

MSF – Preliminary INFO for
JTWG – REPORT TO FOLLOW

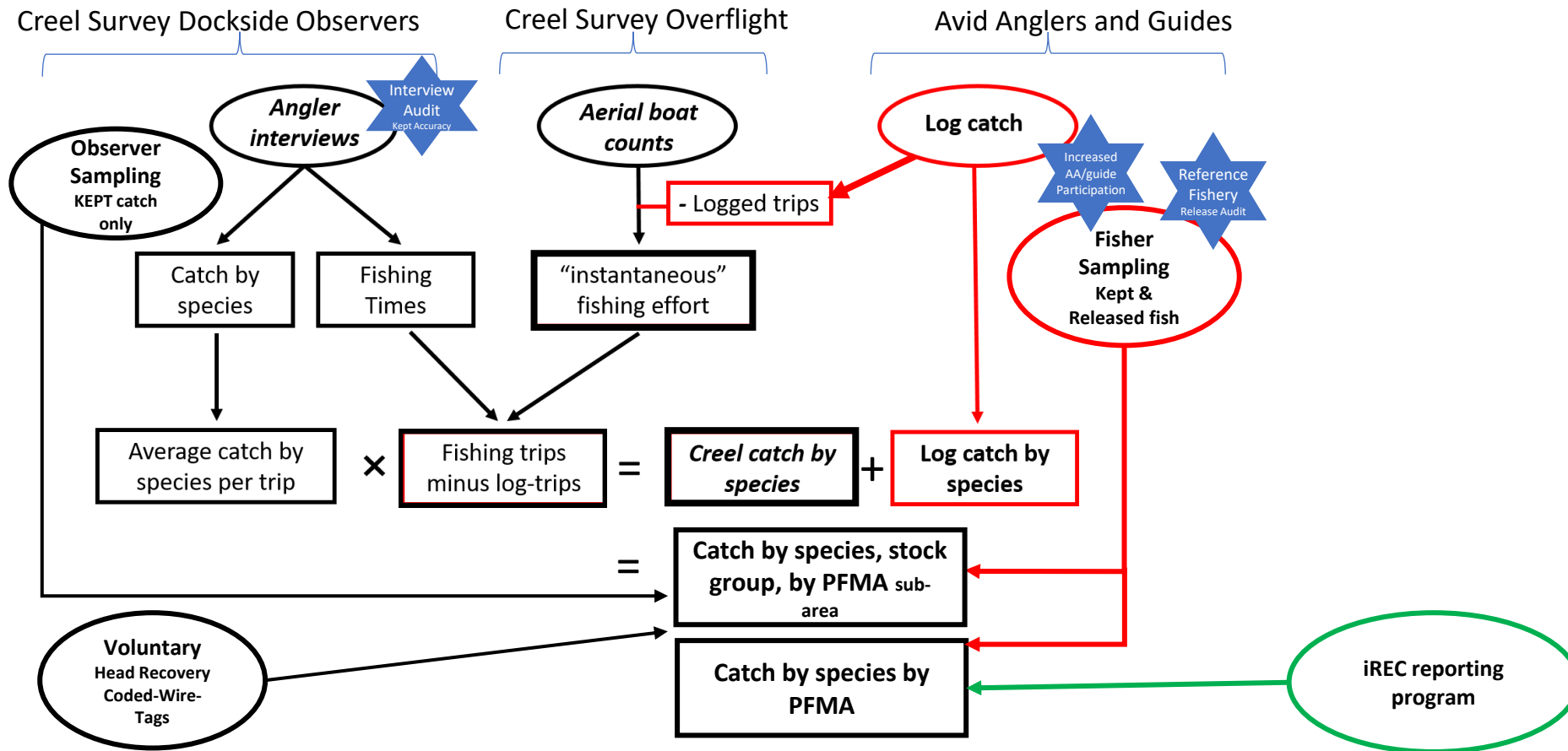
Preliminary 2021 MSF Mortalities – report to come mid/late April

Estimated fishery mortalities in 2021 Pilot MSF by PFMA based on stock composition and creel catch data. Estimated exploitation as a function of 2021 returns for Fraser stocks of concern included. Note: both retained and released mortalities are included assuming 20% FRIM.

