

Southern Resident Killer Whale Information Webex

February 23rd, 2018

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Photo: S.J. Thornton



Resident Killer Whale - Biology

Resident

- Mostly salmon diet
- Some other fish species & squid
- No mammals
- **S pop'n: Endangered**
- **N pop'n: Threatened**

Bigg's (Transient)

- Mostly mammal diet
- Some seabirds & squid
- No fish
- **Threatened**

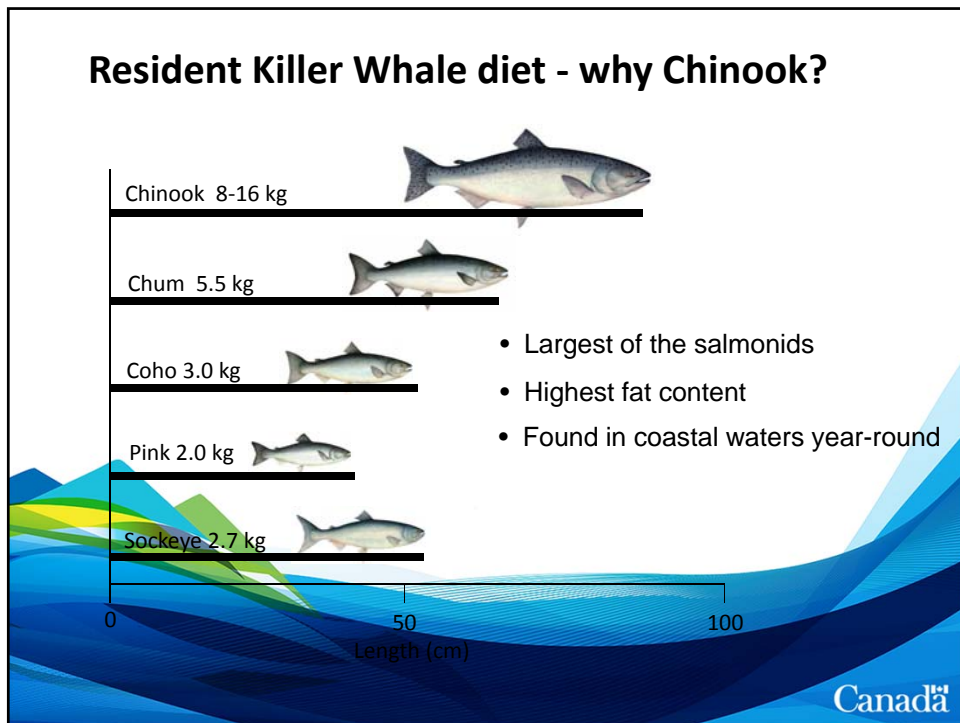
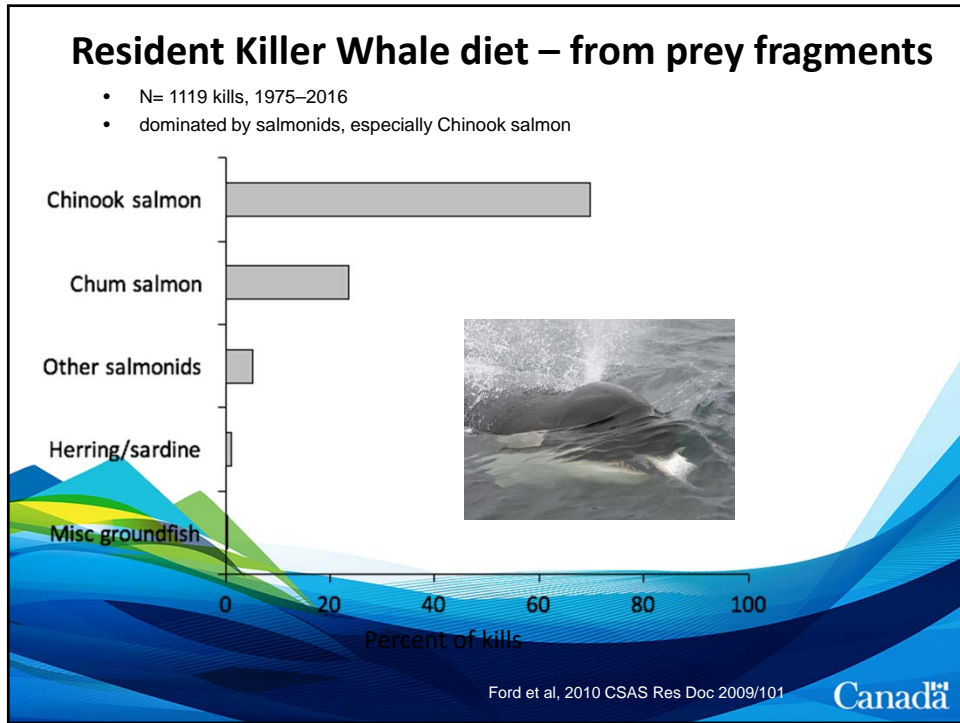
Offshore

- Mostly sharks
- Some other fish species
- No mammals
- **Threatened**



Illustrations: Uko Gorter





Southern Resident Killer Whale – Distribution

Southern Resident Killer Whale range extends from Monterey Bay, California to Chatham Strait, SE Alaska.

Overlapping range with NRKW, but vocally, culturally and genetically distinct.

The SRKW population represents the southernmost extent of Resident Killer Whale populations; may be at the edge of range.



Resident Killer Whales – population Harvest/removals and persecution



1835 - "...has the character of being exceedingly voracious and warlike. It devours an immense number of fishes of all sizes...when pressed by hunger, it is said to throw itself on every thing it meets with..."

1973 U.S. Navy diving manual warning that killer whales "...will attack human beings at every opportunity".

Awatea Island, New Zealand; University of Otago archives

Live-capture Fishery

1964 - first capture of a young male Killer Whale off Saturna Island (accidental).

1964-1977 – approximately 250 animals were captured in Strait of Georgia and adjacent US waters; 50 were retained to supply aquariums in North America and Europe; at least 12 died during the capture events.

