



Executive Secretary's Summary of Decisions
Special Meeting
May 4, 2021 (online)

The Pacific Salmon Commission held a Special Meeting on May 4, 2021 via webinar, and discussed a number of topics (see attached agenda).

The Commission AGREED:

1. The agenda was adopted after striking item 8 (Presentation of coho and pink salmon reports from the Northern Panel) and replacing it with a new topic (CTC memo and potential assignment to CIG).
2. The minutes from February 2021 are adopted as circulated.
3. The commissioners involved with the report on food, social, and ceremonial fisheries significance will review the final draft, confirm its readiness, and work with the Secretariat to publish it as a PSC Special Report as soon as possible. The Secretariat will liaise with appropriate personnel for a presentation of the report's findings in January or February 2022.
4. The notional spending limit of \$750,000 USD for mark-selective fisheries projects is confirmed, noting the Commission may approve higher or lower spending levels upon review of the MSF Fund Committee recommendations in October 2021.
5. The national reports regarding COVID-19 impacts on 2021 treaty implementation will be provided in written form as part of this meeting's record.
6. The F&A Committee will meet to address supplemental payments to the Test Fishing Revolving Fund and advise the Commission of its findings through the Secretariat.

ATTENDANCE

PACIFIC SALMON COMMISSION
SPECIAL MEETING

May 4, 2021

Via Webinar

COMMISSIONERS

CANADA

R. Reid (Chair)

R. Jones

J. McCulloch

M. Ned

M. Paish

B. Rezansoff

B. Riddell

A. Thomson

UNITED STATES

D. Vincent-Lang (Vice Chair)

W.R. Allen

P. Anderson

W. Auger

S. MacCorkle

M. Oatman

R. Klumph

S. Rumsey



**Draft Agenda
Special Session
May 4, 2021
Online**

1. Adoption of agenda
2. Approval of minutes: February 2021 Annual Meeting
3. Update on publication of sociocultural report on food/social/ceremonial use
4. PICES MOU drafting group: update from the Executive Secretary
5. Report from MSF Fund Committee
6. Report from the CSC Steering Committee
7. COVID-19 impacts on Treaty implementation
8. Presentation of coho and pink salmon reports from Northern Panel
9. Test Fishing Revolving Fund status and needs
10. Big Bar Slide update
11. Confirmation of meeting arrangements for October 2021 - February 2022
12. Public comment

Annotated agenda – May 2021 Special Meeting

(Executive Secretary's annotations in *italics*)

1. Adoption of Agenda

- *Consistent with PSC bylaws, an agenda shall be adopted by the Commission at the start of each meeting. The Commission shall not ordinarily take a decision on any item that has not been included in the draft agenda for the meeting. Where circumstances warrant, supplementary decision items may be added to the agenda with the concurrence of the Chair and Vice Chair.*

2. Approval of minutes

- *The Parties received draft minutes from the February 2021 Annual Meeting for review prior to the present meeting.*

3. Update on publication of sociocultural report on FSC use

- *At the Annual Meeting, the Commission directed the Executive Secretary to liaise with relevant Commissioners about publication plans and provide an update at the next opportunity. The Commission is invited to confirm plans for eventual publication as a PSC Special Report.*

4. PICES MOU drafting group: update from the Executive Secretary.

- *At the Annual Meeting, the Commission directed the Executive Secretary to communicate with the PICES Secretariat to approve the formation of a Joint Study Group to draft an MOU between the organizations.*
- *The Parties have appointed Bill Templin and Scott Rumsey (USA) plus Shannon Balfry and Diana Dobson (Canada) to the group. The Secretariat will be represented by the Executive Secretary and Catherine Michielsens (Chief, Fisheries Management Science).*
- *The PICES Secretariat will relay the PSC decision to the PICES Science Board at its next meeting (May 2021), then to the PICES Governing Council via email. It is expected the group will be fully populated in late spring 2021 and drafting will occur over the summer.*
- *The PSC will review and respond to the draft MOU as early as October 2021, or at the January/February 2022 meetings. There is no action required at this time.*

5. Report from the MSF Fund Committee: *At the Annual Meeting, the Commission agreed on a notional spending limit of \$750K USD for 2021 MSF projects. The Committee will have met on March 30 and discussed this limit relative to expected project submissions and needs. The Committee will report on those deliberations and the Commission is invited to confirm spending limits for a June 2021 RFP.*

6. Report from the Committee on Scientific Cooperation (CSC) Steering Committee: *The CSC has collaborated with the Steering Committee to advance the 2021 workplan approved at the annual meeting. The Steering Committee will provide a verbal progress report for the Commission's consideration, but no action is required.*

7. COVID-19 impacts on Treaty implementation: *Section members shall present and discuss the written summaries provided by Panel and Committee Chairs on the impact of COVID-19 on Treaty implementation.*
8. Presentation of coho and pink salmon reports from Northern Panel: *The Northern Panel leadership will present the relevant reports arising from implementation of Chapter 2.*
9. Test Fishing Revolving Fund status and needs: *The February F&A Committee report highlighted potential shortfalls in the PSC revolving fund for 2021 and beyond. The Secretariat will update the Commission on fund balance and projected needs for the coming fishing season.*
10. Big Bar slide update: *The Canadian section will provide updates on the work completed at the Big Bar site to date.*
11. Confirmation of meeting arrangements for October 2021 – February 2022: *The Secretariat will provide updates on Commissioner meeting arrangements for next fall/winter.*
12. Public comments as needed: *When appropriate, and with the concurrence of the Vice-Chair, the chair may provide time for public visitors to speak during the meeting.*

Evenson
April 23, 2021

2021 ANTICIPATED COVID IMPACTS – ALASKA

April 23, 2021

Alaska has designated fisheries as critical infrastructure to protect the food supply chain and the economy. Accordingly, actions plans have been developed to safely implement field projects to the extent practicable to enable fisheries to be prosecuted as normally as possible.

Similar to last year, all Alaska field projects are operating as close to normal as possible. While we have taken precautionary measures at all projects and it has not been without its challenges, impacts to operations have been and continue to be minimal. No project goals or objectives are anticipated to be substantially modified due to COVID-19. Additionally, the State of Alaska plans to have similar levels of enforcement as in previous years.

Chp 1. Transboundary Rivers

The TBR projects are operating as close to normal as possible. One change is the addition of the Alek Chinook and sockeye salmon stock assessment project; currently staff are busy buying equipment (boats/motors, nets, etc.) and pursuing necessary permits with an eye towards beginning this Chapter 1 required program mid-summer. Most of the TBR projects are bilateral and ADF&G, DFO, and FN staffs are working collaboratively to make sure all project objectives are addressed. Canada Border Services Agency (CBSA) has reviewed the spring projects in the Taku and Stikine Rivers and has designed a plan to allow daily cross-border work for ADF&G smolt tagging crews operating in the lower portions of each river and sockeye enhancement fry releases destined for three remote lakes located in the upper reaches of the two rivers. As in 2020, DFO is allowing access to gear and the use of their Stikine River field camp. In all cases, no interaction among ADF&G, DFO and FN crews will be allowed. New for 2021, CBSA will require a negative PCR test within 72 hours of travel into Canada. Logistics surrounding adult operations such as mark-recapture studies, age-sex-length and tag sampling studies, aerial and radiotelemetry surveys will be discussed in the upcoming months; regardless, staff anticipate smooth sailing this season.