Pilot MSF Area/Creel Sub Area	Fraser Summer	Fraser Spring	Fraser Spring
	5.2	5.2	4.2
Area 12	0.0	0.0	0.0
Area 13	2.6	0.0	0.0
Area 15	4.7	4.7	0.0
Area 16	0.0	0.0	0.0
Total	7.3	4.7	0.0

	Fraser Summer	Fraser Spring	Fraser Spring
	5.2	5.2	4.2
<i>5 Year Avg. Run Size</i>	27,638	25,337	14,216
<i>2021 run size</i>	28,891	31,388	12,251
<i>Mortalities at 1% ER</i>	289	314	123
<i>Estimated 2021 Mortalities</i>	7	5	0
<i>Estimated 2021 ER</i>	0.03%	0.02%	0.00%

3. MSF Enhanced Monitoring Plan



Reference Fishery - Purpose

- Independent verification of at-sea releases
 - Address concern that release estimates are from fisher-dependent data only
 - Increase public confidence
- Audit function only
 - Used to compare against estimates generated from Creel and/or iREC
 - Estimates from Creel and iREC will remain the official estimates
 - Focus on potential MSF pilots
 - Not necessary to cover all times/areas
- Biological samples
 - Compare mark:unmark ratios and legal:sublegal sizes ratios
 - Understand stock composition of releases
- Fishery Impacts by stock
 - Releases multiplied by stock proportion

Reference Fishery vs Commercial Test Fishery

Commercial Test Fishery	Recreational Reference Fishery
Unselective gear – represents fish present	Recreational gear/techniques – must reflect fish encountered in the recreational fishery
CPUE's used to estimate abundance	CPUE's expected to be higher than average – not representative of general recreational fishery
Operates consistently through the season – run timing	Audit function – occurs at selected times/areas – focus on MSF pilots in 2023
Scientific licence	Recreational licence
Requires all-sector approval of test fishery allocation	Part of recreational fishery
Biological samples represent true stock composition	Biological samples represent recreational fishery encounters
	Mark:Unmarked ratio and length category ratios are the key data!

Reference Fishery – vs WA "test" fishery

- No overflights
 - Effort determined from landing site fraction sampled by creel interviews
 - At-sea interviews determine intended landing sites
- Interviews for landed catch only
 - Releases not asked for in interview questions
- Release estimates from test fishery
 - Ratio of legal:illegal
 - Expanded from landed catch estimate
 - Also Voluntary Trip Reports

Test Fishery Data

	# Fish	Proportion
Legal-AD	50	0.50
Legal-UM	20	0.20
Sublegal-AD	20	0.20
Sublegal-UM	10	0.10
Total	100	

Reference Fishery – Prioritization

- Where/when to implement Reference Fishery?
 - Chinook MSF focus for 2023 (TBD)
 - Pure (marked only) vs hybrid (some unmarked retention permitted)
 - Times/areas with most effort anticipated
 - Times/areas with encounters of stocks of concern anticipated
 - Match spatial/temporal strata of creel/iREC program estimates
 - Other priority metrics?

Reminder: Supplementary biological sampling

- Creel survey
 - Retained fish only
- Avid Angler program
 - Continue to collect samples from retained and released fish
 - Times/areas with reference fishery and without reference fishery
 - Results can be compared to reference fishery
- First Nations sampling