“The biggest whale sale in the world is taking place here in an atmosphere of high excitement”.
April 5th, 1968; Vancouver Sun



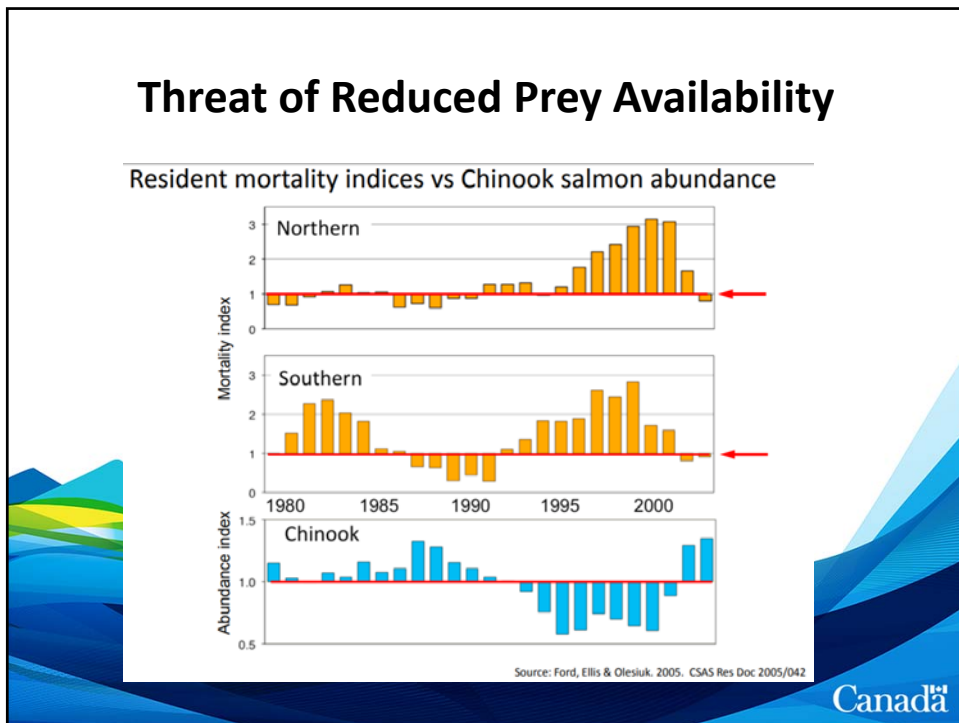
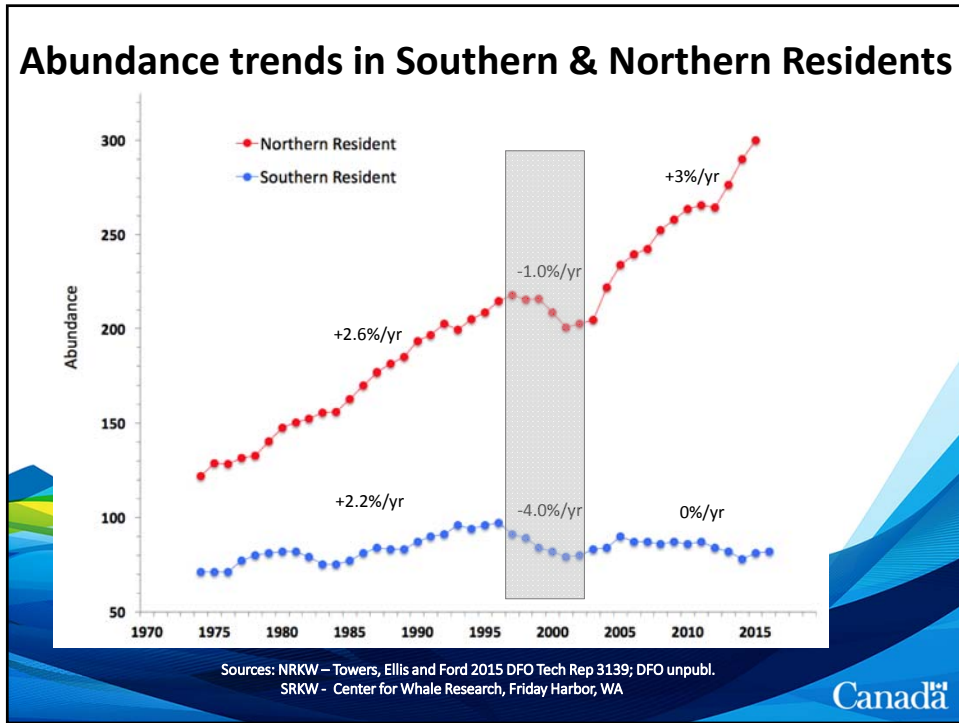
Beginning of scientific studies: 1972 onwards

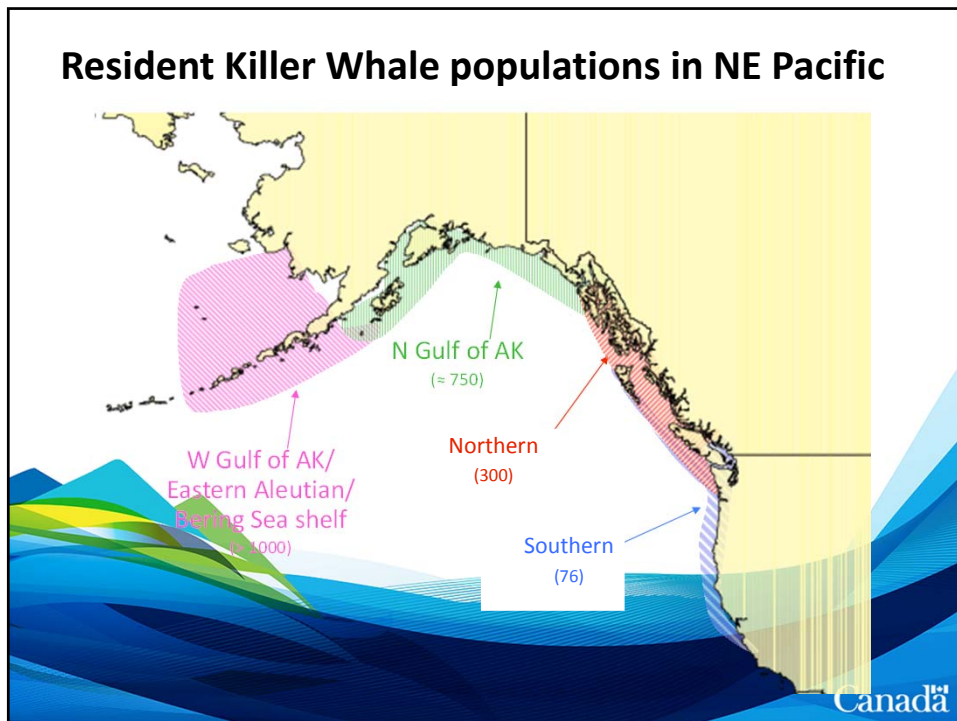
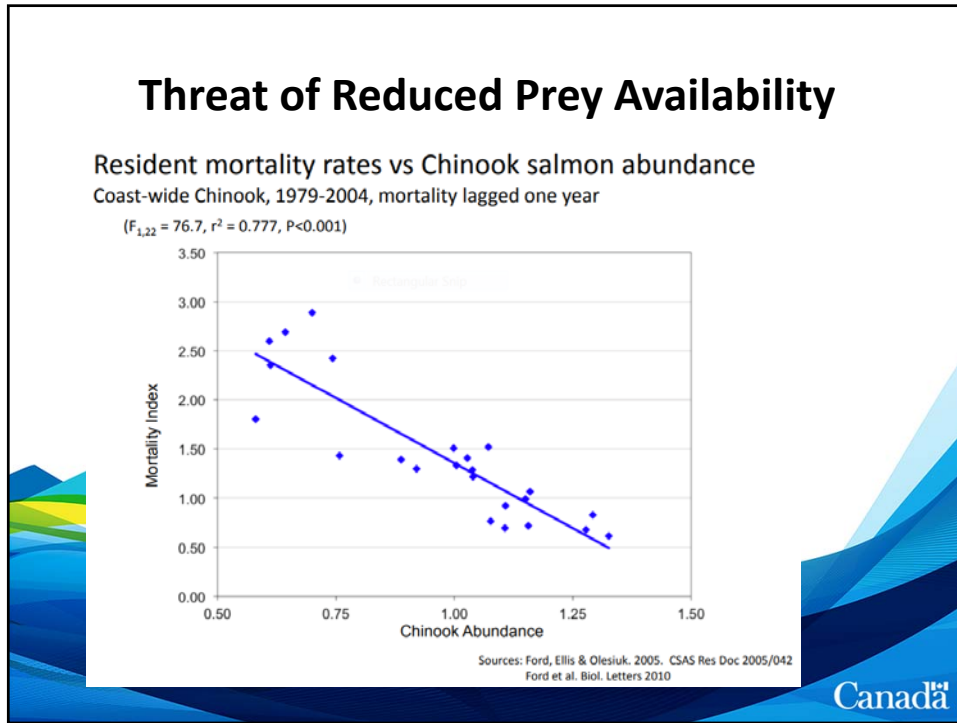
- Dr. Michael Bigg – pioneer of modern studies of killer whales
- Tasked with managing live-capture fishery

