working Group advisor, provided a snapshot of seasonal blue whale distribution information since 2012. As of February 14, 2019, the 7-day composite running average of whale sightings in the Monterey Bay area and Gulf of the Farallones was less than 5 whales, which is within the low concentration range. John Calambokidis, founder of Cascadia Research and Working Group advisor, confirmed that this low level of blue whale concentrations is typical for this time of year. Monterey Bay Whale Watch data: http://www.montereybaywhalewatch.com/slstcurr.htm Worked up Monterey Bay Whale Watch data and Oceanic Society data: http://bit.ly/MidSeason2018-19WhalesData	Discussed blue whale migration pattern. Normally, blue whales return to Southern California in May and June and then move north. However, blue whales can travel great distances in a short amount of time and can be unpredictable. While the Working Group determined the level of risk for this factor to be low at this time, members forecasted a moderate risk level in April and May when blue whales typically start returning to California.	Requests for bi-weekly reports of the MBWW and Oceanic Society data so they can more closely track changes in blue whale concentrations as the season progresses. This factor will continue to be tracked by the agencies and any updated information related to blue whales, including information gathered via aerial surveys scheduled for the spring/summer, will be shared with the Working Group.
Fleet dynamics	Low	Low to Moderate	How has the impact of the Northern delay affected fishing behavior? How is pricing/markets affecting the spring fishery? Do fishermen have other fisheries to transition to this spring? Are there large aggregations of gear concentrations concentrated in areas? Where is the location of crab and the location/concentration of gear relative to whale concentrations? Are there large aggregations of gear concentrations concentrated in offshore canyon areas? Is fishing being pushed into deeper water (seasonality)? Where is the location of crab and the location/concentration of gear relative to blue whale concentrations?	TBD- Need to develop objective criteria for blue whales	Considered the same information shared during the humpback whale pre-season assessment.	Discussed the spatial distribution of blue whales in relation to forage distribution and whale behavior and how this may overlap (or not) with where gear is being operated. Typically, blue whales are found in greater than 100 fathoms. If there was an increase in blue whale concentrations in the future, depth restrictions for fishing activity may be a possible management measure for consideration. This requires additional information and discussion. Discussed the need to monitor this factor closely as spring fishing efforts become more apparent closer to the blue whales return. Based on the evaluation of the other factors and the information shared regarding fleet dynamics when considering humpback whales, agreement that the risk level for fishing dynamics is low at this time. Due to the uncertainty of the spring/summer price for crab and the ability for a fisherman to transition to another fishery (salmon, shrimp), the outlook is low to moderate risk looking ahead to April and May when blue whales are anticipated to return to seasonal feeding grounds in Southern and Central California.	CDFW agreed to look into options for fishermen to declare they have ended fishing for the season and follow back up with the Working Group on how to potentially coordinate this type of effort in an organized and systematic way. Fishing dynamics will continue to be tracked by CDFW and updates will be shared with the Working Group and the broader fleet. The Working Group requested that, as available, additional fishing information be brought forward during the March meeting which could be gathered by aerial surveys that are planned for February through May.