



Please accept the following as the Pacific Marine Conservation Caucus Salmon Sub-Committee's response to DFO's 2021 Priorities Planning Letter and advice into the 2021/22 IFMP. Our submission includes:

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1. Introduction

British Columbia is in the middle of an unprecedented wild salmon crisis, driven largely by a warming North Pacific Ocean and more extreme freshwater conditions. Every region and species in the province is experiencing populations with low to record low returns. This is in spite of dramatic reductions in harvest over the last two decades. The situation is made worse by the smaller size at age and age at maturity of returning adults, meaning the few fish that do return carry fewer and smaller eggs and produce fewer offspring. In some cases, these smaller spawners are not able to fully utilize available habitat or cannot successfully bury eggs below the typical scour force of a river. In some places, skewed sex ratios with fewer female spawners are also observed. Further, many fish that do make it to their home rivers are experiencing record water temperatures, frequent droughts and more extreme fall flood events, resulting in decreased spawning success.

These new climate pressures add huge challenges to our decades long assault on salmon habitat, overharvesting, and impacts from fish farms.

To top it off, we are flooding many rivers with hatchery fish; adding competition, reducing genetic health, and increasing mixed stock fishing pressure on wild populations. We are spending scarce taxpayer dollars on hatcheries when we can't even afford to do basic counts on the hundreds of wild salmon systems that were once monitored. When salmon arrive in the ocean feeding grounds, they are competing for scarce food with over five billion hatchery salmon released from Nations around the Pacific rim each year. Currently 40% of the salmon in the ocean are from hatcheries, and we are in danger of this number growing at the expense of wild salmon.

If we are serious about saving wild salmon, these extraordinary challenges must be recognized; we must rethink our relationship with these fish and manage our expectations accordingly. The present looks nothing like the

past, the future will be even more challenging and we need significant changes to our management systems to reflect our new reality, if we are to keep wild salmon on the landscape.

Our management systems were designed when salmon populations were more stable, stronger and predictable. They were designed when we had more room for error and when counting conditions were less challenging. Our pre-season forecasts are becoming more uncertain and the resources to count salmon in-season are reduced. We are prosecuting fisheries in much more challenging times and managing mixed stock fisheries that are impacting a growing number of populations in the red zone. This requires far more precaution, careful in-season management, adaptability and lowering the expectations of harvesters.

Our submission is based on acknowledgement of the seriousness of the crisis we are facing, and understanding of the limitations of our management tools. It is rooted in the commitments of the Fisheries Act, the Wild Salmon Policy and the Canadian Constitution – a conservation first approach. It is also presented with a deep sadness of the devastation our indigenous, commercial and recreational fishers and friends have and will continue to experience.

2. Fraser Chinook management issues

In 2020 Conservation & Protection identified a significant amount of unsanctioned fishing in the Fraser River in times and areas where 4-2 and 5-2 Chinook were expected to be present. DFO management and C&P must collaborate to produce estimates of total mortalities of 4-2 and 5-2 Chinook (retained catch, drop-outs, and FRIM) in unsanctioned fisheries and incorporate them in estimates of 2020 total mortalities and 2021 planning.

There is some evidence of a ‘fishery effect’ in the 2020 return of 4-2 and 5-2 Chinook in that the escapement of these populations appeared to decrease as fishing effort increased. DFO needs to examine this issue and incorporate it in 2021 planning.

DFO recognized that it was in contravention of the PST in regards to Harrison Chinook in 2020 and chose not to take the necessary actions to increase escapements. This deliberate failure to meet Canada’s international commitments should not be allowed to happen again in 2021.

Although it won’t be known if the 5% total mortality objective was met until April, the IHPC should engage in contingency planning well prior to this so that options are on the table if it turns out additional management actions are required in 2021.

3. Southern Resident killer whales management issues

In the 2020 priority letter, the MCC iterated that the marine environment that both killer whales and Chinook salmon must now recover in is vastly different from the one in which they evolved. Their ability to recover is unlikely unless significant measures are taken to stop threats and encourage, rather than undermine, their resilience.

In the 2020 priority letter, the MCC also identified a series of population viability analysis that evaluated the likelihood of SRKW recovery, each building on previous work, and each documenting a decrease in recovery potential as the population declined. Another updated population viability analysis (Lacy 2020) conducted prior to the birth of two new calves, determined the likelihood of functional extinction within 100 years was now 59%, another significant jump in extinction probability. While new calves and pregnancy of other whales in 2020 is encouraging, the survival of these calves and fetuses to breeding adults has been a significant problem for this population for more than two decades. Efforts to reduce threats and implement recovery actions must be ongoing. Given that repeated studies have identified the accessibility and availability of large, old Chinook as fundamental to SRKW recovery, harvest reductions that would get ahead of coast wide declines in preferred age and size classes of Chinook and facilitate genuine rebuilding of wild populations need to be implemented to further facilitate SRKW recovery.