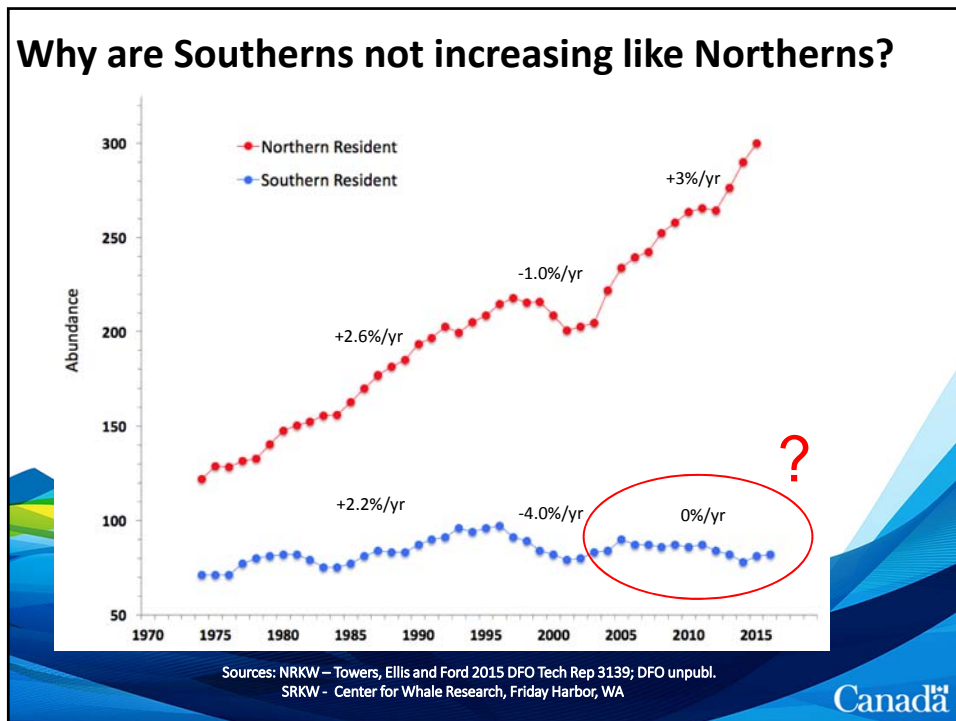
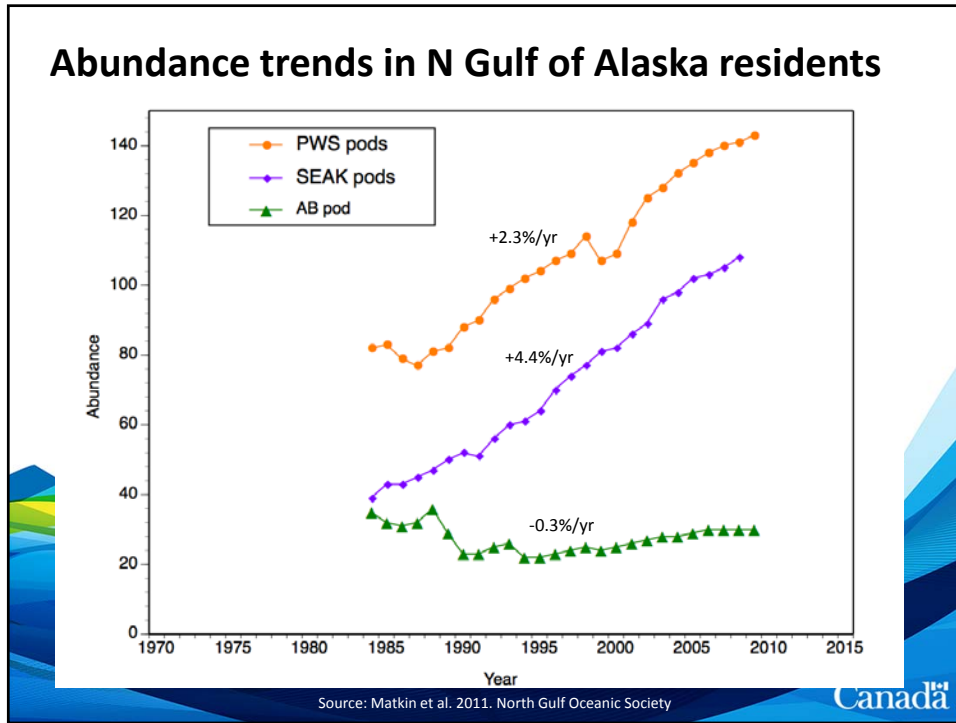


Photo: DFO









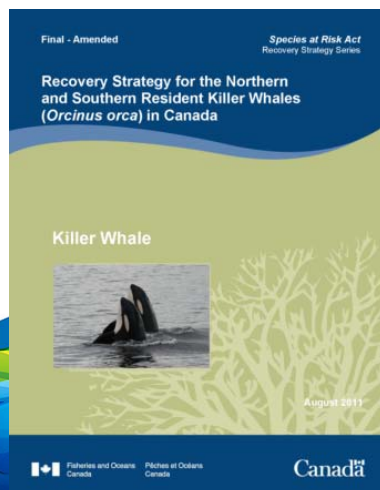
Population demographics – Residents

Table 3.2 Southern Resident and Northern Resident population demographics in 1979 versus most recent levels.