FORECAST Fishery Encounters and Mortalities by MSF Pilot PFMA

If new pilots are approved in 2023

Pilot MSF Area/Creel Sub Area	ESTIMATED FISHERY ENCOUNTERS BASED ON DNA STOCK COMPOSITION AND CREEL DATA BY MSF PILOT PFMA 2023																Total Est. Catch	CREEL ESTIMATE		
	Fraser Summer 5.2	Fraser Spring 5.2	Fraser Spring 4.2	Fraser Summer 4.1	Fraser Fall 4.1	Harrison	Puget Sound	Columbia River	ECVI Fall	SWVI	NWVI	S Mainland Inlets	ECVI Summer	NEVI	Other US	90 th Percentile 2014-2018	Kept	Released	Mark Rate	
APRIL																				
Area 17-19 (GISI)	0	0	0	3	0	0	56	3	10	0	0	0	0	0	0	73	35	38	48.3%	
Area 19 (VIC)	0	0	0	0	0	0	766	12	23	0	0	0	12	0	0	812	659	153	81.2%	
Area 20 (JDF)	0	0	0	0	8	0	480	24	8	0	0	0	0	0	0	520	345	175	66.4%	
Area 28 (HS)	0	0	0	0	158	79	552	0	236	0	0	79	0	0	79	1182	296	887	25.0%	
Total	0	0	0	3	166	79	1854	39	278	0	0	79	12	0	79	2587	1336	1252	0.0%	
MAY																				
Area 17-19 (GISI)	0	0	0	0	34	42	379	0	25	0	0	0	0	0	0	480	170	311	35.3%	
Area 19 (VIC)	0	13	0	0	0	13	1380	13	26	0	0	0	0	0	0	1444	896	547	62.1%	
Area 20 (JDF)	20	0	80	0	100	60	1678	220	20	0	20	0	0	0	40	2238	1578	660	70.5%	
Area 28 (HS)	0	0	0	0	84	112	448	0	112	0	0	56	56	0	28	895	295	600	33.0%	
Total	20	13	80	0	217	227	3885	233	183	0	20	56	56	0	68	5056	2939	2118	0.0%	
JUNE																				
Area 17-19 (GISI)	0	0	0	0	27	14	177	0	27	0	0	0	14	0	0	259	169	91	65.0%	
Total	0	0	0	0	27	14	177	0	27	0	0	0	14	0	0	259	169	91	0.0%	
JULY																				
Area 17-19 (GISI)	0	0	0	0	41	0	207	0	83	0	0	0	0	0	0	331	194	137	58.7%	
Total	0	0	0	0	41	0	207	0	83	0	0	0	0	0	0	331	194	137		
GRAND TOTAL	20	13	80	3	452	319	6123	271	570	0	20	135	81	0	147	8234	4637	3597		
Mortalities (20% FRIM)	4	3	16			86														
%ER (2019 run size)	0.022%	0.014%	0.247%			0.236%														

PROPOSED NEW MSF for 2023

Area 16

Sechelt Inlet & Jervis Inlet

Previous MSF regulations: 1 Chinook / day from April 1 to July 14: Unmarked retention, maximum 80 cm size limit; and marked only retention greater than 62 cm.

2023 Pilot Proposal: April 1 to July 14: Marked only retention >62 cm. Unmarked retention prohibited.

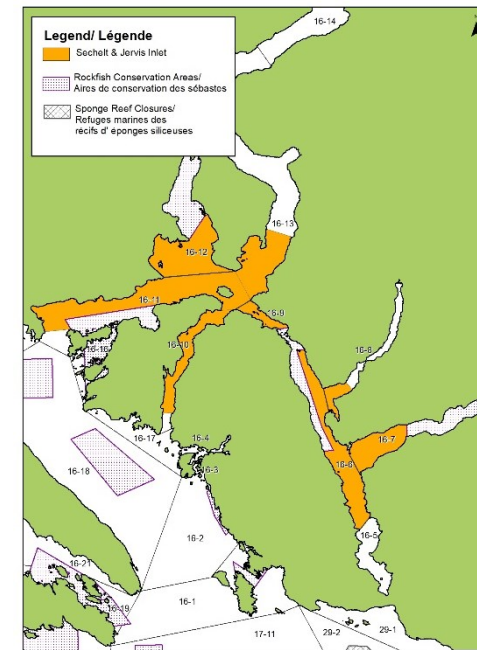
Main stocks contributing to fishery: Mixed stocks including ECVI and US stocks (Puget Sound). Small number of Fraser Fall 4(1) Chinook observed.