Transboundary Rivers Enhancement. The sockeye enhancement program forms the backbone of bilateral cooperation under Chapter 1 TBR. It involves eggs being collected in Canada, flown to a hatchery in Alaska, and then fry are flown back to lakes in Canada. Cross-border transport of live animals requires inspection by a certified veterinarian and the transport certificate is good for only 14 days. Last year we experienced some challenges with the TBR sockeye enhancement program, but after a large cooperative effort by ADF&G, DFO, and Port Snettisham Central Incubation Facility, the enhancement program was ultimately successful. This year, the biggest issue we were grappling with was the impact of the additional requirement to have a negative PCR COVID test within 72 hours of travel into Canada on the timely transportation of hatchery fish. Steve Gotch and Bill Waugh worked with CBSA to secure some much-needed exemptions for cross-border Treaty operations. We would like to express our gratitude to both Steve and Bill for going above and beyond to work through this issue.

With the Port Snettisham and Ward Air staff being fully vaccinated and no travel restrictions within the State of Alaska, we are hopeful that the APHIS inspection can be done in-person this year thus providing a timely stamp of approval to transport fish. In 2020, 4–5 days of flying time (after each virtual

inspection) were missed because of inspection delays. An in-person inspection would allow for paperwork to be signed and in-hand the same day as the inspection.

Chp 2. Northern Boundary

Projects are proceeding as planned in 2021. Hugh Smith Lake coho salmon smolt tagging is starting with normal timing this spring and the adult coho/sockeye weir will be fully operational this summer. Berners River coho salmon smolt tagging is also scheduled to proceed on a normal schedule this spring. ADF&G plans on conducting all our Ketchikan area escapement surveys for all species as usual. The Southeast Coastal Monitoring Survey, a collaborative project with NOAA Fisheries, cruise dates and staffing are set, and the June and July surveys are scheduled to go ahead as planned. There is also a continuing coho genetic baseline sampling project funded by the Northern Fund that will proceed as planned this fall.

Chp 3. Chinook Salmon

The State of Alaska does not anticipate any implications for meeting annual Treaty commitments nor does the state anticipate implications for Chapter 3 implementation resulting from Chinook stock and fisheries assessment in Southeast Alaska.

Escapement Assessment & Sampling: All projects will be fully operational.

Marking & Tagging: Wild coded-wire tagging (CWT) projects will be fully operational. All hatcheries are marking and tagging Chinook as usual. This includes the federal NOAA Fisheries Little Port Walter research facility which suspended marking and tagging operations in 2020 but has resumed operations in 2021. Alaska purchased 2 tagging trailers and the hatcheries are currently awaiting training from Northern Marine Technologies. If training occurs as planned, Alaska may have an increase in marking and tagging at some facilities. The one exception is the Macaulay Hatchery in Juneau, which lost its entire Chinook brood when a landslide severed the penstock that supplied the hatchery's primary water supply.

Fishery Sampling: Fisheries continue to be sampled at rates similar to, and for some fisheries above, past years.

Catch Estimation: Catch accounting is proceeding per usual.

COVID-19 Impacts to Salmon Marking, Tagging, Fisheries and Escapement Area Sampling and Catch Estimation

April 15, 2021 UPDATE by the Southern U.S. Management Entities

The following findings and statements are building on the CTC Memorandum to the Chinook Interface Group and the bilateral PSC dated September 30, 2020, input received from Washington Tribal management entities and technical reports to the Columbia River U.S. vs. Oregon Management Agreement Policy Committee. They are intended to reflect on current 2021 conditions, which are not expected to change significantly through the end of the annual management cycle.

Southern U.S. management entities and their members to PSC Technical Committees are experiencing slower annual processes mainly due to mandatory webinar format meetings, furloughs and some staff reductions.

While uncertainty continues surrounding the extent of COVID-19 specific implications to appropriate PST Chinook Model assessments and the evaluation of Individual Stock Based Management (ISBM) fisheries using Calendar Year Exploitation Rates (CYERs), it is the understanding of the Southern U.S. management entities that the CTC will continue to discuss necessary analyses and the development of these added CTC deliverables.

The following are implications and challenges that were identified by Southern U.S. management entities to date concerning 1) escapement assessment and outmigration sampling, (2) marking and tagging, (3) fishery sampling, and (4) catch estimation. Unless specifically noted below, state and tribal fish stock monitoring strategies and assessment activities located in Oregon and Washington were not impacted by safety and health measures taken during the ongoing COVID-19 pandemic.

1) Escapement assessment and outmigration sampling

COVID-19 did not cause impacts to spawning ground surveys that would compromise comparisons between years. In some instances, co-managers worked together to address staffing issues (example: Chehalis River). Unanticipated, COVID-19 related precautionary measures and furloughs necessitated by state revenue shortfalls for coast wide spawning ground surveys lead to fewer than the usual number of surveys being completed in 2020, particularly those done for spring-run Chinook Salmon stocks, however, increased sampling efficiencies and reach coverages were possible, largely due to cooperative action among inter-agency work teams.

Project cost increased throughout the Southern U.S., particularly due to the need to transport multiple staff to sampling locations with single occupancy vehicles.

Some aerial observations were canceled and partially replaced with on-the-ground surveys to maintain similar spawning ground sampling rates as had been achieved in past years.

Many fish hatcheries limited the use of volunteers, but otherwise were able to process returning fish as normal, albeit spawner processing took longer than usual, but was achieved at the same level as non-COVID-19 impact years.

Chinook Salmon scale processing and determinations of age compositions were temporarily delayed due to limited access to office and laboratory spaces. In some instances, scale processing continues to lag behind schedule for recovery years 2019 and 2020.

NOAA Fisheries staff was unable to operate the Lower Granite Dam (Snake River) adult trap. With help from other agencies and after a few weeks had passed, some sampling was conducted, however. Finally, sampling at the Bonneville Dam Adult Fish Facility proved to be difficult during the early spring period last year, which may continue to impact comparable data analyses. While some of these setbacks can be contributed to COVID-19, difficulties with adequate sampling may also attributed to ongoing issues with USCoE operating procedures.

On the Queets, Puyallup River, and south Puget Sound tributaries, regular smolt trap operations continue, while cooperative monitoring projects with other entities were either delayed or canceled. Smolt traps operated by WDFW on the Skagit, Cedar, Green, Nisqually, Duckabush and Dungeness rivers suspended operations for approximately three weeks from late March to mid-April due to COVID-19. The WDFW has estimated catch during this period, so abundance estimates are available, though they have higher uncertainty than most years. Smolt monitoring and weir operation on the Snohomish, White and Elwha rivers were affected as well. While screw trap operations continued, some weirs were not monitored during the 2020 season. Smolt monitoring operations in the Snohomish River Basin conducted by the Tulalip Tribes in the Skykomish and Snoqualmie rivers were discontinued in March 2020, due to COVID-19 related concerns for the remainder of the outmigration period. This year, smolt trap operations were delayed by two weeks and will be run about two thirds of the total number of hours, as compared to a regular season. Likewise, sampling of the White, Green and Snohomish mainstem rivers was also interrupted in 2020, but will resume in 2021.

2) Marking and tagging

The impacts of marking and tagging operations that were reduced or eliminated during 2020 will begin to manifest in 2022, when fish from brood years 2018 (yearling stocks) and 2019 (fingerling stocks) start recruiting to fisheries. These impacts will likely extend into 2026.

Covid-19 has not significantly impacted marking and tagging operations at state and tribal facilities, as well as any associated cooperative programs located in Oregon and Washington. In

response to social distancing concerns, some reductions in marking and tagging goals occurred, particularly where manual operations had been planned to mark and tag juvenile salmon at various smaller facilities. Fewer individuals were scheduled to participate in fish marking activities, which at times lead to fewer fish being processed over a longer time period. Most operations were accommodated and made whole by increasing the deployment of automated fish marking trailers and thus, overall marking goals were mostly met.