	SRKW 1979 (%)	SRKW 2016 (%)	NRKW 1979 (%)	NRKW 2010 (%)
Juveniles (< 10)	37	31	33	38
Adult males (10+)	18	29	31	22
Adult females (10-42)	27	33	32	34
Post-reproductive females (42+)	19	7	4	7



Species at Risk – Recovery Strategy

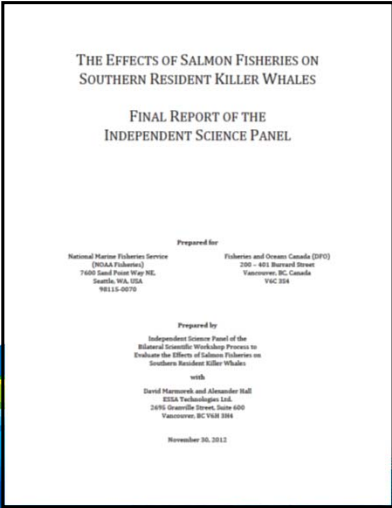


Primary Threats to Recovery

- Prey Availability
- Physical and Acoustic Disturbance
- Contaminants



2011/12 NOAA/DFO Bilateral Workshops



RECOMMENDATIONS

- Increased effort – winter prey samples
- Fecal/scale sampling
- Blubber and stomach samples
- Contaminant fingerprinting
- Energetic needs/foraging behaviour
- Prey switching
- Impacts of other predators
- Competing risks of death framework

Photogrammetry
for ongoing
assessment
body condition



Photo credit: NOAA

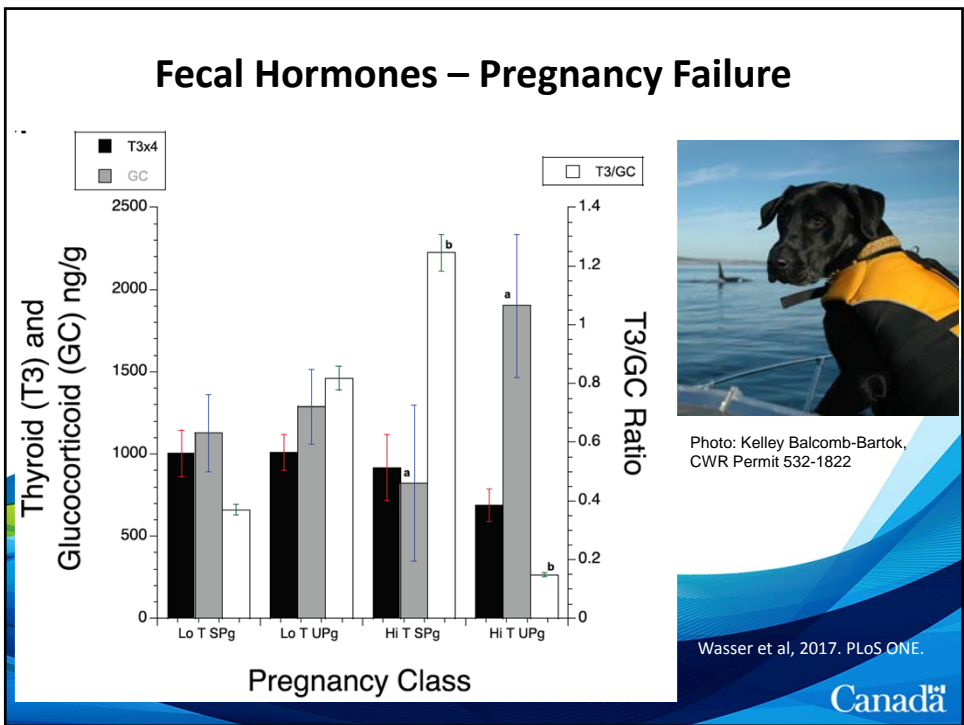
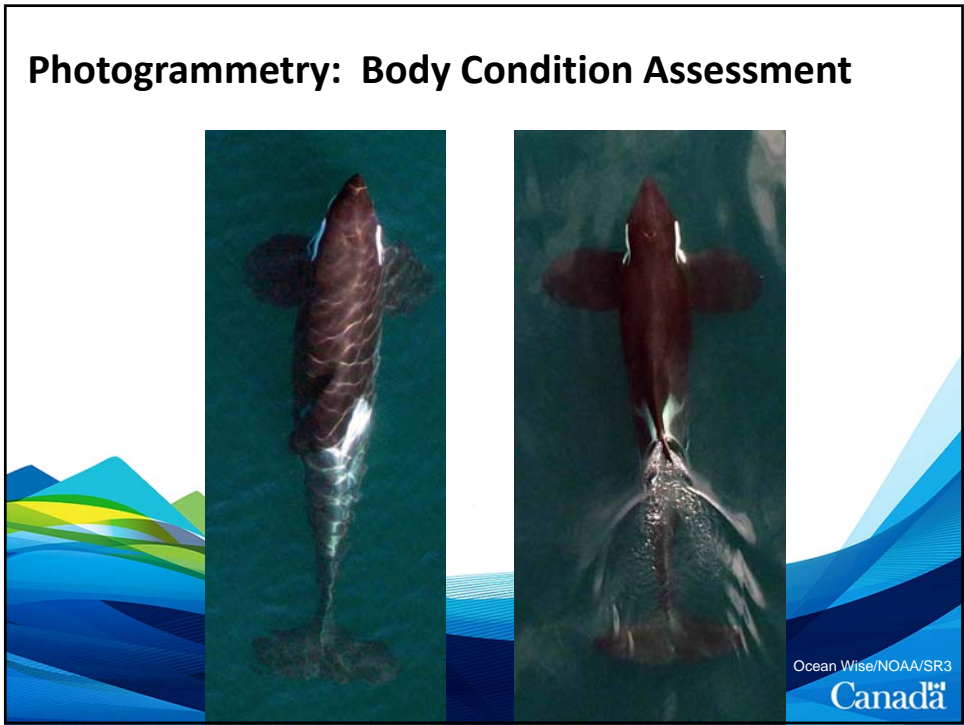


Photogrammetry



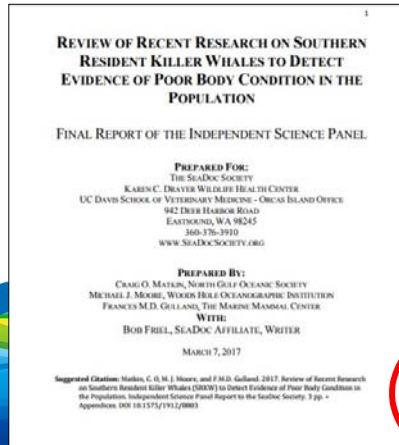
Photo: NOAA Fisheries, Vancouver Aquarium





Killer Whale Health Workshop

March 6 and 7, 2017



There are multiple lines of evidence that indicate the presence of poor body condition in SRKW.