Potential impacts on stocks of concern: Estimated impact on stocks of concern is low. CWT samples within proposed subareas do not reveal any stocks of concern. Low prevalence of stocks of concern based on DNA samples. A modest increase in effort is unlikely to have an impact of stocks of concern. Small sample sizes to produce CWT and DNA information.

Mark rates: Low to moderate in base period (average 28.5% March to September; lowest in May at 15.6% and highest in March at 69.8%). Observed mark rates in recent pilots were higher than expected at 37.3% in 2021 and 47.2% in 2022.

Current monitoring information: Recent effort and catch in the proposed area (creel subarea 16B, J, K, and N) are available for 2009-2022 from May through July. Effort prior to 2019 has been low (from 100-600 boat days) compared to the short duration fishery in July 2020 with about 1,250 boat days. Effort increased to 2,730 boat trips for this area in 2021 (June 1-July 14). Preliminary data from 2022 indicate similar effort at 2,750 boat trips over a longer timeframe (April 1 – July 14) but a reduction to 1,750 in the June 1- July 14 period.

Anticipated 2023 Effort: Some evidence of reduced effort in 2022 due to lower CPUE on Chinook. Response to pure MSF likely to be neutral or negative with respect to boat trips while CPUE more likely to influence effort.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, low effort, DNA data (2014-2021) and CWT recoveries (1980-2021).

Ecosystem issues: None noted.

Monitoring issues: Biological GSI sampling to confirm stock composition in area. Expansion of the creel program would be required to understand the catch and effort.

Compliance issues: Concerted effort will be required by Conservation and Protection to enforce this remote area.

Other issues (e.g. allocation, gear conflict): Fishery assumes FSC is permitted.

Suggested mitigations: Many local stocks are intermittently monitored and data deficient, and many have incomplete GSI baseline information. Recommend assessment and sampling of local Chinook populations to evaluate status and to ensure proposed fishing plans do not negatively impact their production.

Portions of Area 17 to 19 Gulf Islands & Saanich Inlet

Previous regulations: Chinook non-retention April 1 to July 14 (Area 17); Non-retention April 1 to July 31 (Areas 18 and 19).

2023 Proposed Pilot: April 1 to July 14 or 31 (Area dependent): Marked-only retention > 62 cm. Daily limit: One (1) Chinook per day, Two (2) possession.

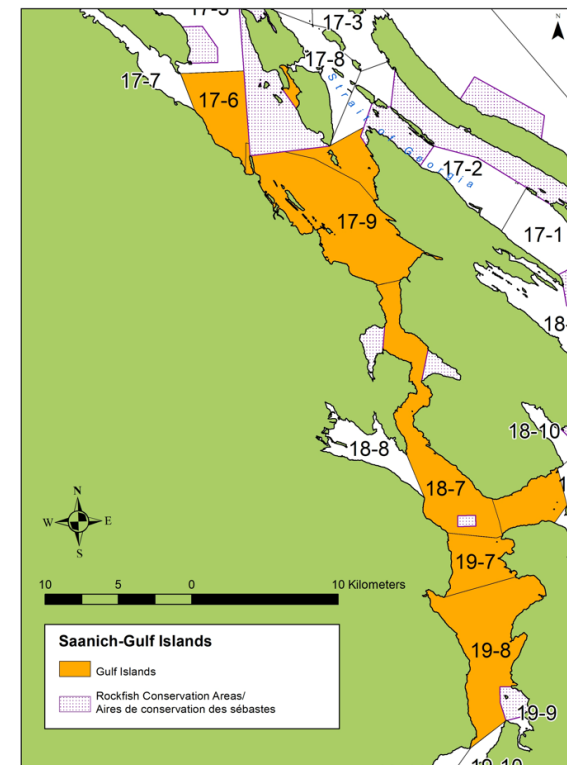
Main stocks contributing to fishery: Mixed stocks including ECVI, LWFR, and US stocks (Puget Sound). Puget Sound and other US stocks make up more than 70% of catch.

