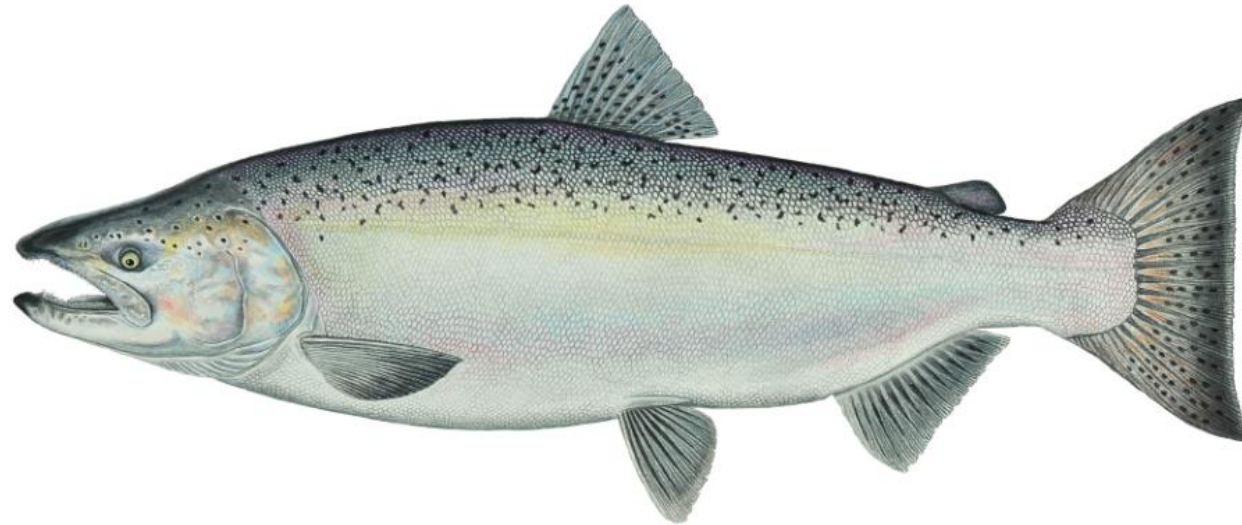




Southern BC Chinook: Fishing Proposal Evaluation



February 22, 2021



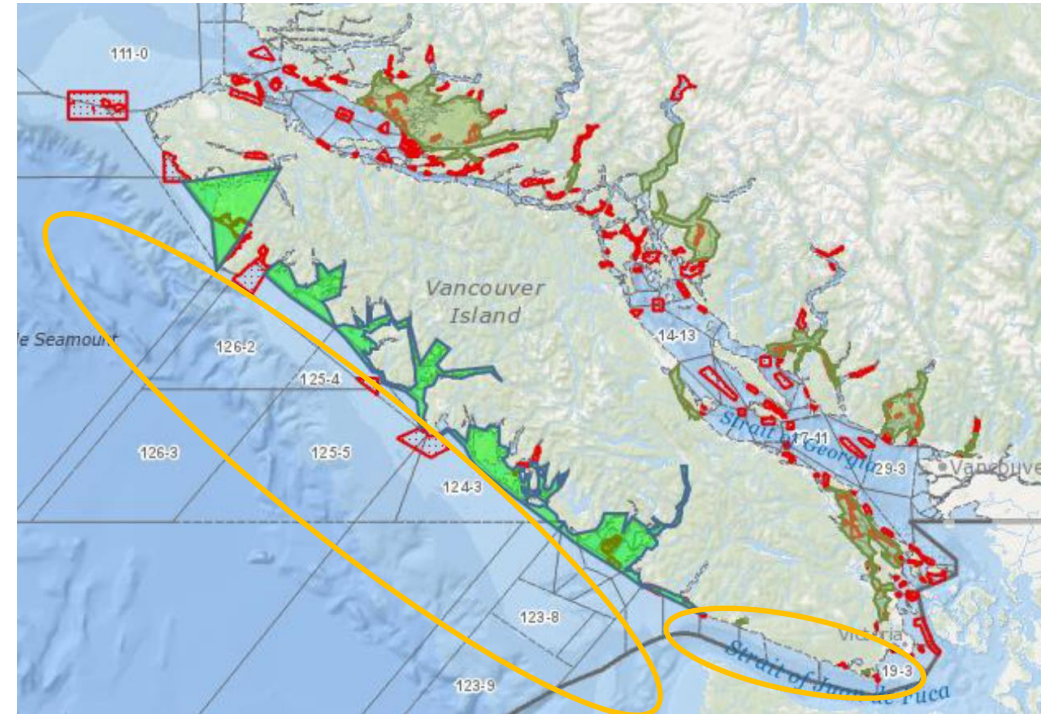
What is the purpose of the presentation?

- This presentation is intended to provide:
 - an overview of recreational and Area G troll fishery proposals submitted in 2020 for consideration as part of the 2020/21 Southern BC Salmon IFMP for possible implementation beginning in April 2021
 - A summary of the results from an evaluation framework used to assess proposals
 - Proposed fishery opportunities have not been approved
 - Preliminary information on the evaluation of these proposals is intended to support provision of feedback from First Nations and stakeholders on concerns, possible mitigations and level of support to inform decision making

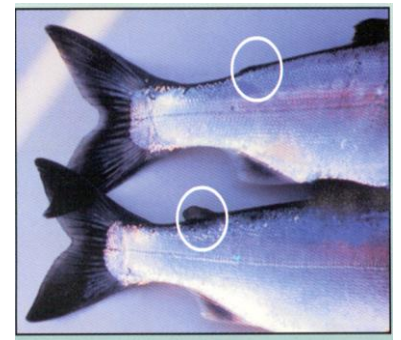


What is the origin of these proposals?

- During the development of Chinook management measures in 2020, there were a number of proposals to consider additional fishery opportunities beginning in the Spring 2021 period covered by the current IFMP
- Proposals were submitted by:
 - **Sport Fishing Advisory Board (SFAB)** for a number of Chinook fishery opportunities utilizing mark selective fishery regulations in Southern BC waters beginning in April 2021
 - **Area G Harvest Committee** for a Chinook directed fishery (non-selective) in the waters inside 1nm seaward of the surfline on the West Coast of Vancouver Island (WCVI) in April and May 2021.



Map from April 2020 SFAB proposal. Note: Offshore WCVI and Juan de Fuca MSF proposals (approx. area shown by orange ovals).



Background / Context

- **What is a mark selective fishery (MSF)?** MSF refers to any fishery in which retention possibilities for marked hatchery fish (i.e. with a healed scar in place of adipose fin) are greater than for unmarked wild fish.
- **What is mass marking (MM)?** the application of an adipose-fin-clip (AFC) to all or a high proportion of hatchery fish that do not carry a coded-wire tag (CWT).
 - For Chinook salmon produced in Canada, AFC is currently reserved for fish that carry a CWT to enable the monitoring of certain populations for stock assessment.
 - Currently, DFO is conducting a pilot project involving the mass marking of Burman, Sarita and Conuma stocks on the West Coast of Vancouver Island.
 - The southern US mass marks >100 million hatchery origin Chinook which represent the bulk of marked encounters in Canadian fisheries.
- Internal work is underway to develop a framework describing technical feasibility (benefits, risks, implementation challenges, key gaps, mitigation) to support discussion on mass marking (MM) and mark selective fisheries (MSF); further consultations on this work have not yet been scheduled.
- In the interim, DFO is seeking feedback on whether to permit additional pilot opportunities that include MSF regulations subject to considerations outlined in the fishery evaluations that were completed.



What management measures are currently anticipated for 2021?

The following measures developed in 2020 are anticipated to be in effect but may be modified based on consultations to develop the 2021/22 salmon IFMPs.

First Nations fisheries: Provision of priority access for First Nations FSC harvests in South Coast and Fraser River.

- Fraser River First Nations FSC fisheries opportunities limited to unplanned events or first fish ceremonies into July followed by opportunities to target healthy Summer 4(1) Chinook primarily in August.
- South Coast FSC fisheries opportunities for mixed Chinook stocks will be permitted in marine areas with the exception of the approaches to the Fraser River (Subareas 29-6, 29-7, 29-9 and 29-10).
- Five Nations (Ahousaht, Ehattesaht, Hesquiaht, Mowachaht/Muchalaht, and Tla-o-qui-aht) rights-based commercial fishery in 2020 was delayed until July 15 in areas seaward of 1 nautical mile from the surfline on the West Coast of Vancouver Island. A maximum 80cm size limit was in effect from July 16 to July 31. Fishing may be authorized in areas shoreward of 1 nautical mile from the surfline.



What management measures are currently anticipated for 2021? (cont.)

Recreational fisheries*: Chinook restrictions will be implemented in most South Coast areas to address conservation concerns for Fraser River Chinook salmon. See maps with specific details attached in background slides.

- Chinook non-retention beginning April 1 in most south coast waters with exception of WCVI waters inside 1nm from the surfline;
- No fishing for Chinook beginning April 1 in marine approaches to Fraser River; and,
- No fishing for salmon at mouth of Fraser and within Fraser in effect beginning January 1

*additional fishery proposals may be approved following consultations on evaluations.

Commercial troll fisheries*:

- Area F (Northern BC) – Chinook non-retention until August 15; (additional objective to pass additional Summer 4₁ Chinook to Fraser River)
- Area G (WCVI) – Delayed start until August 1

*additional fishery proposals may be approved following consultations on evaluations.



How did DFO review fishery proposals?

- DFO used an evaluation framework that was originally developed last year to assess fishing proposals submitted as part of the 2020/21 IFMP.
- The evaluation framework is intended to document:
 - Expected outcomes relative to general fishery management objectives and the associated risk of fishery proposed.
 - Identify and evaluate other related risk factors/ issues and mitigating factors.
 - Evaluate the proposals relative to catch monitoring and assessment requirements; identifying key gaps and uncertainties and potential mitigation(s).
 - improve transparency in DFO decision-making considerations and support discussion with First Nations and stakeholders about potential support, concerns and mitigations to address risks identified
 - improve documentation of fishing proposals and help build a shared understanding of management and assessment issues.
- Note: DFO expects to continue to incorporate feedback to improve the framework; however, the current framework elements do not represent common agreement between all parties.



Evaluation Framework - Updates for 2021

Based on feedback received in 2020, DFO made updates to the evaluation framework which include:

- Clearly identifying management issues and management objectives in relation to Chinook fisheries generally, including potential impacts on Fraser Chinook and other Chinook stocks;
- Emphasis on describing and evaluating Chinook mixed-stock fishing plans generally, not just in relation to Fraser Chinook impacts;
- Use of well defined criteria for characterizing impacts and risk assessment evaluations;
- Identification of more prescriptive measures to address potential monitoring and sampling gaps.

Draft evaluation framework elements:

- Starting components of regional mixed-stock Chinook fishery management plan (i.e. documenting management issues, general objectives, specific harvest measures). Further work is required to develop a longer term plan.
- An evaluation of changes proposed to Chinook fishing plans (by group) relative to 2019 and 2020 measures based on benefit-risk assessment.
- Compilation of background information that was used in the evaluation of proposed fishery changes.