3.1 Defining abundance thresholds

For 2021, the IFMP must define thresholds of Chinook abundance under which management measures (marine fishery restrictions/closures) will go into effect. Movement toward this objective has now been taken in the US by the Pacific Fisheries Management Council (PFMC). In December 2020, the PFMC set a threshold for pre-season abundance of 966,000 Chinook below which management actions are taken. A summary of those actions is below. Details are at <https://www.pcouncil.org/november-2020-decision-summary-document/>

PFMC: Southern Resident Killer Whale Endangered Species Act Consultation

The Pacific Fisheries Management Council adopted an approach to address the effect of Council-area ocean salmon fisheries on the Chinook salmon prey base of SRKW. The Council adopted the arithmetic mean of the seven lowest years of pre-fishing Chinook salmon abundance in the area North of Cape Falcon (1994-1996, 1998-2000, and 2007, currently estimated at 966,000) as a management threshold.

When a year's preseason abundance projection falls below the established threshold, the following management actions will be implemented through annual regulations:

- Reduce quotas for non-treaty fisheries North of Falcon to not exceed the value generated by a regression analysis of historic time-step 1 Chinook abundance and non-treaty Chinook quotas.
- No more than 50% of the non-treaty commercial troll Chinook salmon quota will be assigned to the spring (May-June) period.
- Close the expanded area of the Columbia River control zone as described to salmon retention from the start of non-treaty ocean salmon fisheries until June 15.
- Close the Grays Harbor control zone to salmon retention from the start of non-treaty ocean salmon fisheries until June 15.
- Delay the start of the commercial troll fishery between Cape Falcon and the Oregon/California border until April 1.
- Close the Oregon and California waters of the Klamath Management Zone to commercial and recreational salmon fisheries from October 1 through March 31 of the following year.
- Increase the duration of the Klamath Control Zone area expansion beginning September 1 through March 31 of the following year.
- Close commercial and recreational salmon fisheries in the Monterey management area from October 1 through March 31 of the following year.

While the PMFC thresholds for restrictions are an important first step, the MCC recommends establishing an abundance threshold below which no marine or non-terminal Chinook fishery can occur. Ecological considerations to determine this threshold in Canada should consider the long term relationship established between coast wide Chinook indices of abundance and SRKW mortality, survival and fecundity (Ford et al. 2010, Ward et al. 2009). In addition to this, modelling has shown positive growth for SRKW requires levels of Chinook abundance higher than the long term average (Lacy et al. 2017).

As the MCC identified in its 2020 Priority letter, the benefits to higher relative abundance of larger, older Chinook that should occur from transitioning the AABM west coast mixed-stock interception Chinook fisheries (that occur on the rearing grounds of immature Chinook) to terminal fisheries, needs to be advanced. Such a transition should significantly reduce, if not eliminate, the risk that immature Chinook are encountered by the fishery. Age overfishing of Chinook in coastal marine mixed stock salmon fisheries is a significant conservation concern because it reinforces the tendency for Chinook to return at younger ages and smaller sizes-at-age, contributing to declines in both fecundity and productivity. Eliminating age overfishing will increase the proportion of older, larger Chinook in the spawning return (which will benefit population rebuilding) and increase the average size (weight) of individuals in the catch. Increasing the average weight of Chinook caught will permit the same total catch biomass to be attained with fewer numbers of Chinook, further benefitting spawner abundance and population rebuilding.