Potential impacts on stocks of concern: Estimate a very low impact to Fraser stocks of concern and local stocks.

Mark rates: low (37.2% February to October, Area 17); moderate (55.7% December to September, Area 18); moderate (61.6% January to December, Area 19). These mark rates may be overestimates because they are based on encounters in the entire PFMA.

Current monitoring information: Recent catches in the proposed area (creel subareas 17J and K, 18A and B, and 19A) are available for 2009-2022 from April through July. Fishing effort within the Gulf Islands is generally low relative to other areas with an average of 500-1500 trips per month. From April to July, on average less than 500 Chinook are caught. Low catch numbers limit the amount of DNA samples available for the proposed area; limited recent samples due to non-retention regulations.

Anticipated 2023 Effort: Potential to draw effort to area(s) where retention is permitted.



DFO Review / Suggested Mitigations

Stocks of concern: Low impact to Fraser stocks of concern or local stocks.

Ecosystem issues: None noted.

Monitoring issues: Increase biological GSI sampling to confirm stock composition in area.

Compliance issues: Different retention measures in adjacent PFMA's can pose compliance challenges.

Other issues (e.g. allocation, gear conflict): SRKW sanctuary closures. Proposal assumes FSC permitted.

Suggested mitigations: Limited bio-samples from this area should be augmented by sampling encounters (kept and released) to improve data resolution.

Portions of Subareas 28-1 to 28-5 - Howe Sound

Previous regulations: April 1 to July 31: Chinook non-retention.

2023 Proposed Pilot: April 1 to May 31: One (1) Chinook per day, marked-only retention > 62 cm, maximum 80 cm. Unmarked retention not permitted.

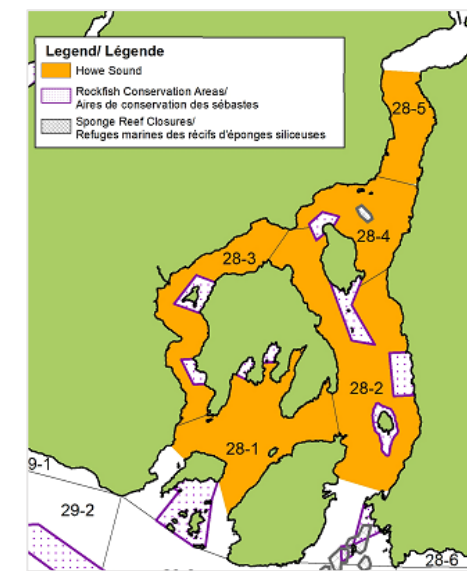
Main stocks contributing to fishery: mixed stocks including rearing ECVI, NEVI, LWFR, US stocks and migrating summer run to Southern Mainland Inlets

Potential impacts on stocks of concern: Fraser stocks of concern are encountered, though likely in small proportions relative to other stocks in the area. Likely that exploitation rates would be Very Low (<1%) for each Fraser MU. Marked Tenderfoot hatchery stocks local to the area have a rebuilding objective but escapement estimates are very uncertain. Expect ~30 individuals to be caught in Apr/May fishery. Size limit regulations may reduce impacts by ~25%.

Mark rates: Low to Moderate (25% - 43% Apr-Jul, avg. 55% Aug-Mar).

Current monitoring information: Recent annual catches in the proposed area are quite low, with estimated mortalities for Apr-Sep averaging 350 Chinook.

Anticipated 2023 Effort: Potential to draw effort to area(s) where retention is permitted including from Greater Vancouver area.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch and effort, and low encounters noted in CWT data from 1975-2020 and DNA data from 2014-2020.

Ecosystem issues: There are several proposed and existing Glass Sponge reefs within this proposed area. There are regulations on the use of down riggers in GSP to mitigate any potential conservation issues.