Evaluation Summaries for each area

- **These summaries are intended to provide a high level overview of proposals and potential issues for each area. Please refer to the Technical document for complete details and available data for each proposed area.**
- **Fishery Description:** summary of past/proposed regulations, main stocks/stocks of concern that may be caught, current monitoring in area, anticipated 2021 effort if proposal proceeds.
- **Mark rates:** Estimated proportion of adipose fin clipped Chinook based on encounter information from various sources (e.g. recreational creel survey, log book, iRec or WCVI troll data). Mark rates represent the entire statistical area (i.e. Area 12) and therefore may not represent the actual mark rates in smaller proposed fishery areas.
- **Stocks of Concern:** Information on samples available and potential encounters of stocks of concern.
- **Ecosystem Issues:** Potential ecosystem interactions. E.g. Chinook prey availability for Southern Resident Killer Whales.
- **Monitoring:** Potential issues and suggested improvements to fishery monitoring and biological sampling.
- **Compliance:** Potential issues related to compliance and enforcement.
- **Other issues (e.g. allocation, gear conflict):** e.g. Potential impact on FN FSC harvest or gear conflicts that could arise.
- **Suggested mitigations:** Additional adjustments that could be considered to address issues identified in the review.



Hatchery Mark Selective Fishery Proposals

- The Sport Fishing Advisory Board proposed a number of mark-selective fishery (MSF) opportunities as means to provide additional fishing opportunity while limiting impacts on wild fish;
- For time-areas with non-retention (NR) measures in place over the last few years, the potential impact of MSF opportunities on wild stocks will not change relative to NR if effort levels are similar.
- However, as effort increases, potential impacts of MSF on wild stocks will also increase depending on risk factors such as the relative contribution of the stock to the fishery, mark rate and uncertainty associated with release mortality.
- Significant increase in effort may require a DFO response such as time/area/size/gear/daily limit restrictions.

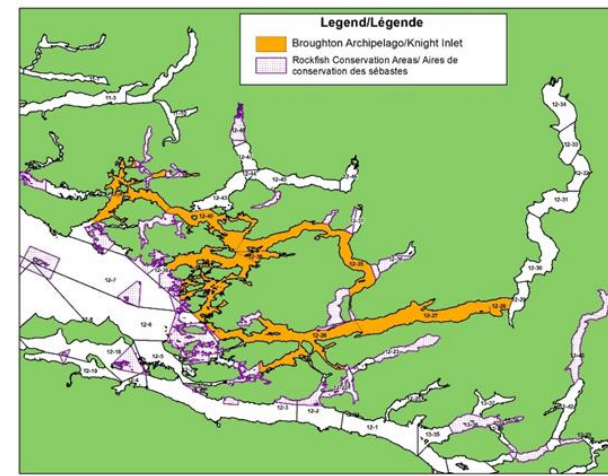


SUMMARIES OF FISHERY PROPOSAL EVALUATIONS



Area 12

Broughton Archipelago



2020 regulations: April 1 to June 30: Chinook non-retention. July 1 to July 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention >62 cm. Daily limit: 1 Chinook /day, 2 possession.

2021 Proposal: April 1 to July 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention >62 cm. Daily limit: 1 CN /day, 2 possession.

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: Sample information is extremely small and likely related to low effort and a lack of a dedicated sampling program in the area. 3 Fraser Chinook stream type CWTs recovered from 1980-2019; all in the early 1990s.

Mark rates: low (average 9.3% May to September; lowest in September at 5.0% and highest in June at 13.1%). 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 Sub area 12F) are assumed to be small with no creel estimates until 2019 over the last 6 years. Effort and Chinook catches in 2019 and 2020 were very low (June 2020 data not available at time of evaluation).

Anticipated 2021 Effort: Remote location, potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. Within the proposed area in July, there was a 6 fold increase in effort and a 4 fold increase in Chinook catch in 2020 when compared to 2019; but overall the effort in the area was low.

DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, low effort and CWT data from 1980-2019. No contribution of stocks of concern in recent DNA samples (2014-2019) in proposed area, although sample sizes continue to be low.

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

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

Suggested mitigations: Recommend adjustments to the proposed fishing areas: 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.

- Subarea 12-43 would be non-retention as historically there was catch of large-bodied Chinook in May. There is no genetic information from the historical catch but suspect this as a staging area for Kingcome and Wakeman summer run Chinook.
- A portion of Subarea 12-26 would remain non-retention (no change from 2020) as CWT information indicates some migration of Fraser stocks of concern.



Area 13

Bute Inlet & Ramsay Arm

2020 regulations: April 1 to June 30: Chinook non-retention. July 1 to July 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention >62 cm. Daily limit: 1 Chinook /day, 2 possession.

2021 Proposal: April 1 to July 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention >62 cm. Daily limit: 1 CN /day, 2 possession.

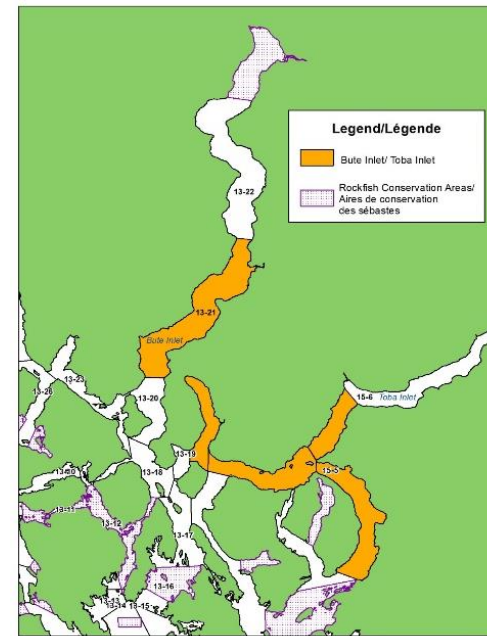
Main stocks contributing to fishery: Mixed stocks including rearing ECVI, NEVI, LWFR, US stocks and migrating summer run to Southern Mainland Inlets.

Potential impacts on stocks of concern: Sample information for CWT recoveries and DNA tissue collections are both small and likely related to low effort and a lack of a dedicated sampling program in area. While no Fraser Chinook stream type CWTs were recovered from 1980-2019, there were 3 Fraser Chinook stream type samples from recent DNA tissue collections (2014-2019).

Mark rates: low (average 15.2% January to December; lowest in March at 5.6% and highest in February at 35.4%). These mark rates may be overestimates because they are based on encounters in the entire PFMA.

Current monitoring information: May through July catch and effort data in Subarea 13-21 available over the last 11 years. Annual catch and effort data are low (but variable) and likely dependent on success given the remote location. Data from an early season fishery in Subarea 13-22 supports the assumption of low effort in April, but suggests improved catches.

Anticipated 2021 Effort: Remote location, potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. The 2020 effort and catch of Chinook increased in July, associated with the pilot opportunity. Relative to 2019 (effort approximately 3 times greater and catch 2 times greater). Likely effort would be low but subject to fishing success.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, low effort, DNA data (2014-2019) and CWT recoveries (1980-2019).

Ecosystem issues: Recent landslide above the head of Bute Inlet and concern about impact on local stocks.

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

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



Area 14 Baynes Sound

2020 regulations: Non-retention April 1 to July 14

2021 Proposal: April 1 to July 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention >62 cm. Daily limit: 1 CN /day, 2 possession

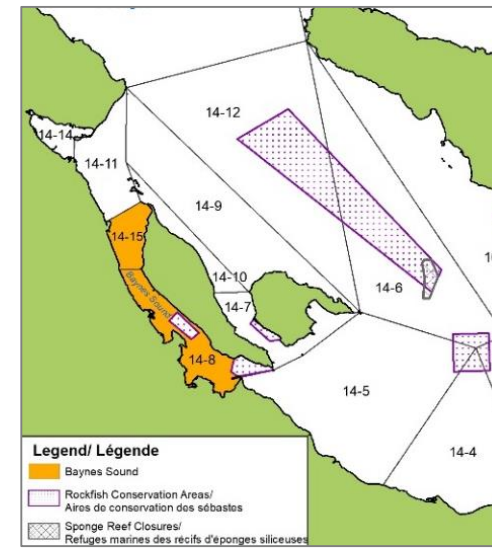
Main stocks contributing to fishery: Mixed stocks including ECVI, LWFR fall runs, and US stocks.

Potential impacts on stocks of concern: Estimated impact on stocks of concern based on DNA stock composition and creel data collected in areas 14E and 14F from 2014-2019 is based on a very small amount of data but observations of Fraser fall stocks was low.

Mark rates: low (average 20.8% January to September; lowest in June at 12.2% and highest in March at 38.9%). These mark rates may be overestimates because they are based on encounters in the entire PFMA.

Current monitoring information: Recent effort and catch in the proposed area (creel subarea 14F) are available for 2009-2020 from April through July. Effort and Chinook catch decreased slightly in 2020 from 2019. No data available for 14E due to very low effort.

Anticipated 2021 Effort: Potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. Effort will depend on when and if this proposal is approved. Low effort and catch anticipated for Subareas 14-8 and 14-15 based on current distribution of effort and the lack of well known fishing locations in Baynes Sound.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, low effort, DNA data (2014-2019) and CWT recoveries (1980-2019).

Ecosystem issues: Rockfish conservation area.

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, especially in April/May.

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

Other issues (e.g. allocation, gear conflict): Proposal assumes FSC permitted. Several shellfish aquaculture tenures in area as well as a cable ferry. Proposal includes Subarea 14-11 and timing overlaps with existing non-retention measure to protect staging Puntledge River summer Chinook, which goes into effect May 1.

Suggested mitigations: Recommend adjustments to the proposed fishing areas:

- Subarea 14-11 remains non-retention for the month of April prior to the annual May 1 non-retention regulation going into effect. **The local SFAC supports this mitigation.**
- Increase collection of biological samples for better understanding of stock composition.



Area 15

Homfray Channel & Toba Inlet

2020 regulations: April 1 to June 30: Chinook non-retention. July 1 to July 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention >62 cm. Daily limit: 1 Chinook /day, 2 possession.

2021 Proposal: April 1 to July 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention >62 cm. Daily limit: 1 CN /day, 2 possession.

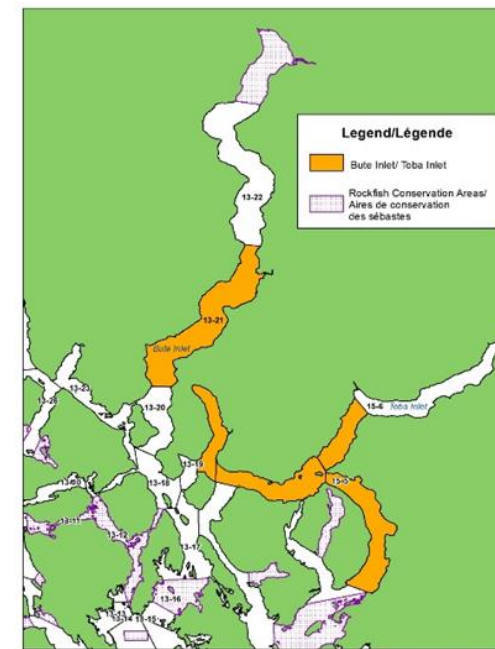
Main stocks contributing to fishery: Mixed stocks including rearing ECVI, NEVI, LWFR, US stocks and migrating summer run to Southern Mainland Inlets.

