SRKW 2018 Foraging Area Monitoring Activities

The primary objective of the 2018 fishery management measures is to improve Chinook Salmon availability for SRKW by decreasing potential fishery competition, as well as, minimizing physical and acoustic disturbance from fishing vessels in key foraging areas to the extent possible. Below is an overview of monitoring activities that are occurring during the 2018 fishing season that may help to inform future activities.

Below is a short overview of the fishery management actions, more information can be obtained in the Southern Integrated Fisheries Management Plan (http://waves-vagues.dfo-mpo.gc.ca/Library/40694306.pdf)

For Southern Resident Killer Whales (SRKW), additional fishery management actions are in place to support increased Chinook Salmon prey availability for SRKW in important foraging areas within the critical habitat. Management measures include recreational finfish and commercial salmon fishing closures in in the Strait of Juan de Fuca (Subareas 20-3, 20-4, and a portion of 20-5 west of Otter Point) and the Gulf Islands (Subareas 18-2, 18-4, 18-5, and 18-9). Management measures near the mouth of the Fraser River (Subareas 29-6, 29-7, 29-9, and 29-10) include a salmon fishing closure or Chinook non-retention depending on time/area. These measures are intended to reduce competition for Chinook Salmon and disruption of SRKW foraging activities associated with the physical presence of fishing vessels (physical disturbance) and acoustic disturbance during the May to September period based on timing of previous SRKW foraging observations. For 2018, management measures are in effect from June 1st to September 30th.

For Chinook, additional fishery management measures are also in place for 2018 fisheries to address conservation concerns for many BC Chinook Salmon populations. Conservation concerns for BC Chinook populations are documented in a Science Response, Science information to support consultations on BC Chinook Salmon fishery management measures in 2018 that is available at the following link: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2018/2018_035-eng.html. DFO implemented a precautionary 25% to 35% reduction in exploitation rates for specific Chinook stocks of concern to support conservation and promote rebuilding. The additional reductions are intended to address conservation concerns for all Fraser River Chinook populations (including Spring 4_2, Spring 5_2, Summer 5_2, Summer 4_1, and Fall 4_1) in Southern BC and may support increased prey availably for SRKW.

An assessment of the effectiveness of fishery management actions to increase Chinook prey availability and/or accessibility for SRKW recovery is likely to be challenging due to:

- limited information on the relative importance of multiple different factors affecting chinook availability in key foraging areas and times (e.g. abundance, timing, behaviour, and distribution of specific Chinook stocks);
- limited understanding of the relative importance of factors affecting Chinook accessibility in the key foraging areas (e.g. foraging success may be affected by local foraging conditions including physical and acoustic disturbance);
- the potential for cumulative effects from these factors;

- limited long-term observations of SRKW foraging behaviour and associated factors that may affect foraging success, particularly in the foraging areas; and,
- potential lags in response for SRKW population metrics (e.g. growth, mortality, birth rates, body condition, etc).

Development of potential performance indicators:

The following information will support the development of performance indicators for recovery actions.

a. SRKW observations (e.g. whale condition, presence, time spent in closed vs open areas, time spent in the identified critical habitat area)
b. Vessel information in key foraging areas (e.g. vessel types, activities and locations)
c. Acoustic environment: hydrophones are deployed in the key foraging areas and may provide information on ambient noise levels from different sources and SRKW presence
d. Chinook abundance/Fishery Removals: considerable information is available from recreational, commercial, and First Nations fishery monitoring, monitoring of Fraser spring and summer chinook abundance through the Albion test fishery, and monitoring of chinook populations in spawning areas. Biological data include coded-wire tag (CWT), DNA based stock composition, length, age, etc. These data are used to reconstruct returns to the Fraser, assess status, forecast returns, estimate fishery catch/release, estimate fishery exploitation for key indicator stocks, and assess timing and distribution of various chinook populations in the critical habitat areas.
e. Other available information may also be useful (e.g. environmental conditions)

2018 Monitoring Program Information

Information from research and monitoring programs may help to increase our understanding related to the potential performance indicators. Here is an overview of some of the programs undertaken in 2018.

DFO Conservation and Protection

Regular aerial surveillance operations occur along the Pacific coast. Patrols are expected to include regular over-flights of SRKW foraging area closures. The focus of these flights is on enforcement and compliance but summary information may be available on presence of SRKW and vessel use within foraging area closures.

Summary of planned science initiatives on SRKW

Salmon Stock Assessment

The Department conducts regular overflights to count recreational fishing (and other non-fishing) vessels in southern BC as part of creel survey monitoring. These surveys include regularly scheduled flights usually 2 times per week over defined routes through much of the critical habitat. The purpose of these overflights is to support estimation of recreational fishing effort. The flights pass over the 2018 SRKW foraging area closures and all visible boats coded by vessel type will be documented on charts. Overflights are planned until the end of October in the Juan de Fuca area. Photos/Video will be taken when killer whales are observed to help inform SRKW presence in specific areas and distribution of nearby vessels.

Creel survey interview questions asked of anglers returning to key access points (e.g. docks, boat launches) have been updated for this year to include questions about marine mammal interactions, including Killer Whales.

In rivers, chinook abundance is assessed through the Albion test fishery, while spawning ground surveys for key indicator stocks will provide information related to abundance and status.

Cetacean Research Program (CRP).

Undertakes annual census work for SRKW and NRKW. The census is conducted from small vessels and tends to be opportunistic in nature. High resolution photos are taken, and for SRKW, are predominantly identified by colleagues at the Center for Whale Research (Ken Balcomb) in Washington State. This work is also supported tangentially by the BC cetacean Sightings Network. CRP also has a small number of acoustic listening devices in the Strait of Georgia to help understand winter dispersion and migration.

Pinniped Research Program.

The pinniped research program uses aerial surveys to determine population abundance for harbour seals and sea lions. This work is done coast wide. Scat collection, and subsequent analysis, is underway to determine prey composition and relative abundance. This work involved collecting scat samples from haul-outs and rookeries, sorting through the hard parts to determine species composition and then extracting DNA to determine stock composition of the salmonid prey. In time, this will help understand if specific Chinook populations are being targeted and potential for pinnipeds competition with SRKW for Chinook prey.

Ocean Protection Plan – Marine Environmental Quality (MEQ).

The MEQ initiative is new and is broadly focused on determining the acoustic impact on SRKW from marine vessels. In the last fiscal year, a series of acoustic devices were deployed in the Strait of Juan de Fuca and Haro Strait to develop an acoustic signature for the area. This will serve as a baseline for future comparisons for assessing increased shipping. The devices are retrieved and replaced roughly every 12 weeks resulting in a comprehensive data set. This summer in the Juan de Fuca, field teams are assessing feeding behaviour and successes (known as focal follows) while capturing data on the presence of different vessel types and their activity. Biological samples (scat, prey debris etc.) are collected as well..

Ocean Protection Plan – Large Mammal Collision Avoidance System (LMCAS).

The LMCAS is in year two of a five year initiative to evaluate the efficacy of the Whale Tracking Network. This year the emphasis will focus on the deployment locations of existing instruments, evaluating the currently used auto-detection software and undertaking research to assess other software systems and land based technologies e.g. infrared cameras.

<u>Potential Opportunities to collaborate and share information</u>

- Photogrammetry- provides information on body condition for individual killer whales over time. Lance Barrett-Leonard (Van. Aquarium) and US collaborators.
- Whale Watching Association- Log of whale watching activities that could be cross-referenced with other data that is being collected