Monitoring issues: Improve number of CWT head submissions and biological GSI sampling to confirm mark rates and stock composition in area. Expansion of the creel program may be required to improve understanding of catch and effort.

Compliance issues: Concerted effort will be required by Conservation and Protection to enforce this remote area. Different retention measures in adjacent PFMAs can pose compliance challenges.

Other issues (e.g., allocation, gear conflict): None noted. FSC retention permitted.

Suggested mitigations: It is strongly recommended to increase monitoring and sampling to better understand fishery impacts. Suggest focusing on sampling releases where practical.

Area 19 - Victoria

Subareas 19-1, 19-3 to 19-5

Previous regulations: Chinook non-retention April 1 to July 31

2023 Proposed Pilot: Month of April, and possible portion/all of May: One (1) Chinook per day, marked only >45 cm (except >62 cm in Subarea 19-5). Unmarked retention prohibited.

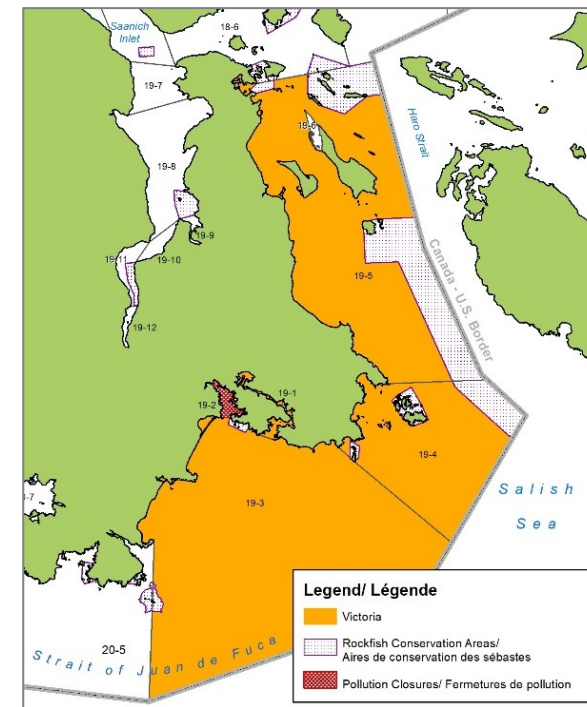
Main stocks contributing to fishery: Mixed stock comprised primarily of US stocks (Puget Sound) and low occurrences of LWFR, ECVI and WCVI stocks.

Potential impacts on stocks of concern: Estimate low incremental impact to stocks of concern based on DNA and CWT information for creel subareas 19B through 19E (2014-2018). Impact primarily due to releases from increased effort relative to non-retention.

Mark rates: moderate (61.6% January to December; lowest in September at 19.1% and highest in December at 84.1%).

Current monitoring information: Recent catches in the proposed area (creel subareas 19B and 19E) are available for 2009-2022 from April through July. Area 19 fisheries are well monitored and catch and effort data is consistent from April to July. A moderate amount of DNA and CWT information is available for creel subareas from April to July. Recent effort from April 1- May 31 was 3,170 boat trips in 2021 and 2,070 in 2022.

Anticipated 2023 Effort: Potential to draw effort to area(s) where retention is permitted. Effort will depend if and when this proposal may be approved. Base period effort for April 1- May 31 averages 3,000-6,000 boat trips.



DFO Review / Suggested Mitigations

Stocks of concern: Encounter rate with stocks of concern has been reduced with pre-existing regulations in the past (slot limit/MSF). Moderate to large contribution of US stocks (>90%).

Ecosystem issues: Potential interactions with SRKW.

Monitoring issues: Biological GSI sampling to confirm stock composition in area; baseline data affected by recent mark/size selective fishery.

Compliance issues: Different retention measures in adjacent PFMA's can pose compliance challenges.

Other issues (e.g. allocation, gear conflict): Proposal assumes FSC permitted.

Suggested mitigations: It is strongly recommended to increase monitoring and sampling to better understand fishery impacts. Suggest focusing on sampling releases where practical.