Potential impacts on stocks of concern: Sample sizes for both CWT recoveries and DNA tissue collections in Creel Subarea 15E are modest, with slightly better sample sizes in recent years. One Fraser Chinook stream type CWT was recovered from 1980-2019, and 2 Fraser Chinook stream type samples from recent DNA tissue collections (2014-2019).

Mark rates: low (average 21.2% May to September; lowest in April at 2.6% and highest in February at 85.7%). These mark rates may be overestimates because they are based on encounters in the entire PFMA.

Current monitoring information: Estimates for Creel Subarea 15E available for 3 or last 7 years. The annual catch and effort data are variable (but low) and likely dependent on success given the remote location of the proposed fishery. Little information is available regarding catch and effort during the April-May time period but it is assumed to be less than what is observed in June and July.

Anticipated 2021 Effort: Remote location, potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. The 2020 effort and catch of Chinook increased in July, associated with the pilot opportunity. Relative to 2019 (effort approximately 2 times greater but catch per unit effort continued to remain low).



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, low effort, DNA data (2014-2019) and CWT recoveries (1980-2019).

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): Proposal assumes FSC retention permitted.

Suggested mitigations: Chinook stock information in Area 15 is poorly understood and represents a significant gap in the assessment framework. This highlights the need for further intensive work on these local Chinook populations to evaluate status and to ensure proposed fishing plans do not negatively impact their production.



Area 16

Sechelt Inlet & Jervis Inlet

2020 regulations: Chinook non-retention April 1 to July 14

2021 Proposal: April 1 to July 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention >62 cm. Daily limit: 1 Chinook /day, 2 possession.

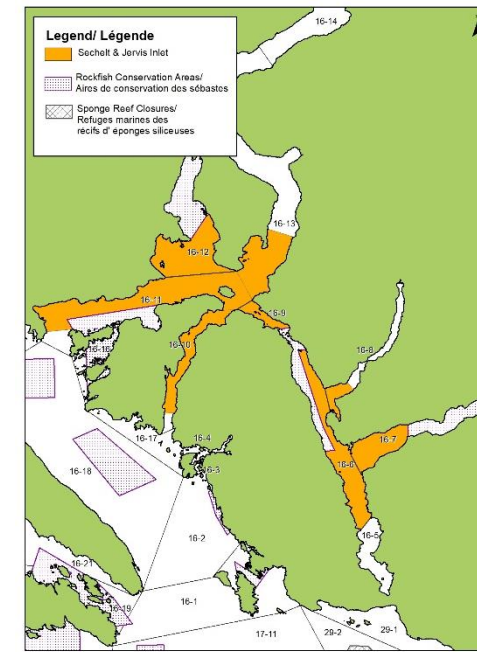
Main stocks contributing to fishery: Mixed stocks including ECVI and US stocks (Puget Sound). Small number of Fraser Fall 4(1) Chinook observed.

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 (average 28.5% March to September; lowest in May at 15.6% and highest in March at 69.8%). These mark rates may be overestimates because they are based on encounters in the entire PFMA.

Current monitoring information: Recent effort and catch in the proposed area (creel subarea 16B, J, K, and N) are available for 2009-2020 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. Estimates for this area in 2020 are currently under review.

Anticipated 2021 Effort: Potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. Effort will depend on when and if this proposal is approved. Based on the increase of boats in 2020, effort will likely increase with the proposed opportunity.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, low effort, DNA data (2014-2019) and CWT recoveries (1980-2019).

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): Proposal assumes FSC retention permitted.

Suggested mitigations: Recommend adjustments to the proposed fishing areas: 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.



Area 17

North of Nanaimo

2020 regulations: Chinook non-retention April 1 to July 14

2021 Proposal: April 1 to July 14: Marked (MSF) CN retention > 62 cm. Daily limit: 1 Chinook /day, 2 possession

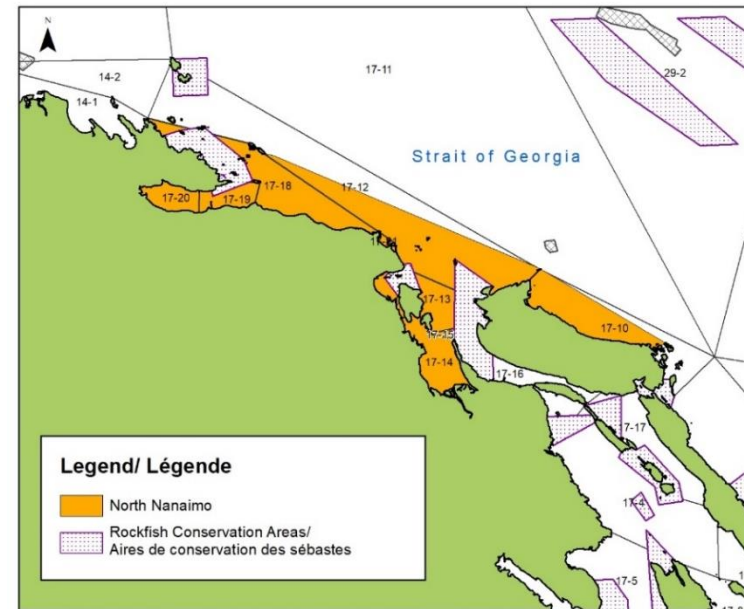
Main stocks contributing to fishery: Mixed stocks including ECVI, LWFR Fall run stocks, and US stocks (Puget Sound Fall run stocks).

Potential impacts on stocks of concern: CWT indicate 15 Fraser stocks of concern recovered in all of Area 17 (n=2,400 samples) but less than half within proposed area. Prevalence of Fraser stocks of concern, based on DNA samples, is low. Low prevalence of Nanaimo and Puntledge River summer Chinook.

Mark rates: low (37.2% February to October; lowest in September at 20.2% and highest in February and October at 50.0%). These mark rates may be overestimates because they are based on encounters in the entire PFMA.

Current monitoring information: Recent effort and catch in the proposed area (creel subarea 17E, F and I) are available for 2009-2020 from May through July. Moderate effort throughout the base period with May being a popular fishing month.

Anticipated 2021 Effort: Potential for continued travel restrictions related to COVID but potential to draw effort to an area where retention is permitted. Effort will depend on if and when this proposal may be approved.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, moderate effort. Adequate DNA data (2014-2019) and CWT recoveries (1980-2019) to assess impact.

Ecosystem issues: None noted.

Monitoring issues: Continue biological GSI sampling to confirm stock composition in area – extensive samples in database. Expansion of the creel program would be required to understand catch and effort in April.

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: Recommend adjustments to the proposed fishing areas:

- Enhanced creel survey to improve April estimates and continued bio-sampling of all encounters to screen for stocks of concern, particularly ECVI summer run Chinook.
- The local SFAC requested to remove Subareas 17-13 and 17-14 from the proposed fishing areas



Portions of Area 17 to 19

Gulf Islands & Saanich Inlet

2020 regulations: Chinook non-retention April 1 to July 14 (Area 17); Non-retention April 1 to July 31 (Areas 18 and 19)

2021 Proposal: April 1 to July 14: marked (MSF) CN retention > 62 cm. Daily limit: 1 Chinook /day, 2 possession.

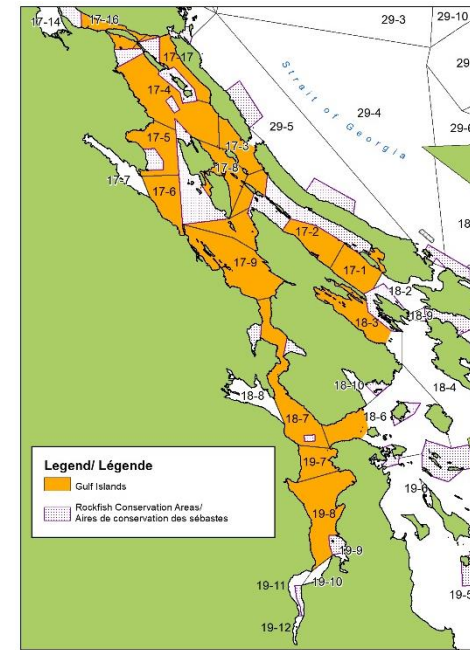
Main stocks contributing to fishery: Mixed stocks including ECVI, LWFR, and US stocks (Puget Sound). Puget Sound and other US stocks make up more than 70% of catch.

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 2009-2020 from April through July. Fishing effort within the Gulf Islands is generally low relative to other areas with an average of 500-1500 trips a 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.

Anticipated 2021 Effort: Potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. Effort will depend on if and when this proposal may be approved.



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: Recommend adjustments to the proposed fishing areas:

- Porlier Pass (portion of Subarea 17-3) would be removed if the proposal is approved to avoid encounters with stocks of concern.
- Limited bio-samples from this area should be augmented by sampling encounters (kept and released) to improve data resolution.



Area 19 - Victoria

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

2020 regulations: Chinook non-retention April 1 to July 31

2021 Proposal: April 1 to **May 31**: Marked (MSF) CN retention >45 cm (except >62 cm in Subarea 19-5). Daily limit: 1 Chinook /day, 2 possession

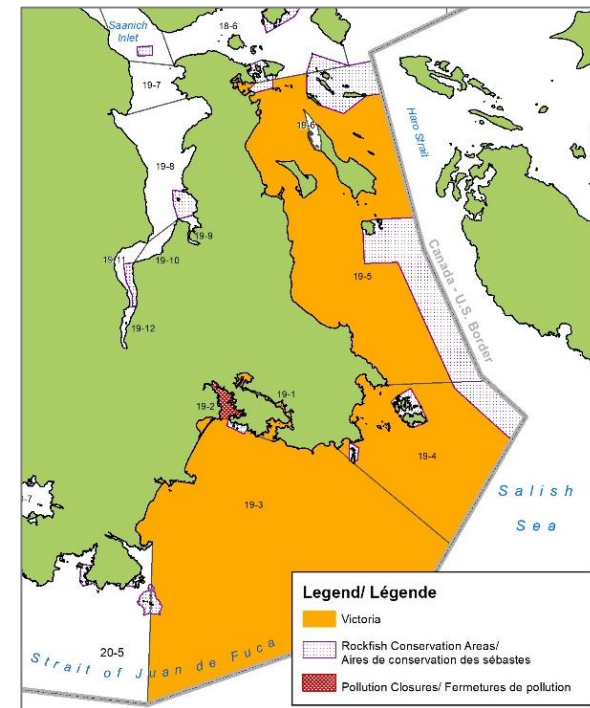
Main stocks contributing to fishery: Mixed stock comprised primarily of US stocks (Puget Sound) and low occurrences of LWFR, ECVI and WCVI stocks.