Exceptions at a few locations and incidences where complete production marking did not occur include:

- Glenwood Springs hatchery otolith marked about 300K juvenile Chinook Salmon, but did not fin mark or CWT them.
- Washington DFW hatchery staff did not PIT tag any Upriver Brights (URBs) in 2020
- Hanford Reach Wild Upriver Brights were not CWTed, due to COVID-related health and safety concerns.
- The USFWS achieved about two thirds of the 2020 marking goals for mass marking (adipose fin mark only), Ad+CWTing and CWT only groups, respectively, at Spring Creek National Fish Hatchery.
- The 2020 Klickitat Fish Hatchery URB Sub-yearling fall Chinook release of 4.5 million fish that were released last June/July did not get marked/CWTed.
- WDFW tagged about 50% of the target number for the Lewis River wild Chinook Salmon production.

Processing of CWTs has been minimally affected by COVID-19 related precautions.

3) Fishery sampling

Anecdotally, as with other recreational fishing during COVID-19, we have seen relatively high participation in ocean salmon fisheries (as compared to forecasted salmon abundances). Coded Wire Tag sampling rates for the vast majority of state implemented fisheries remain similar to previous years. Specifically, impacts to fisheries implementation and sampling rates in the lower Columbia River were limited and normal sampling targets have been attained for most of the WA/OR coastal areas.

Commercial landings of ocean caught salmon in the ports of LaPush and Neah Bay were discontinued in 2020, following in-season management action. These two main ports provide access to coastal waters north of the Queets River. The fleet was instructed to land their catch at an alternative port that is located further inland.

For the Upper Columbia Basin, the effects of COVID on fisheries and sampling were not significant. Fisheries took place as expected and sampling occurred at nearly the same rate as during the pre-COVID-19 era.

State and tribal **fishing effort** in ocean areas was reduced by varying degrees and due to COVID-related restrictions for charter boat operators and the ongoing closure of Neah Bay and La Push. No significant impacts to those catch estimations of ocean Chinook Salmon fisheries have been noted.

Recreational effort in the lower Columbia River downstream of Bonneville Dam is usually estimated via boat/trailer counts by aerial surveys; however, this practice was temporarily curtailed and replaced by boat based effort counts. By June 22, staff were able to revert to aerial counts.

4) Catch estimation

Impacts to catch accounting and estimation processes for state implemented fisheries are limited to non-existent. Initially closed recreational fisheries in the lower Columbia River were re-opened as of May 4, 2020 and conducted in accordance with preseason plans and in-season monitoring information updates. . Staff were able to sample and monitor fisheries when open, with limited impacts to sample rates (and associated CWT sampling), while operating more slowly and/or with fewer staff in confined spaces to accommodate social distancing guidelines. Catch estimation is not expected to be impacted at any measurable level.

To the extent that fish marking in lower Columbia River hatchery facilities was curtailed, the confidence limits of future exploitation rate analyses may be impacted starting with return year 2022 and likely continuing through 2026.

The current expectation for the CTC is that core functions, such as Exploitation Rate Analysis (ERA) and model calibration, continue to not be impacted through the 2020/2021 annual cycle and beyond. Changes or delays in fishery sampling, catch estimates and escapement assessment programs are not expected to have significant impacts. Some work products were delayed slightly; however, the completion of model calibration and the annual ERA appear to be on schedule at this time.

May 19, 2021

Update on COVID-19 Impacts to Canada's Implementation of the Pacific Salmon Treaty

During the February 2021 Annual Meeting, parties to the Pacific Salmon Commission agreed to hold an additional meeting in May 2021 to focus on the impacts of COVID-19 on implementation of the Pacific Salmon Treaty (PST). The following update pertains to Canada's implementation of the Treaty under its domestic COVID-19 health and safety protocols.

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Transboundary Panel, Technical Committee and Enhancement Sub-Committee

COVID-19 Impacts on Treaty Implementation:

- *Implementation of Chapter 1 relies on Canada – US cooperation in the delivery of salmon stock assessment and enhancement activities in northwest British Columbia and southeast Alaska.*
- *The primary implications of COVID-19 public health restrictions on Chapter 1 Transboundary Panel, Technical Committee and Enhancement Sub-Committee activities pertain to regional and local communities as well as international COVID-19 travel restrictions. Although all core/critical Chapter 1 salmon assessment and enhancement programs were delivered in 2020, the initiation of a number of new and emerging projects was delayed to 2021.*
- *All COVID-19 public health and safety protocols and procedures have been reviewed, updated and finalized to enable the delivery of all planned Chapter 1 programs as outlined within the bilateral implementation plan in a manner which provides the highest degree of protection for employee and public health and safety. Barring any unforeseen events, all core and planned Transboundary salmon stocks assessment / enhancement projects and programs are scheduled to proceed in 2021.*

Outstanding and Upcoming Issues:

- *No issues outstanding.*

Recommendations or Next Steps:

- *Proceed with implementation of Chapter 1 Transboundary River salmon stock assessment and enhancement activities in 2021 in accordance with established international and domestic public health requirements and protocols.*

Northern Panel and Northern Boundary Technical Committee

COVID-19 Impacts on Treaty Implementation:

- *Most Canadian assessment programs related to Chapter 2 obligations will be implemented in 2021 under amended operating protocols, similar to what was in place in 2020.*
- *The Tyee Test Fishery on the Skeena River was identified early in 2020 as being essential to the delivery of Chapter 2 obligations and appropriate measures were developed to ensure installation took place on time. Similar operating measures will again be in place for 2021 and operations are scheduled to begin on June 10.*
- *Approval for the operation of the Babine Counting Fence is also anticipated with conditions similar to 2020. Canada expects operations to commence in early July 2021.*
- *The Nass Fishwheel program (operated by the Nisga'a Fisheries Program) will proceed with approval for the operation of the Meziadin Fishway, with measures similar to 2020 will be sought.*
- *Amended protocols for the at-sea genetic sampling program of commercial sockeye harvests in Areas 3 and 4 are currently under development and will require approval by Fisheries and Oceans Canada's (DFO) Pacific Region office before a program can be implemented.*

Outstanding and Upcoming Issues:

- *In 2020, the genetic sampling program for commercially-caught sockeye in Area 3 and 4 commercial fisheries did not take place due to concerns for COVID-19. Due to low sockeye returns in 2020, the absence of this data led to minor impacts to the Northern Boundary Sockeye Run Reconstruction (NBRR) for the 2020 season. The NBRR can be run without Canadian genetic sampling results by using historical averages from data collected since 2000.*
- *For the 2021 season, the pre-season expectations for Nass and Skeena sockeye are for a strong enough return to support commercial fishing opportunities. Work is underway to develop amended operating procedures to ensure that the genetic sampling program can take place. Once developed, the operating protocols will require approval from DFO Pacific Region's Regional Director of Science.*

Recommendations or Next Steps:

- *None to report.*

Chinook Technical Committee

COVID-19 Impacts on Treaty Implementation:

- COVID-19 presented some challenges for the Chinook Technical Committee (CTC); however, these did not affect any CTC core functions (i.e., Exploitation Rate Analysis (ERA), model calibration) for the 2020-21 cycle. The annual ERA and the Chinook Model Calibration were completed on time, and the memo to the Commissioners with the AABM Fisheries Pre-Season Abundance Indices for 2021 and Post-Season Abundance Indices for 2020 was submitted on April 1st 2021 in compliance with PST timelines.
- Impacts of COVID-19 on Chinook salmon stock and fishery assessments under the jurisdiction of the Pacific Salmon Treaty during 2020 are primarily on marking and tagging operations, especially in British Columbia where the majority of exploitation rate indicator stocks were released without adipose-fin-clip marks and coded-wire tags (see Table 1).