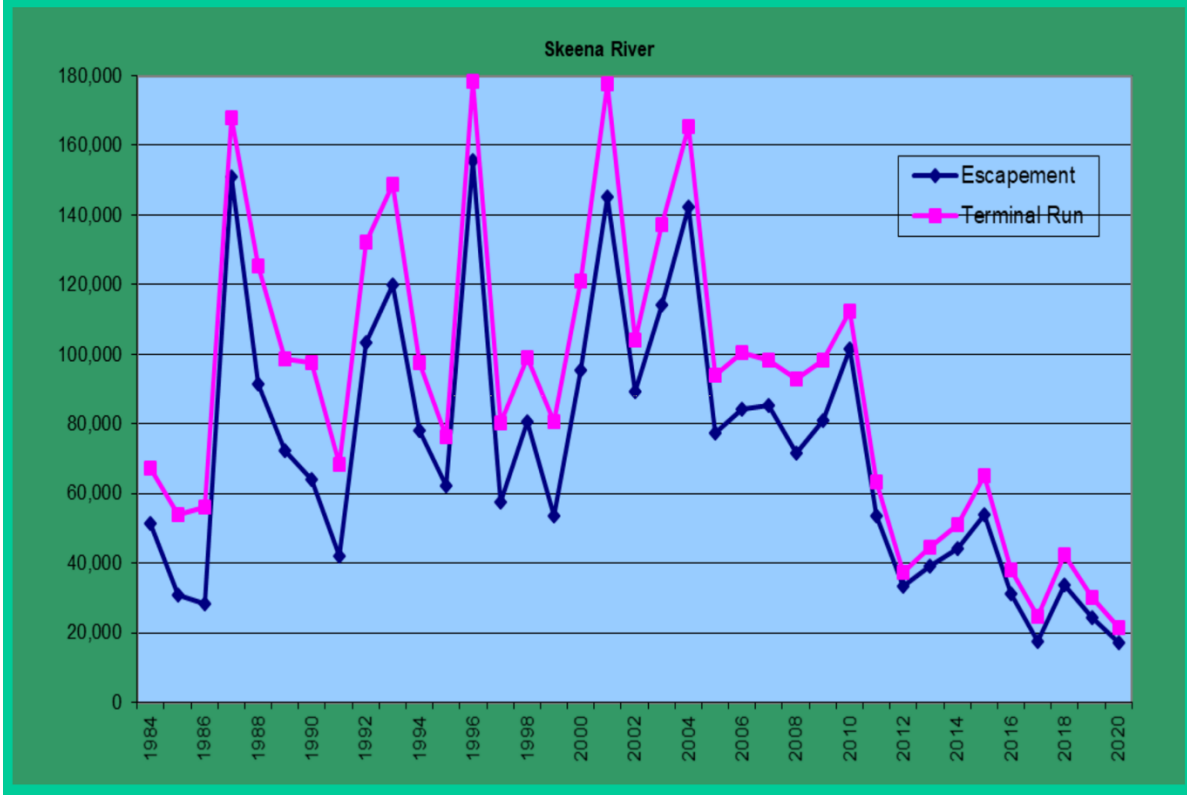
4. North Coast management issues

Low productivity for all species and record low returns for many populations across the North Coast requires a precautionary approach and increased management actions in all fisheries in 2021. Skeena and most area 5 and 6 Chinook returns are at record low levels, NC Coho returns have been poor the last two years. With the exception of a few Area 3 streams, chum returns are dismal and getting worse across the North and Central Coast. Many NC Pink systems have been experiencing record low returns. Many Skeena sockeye populations remain depressed and Nass sockeye have been having some of the worst returns on record.

4.1 North Coast Chinook

Chinook returns to the Skeena are particularly troubling. Skeena Chinook have been on a sharp decline since 2010, averaging less than 50% of their long-term average, the 2020 return was 20% of average.

Skeena River Chinook Escapement & Terminal Run 1984-2020



Management actions in recent years have not been enough to slow the decline and dramatic actions are required in 2021. We recommend DFO implement similar management objectives as have been implemented for at-risk Fraser Chinook - to allow as many fish to pass through to the spawning grounds as possible, reduce overall Canadian fishery mortalities on these populations (5%).

- DFO needs to reduce domestic ER's to below 5%. We urge DFO take this action by informing the IHPC process on options of how this can be achieved, implement closures and management actions that detail how a 5% ER ceiling will be achieved, and assess post season the success of these actions in achieving the 5% ceiling.

The issue of low productivity extends well beyond the Skeena. Many populations in the North and Central coast and further South are at historic lows. This requires a precautionary approach in all North Coast Fisheries.

- DFO should implement the same reductions for Area F troll as last year.
- All NC recreational fisheries (Areas 1 – 6) catch limits should be reduced to 1 Chinook per day / 2 possession.

4.2 Skeena / Nass Sockeye

- Uncertainty in forecasting in recent years should be taken into account when planning in 2021.

- The MCC supports the continuation of the FNs higher trigger (600,000) for FSC fisheries to ensure precautionary management given the recent low returns, high uncertainty and continued trends towards low ocean productivity.
- In the event of a late-season increase in sockeye abundance, commercial harvest should be managed to avoid high harvest rates on Kitwanga on Babine River sockeye and impacts on depressed Skeena chum.