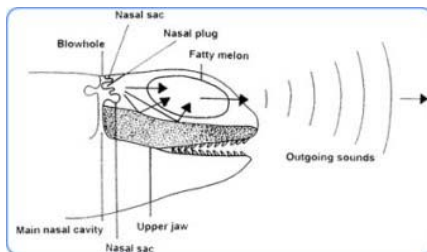
This review found that poor body condition is associated with loss of fetuses, calves and adults.

The causes of this are complex, and analysis is further compounded by stochastic events such as vessel strike.

However, food availability, contaminant burden and noise and vessel stress would all appear to be acting in concert causing the decline of this population.

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Disturbance - Resident Killer Whale foraging



SRKW echolocation and communication frequencies overlap with vessel frequencies

Masking of received sound in SRKW environment = decreased foraging success

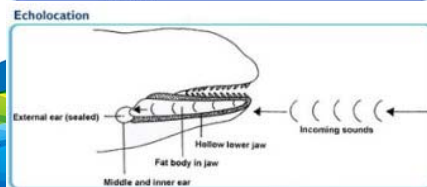
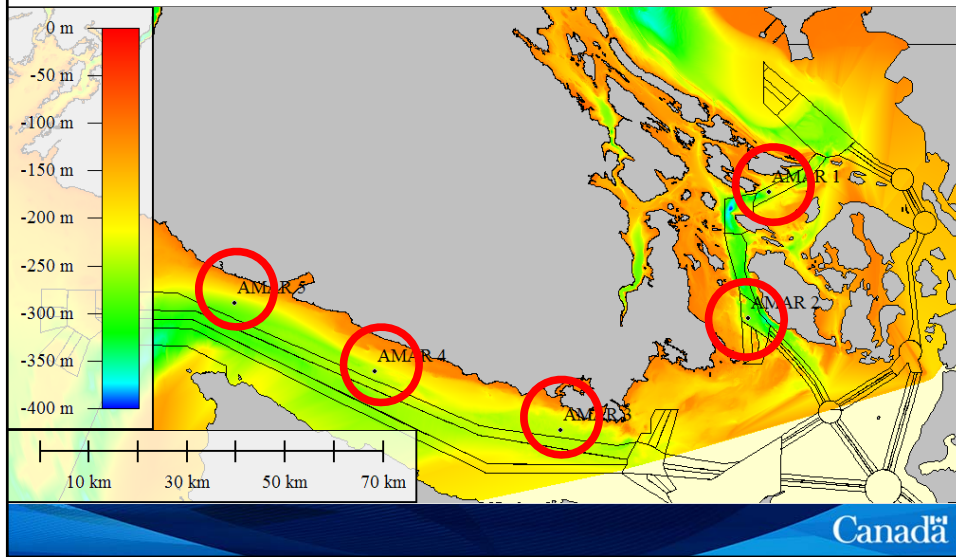


Photo: Center for Whale Research

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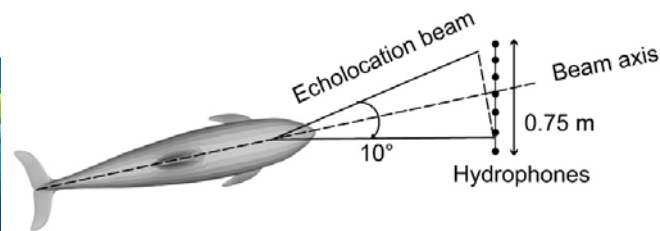
Disturbance - Commercial Shipping Traffic

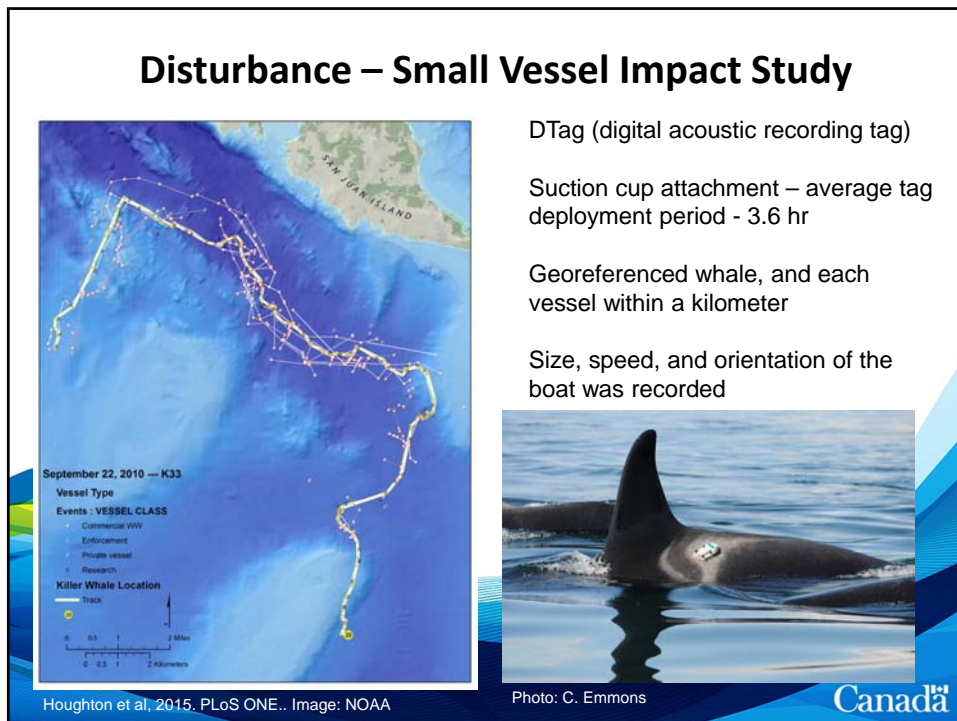
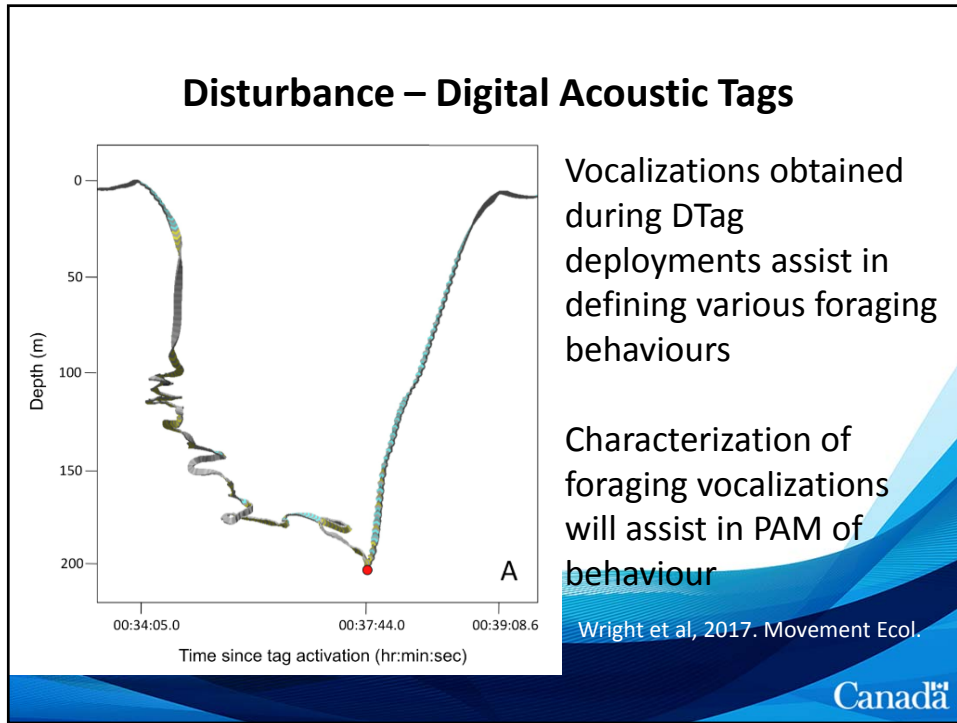
Monitoring locations - January 2018 and onwards:



Disturbance – Echolocation Studies

Development of Unmanned Aerial Vehicle (UAV) acoustic recorders to assess echolocation use/foraging effort and test with DTag deployment





Disturbance – Future Studies



University of Victoria Contribution Agreement

Range: 59 Temp Diff: 1 Range: 60 Temp Diff: 2

Visual assessment of vessel and whale presence in important habitat areas

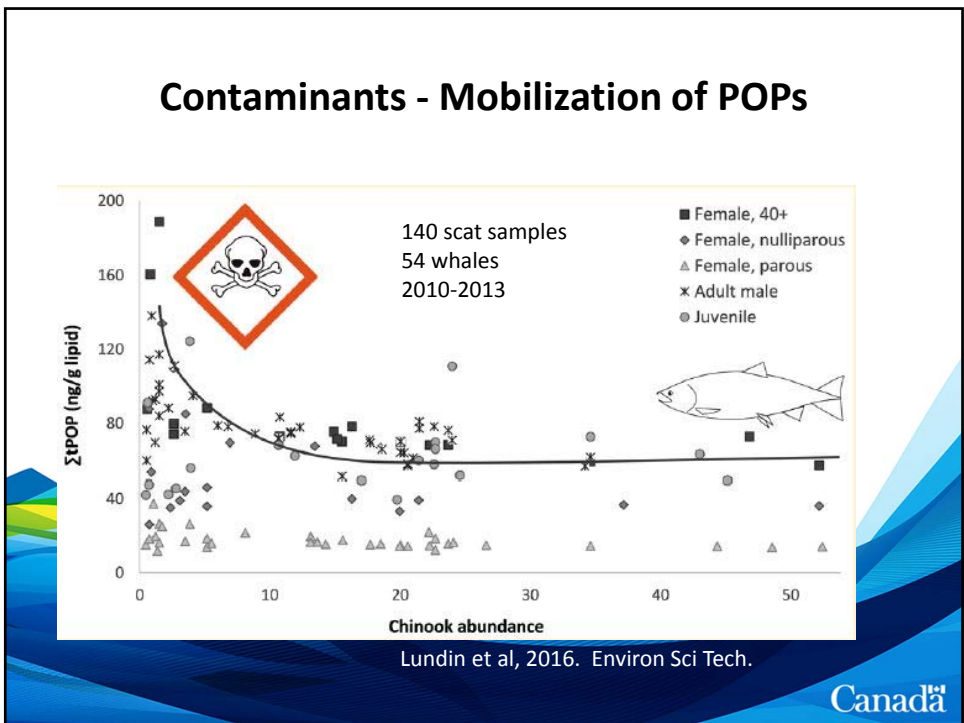
Strategically placed high resolution cameras and validation of infrared camera detection rates