Table 1. Updated 2020 tagging summary of Chinook indicator stocks (Brood Year 2019). Note: all 2020 yearling (1+) releases (Brood Year 2018) were unaffected by the COVID-19 pandemic as they were tagged in 2019.

Program	Stage	Tags applied	Unmarked	Released?	Notes
Atnarko R	Smolt 0+		1,924,871	Y	
Big Qualicum R	Smolt 0+		3,418,046	Y	
Chilko R	Smolt 1+	30,970		N	
Chilliwack R	Smolt 0+		2,231,008	Y	
Cowichan R	Smolt 0+	200,170	505,644	Y	
Harrison	Smolt 0+		365,653	Y	
Kitsumkalum	Fed Fry		253,028	Y	All 2019 brood released unmarked
Nicola R	Smolt 1+	214,507		N	
Phillips R	Smolt 0+	83,217	8,381	Y	
Puntledge R	Smolt 0+		264,239	Y	
Quinsam R	Smolt 0+	237,414	2,457,452	Y	
Robertson Cr	Smolt 0+		6,397,220	Y	
Shuswap R Low	Smolt 0+	60,223	493,377	Y	
Shuswap R Up	Smolt 0+		169,200	Y	

Outstanding and Upcoming Issues:

- *The impacts of marking and tagging operations that were reduced or eliminated in 2020 will begin to manifest in 2022 when fish from brood years 2018 (yearling stocks) and 2019 (fingerling stocks) start recruiting to fisheries and extend to 2025. The CTC is actively discussing what the implication of this means for the Chinook Model and evaluation of Individual Stock Based Management (ISBM) fisheries using Calendar Year Exploitation Rates (CYERs). These discussions could result in ad hoc assignments.*

Recommendations or Next Steps:

- *Broodstock collection activities for Chapter 3 indicator stocks are currently on target, although hatchery staff continue to adapt to COVID-19 operational protocols. These protocols have the potential to reduce staff capacity to conduct fish and gamete collection activities.*
- *It is also important to note that DFO's Salmonid Enhancement Program (SEP) broodstock collection for several of the Chinook indicator programs is heavily or entirely reliant on support from DFO's stock assessment group (e.g., Harrison, Shuswap, Nicola, Chilko, Kitsumkalum programs). As such, new or unforeseen COVID-19 related implications on regular operations within either program, SEP or stock assessment, have the potential to result in broodstock/egg target shortfalls in 2021. As with the tagging and marking programs, efforts should be made to maintain brood collection activities operational in 2021.*
- *Significant improvements in DFO's COVID-19 operational protocols and advanced planning have DFO on track to meet all 2021 tagging commitments. There are 13 Chinook hatchery indicator stocks of which all (100%) will receive a significant portion of their CWT target. Eight indicators will achieve their full number of tags, four will receive the majority of their coded-wire tag target, and one will receive roughly one-third (36%) of the tagging target due to environmental conditions during brood collection.*

Fraser River Panel and Technical Committee

COVID-19 Impacts on Treaty Implementation:

- *COVID-19 has had minimal impacts on the operations of the Fraser River Panel and Technical Committee to-date and is not expected to have significant impacts for the 2021 season and beyond. In 2020, impacts were primarily related to the implementation of juvenile sockeye and pink salmon stock assessment programs in the spring. This resulted in the elimination of that data for forecasting the 2021 pink salmon return and may affect the 2022 sockeye return forecast.*
- *From a Panel operation perspective, no face-to-face meetings were held either pre-season, in-season or post-season in 2020 and this will continue in 2021. This was not a significant impediment to Panel operations in 2020 but may be problematic if controversial decisions are required in 2021 as in-person meetings allow for the timely diffusing of issues.*
- *Transportation and processing of DNA samples were delayed somewhat in 2020 but were not a significant issue; however this could become a bigger issue in 2021 if the sockeye and pink returns are larger than forecasted and timely processing of the Stock ID samples is required.*

Outstanding and Upcoming Issues:

- *As identified above, not having face-to-face meetings in-season and delays in DNA sample processing are likely to be the primary issues in 2021; however, neither of these is anticipated to be a significant problem.*

Recommendations or Next Steps:

- *No recommendations at this time for the 2021 season.*

Southern Panel, Coho Technical Committee and Chum Technical Committee

COVID-19 Impacts on Treaty Implementation:

- *Southern Panel impacts include change of meeting format from in-person to virtual. There were some glitches however the Zoom platform worked well. While the changed format allowed meetings to go ahead and information exchange/presentations to occur, there was a loss of social and informal networking opportunities and relationship building activities.*

Chum Technical Committee:

- *Overall the Chum Technical Committee was able to execute most programs but with increased pressure to plan and administer the programs due to COVID-19:*
 - *More expenses for personal protective equipment and vehicles (more vehicle use to minimize transmission) was balanced by overall less travel.*
 - *Safety and mitigation plans were developed and implemented.*
 - *In-season assessment programs continued in Area 12, Albion Test fisheries, and Juan de Fuca Chum Sampling.*
 - *Escapement programs continued.*
 - *Lab analysis delays (Scales, DNA) caused assessment report delays. Information is also arriving slower than normal.*
 - *All meetings moved virtually with good success.*

Coho Technical Committee:

- *Coho Technical Committee members were able to conduct relevant assessment programs in 2020, although additional attention was paid to administering programs and ensuring appropriate COVID-19 mitigation protocols were in place.*
- *Risk assessments were conducted on all programs for approval to implement. Since most coho specific programs began in late Aug-Sept timeframe, these assessments were based on experience from other programs beginning earlier in the year.*
- *Southern Endowment Fund Projects (lower Fraser coho escapement assessment, coho enumeration in the Chilcotin River) were executed as planned.*
- *Age data and coded wire tag (CWT) recovery data were delayed because of lab backlogs; however, this did not impair reporting as the Coho Technical Committee post-season reports are 2 years behind. Labs were caught up by the time pre-season planning was completed.*
- *The Coho Technical Committee and Coho Working Group met virtually and continued to be productive and complete work plans.*

Outstanding and Upcoming Issues:

- *Mitigation plans in place for COVID-19 will be rolled over for next year. Zoom licences will be required for upcoming meetings.*
- *The Environmental Change Working Group of the Coho Technical Committee together with the Committee on Scientific Cooperation is organizing an introductory workshop on environmental indicators on May 11 for the PSC family.*
- *Coho Technical Committee members will be discussing the Coho DIT report with the Selective Fishery Evaluation Committee to develop an action plan.*

Recommendations or Next Steps:

- *None to report*

Selective Fishery Evaluation Committee

COVID-19 Impacts on Treaty Implementation:

- *In response to COVID-19, the Selective Fishery Evaluation Committee (SFEC) meetings have occurred over conference calls or virtually. There has been no effect of this change on the completion of SFEC tasks.*

Outstanding and Upcoming Issues:

- *Resuming in-person meetings when safe to do so will be valuable to develop working relationships with new committee members.*

Recommendations or Next Steps:

- *None needed.*

Chinook Okanagan Work Group

COVID-19 Impacts on Treaty Implementation:

- *There were no impacts on work related tasks in the 2020-21 work plan. All meetings and workshops were completed electronically.*

Outstanding and Upcoming Issues:

- *None*

Recommendations or Next Steps:

- *Continue to follow work plan to the best extent under the current circumstances.*

Data Sharing Technical Committee

COVID-19 Impacts on Treaty Implementation:

- *As the Data Sharing Technical Committee has no specific elements associated with Treaty Implementation, no COVID-19 impacts are anticipated.*

Outstanding and Upcoming Issues:

- *No outstanding or upcoming issues are anticipated.*

Recommendations or Next Steps:

- *The only next step for the Data Sharing Technical Committee is to review feedback from other technical committees on existing data exchange specification changes. COVID-19 is not expected to impact this process.*

Update on COVID-19 Impacts to Canada's Implementation of the Pacific Salmon Treaty

During the February 2021 Annual Meeting, parties to the Pacific Salmon Commission agreed to hold an additional meeting in May 2021 to focus on the impacts of COVID-19 on implementation of the Pacific Salmon Treaty (PST). The following update pertains to Canada's implementation of the Treaty under its domestic COVID-19 health and safety protocols.