Potential impacts on stocks of concern: Estimate low incremental impact to stocks of concern based on DNA and CWT information for creel subareas 19B and 19E (2014-2018). Impact primarily due to releases from increased effort relative to non-retention in 2020.

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 2009-2020 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.

Anticipated 2021 Effort: Potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. Effort will depend if and when this proposal may be approved.



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.

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: Recommend adjustments to the proposed fishing areas:

No adjustments to the proposed fishing areas recommended, however it is strongly recommended to increase monitoring and sampling to better understand fishery impacts.

DFO reviewed the data for potential fisheries through to the end of July.



Area 20 – Juan de Fuca

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

2020 regulations: Chinook non-retention April 1 to July 31

2021 Proposal: April 1 to **May 31**: Marked (MSF) CN retention >45 cm. Daily limit: 1 Chinook /day, 2 possession

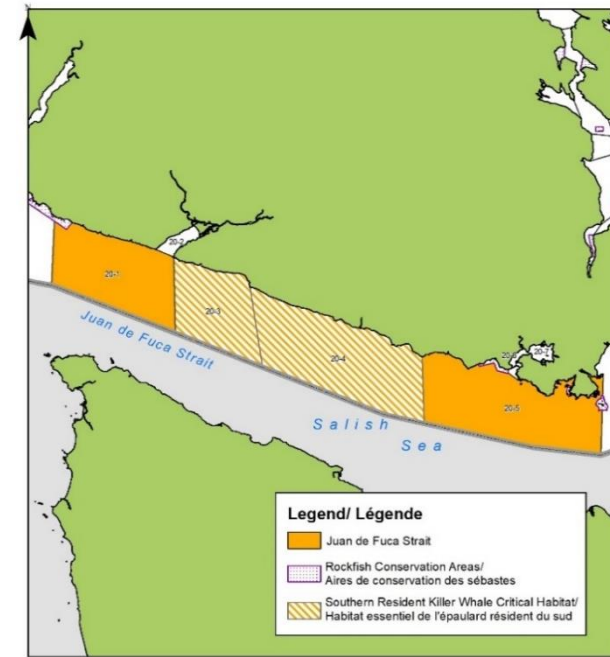
Main stocks contributing to fishery: Mixed stock composition comprised primarily of US stocks and a small amount of local stocks. Fraser summer composition increases in July.

Potential impacts on stocks of concern: Highest average encounter rate for stocks of concern relative to other proposed areas. Incremental impact relative to 2020 anticipated due to increased effort.

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 2009-2020 from April through July. Area 20 fisheries are well monitored and reports indicate that effort is high from April to July and catch rate is high during June and July. DNA and CWT primarily recovered in creel subareas 20A and 20D with a high collection and recovery rate.

Anticipated 2021 Effort: Potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. Effort will depend on if and when this proposal may be approved.



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 Subareas 20-3 and 20-4 began July 15 (after CN non-retention period) and would need to review start date (e.g. June 1) for SRKW measures if retention permitted.

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

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: Recommend adjustments to the proposed fishing areas:

- DFO reviewed the data for potential fisheries through to the end of July.
- Requires further review to address high stock of concern encounter rate in June and July.
- Potential reduction of fishery duration to April-June.



Area 20

Beecher Bay

2020 regulations: Chinook non-retention April 1 - June 30; Marked (MSF) 1 CN/day July 1-31. Daily limit: 1 Chinook /day, 2 possession.

2021 Proposal: April 1 to July 31: Marked (MSF) CN retention >45 cm. Daily limit: 1 Chinook /day, 2 possession.

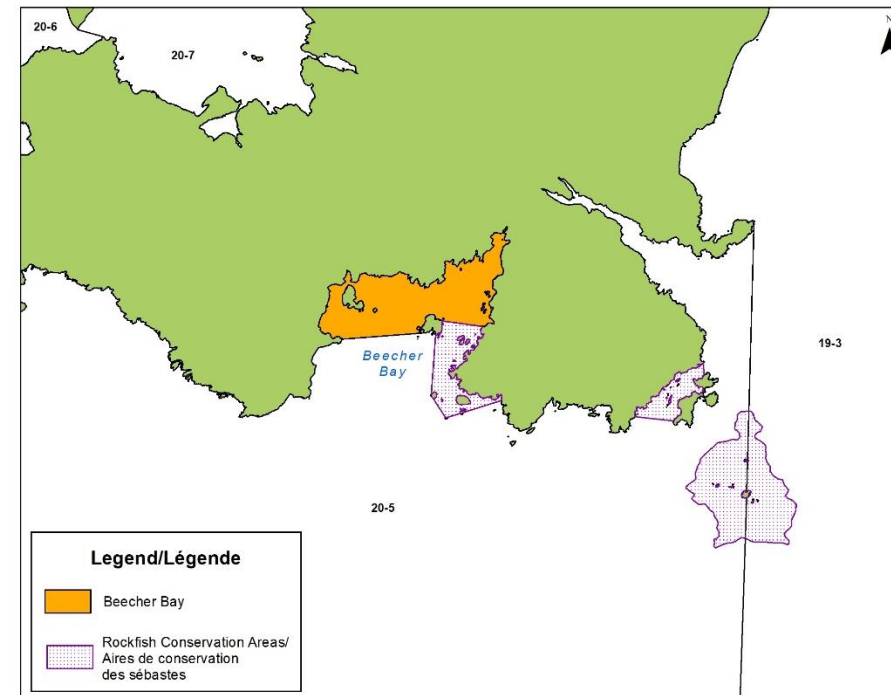
Main stocks contributing to fishery: Mixed stock composition comprised primarily of US stocks and a small amount of local stocks.

Potential impacts on stocks of concern: Sample information is extremely small and likely related to low effort and a lack of a dedicated sampling program in that area. 3 Fraser Chinook stream type CWTs recovered from 1980-2019.

Mark rates: moderate (averages 53.7% from January to December; lowest in August at 19.7% and highest in March 83.9%). 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 subarea 20D) are available for 2009-2020 from April through July. Beecher Bay is a small fraction of 20D and will be monitored as its own creel subarea in 2021.

Anticipated 2021 Effort: Potential for continued travel restrictions related to COVID, and potential to draw effort to an area where retention is permitted. Effort will depend on if and when this proposal may be approved.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, effort and CWT data from 1980-2019

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 area. Different retention measures in adjacent PFMA's can pose compliance challenges.

Other issues (e.g. allocation, gear conflict): Proposal assumes FSC retention permitted. High use crab area could cause some gear conflicts.

Suggested mitigations: Recommend adjustments to the proposed fishing areas:

No adjustments to the proposed fishing areas recommended, however it is strongly recommended to increase monitoring and sampling to better understand fishery impacts.



Area 20 San Juan Bay

2020 regulations: Subarea 20-2 Chinook non-retention April 1 to July 14; smaller local area non-retention July 15 to October 25.

2021 Proposal: April 1 to July 31: Marked (MSF) CN retention >45 cm. Daily limit: 1 Chinook /day, 2 possession

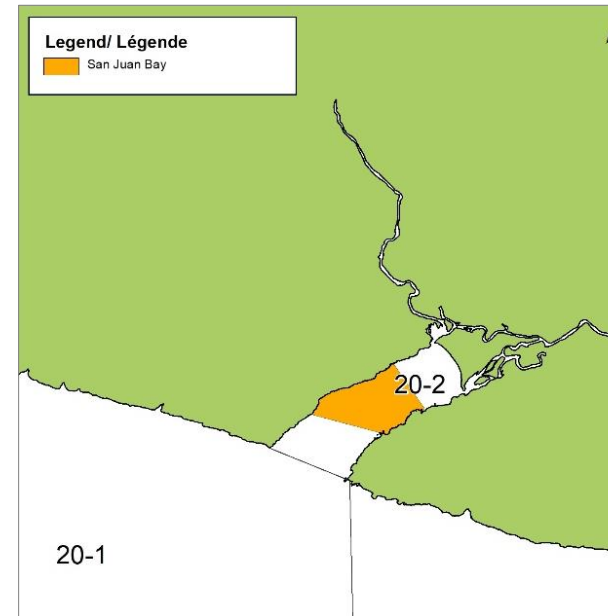
Main stocks contributing to fishery: Mixed stock composition comprised primarily of US stocks and a small amount of local stocks.

Potential impacts on stocks of concern: Sample information is extremely small and likely related to low effort and a lack of a dedicated sampling program in that area. 3 Fraser Chinook stream type CWTs recovered from 1980-2019.

Mark rates: moderate (averages 53.7% from January to December; lowest in August at 19.7% and highest in March 83.9%). 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 subarea 20E) are available for 2009-2020 for June and July. Data was not available for the April and May period.

Anticipated 2021 Effort: Potential for continued travel restrictions related to COVID, but potential to draw effort to an area where retention is permitted. Effort will depend on if and when this proposal may be approved.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch, effort and CWT data from 1980-2019

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 in April/May

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

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

Suggested mitigations: Recommend adjustments to the proposed fishing areas:

- The proposed fishing period would end July 14 and the local area closure would be July 15 as in previous years if approved.



Area 28-1 to 28-5

Howe Sound

2020 regulations: Jul. 1 to Aug. 31: No fishing for Chinook; Sep. 1 to Dec. 31: 2 Chinook per day.

2021 Proposal: April 1 to July 14: Marked (MSF) CN retention any size over minimum. Daily limit: 1 CN/day, 2 possession

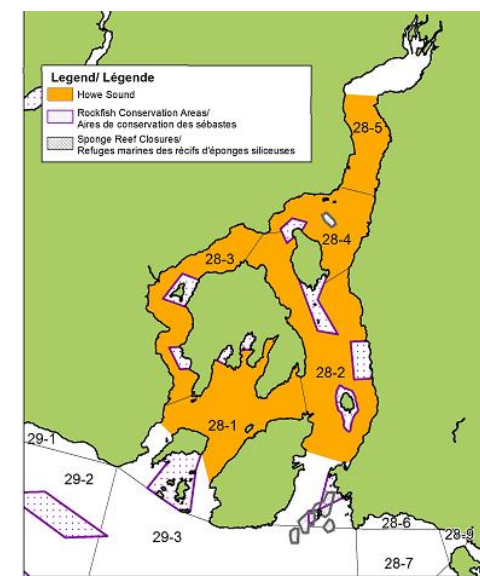
Main stocks contributing to fishery: mixed stocks including rearing ECVI, NEVI, LWFR, US stocks and migrating summer run to Southern Mainland Inlets

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.

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 2021 Effort: Somewhat remote location, potential for continued travel restrictions related to COVID-19, but potential to draw effort to an area where retention is permitted.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch and effort, and low encounters noted in CWT data from 1975-2019 and DNA data from 2014-2019.