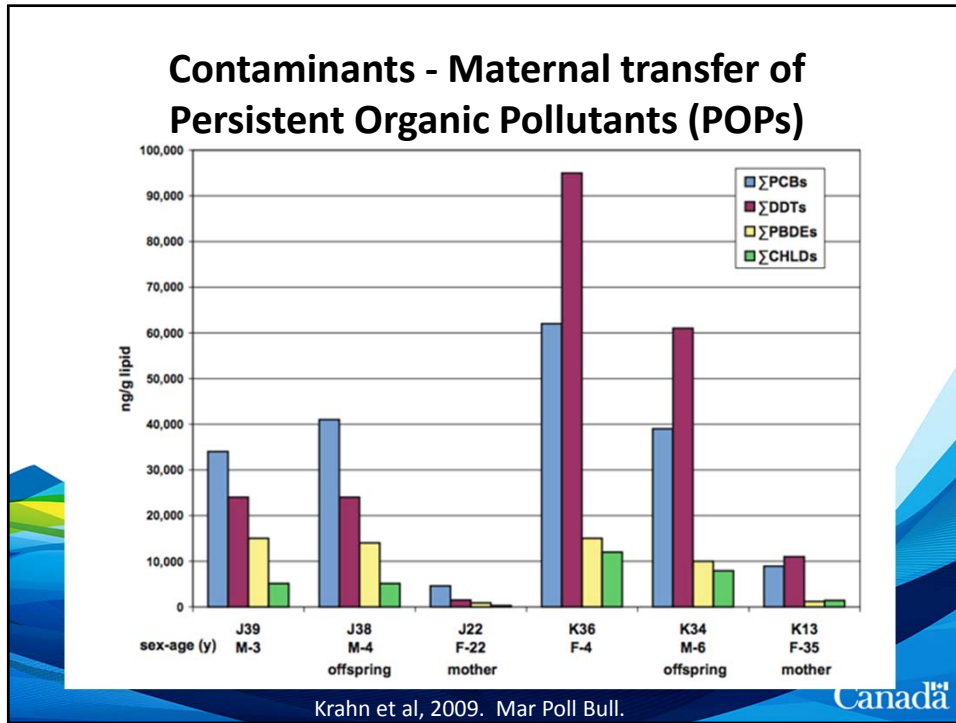






Contaminants - Mobilization of POPs



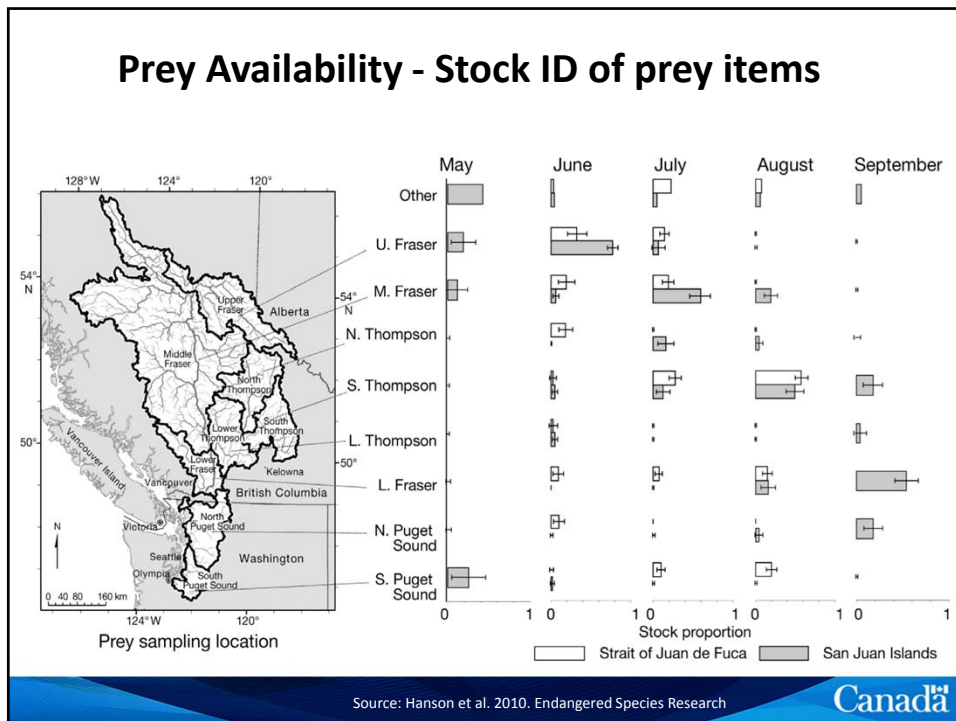
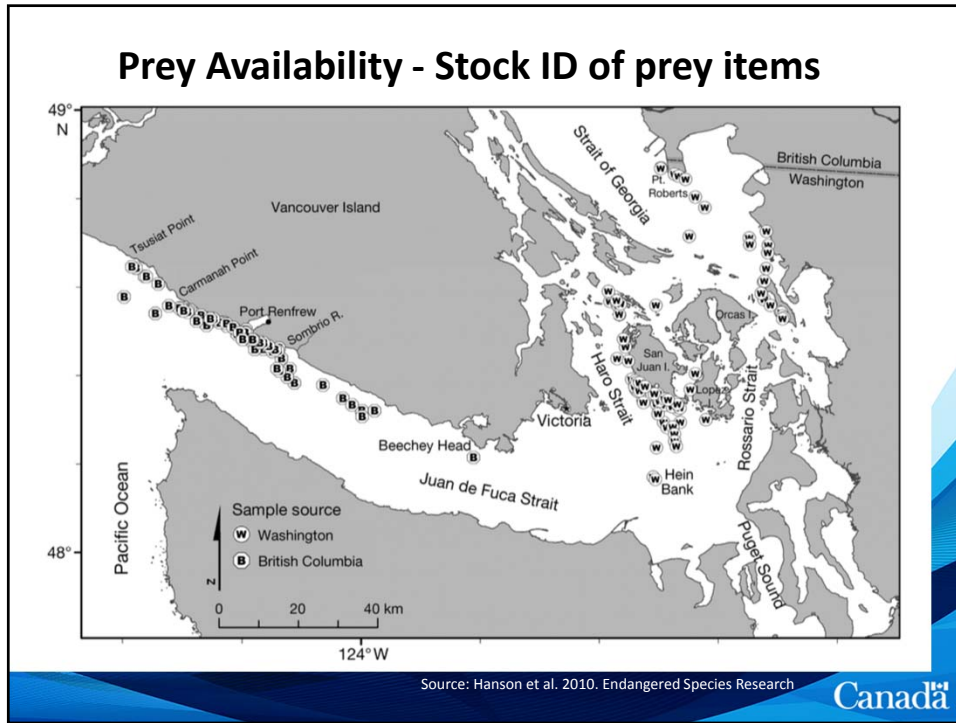


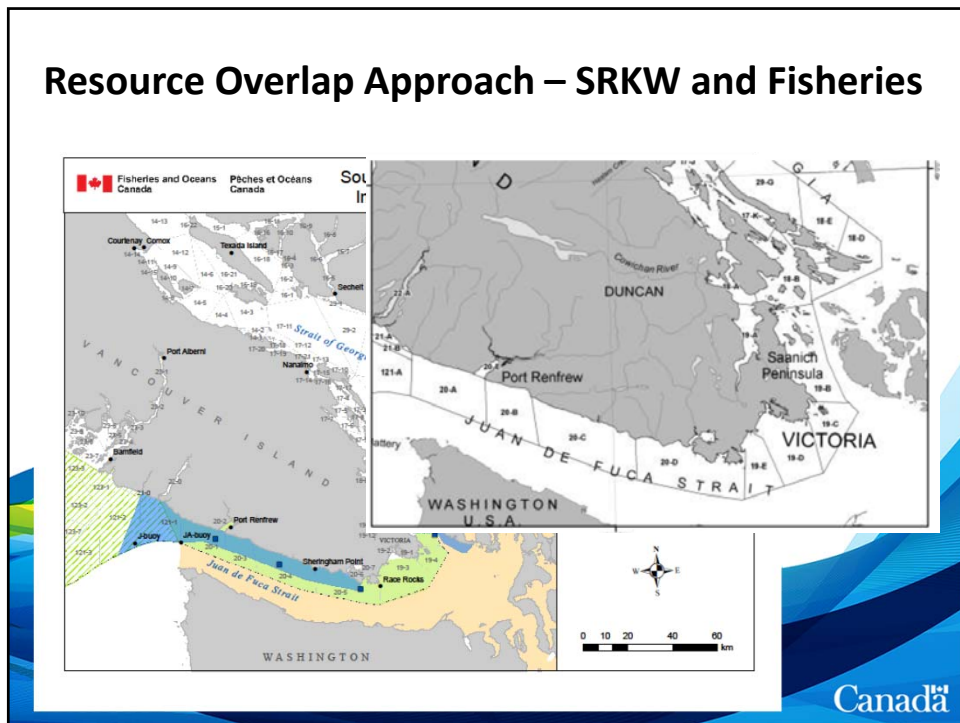
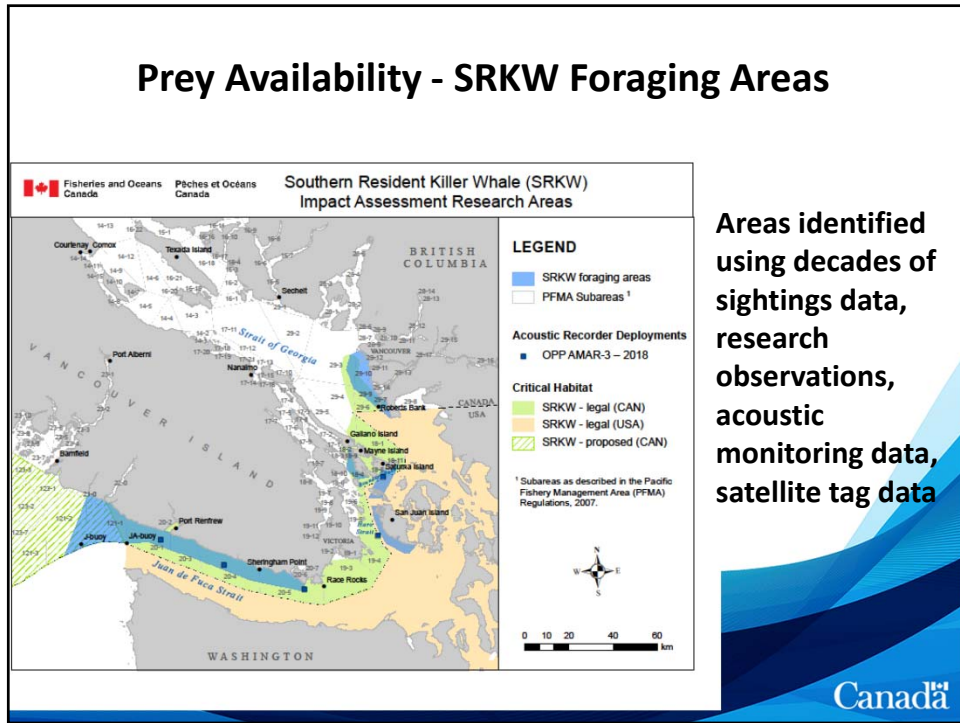
Prey Availability Workshop Nov 15-17, 2018