Area 20 – Juan de Fuca

Subareas 20-1, 20-3 to 20-5

Previous regulations: Chinook non-retention April 1 to July 31.

2023 Pilot Proposal: from April 1 – 30 and possible portion/all of May: One (1) Chinook per day, marked only >45 cm. Unmarked retention prohibited.

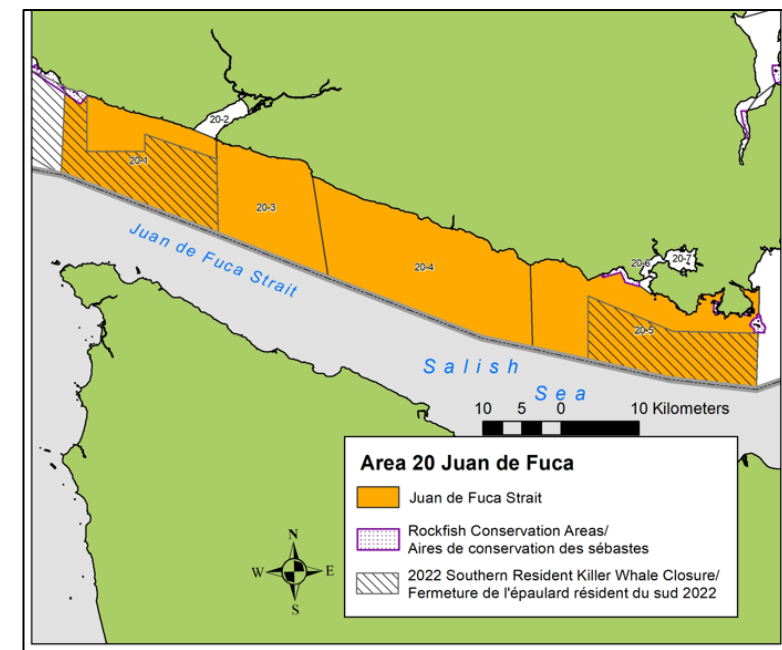
Main stocks contributing to fishery: Mixed stock composition comprised primarily of US stocks and a small proportion of local stocks.

Potential impacts on stocks of concern: Incremental impact relative to non-retention anticipated due to increased effort. Prevalence of stocks of concern estimated at 2.9% for the April 1- May 31 period (near zero in April with increases seen in the latter part of May).

Mark rates: moderate (averages 53.7% from January to December; lowest in August at 19.7% and highest in March 83.9%).

Current monitoring information: Recent catches in the proposed area (creel subareas 20A to 20D) are available for 2009-2022 from April through July. Area 20 fisheries are well monitored. DNA and CWT primarily recovered in creel subareas 20A and 20D with a high collection and recovery rate. Recent effort in 20-4 and 20-5 was 1,100 boat trips in 2021 and 1,600 trips in 2022.

Anticipated 2023 Effort: Potential to draw effort to an area where retention is permitted. Effort will depend on if and when this proposal may be approved. Base period effort ranges between 1,750 and 3,175 boat trips for 20-4 and 20-5. Chinook encounters range from 700-3,100 fish.



DFO Review / Suggested Mitigations

Stocks of concern: High encounter rate with stocks of concern in June and July based on effort, catch, DNA and CWT recoveries.

Ecosystem issues: Potential interaction and SRKW measures. Previous SRKW measures of no fishing for salmon in portions of Subareas 20-1 and 20-5 began July 15 / August 1 (after CN non-retention period) and would need to match start date (e.g. April 1) for SRKW measures if retention permitted.

Monitoring issues: Biological GSI sampling to confirm stock composition in area. Creel survey typically not active in 20-1 and 20-3 for the April 1- May 31 timeframe.

Compliance issues: Differential retention measures in adjacent PFMA's can pose compliance challenges.

Other issues (e.g. allocation, gear conflict): Proposal assumes FSC retention permitted.

Suggested mitigations: It is strongly recommended to increase monitoring and sampling to better understand fishery impacts. Suggest focusing on sampling releases where practical.