Ecosystem issues: There are a number of 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 PFMA's can pose compliance challenges

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

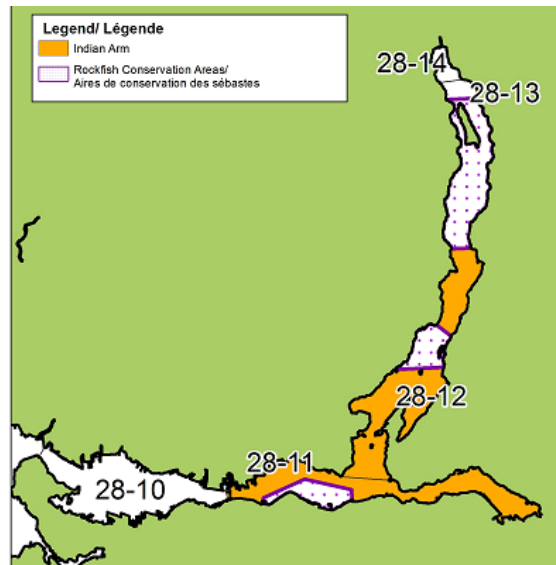
Suggested mitigations: Recommend adjustments to the proposed fishing areas:

Several of the recoveries identified as Fraser stocks of concern were caught in fishing areas slightly north of Horseshoe Bay in creel sub-area 28J; moving the boundary line of the proposed area northward may result in avoiding these stocks of concern.



Area 28-11 & 28-12

Indian Arm



2020 regulations: Apr. 1 to Jul. 31: No retention of Chinook; Aug. 1 to Aug. 31: 1 CN/day maximum 80 cm; Sep. 1 to Dec. 31: 2 Chinook per day.

2021 Proposal: Apr. 1 to Jul. 14: Unmarked CN retention w/ maximum 80 cm size limit and marked (MSF) CN retention any size over minimum. Daily limit: 1 CN/day, 2 possession

Main stocks contributing to fishery: rearing LWFR and Southern Mainland Inlets; very limited data for these sub-areas

Potential impacts on stocks of concern: Location is off main migration path of Fraser Chinook stocks of concern, encounters unlikely but little data to inform. Straying possible but rates low.

Mark rates: Unknown

Current monitoring information: Very little data in these sub-areas; precautionary management measures should be taken to limit and monitor potential impacts.

Anticipated 2021 Effort: Somewhat remote location, potential for continued travel restrictions related to COVID-19, but potential to draw effort to an area where retention is permitted.

DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on location and limited CWT data.

Ecosystem issues: None noted

Monitoring issues: Great need for 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. Alternating measures in adjacent PFMA's can pose compliance challenges.

Other issues (e.g. allocation, gear conflict):

None noted. FSC retention permitted.

Suggested mitigations:

No adjustments to the proposed fishing areas recommended, however it is strongly recommended to increase monitoring and sampling in these sub-areas to better understand fishery impacts.



Area 28-9 Capilano River area

2020 regulations: Jul. 1 to Aug. 16: No fishing for Chinook; Aug. 17 – 31: 1/day; Sep. 1 to Dec. 31: 2 Chinook per day.

2021 Proposal: Aug. 1 to Dec. 31: Unmarked CN retention w/maximum 80 cm size limit or marked (MSF) CN retention any size over minimum. Daily limit: 1/day Aug. 1-31, 2/day after Sep. 1

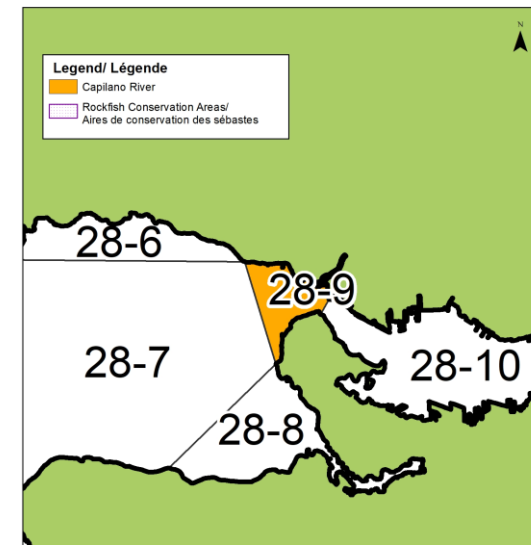
Main stocks contributing to fishery: mixed stocks including rearing ECVI, NEVI, LWFR, US stocks and migrating summer run to Southern Mainland Inlets (primarily Capilano River).

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.

Mark rates: Unknown but likely low

Current monitoring information: Catch typically very low, annual range of 11-126. Effort has decreased dramatically since 2015, from 1013 boat trips to 156.

Anticipated 2021 Effort: Potential to draw effort to an area where retention is permitted.



DFO Review / Suggested Mitigations

Stocks of concern: Overall low risk based on low catch and effort, and low encounters noted in CWT data from 1975-2019 and DNA data from 2014-2019.

Ecosystem issues: None noted

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

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

Suggested mitigations:

DFO recommends delaying the start of this fishery to reduce likelihood of intercepting any Fraser stream-type stocks of concern. DFO recommendation would be to maintain regulations from 2020 (retention Aug. 15 earliest).

If available, data collected from the fishery that occurred in this area in 2020 should be reviewed when considering opening this fishery in 2021.



Areas 121-127

WCVI Offshore

2020 regulations: April 1 to July 14: Chinook non-retention; July 15-31: 2/day maximum size 80 cm; Aug 1 to Dec. 31 2/day.

2021 Proposal: Marked MSF Chinook retention only 2/day April 1 to July 15

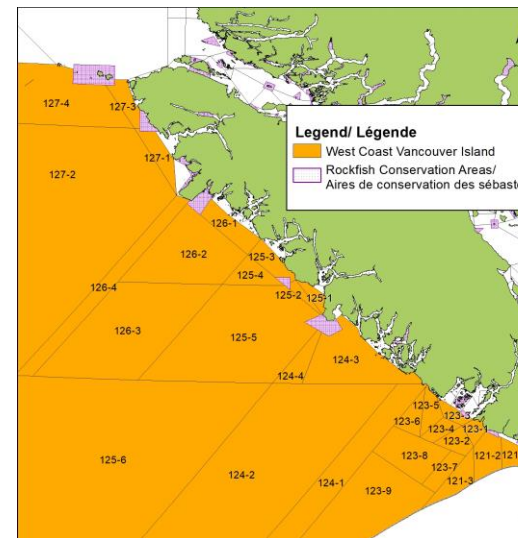
Main stocks contributing to fishery: Spring fishery period (offshore/inshore): Columbia (60%-68%); Puget Sound/WA/OR/CA (16%-38%); Fraser (1%-8%); WCVI (0%-7%).
Summer period: USA (60% -76%); Fraser (12%-20%); WCVI (11%-19%).

Potential impacts on stocks of concern: Estimated incremental additional ER is:
0.04% on Fraser Spring 4.2; 0.11% on Fraser Spring 5.2; 0.13% on Fraser Summer 5.2.
WCVI impacts expected to be lower than 2019/2020 with effort redistributed into offshore areas.

Mark rates: April (51%-60%); May (46%-78%); June (46%-57%); July (27%- 57%).
Range reflects observed lowest/highest across PFMA's on the WCVI.

Current monitoring information: Creel survey through peak effort months (June-August) with DNA and CWT sampling. iREC survey off-peak months.

Anticipated 2021 Effort: Potential increase moderated by inshore non-selective fishing opportunity open at same time.



DFO Review / Suggested Mitigations

Stocks of concern: The magnitude of the incremental ER impact is very low with a highly likely degree of certainty = Low Risk.

Ecosystem issues: SRKW critical habitat in 123 and 21/121. Timing of salmon fishing closure in 121-1 (July 15-Oct 31) may require earlier start date if proposal approved.

Monitoring issues: Creel survey coverage continues (required for other species e.g. halibut)

Compliance issues: Concerted effort will be required by Conservation and Protection to enforce this remote area. Different retention rules causes enforcement challenges but would also exist without proposed changes (i.e. non-retention in offshore areas)

Other issues (e.g. allocation, gear conflict): FSC retention permitted. Five Nations rights-based sale fishery closed in offshore area in 2020 until July 15.

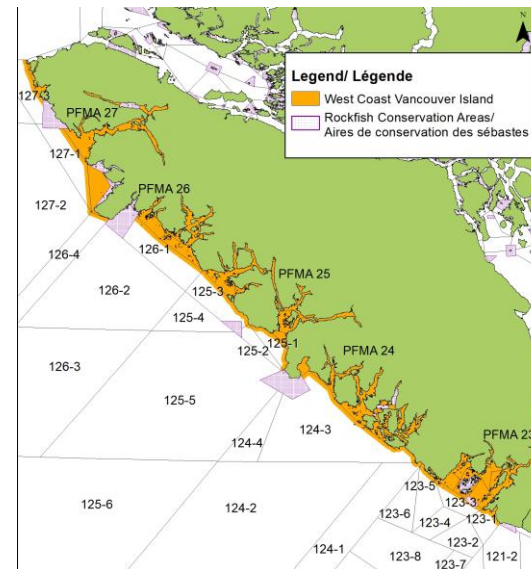
Suggested mitigations:

Option to extend MSF period to the end of July to avoid impacts on wild Chinook.



WCVI Near shore - Troll

Areas 23-27 plus 1nm seaward of surfline (123-127)



2020 regulations: Spring fishery closed.

2021 Proposal: Spring fishery: Inshore areas open April 1 – June.

Main stocks contributing to fishery: Spring fishery period (offshore/inshore): Columbia (60%-68%); Puget Sound/WA/OR/CA (16%-38%); Fraser (1%-8%); WCVI (0%-7%).

Potential impacts on stocks of concern: Spring fishery: Stock proportions from inshore recreational June DNA/CWT samples (n= ~930): Fraser Spring 4₂ (0.00%); Fraser Spring 5₂ (0.37%); Fraser Summer 5₂ (0.10%). Earlier summer start date: Estimated incremental impact to Fraser Summer 5₂ is an additional 0.065% ER. No impact to WCVI stocks based on timing info from CWT's.

Mark rates: n/a – not a MSF proposal

Current monitoring information: Area G has a logbook program and a partial landed catch validation program (20%) with DNA and CWT sampling

Anticipated 2021 Effort: Spring fishery: 1,000 boat days.

DFO Review / Suggested Mitigations

Stocks of concern: The magnitude of the expected incremental ER impact is very low with a highly likely degree of certainty = Low Risk.

Ecosystem issues: SRKW critical habitat in 123

Monitoring issues: No different than prior to Fraser Chinook measures implemented in 2019.

Compliance issues: Potential closed area violations for spring fishery (offshore areas closed)

Other issues (e.g. allocation, gear conflict): Potential fleet competition with recreational and Five Nations fisheries in some of the same times and areas.

- **Suggested mitigations:** Consistent with Zone 1 management prior to 2019: NWWI opening April 19, SWVI opening May 1 (excluding Area 23), Area 23 opening May 7. Consistent with Zone 1 management prior to 2019 the spring troll fishery closed June 1 all Areas. Earlier closed dates in Areas 24, 26 and 27 to protect wild WCVI Chinook could be considered. A smaller TAC for the spring fishery could be applied to further reduce potential impacts.