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Transboundary Panel, Technical Committee and Enhancement Sub-Committee

COVID-19 Impacts on Treaty Implementation:

- *Implementation of Chapter 1 relies on Canada – US cooperation in the delivery of salmon stock assessment and enhancement activities in northwest British Columbia and southeast Alaska.*
- *The primary implications of COVID-19 public health restrictions on Chapter 1 Transboundary Panel, Technical Committee and Enhancement Sub-Committee activities pertain to regional and local communities as well as international COVID-19 travel restrictions. Although all core/critical Chapter 1 salmon assessment and enhancement programs were delivered in 2020, the initiation of a number of new and emerging projects was delayed to 2021.*
- *All COVID-19 public health and safety protocols and procedures have been reviewed, updated and finalized to enable the delivery of all planned Chapter 1 programs as outlined within the bilateral implementation plan in a manner which provides the highest degree of protection for employee and public health and safety. Barring any unforeseen events, all core and planned Transboundary salmon stocks assessment / enhancement projects and programs are scheduled to proceed in 2021.*

Outstanding and Upcoming Issues:

- *No issues outstanding.*

Recommendations or Next Steps:

- *Proceed with implementation of Chapter 1 Transboundary River salmon stock assessment and enhancement activities in 2021 in accordance with established international and domestic public health requirements and protocols.*

Northern Panel and Northern Boundary Technical Committee

COVID-19 Impacts on Treaty Implementation:

- *Most Canadian assessment programs related to Chapter 2 obligations will be implemented in 2021 under amended operating protocols, similar to what was in place in 2020.*
- *The Tyee Test Fishery on the Skeena River was identified early in 2020 as being essential to the delivery of Chapter 2 obligations and appropriate measures were developed to ensure installation took place on time. Similar operating measures will again be in place for 2021 and operations are scheduled to begin on June 10.*
- *Approval for the operation of the Babine Counting Fence is also anticipated with conditions similar to 2020. Canada expects operations to commence in early July 2021.*
- *The Nass Fishwheel program (operated by the Nisga'a Fisheries Program) will proceed with approval for the operation of the Meziadin Fishway, with measures similar to 2020 will be sought.*
- *Amended protocols for the at-sea genetic sampling program of commercial sockeye harvests in Areas 3 and 4 are currently under development and will require approval by Fisheries and Oceans Canada's (DFO) Pacific Region office before a program can be implemented.*

Outstanding and Upcoming Issues:

- *In 2020, the genetic sampling program for commercially-caught sockeye in Area 3 and 4 commercial fisheries did not take place due to concerns for COVID-19. Due to low sockeye returns in 2020, the absence of this data led to minor impacts to the Northern Boundary Sockeye Run Reconstruction (NBRR) for the 2020 season. The NBRR can be run without Canadian genetic sampling results by using historical averages from data collected since 2000.*
- *For the 2021 season, the pre-season expectations for Nass and Skeena sockeye are for a strong enough return to support commercial fishing opportunities. Work is underway to develop amended operating procedures to ensure that the genetic sampling program can take place. Once developed, the operating protocols will require approval from DFO Pacific Region's Regional Director of Science.*

Recommendations or Next Steps:

- *None to report.*

Chinook Technical Committee

COVID-19 Impacts on Treaty Implementation:

- COVID-19 presented some challenges for the Chinook Technical Committee (CTC); however, these did not affect any CTC core functions (i.e., Exploitation Rate Analysis (ERA), model calibration) for the 2020-21 cycle. The annual ERA and the Chinook Model Calibration were completed on time, and the memo to the Commissioners with the AABM Fisheries Pre-Season Abundance Indices for 2021 and Post-Season Abundance Indices for 2020 was submitted on April 1st 2021 in compliance with PST timelines.
- Impacts of COVID-19 on Chinook salmon stock and fishery assessments under the jurisdiction of the Pacific Salmon Treaty during 2020 are primarily on marking and tagging operations, especially in British Columbia where the majority of exploitation rate indicator stocks were released without adipose-fin-clip marks and coded-wire tags (see Table 1).

Table 1. Updated 2020 tagging summary of Chinook indicator stocks (Brood Year 2019). Note: all 2020 yearling (1+) releases (Brood Year 2018) were unaffected by the COVID-19 pandemic as they were tagged in 2019.

Program	Stage	Tags applied	Unmarked	Released?	Notes
Atnarko R	Smolt 0+		1,924,871	Y	
Big Qualicum R	Smolt 0+		3,418,046	Y	
Chilko R	Smolt 1+	30,970		N	
Chilliwack R	Smolt 0+		2,231,008	Y	
Cowichan R	Smolt 0+	200,170	505,644	Y	
Harrison	Smolt 0+		365,653	Y	
Kitsumkalum	Fed Fry		253,028	Y	All 2019 brood released unmarked
Nicola R	Smolt 1+	214,507		N	
Phillips R	Smolt 0+	83,217	8,381	Y	
Puntledge R	Smolt 0+		264,239	Y	
Quinsam R	Smolt 0+	237,414	2,457,452	Y	
Robertson Cr	Smolt 0+		6,397,220	Y	
Shuswap R Low	Smolt 0+	60,223	493,377	Y	
Shuswap R Up	Smolt 0+		169,200	Y	

Outstanding and Upcoming Issues:

- *The impacts of marking and tagging operations that were reduced or eliminated in 2020 will begin to manifest in 2022 when fish from brood years 2018 (yearling stocks) and 2019 (fingerling stocks) start recruiting to fisheries and extend to 2025. The CTC is actively discussing what the implication of this means for the Chinook Model and evaluation of Individual Stock Based Management (ISBM) fisheries using Calendar Year Exploitation Rates (CYERs). These discussions could result in ad hoc assignments.*

Recommendations or Next Steps:

- *Broodstock collection activities for Chapter 3 indicator stocks are currently on target, although hatchery staff continue to adapt to COVID-19 operational protocols. These protocols have the potential to reduce staff capacity to conduct fish and gamete collection activities.*
- *It is also important to note that DFO's Salmonid Enhancement Program (SEP) broodstock collection for several of the Chinook indicator programs is heavily or entirely reliant on support from DFO's stock assessment group (e.g., Harrison, Shuswap, Nicola, Chilko, Kitsumkalum programs). As such, new or unforeseen COVID-19 related implications on regular operations within either program, SEP or stock assessment, have the potential to result in broodstock/egg target shortfalls in 2021. As with the tagging and marking programs, efforts should be made to maintain brood collection activities operational in 2021.*
- *Significant improvements in DFO's COVID-19 operational protocols and advanced planning have DFO on track to meet all 2021 tagging commitments. There are 13 Chinook hatchery indicator stocks of which all (100%) will receive a significant portion of their CWT target. Eight indicators will achieve their full number of tags, four will receive the majority of their coded-wire tag target, and one will receive roughly one-third (36%) of the tagging target due to environmental conditions during brood collection.*