“Availability” means being able to be used or obtained – combination of accessibility and abundance.

“Accessibility” – means the ability to obtain prey

“Abundance” – the quantity of Chinook salmon in areas where the Killer Whales forage





SRKW – Potential Fishing-Related Impacts

Chinook Catches (2012-2017):

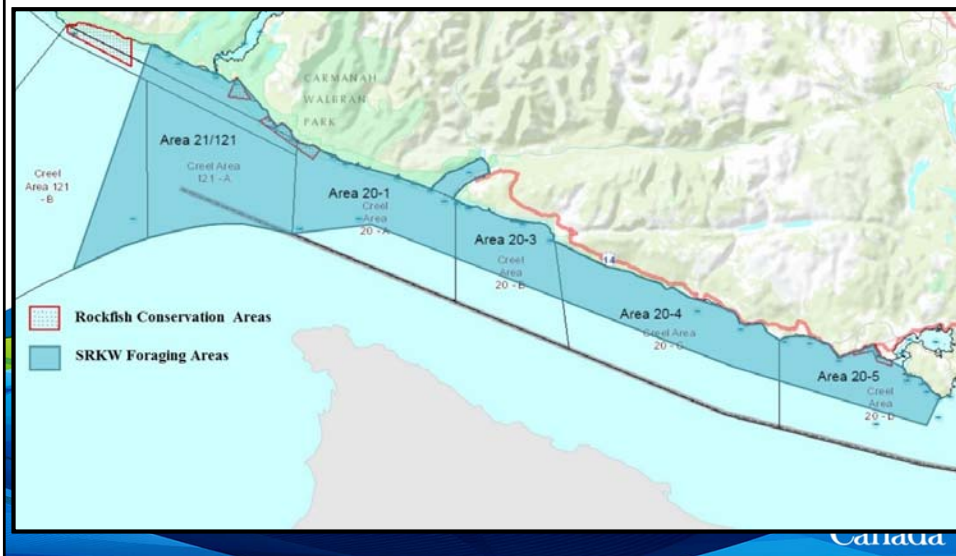
Average Percentage of Landed Catch by Month and Creel Subarea - Last 5 years

Creel Sub Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
18A					0.0%	0.1%	0.0%						0.1%
18B					0.7%	0.2%	0.4%	0.6%					1.8%
18D					0.1%	0.1%	0.2%	0.6%					1.0%
18E					0.0%	0.1%		0.1%					0.2%
19A		0.0%	0.0%	0.1%	0.1%	0.0%	0.0%		0.1%				0.4%
19B		0.2%	0.1%	0.3%	0.4%	0.1%	0.2%	0.2%	0.0%	0.1%			1.5%
19C		0.1%	0.1%	0.3%	0.9%	0.4%	0.5%	0.3%	0.3%	0.0%			3.0%
19D		0.4%	0.5%	0.5%	0.6%	0.7%	0.9%	1.8%	1.8%	0.1%			7.2%
19E		0.0%	0.1%	0.2%	0.4%	0.3%	0.1%	0.2%	0.2%	0.0%			1.5%
20A					1.6%	4.8%	12.0%	3.0%					21.4%
20B					0.0%	0.1%	0.3%	0.2%					0.6%
20C					0.1%	1.3%	1.2%	0.9%					3.5%
20D		1.1%	0.5%	0.8%	2.7%	7.1%	10.8%	23.2%	6.0%	0.5%			52.7%
20E					0.0%	0.3%	2.4%	0.3%					2.8%
Area 18					0.2%	0.5%	0.6%	1.0%	0.2%				2.4%
Total		1.8%	1.3%	2.2%	6.0%	12.4%	19.9%	43.6%	12.1%	0.6%			100%

Evaluate the effects of recreational fishing (acoustic and physical disturbance, removals) in areas with high recreational fishing pressure vs low recreational fishing pressure (e.g., Area 20)

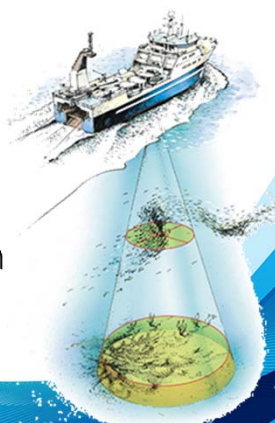


SRKW CPUE – High vs low fishing effort



Fine Scale Prey Field Assessment

- Prey field assessment using wide band echo sonar (UBC – Drs. Andrew Trites and Brian Hunt) to evaluate prey field components and habitat suitability; ground truth using seine/net tow sampling.
- Prey quality - seasonally and between N to SRKW foraging areas (lipid/protein content, lipid spp, caloric content, etc).



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