Total CDN Fishery Mortalities on Fraser Chinook

- Rebuilding objectives for Fraser Spring 4₂, Spring 5₂ and Summer 5₂ Chinook are not yet developed; Expected fishery mortalities are not intended to be a management target and the objective is to allow as many fish to pass through to the spawning grounds as possible. Fishery impacts are expected to include incidental Chinook mortalities in Fraser River Chinook and Sockeye test fisheries, limited Chinook retention or bycatch retention in Fraser River First Nation FSC fisheries, release mortalities, and incidental mortalities during Chinook-directed fisheries.
- To consider the contribution of multiple fishery proposals on overall fishery mortality indices for Fraser Chinook, we used the run reconstruction approach of fishery mortality used previously in the 5 year review
- Fraser River run reconstruction was combined with catch for fisheries in Canadian marine waters (no US catch) using genetic stock identification (e.g. DNA) for a base period 2014-2018 and 2019
- Projections were done for 2021 by scaling 2014-2018 fishery mortality indices to project outcomes for alternative management actions (e.g. MSF). See methods in background slides.
- Results are intended to represent a relative change projected for 2021 if fishery proposals are implemented relative to 2019 or 2020.



	Fraser Spring 4.2	Fraser Spring 5.2	Fraser Summer 5.2	Fraser Summer 4.1	Fraser Fall
Year Average Annual 2014-18					
SBC marine sport	481	1,652	2,412	21,583	19,509
Northern sport	61	226	223	5,709	44
Northern Troll	132	948	981	23,626	341
WCVI Area G	84		66	5,677	3,973
Marine First Nations					
Fraser First Nations	2,545	2,911	2,102	9,551	1,023
Fraser Sport	63	204	577	6,405	4,985
Fraser Commercial	127	251	420	4,974	564
sub Total Spawners	10,727	19,600	21,699	107,535	91,013
Total Abundance	14,219	25,792	28,480	185,060	121,453
sub Total Catch	3,492	6,192	6,780	77,526	30,439
Total ER	25%	24%	24%	42%	25%
Fraser In-river all gear ER	19%	13%	11%	11%	5%
Marine all gear ER	5%	11%	13%	31%	20%

2014-18 (Base Period).

5 year average annual
total mortalities and
abundance of Fraser
Chinook in Canadian
fisheries



2019	Fraser Spring 4.2	Fraser Spring 5.2	Fraser Summer 5.2	Fraser Summer 4.1	Fraser Fall
SBC marine sport	58	340	609	28,733	15,589
Northern sport	0	187	187	9992	298
Northern Troll	0	0	309	3,625	61
WCVI Area G					
Marine First Nations					
Fraser First Nations	63	723	1,051	26,718	441
Fraser Sport	0	0	58	3,715	7,735
Fraser Commercial	61	208	142	2,924	637
Big Bar mortality		17,872	5,090		
sub Total Spawners	6,200	4,376	9,134	173,622	120,428
Total Abundance	6,382	23,706	16,579	249,329	145,190
sub Total Catch	182	1,458	2,355	75,707	24,762
Total ER	2.9%	6.1%	14.2%	30.4%	17.1%
Fraser In-river all gear ER	1.9%	3.9%	7.5%	13.4%	6.1%
Marine all gear ER	0.9%	2.2%	6.7%	17.0%	11.0%

2019

Total mortalities and
abundance of Fraser
Chinook in Canadian
fisheries

Note: Area G and marine First Nations not available at this time



Fishery/Catch/Reg	2014-18 avg	2019			
SBC marine sport	2,412	609			
Northern sport	223	187			
Northern Troll	981	309			
WCVI Area G	66	n/a			
Marine First Nations					
Fraser First Nations	2,102	1,051			
Fraser Sport	577	58			
Fraser Commercial	420	142			
Big Bar mortality		5090			
sub Total Spawners	21,699	9,134			
Total Abundance	28,480	16,579	projected	projected	projected
sub Total Catch	6,781	2,355	2019	2020	2021
Total ER all fisheries	23.8%	14.2%			
Fraser inriver	10.9%	7.5%			
Northern Troll	3.4%	1.9%		<1.9%	<1.9%
SBC marine sport Total ER	8.5%	3.7%	3.7%	3.06%	3.25%
JST/GST rec ER	3.6%	2.0%	1.7%	1.45%	1.45%
JDF rec ER	3.8%	1.0%	1.5%	1.19%	1.35%
offshore WCVI rec ER	0.7%	0.2%	0.2%	0.25%	0.28%
other rec ER	0.3%	0.4%	0.2%	0.18%	0.18%

Projected cumulative impacts on Fraser River Summer 5/2 Chinook; based on scaling base period fishery ER by month and region

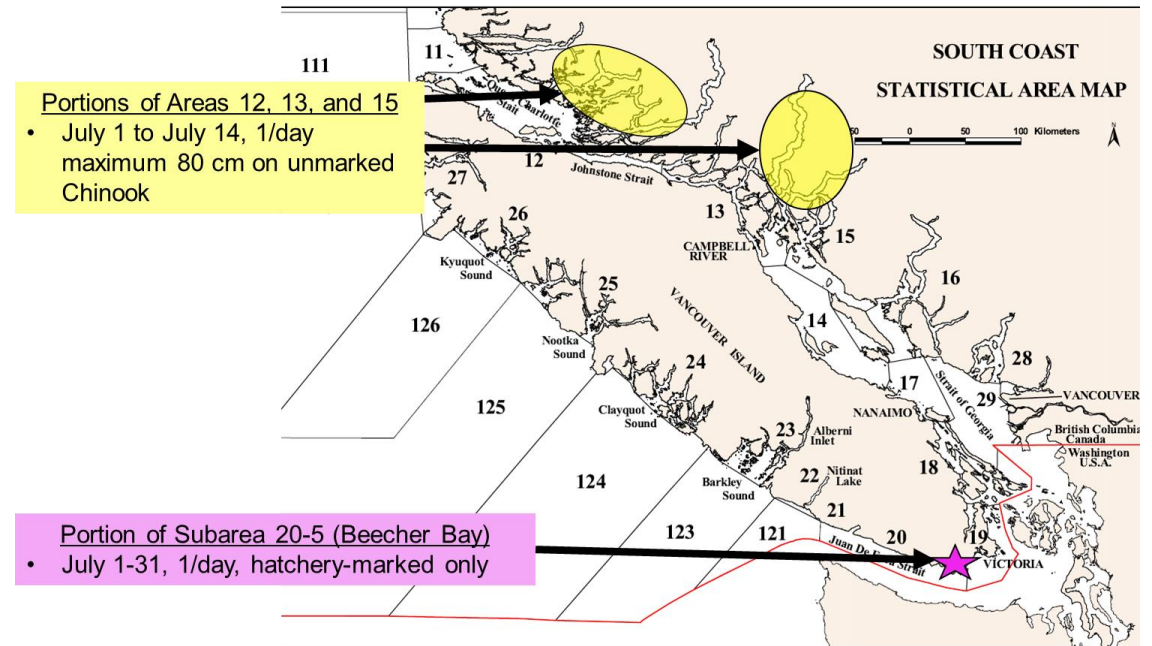
(where regions are JST, northern GST, southern GST, JDF east, JDF west, SWVI offshore, NWVI offshore, inshore WCVI by area)

2021 sport proposals projected to increase CYER relative to 2020 projection (more than 50% reduction from 2014-18 average).



What can we learn from 2020 pilots?

- Area 12:
 - Expanded overflight program; July 4th, 7th, and 13th.
 - Additional boat surveys were conducted from July 1 to July 14 within Area 12. Route chosen to ensure all potential fishing locations were monitored.
 - No recreational vessels were observed fishing for salmon, none of the interviewed recreational vessels were aware of opening for CN in Area 12.
 - DFO Surveyors provided Logbooks to vessels encountered in expanded area. At the time of this presentation none of those distributed logs had been returned.
- Bute (Area 13) /Toba Inlets (Area 15):
 - Three on-water surveys were conducted by Charter Patrol in cooperation with the local Klahoose and Homalco FN's on Jul 3rd, 7th, and 11th
 - Charter Patrol also conducted a helicopter flight on Jul 9th and observed 2 recreational vessels fishing in the extension areas.
 - Two extra recreational effort flights (plus 5 regular) were planned for the period July 1 – 14; overflight path was also extended to count the portion up to Area 15-6 (not normally flown) for all of July.
 - Interviews indicated roughly 50% of the boats were filling out logbooks
 - The rest of the extension areas were flown on a regular basis as per previous years (13-21 – lower Bute and 13-19 to 15-5 – Ramsey/Raza to Pryce Channel area).
 - Effort highest during the first week of the extension peaking mid-week but low overall for this area.



Beecher Bay:

- Creel survey coverage for portion of 20-5 (Becher Bay) is covered in regular effort flights and the creel survey.
- New creel sub-areas have been created in 20-5 to allow for finer detailed review in the future.

• Data from expanded areas is still being analyzed / reviewed.



What monitoring and assessment plans are under consideration?

- Any new openings will have enhanced fishery monitoring with additional dockside observers, creel surveys starting earlier and adjusting the level of monitoring to the level of effort response.
- Sector cooperation will be required for catch reporting and sampling, such as commitment from Avid Anglers and guides to keep catch and sample logs; to assess mark rate, and to sample legal sized releases in key areas. Additional Pacific Salmon Treaty G+C funds may be available to support First Nations involvement in catch monitoring activities.
- Renewed research on release mortality rates, including proposed UBC, PSF, DFO studies re longer term mortality.
- Improved education for head recovery in recreational fishery.
- Use of run reconstruction approach for developing fishery mortality indices, particularly for Spring and Summer 5_2 which don't have CWT indicators.



What are the next steps?