Fraser River Panel and Technical Committee

COVID-19 Impacts on Treaty Implementation:

- *COVID-19 has had minimal impacts on the operations of the Fraser River Panel and Technical Committee to-date and is not expected to have significant impacts for the 2021 season and beyond. In 2020, impacts were primarily related to the implementation of juvenile sockeye and pink salmon stock assessment programs in the spring. This resulted in the elimination of that data for forecasting the 2021 pink salmon return and may affect the 2022 sockeye return forecast.*
- *From a Panel operation perspective, no face-to-face meetings were held either pre-season, in-season or post-season in 2020 and this will continue in 2021. This was not a significant impediment to Panel operations in 2020 but may be problematic if controversial decisions are required in 2021 as in-person meetings allow for the timely diffusing of issues.*
- *Transportation and processing of DNA samples were delayed somewhat in 2020 but were not a significant issue; however this could become a bigger issue in 2021 if the sockeye and pink returns are larger than forecasted and timely processing of the Stock ID samples is required.*

Outstanding and Upcoming Issues:

- *As identified above, not having face-to-face meetings in-season and delays in DNA sample processing are likely to be the primary issues in 2021; however, neither of these is anticipated to be a significant problem.*

Recommendations or Next Steps:

- *No recommendations at this time for the 2021 season.*

Southern Panel, Coho Technical Committee and Chum Technical Committee

COVID-19 Impacts on Treaty Implementation:

- *Southern Panel impacts include change of meeting format from in-person to virtual. There were some glitches however the Zoom platform worked well. While the changed format allowed meetings to go ahead and information exchange/presentations to occur, there was a loss of social and informal networking opportunities and relationship building activities.*

Chum Technical Committee:

- *Overall the Chum Technical Committee was able to execute most programs but with increased pressure to plan and administer the programs due to COVID-19:*
 - *More expenses for personal protective equipment and vehicles (more vehicle use to minimize transmission) was balanced by overall less travel.*
 - *Safety and mitigation plans were developed and implemented.*
 - *In-season assessment programs continued in Area 12, Albion Test fisheries, and Juan de Fuca Chum Sampling.*
 - *Escapement programs continued.*
 - *Lab analysis delays (Scales, DNA) caused assessment report delays. Information is also arriving slower than normal.*
 - *All meetings moved virtually with good success.*

Coho Technical Committee:

- *Coho Technical Committee members were able to conduct relevant assessment programs in 2020, although additional attention was paid to administering programs and ensuring appropriate COVID-19 mitigation protocols were in place.*
- *Risk assessments were conducted on all programs for approval to implement. Since most coho specific programs began in late Aug-Sept timeframe, these assessments were based on experience from other programs beginning earlier in the year.*
- *Southern Endowment Fund Projects (lower Fraser coho escapement assessment, coho enumeration in the Chilcotin River) were executed as planned.*
- *Age data and coded wire tag (CWT) recovery data were delayed because of lab backlogs; however, this did not impair reporting as the Coho Technical Committee post-season reports are 2 years behind. Labs were caught up by the time pre-season planning was completed.*
- *The Coho Technical Committee and Coho Working Group met virtually and continued to be productive and complete work plans.*

Outstanding and Upcoming Issues:

- *Mitigation plans in place for COVID-19 will be rolled over for next year. Zoom licences will be required for upcoming meetings.*
- *The Environmental Change Working Group of the Coho Technical Committee together with the Committee on Scientific Cooperation is organizing an introductory workshop on environmental indicators on May 11 for the PSC family.*
- *Coho Technical Committee members will be discussing the Coho DIT report with the Selective Fishery Evaluation Committee to develop an action plan.*

Recommendations or Next Steps:

- *None to report*

Selective Fishery Evaluation Committee

COVID-19 Impacts on Treaty Implementation:

- *In response to COVID-19, the Selective Fishery Evaluation Committee (SFEC) meetings have occurred over conference calls or virtually. There has been no effect of this change on the completion of SFEC tasks.*

Outstanding and Upcoming Issues:

- *Resuming in-person meetings when safe to do so will be valuable to develop working relationships with new committee members.*

Recommendations or Next Steps:

- *None needed.*

Chinook Okanagan Work Group

COVID-19 Impacts on Treaty Implementation:

- *There were no impacts on work related tasks in the 2020-21 work plan. All meetings and workshops were completed electronically.*

Outstanding and Upcoming Issues:

- *None*

Recommendations or Next Steps:

- *Continue to follow work plan to the best extent under the current circumstances.*

Data Sharing Technical Committee

COVID-19 Impacts on Treaty Implementation:

- *As the Data Sharing Technical Committee has no specific elements associated with Treaty Implementation, no COVID-19 impacts are anticipated.*

Outstanding and Upcoming Issues:

- *No outstanding or upcoming issues are anticipated.*

Recommendations or Next Steps:

- *The only next step for the Data Sharing Technical Committee is to review feedback from other technical committees on existing data exchange specification changes. COVID-19 is not expected to impact this process.*



TO: Pacific Salmon Commission
FROM: John Carlile, Antonio Velez-Espino, and Jon Carey
DATE: April 1, 2021
SUBJECT: AABM Fisheries Preseason Abundance Indices for 2021 and Post-Season Abundance Indices for 2020

The Chinook Technical Committee (CTC) has completed and is providing to the Commission the results of calibration CLB2104 of the PSC Chinook Model for 2021. The calibration provides the 2021 preseason Abundance Indices (AIs) for determining the allowable catches (ACs) for the Northern British Columbia troll and Haida Gwaii sport (NBC) and West Coast Vancouver Island troll and outside sport (WCVI) Aggregate Abundance Based Management (AABM) fisheries. The calibration also provides the AIs required for determining the 2020 post-season ACs for all three AABM fisheries: SEAK, NBC, and WCVI, however, please see item (4) below.

Please note the following:

1. The preseason AC for the SEAK fishery was determined from Table 2 in Chapter 3 of the 2019 Agreement based on the SEAK Early Winter CPUE from the early winter power troll fishery in district 113.
2. The preseason ACs for the NBC and WCVI fisheries were determined from Table 1 in Chapter 3 of the 2019 Agreement.
3. Through the course of the 2021 Calibration process, the Analytical Working Group (AWG) of the CTC found an error in the program used to generate maturation rate inputs used in the approved 2020 Calibration (CLB2002). This produced discrepancies between the 2021 Calibration (CLB2104) and CLB2002. The AWG re-ran CLB2002 with the corrected maturation rates to produce CLB2003. To facilitate comparisons, both the official (CLB2002) and the revised (CLB2003) 2020 preseason AIs are presented below in Table B.
4. There are concerns amongst some of the CTC members over the accuracy of the 2020 post-season AIs and associated ACs produced by CLB2104, potentially due to changes in methods used to generate maturation rates or the ability of the model to handle significantly reduced catches due to access limitations resulting from COVID-19 regulations.¹

In conjunction with recommending CLB2104 as the official 2021 calibration, the CTC recommends investigating the concerns mentioned in item (4) above and potentially revising the corresponding numbers, should there be agreement within the CTC.