- Input from consultation will inform decision making on proposed fisheries.
- Decisions will be communicated via Fishery Notice(s) and DFO web-site.
- Other adjustments to Chinook fishery plans may be considered in the process to develop the 2021/22 Salmon IFMPs for Northern and Southern BC and included in final IFMPs released in June/July 2021

Activity	Target Date
Fishery proposals / evaluations shared with First Nations and stakeholders	February 22, 2021
Consultations on completed Evaluations -webinar(s) to review evaluation document -review at planned meetings -FN Forum (Mar. 2-4); IHPC (Mar. 5)	February/March 2021
Deadline to submit feedback:	March 19, 2021
DFO Approvals	March/April 2021
Fishery Notices with approved management actions	April 2021 following decisions



Questions to consider when providing feedback:

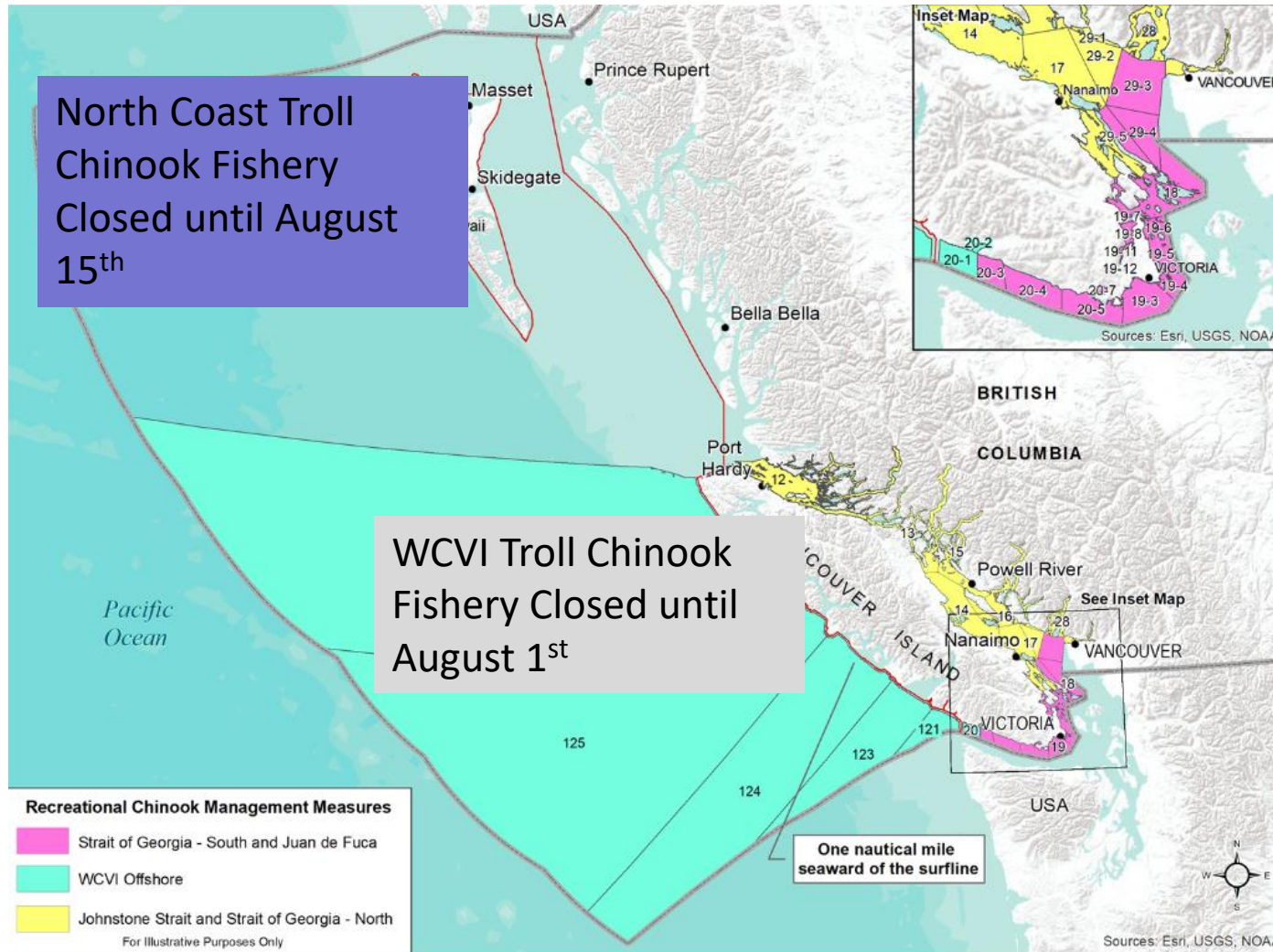
1. Does the evaluation framework adequately assess the proposed fisheries? If not, what suggestions do you have?
2. Are there other considerations that have not been identified?
3. Are there monitoring improvements or other suggestions that could mitigate any concerns?
4. Do you support proceeding with any of the proposed fisheries?
5. Do you have specific questions that should be addressed by technical experts?



Background Information

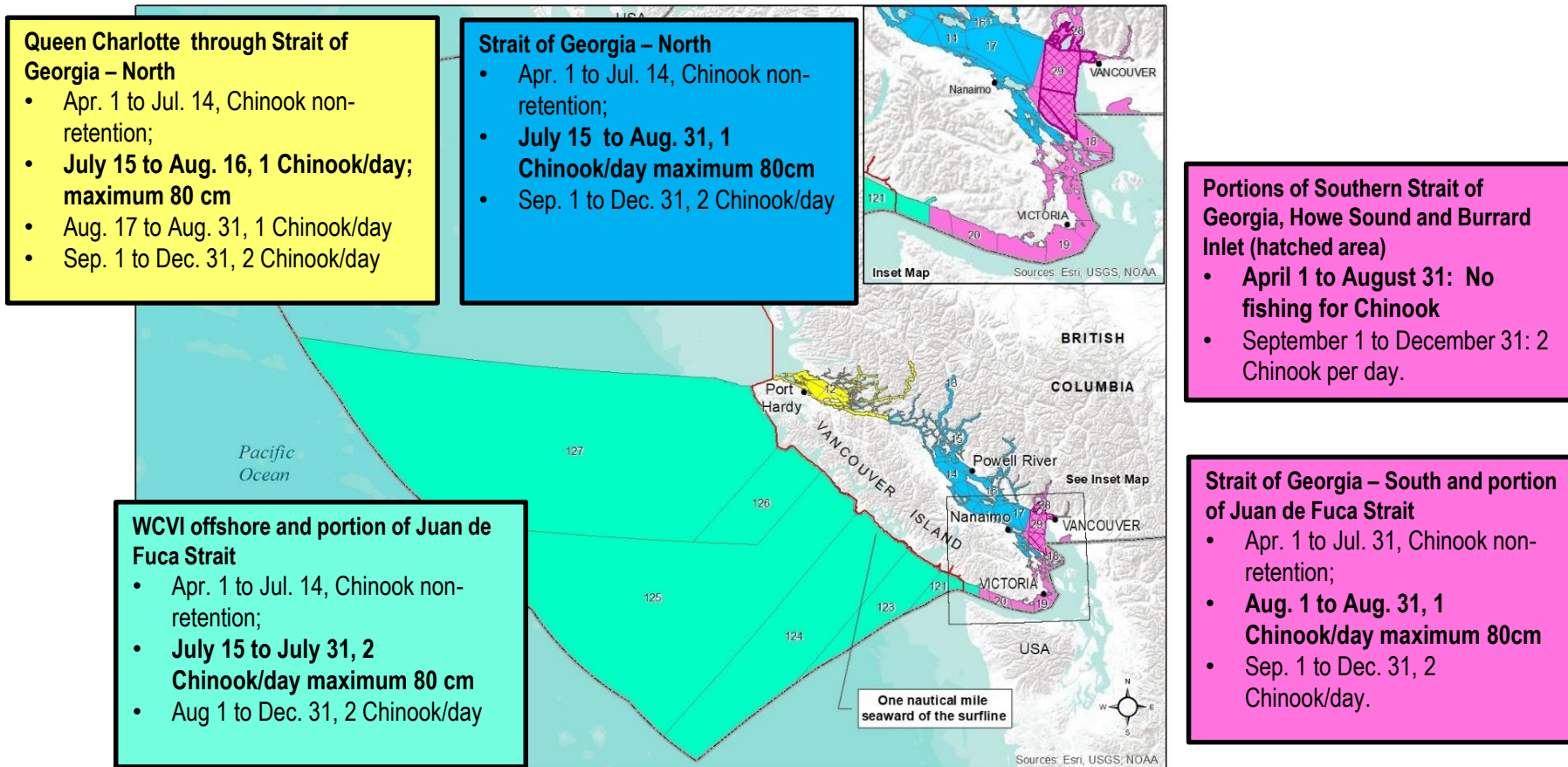


2020 Commercial management measures





2020 Recreational management measures



2020 changes noted in bold font



2020 Recreational management measures – Fraser River



- Approaches to Fraser River - Subareas 29-6, 29-7, 29-9 to 29-17 and the non-tidal waters of the Fraser River from Mission Bridge to the confluence with Sawmill Creek:**
- January 1 to November 1: No fishing for salmon
 - (Fishing opportunities for specific salmon stocks may be considered)
- Freshwater Regions 3,5,7 & 8: Year round:**
- Closed to fishing for salmon
 - (Fishing opportunities for specific salmon stocks may be considered)



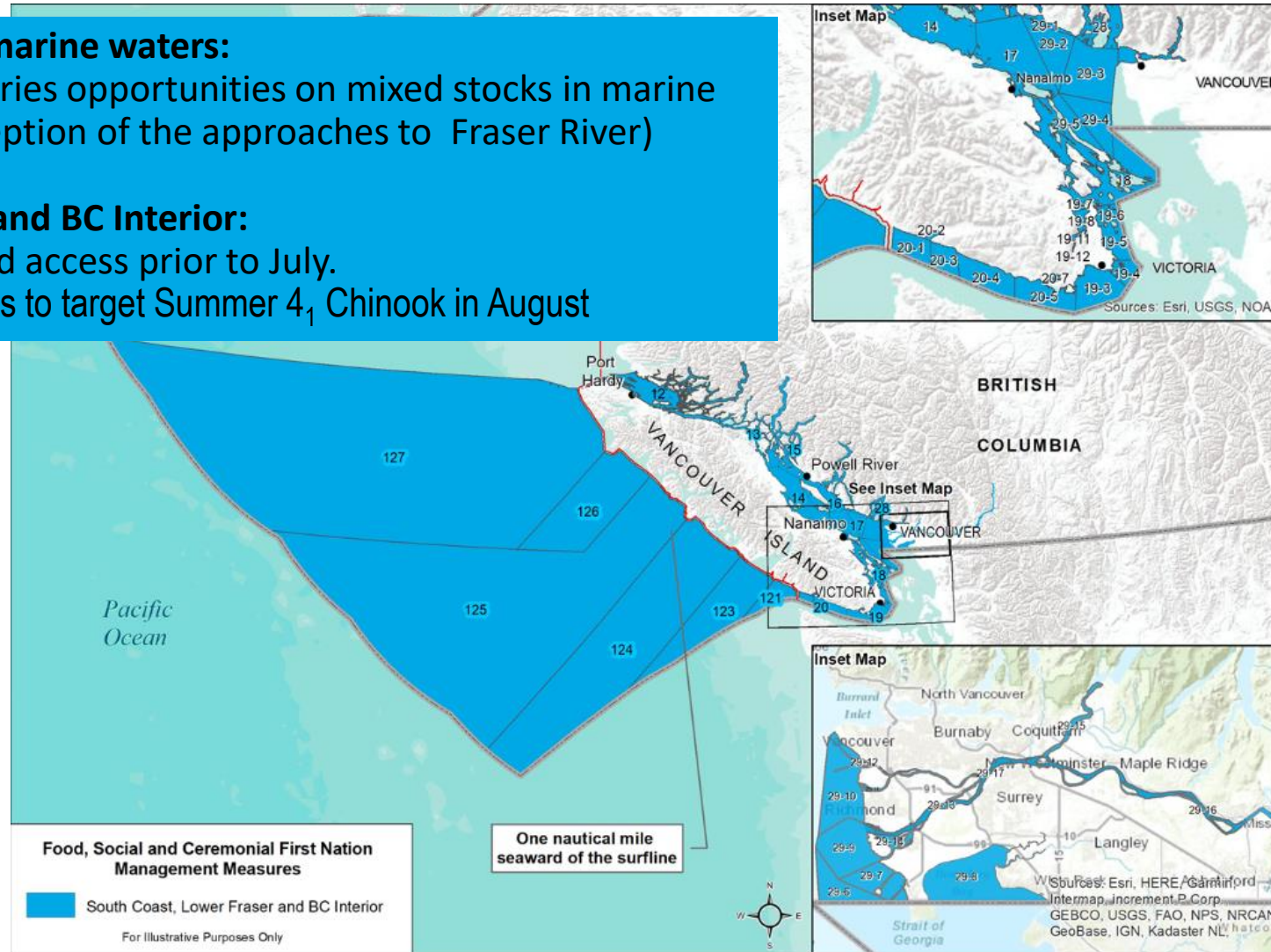
2020 First Nations Food, Social and Ceremonial

Southern BC marine waters:

- Some fisheries opportunities on mixed stocks in marine areas (exception of the approaches to Fraser River)

Lower Fraser and BC Interior:

- Very limited access prior to July.
- Opportunities to target Summer 4₁ Chinook in August





Recent mark rates by PFMA.

Average Mark Rate Estimated by Month and PFMA using data from 2015 to 2018.

PFMA	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave	Data Source, comments
PFMA 11						5.4%	5.4%	4.8%					5.2%	Creel
PFMA 12					11.4%	13.1%	9.5%	7.7%	5.0%				9.3%	Creel
PFMA 13	17.9%	35.4%	5.6%	11.7%	8.8%	12.0%	9.0%	6.0%	10.3%	16.7%	18.8%	30.0%	15.2%	Logbook Jan to April, Oct to Dec
PFMA 14	33.7%	21.4%	38.9%	20.3%	13.4%	12.2%	20.3%	14.0%	13.2%				20.8%	Logbook Jan to April, Sept, iRec Nov
PFMA 15		85.7%	11.8%	2.6%	4.7%	9.3%	8.4%	8.5%	38.9%				21.2%	iRec Feb, Logbook Mar April
PFMA 16			69.8%	18.4%	15.6%	22.0%	21.0%	29.7%	23.1%				28.5%	iRec Mar, April
PFMA 17		50.0%	38.9%	38.2%	35.8%	35.3%	38.0%	25.8%	20.2%	50.0%		40.0%	37.2%	Logbooks Feb-June, Oct-Dec
PFMA 18	46.7%	58.9%	62.5%	48.3%	35.3%	65.1%	58.7%	44.1%	48.9%			88.9%	55.7%	Lobooks Jan to April and Dec
PFMA 28	42.5%	54.4%	54.0%	18.8%	19.4%	25.7%	29.2%	4.9%	19.0%	35.4%	28.6%	45.6%	31.5%	Logbooks Jan to April, and Sept to Dec
PFMA 29	68.9%	42.2%	65.6%	24.1%	23.9%	19.0%	37.2%	7.9%	15.5%				33.8%	iRec Jan to April,
PFMA 19	66.0%	75.9%	68.5%	81.2%	62.1%	60.0%	52.2%	20.7%	19.1%	79.0%	70.6%	84.1%	61.6%	Creel excpet iRec Jan, Nov and Dec
PFMA 20	47.4%	77.4%	83.9%	66.4%	70.5%	40.1%	37.0%	19.7%	31.8%	62.0%	59.7%	48.3%	53.7%	Creel excpet iRec Jan, Nov and Dec
PFMA 21			66.4%	57.8%	64.7%	58.3%	41.2%	21.0%	3.1%				44.6%	irec Mar, April
PFMA 23			50.7%	45.6%	62.0%	37.8%	31.0%	10.7%	5.5%				34.7%	iRec Mar, April
PFMA 24				87.5%	49.2%	44.5%	42.1%	19.7%	22.8%				44.3%	iRec April
PFMA 25					29.8%	36.1%	6.3%	3.0%	41.3%				23.3%	Creel
PFMA 26					26.3%	11.2%	7.8%	8.2%	20.0%				14.7%	iRec Sept
PFMA 27					32.6%	15.2%	11.0%	8.9%	3.0%				14.1%	Creel
PFMA 121			61.6%	55.1%	77.8%	56.5%	56.4%	54.1%	16.7%				54.0%	troll except July-Aug creel
PFMA 123			61.6%	51.2%	73.7%	56.5%	45.0%	32.8%	11.9%				47.5%	troll except July-Aug creel
PFMA 124			61.6%	55.1%	73.7%	56.5%	45.0%	43.0%	43.1%				54.0%	troll except July-Aug creel
PFMA 125				59.9%	45.7%	46.1%	26.7%	25.0%					40.7%	troll
PFMA 126				59.9%	45.7%	46.1%	26.7%	25.0%					40.7%	troll
PFMA 127				59.9%	45.7%	46.1%	26.7%	25.0%					40.7%	troll



Methods used to project CYER on Fraser summer 5/2

1. Base period (2014-18) average annual kept and released CYER by fishery region and month were scaled for catchability change and effort. Base period CYER from direct fishery sampling for stock composition using CWT, DNA PBT, DNA regular, otolith thermal marks.
2. Scale weekly ER in marine area by backing run out 10 days from Albion.
3. Apply actions to estimated catch of Fraser spring and summer 5/2 (DNA results) by size, location, and date.



Method 1. Estimating impact in marine fisheries by scaling Base Period (2014-18) 5 year average CYER, and then extending Fraser Chinook run reconstruction into the marine area details in Dobson etal. Fraser chinook review 2020.

1. Estimate stock composition from fishery sampled CWT, DNA, otolith thermal marks along the WCVI.
 - Fishery samples by fishery region (e.g. northern GST = PFMA 13,14,15,16) and month were pooled for 5 years 2014-18 to provide stock composition by month/area stratum in years prior to the 2019 chinook non-retention.
 - Stock composition applied to estimated kept and released legal sized chinook. The estimates do not include impacts on sub-legal sized chinook releases. Estimates from creel survey or infilled using calibrated iREC.
2. Estimate total mortality based on kept catch plus 20% FRIM on legal size releases.
3. Reconstruct run into marine area.
4. Estimate fishery impact (CYER) = $TM_{(region,month)} \times \% \text{ stock}_{(region,month)}$.
 - This is complete for the base period 2014-18 and almost complete for 2019 (samples are still in the DNA lab).
 - Where samples sizes > 100 then used 2019 stock composition and where samples sizes <100 then used 5 year base period stock composition.
 - CYER for kept and release mortality separately.



PROJECTING impact in marine fisheries using base period CYER from fishery samples and extending Fraser Chinook run reconstruction into the marine area

5. To project impact of proposals across all fisheries we scaled base period CYER

$$\text{Projected CYER}_{(\text{kept,region,month})} = \text{BPCYER}_{(\text{kept,region,month})} \times \text{Catchability Scalar}$$

$$\text{Projected CYER}_{(\text{FRIM,reg,mon})} = \text{BPCYER}_{(\text{FRIM,reg,mon})} + (\text{BPCYER}_{(\text{kept,reg,mon})} - \text{Proj CYER}_{(\text{kept,reg,mon})}) \times \text{RelMortRate}$$

$$\text{Projected CYER}_{(\text{reg,mon})} = (\text{projected CYER}_{(\text{kept,reg,mon})} + \text{projected CYER}_{(\text{FRIM,reg,mon})}) \times \text{Effort Scalar.}$$

Where

Scalars used		
2019	2020	2021
0.2	0.2	0.2 =release mortality rate
0.92	0.9	0.9 =expected scalar due to daily limit 1
0.5	0.5	0.5 =expected effort scalar due to non-ret management
1	1	1 =expected effort scalar once fishery opens fully
1	1	1 =expected effort scalar for MSF (non-retention wild)
1	1	1 =expected additional effort scalar due to covid...
assume that mainland inlets and other localized openings had negligible impact on ER		
for areas sGST,JDF,WCVI where MSF included the scalar changed from non-retention to MSF effort		
for sGST assumed full area under MSF as too hard to divide down to small areas		
for JST, nGST assumed negligible (near zero) increase in ER since off migration corridor		

stock specific scalars for catchability reduction due to max 80 for wild fish=				
Fraser Spring	Fraser Spring	Fraser Summer	Fraser Summer	Fraser Fall
4.2	5.2	5.2	4.1	Fall
0.86	0.53	0.53	0.81	0.81

note that the maximum size scalars are determined across all ages, based on fishery biosamples. These will likely protect a higher % of females than shown here.



PROJECTING impact in marine fisheries using base period CYER from fishery samples and extending Fraser Chinook run reconstruction into the marine area

6. Impacts (ER) were estimates at the scale and scope of local proposals using CWT and DNA sample information.

This example is for Howe Sound. See evaluation framework for more detail.

Table 2B. Legal Chinook DNA-sampled in Area 28 2014-2019. Excludes samples from 28H and 28I, creel survey areas outside the proposed fishing area. Also excludes samples collected outside proposal (Tunstall Bay, Cowan Pt., Salmon Bank, Bowen Bay) or that said "None" for fishing location.

Values	MONTH	Fraser	Fraser	Fraser	Fraser	S					Grand Total
		Spring 4.2	Spring 5.2	Summer 5.2	Summer 4.1	Fraser Fall	Mainland Inlets	Area 12	ECVI	USA	
stock composition	April	0%	2.7%	0.0%	0.0%	21.6%	18.9%	2.7%	8.1%	45.9%	100.0%
	May	0%	0.0%	0.0%	0.0%	25.0%	10.0%	0.0%	10.0%	55.0%	100.0%
	June	0%	8.3%	0.0%	0.0%	16.7%	50.0%	8.3%	8.3%	8.3%	100.0%
	July	0%	0.0%	0.0%	20.0%	0.0%	80.0%	0.0%	0.0%	0.0%	100.0%
	August	0%	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	September	0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Estimated catch	April		1			8	7	1	3	17	37
	May					47	19		19	104	190
	June		5			9	28	5	5	5	55
	July				4		17				21
	August		8	8							17
	September									31	31
Observed Samples	April		1			8	7	1	3	17	37
	May					5	2		2	11	20
	June		1			2	6	1	1	1	12
	July				1		4				5
	August		1	1							2
	September									2	2
Total stock composition		0	3.8%	1.3%	1.3%	19.2%	24.4%	2.6%	7.7%	39.7%	100.0%
Total Estimated mortalities		0	14	8	4	65	70	6	27	157	350
Total Observed Samples		0	3	1	1	15	19	2	6	31	78

2019 Run Size	6,458	23,921	16,539	245,395	146,271
average ER (expanded catch)	0.00%	0.06%	0.05%	0.00%	0.04%
average ER (samples only)	0.00%	0.01%	0.01%	0.00%	0.01%
5 yr avg Run Size	14,216	25,337	27,938	182,540	123,812
average ER (expanded catch)	0.00%	0.05%	0.03%	0.00%	0.05%
average ER (samples only)	0.00%	0.01%	0.00%	0.00%	0.01%

*Estimated mortalities include kept catch and incidental (released) mortalities.

*Highlighted run size estimates are subject to change with updated data