¹ Similar to the discrepancy in Tiers determined by the Early Winter CPUE and the Model post-season AI, two other empirical estimators (Early/Late Winter and Summer Power Troll Indices) used internally by Alaska Department of Fish and Game indicated the SEAK abundance in 2020 was in Tier 4; however, the CLB2104 post-season AI indicated the abundance was in Tier 3 resulting in a discrepancy between preseason and post-season catch limits.

The 2021 preseason SEAK CPUE, the AIs and the associated ACs for each of the AABM fisheries are shown in Table A. The 2020 post-season AIs and associated ACs along with observed catches, preseason AIs and associated ACs for each of the AABM fisheries are shown in Table B.

Table A. Preseason CPUE and AIs and associated ACs for the 2021 AABM Fisheries.

	SEAK	NBC	WCVI
Abundance Index	3.85 (CPUE) ¹	1.27	0.76
Allowable Catch	205,165 (Tier 4)	153,800	88,000

¹ The CLB2104 2021 preseason AI for SEAK is 1.28 which would yield a non-tiered AC of 190,000 if the PSC Chinook Model was being used.

Table B. 2020 preseason AIs, observed catches, post-season AIs, associated ACs and for the 2020 AABM fisheries.

Preseason			
	SEAK	NBC	WCVI
Abundance Index (Official; CLB 2002)	4.83 (CPUE) ¹	1.08	0.75
Allowable Catch (Official; CLB 2002)	205,165 (Tier 4)	133,000	87,000
Abundance Index (Revised; CLB 2003)	4.83 (CPUE) ²	1.00	0.69
Allowable Catch (Revised; CLB 2003)	205,165 (Tier 4)	124,300	80,600
Actual			
Observed Catch	204,624	36,103	43,581
Post-Season			
Abundance Index	1.11 (AI)	1.16	0.67
Allowable Catch	140,323 (Tier 3)	141,700	78,500

¹ The CLB2002 official 2020 preseason AI for SEAK is 1.13 which would yield a non-tiered AC of 140,000 if the PSC Chinook Model was being used.

² The CLB2003 revised 2020 preseason AI for SEAK is 1.02 which would yield a non-tiered AC of 117,300 if the PSC Chinook Model was being used.

cc John Field
Cathy Laetz
Shannon Balfry



Test Fishing Financial Update

Prepared by the Secretariat for the PSC Special Meeting, May 4, 2021

Values presented in CAD

A. Current Revolving Fund Status

Test Fishing Revolving Fund (TFRF) opening balance (March 31, 2021): **\$ 843,220**

B. Projected 2021 (Pink year) Program Finances

Revenue from test fishing is highly dependent on Fraser sockeye run size, and less so on Fraser pink run size due to pinks' lower value. Fraser sockeye forecasts are uncertain and have overestimated the actual return in recent years. Therefore, the Fraser River Panel recommends for financial planning a) a very conservative pre-season test fishing plan, b) an assumed p10 Fraser sockeye return, and c) an assumed pink salmon return requiring protracted purse seine test fisheries. Given this, the Secretariat projects the following program finances:

Projected Cost	Projected Income	Projected deficit/surplus
\$ 1,063,436	\$ 20,436	(\$ 1,043,000)

This projection means that the test fishing program would have a shortfall of \$199,780 by the end of the 2021 season: **\$843,220 TFRF opening balance - \$1,043,000 deficit = (\$199,780)**

C. Projected 2022 (Late Shuswap year) Program Finances

Projected Cost	Projected Income	Projected deficit/surplus
\$ 1,507,230	\$ 1,507, 230	\$ 0

Additional notes on 2022 Program Finances:

1. Test fishing programs on the 2022 cycle line have aimed to target either 1) revenue neutrality or 2) a surplus in order supplement the TFRF. Based on recent 2022 cycle-line run-sizes and guidance from the Test Fishing Policy¹, we expect the run size to be sufficiently large to target cost-neutrality, but not large enough to yield a surplus.
2. The \$199,780 shortfall from 2021 would persist regardless of 2022 sales.

D. PSC Secretariat Recommendation

Given the high degree of uncertainty in forecasting sockeye and pink salmon returns and associated revenues, we recommend that the Test Fishing Revolving Fund is supplemented with \$200,000 to fully cover the potential 2021 deficit. Optimally, supplemental payments should be received from the Parties by June 28, 2021, the start of the test fishing season.

¹ PSC Test Fishing Policy. 2021. <https://www.psc.org/publications/fraser-panel-in-season-information/test-fishing-results/about-the-test-fisheries/>



Big Bar Landslide: Update

May 4, 2021



Progress on Fish Passage Systems

- Permanent fishway
 - Work concluded for the season in March 2021 - rock fall hazard, spring freshet
- “Nature-like” fishway
 - Completed in April 2021
- Concrete fish ladder
 - Work underway
- “Trap and transport”
 - Planning continues; task teams close to providing final recommendations



Kiewit Summer Operations

- Modify existing concrete fish ladder
- Provide water via pumps
- Install transfer system to move fish into tanks
- Install a sediment management system
- Supply electrical to operate the concrete fish ladder
- Truck modifications for fish transport





"Nature-like" Fishway





"Nature-like" Fishway



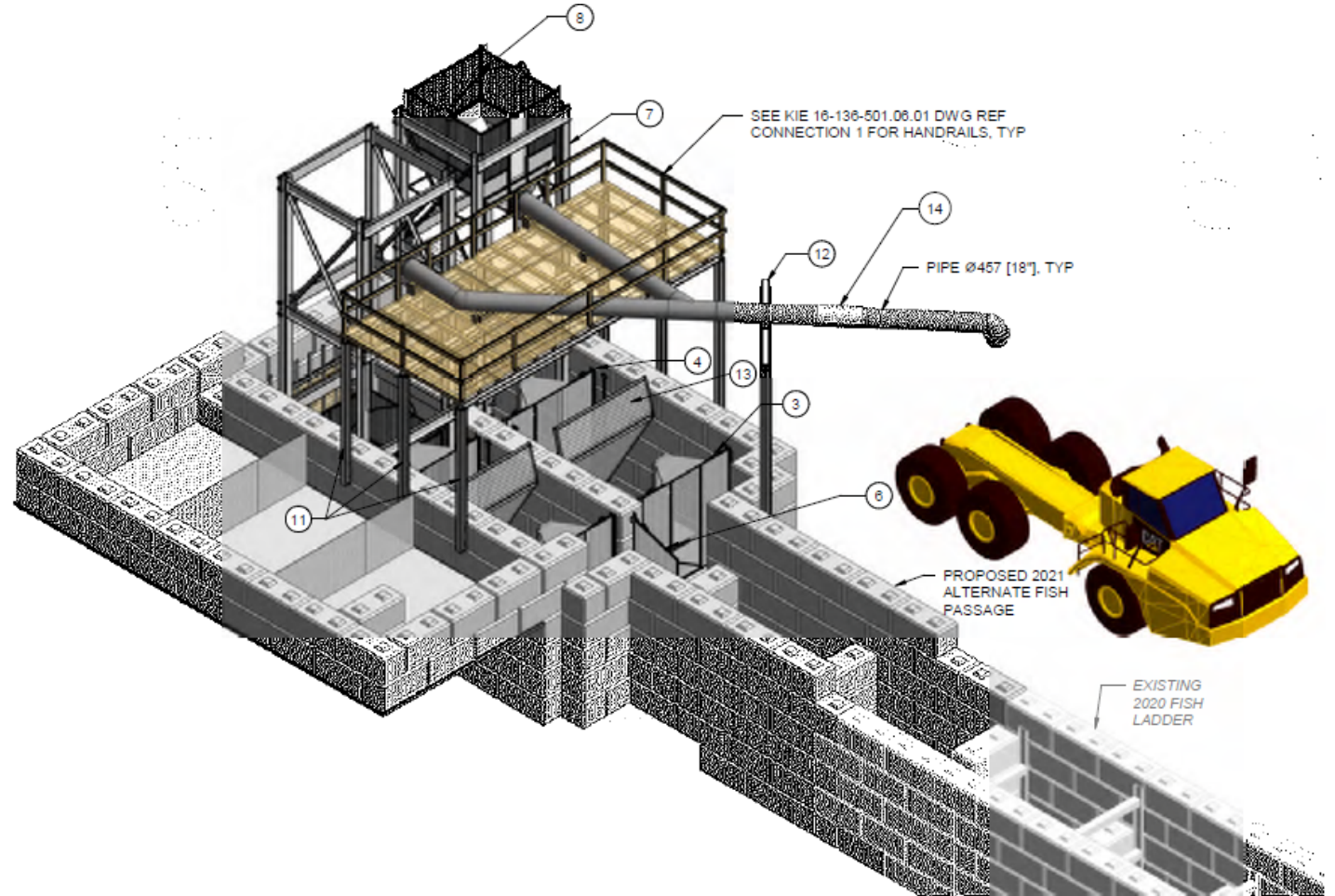


"Nature-like" Fishway





"Trap and Transport"





Chinook Main Road Upgrades



2021 Enhancement Program

- Collect Early Stuart sockeye (ESS) below the slide site; other priority sockeye and Chinook populations natally.
- Conducted extensive review of all at-risk stocks to establish priority populations; Chinook - 14 target populations and two contingencies; sockeye - 4.
- Expanding facility capacity at a number of Upper Fraser hatcheries.
- Conducting enhancement pilot studies to evaluate additional strategies.
- Implement a cryogenics program for ESS and Upper Fraser Chinook to bolster genetic diversity.
- Develop contingency plans for possible high water and full blockage, and securing additional adult holding space.
- Considering ability to expand more smolt production into the program.
- Expanding monitoring to better assess impacts of enhancement measures on populations.



2020 Chinook Brood Stock Release

- Release of 2020 brood stock (April – May 2021):
 - Over 101,000 Chinook fry release from Big Bar enhancement efforts
 - 12 locations in the Upper Fraser: Slim Creek, Salmon River, Swift Creek, McGregor River, Morkill River, Holmes River, Westroad River, Nechako River, Upper Chilcotin River, Cottonwood River, Bowron River including Indian Point Creek
 - Partnership with Upper Fraser First Nations and Secwepemc Fisheries Commission
- Planning underway:
 - 113,000 Early Stuart sockeye fry release (June 2021) and fall smolt release (September 2021)
 - 11,850 Bowron sockeye fry release (May 2021)



Chinook Fry Release in Cottonwood River – April 13, 2021

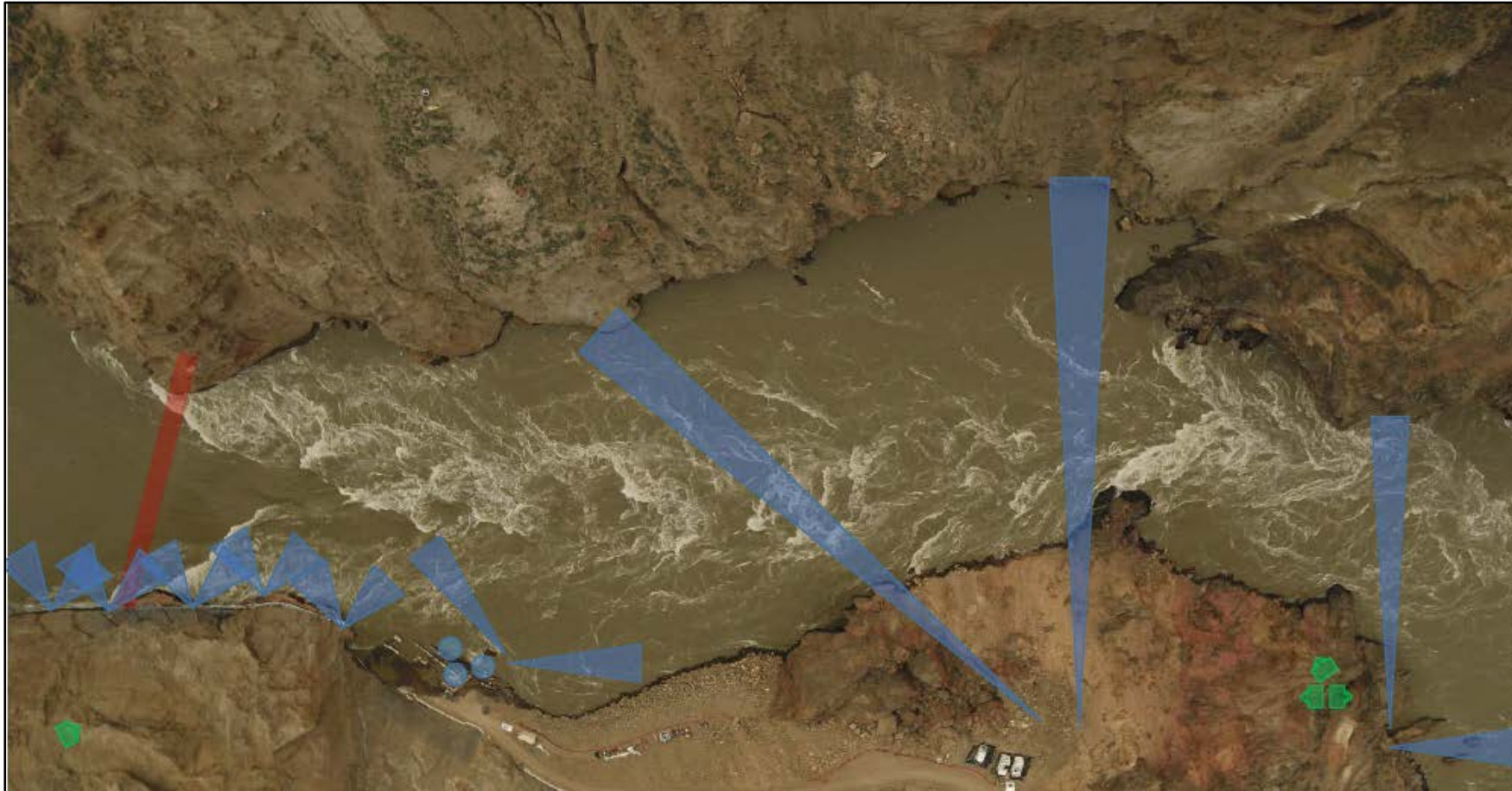


2021 Monitoring Program – Work Plan



- Cable (POE Ethernet)
- Cable (Co-axial)
- Job Boxes (Camera Receivers)
- Water depth/temp sensors
- Receivers
- Antennas Accelerometer
- New Cameras

2021 Monitoring Program – Coverage of River Right



■ Radio antenna coverage ➡ Existing surface velocity camera



Aerial view of Work Camp



More Information

- Images: Province of BC's Flickr channel is updated with images of the work underway at the slide site:
 - [Big Bar Landslide 2021](#)
 - [Big Bar Landslide 2020](#)
 - [Big Bar Landslide 2019](#)
- Information Bulletins: Published alternate Mondays on [DFO's website](#) and the [Province's website](#).