4.3 Skeena / North Coast Coho

- 2018, 2019 and 2020 Coho returns to the Skeena were very low.
- The MCC supports DFO's intent to implement additional management measures to protect North Coast Coho for 2021.
- The same actions as 2020 should be implemented in the commercial Coho troll fishery (reduced by 50%), unless in-season abundance indicates average or above average returns.
- Net fisheries should be non-retention unless in season abundance indicates average or above average returns.
- Bag limits for in all NC recreational fisheries should be reduced to 2 Coho per day, 4 possession, unless in-season abundance indicates average or higher than average abundance.

4.4 North Coast Chum

- All NC fisheries should be required to release chum, except those targeting enhanced US chum and enhanced Kitimat chum. These fisheries should be restricted to areas and times to minimize impacts of wild chum.
- Area 3, 4 and 6 pink seine fisheries and Area 3 and 4 sockeye GN fisheries should require enhanced monitoring and compliance measures to ensure chum are handled and released with least possible harm

4.5 North Coast Pink fisheries

- NC pink fisheries be closed unless in season abundance indicates average or above average returns. The MCC supports limited effort fisheries to assess in-season abundance.

5. Central Coast Management Issues

The MCC notes that DFO has not identified priority issues for the Central Coast IFMP planning in 2021-22. This is perplexing since wild fish populations throughout the region have seen rapid decline or in several cases, have already collapsed. MSC certification for commercial fisheries has been withdrawn. At minimum, the Area 8 mixed stock chum fishery needs to be added as a priority issue. Additionally, bag limits in recreational coho fisheries need precautionary adjustments and a plan to improve all species' catch and escapement monitoring, that distinguishes wild from enhanced stocks, is required as a step toward sustainable fisheries.

The 2021-22 preliminary outlook provided by DFO shows that returns of all wild salmon populations in the Central Coast are expected to be significantly below average. It is well known that by catch of these collapsing wild populations (Chinook, sockeye, pink) consistently occurs in the Area 8 mixed stock chum fishery. The risks

to non-targeted stocks associated with this bycatch are magnified when the commercial fleet congregates in Area 8 at a time when fishing opportunities in other areas are reduced. This is anticipated to re-occur in 2021.

5.1 Area 8 commercial chum fishery

The Area 8 commercial chum fishing plan needs to demonstrate extreme precaution because:

- there is significant risk that bycatch of weak non-targeted stocks of unknown origin will occur;
- expected poor returns of all non-chum wild populations are forecasted;
- there is insufficient catch and escapement assessment data and capacity in the Central Coast; and,
- there is a strong possibility that an enlarged fleet will increase bycatch numbers to the point of jeopardizing conservation and rebuilding efforts for populations that have consistently fallen below their biological escapement goals over the last five years.

5.2 Recreational Coho bag limits

The current bag limit of 4/day, 2-day possession with no annual cap in the recreational coho fishery does not align with a precautionary approach, considering the uncertainty facing coho and the very limited assessment data available. A bag limit of 2/day, 2-day possession with an annual limit of 10 would better reflect the circumstances facing coho and still facilitate a recreational fishery.

5.3 Catch and escapement monitoring

An action plan to improve catch, escapement and hatchery monitoring in 2021 needs to be implemented. This will help Central Coast fisheries meet United Nations standards for sustainable fisheries and lead to the reinstatement of MSC certification. To protect the genetic diversity within species and biodiversity across the region, escapement goals for wild fish and enhanced fish should be established separately and not aggregated. Further, the 2021 management objective should be that all in-season management decisions incorporate a >80% probability that wild chum escapement goals are achieved.

5.4 Fishery Independent Monitoring

Because all Central Coast commercial fisheries require the safe release of bycatch, and often this bycatch is comprised of weak populations and species, all commercial fisheries should incorporate fishery independent monitoring of catch, releases, and compliance as required by National Policy.

6. Interior Fraser Steelhead

The management of Interior Fraser Steelhead is inconsistent with both their conservation and recovery. The continued use of non-selective, unmonitored fisheries in the mainstem Fraser threatens these populations with extinction. The only way to ensure the maximum number of potential spawners is to eliminate the primary immediate human threat: harvest.

This can be accomplished by not allowing gillnets to be used in the mainstem Fraser when any endangered populations are likely to be present. Fishery Related Incidental Mortality (FRIM) associated with both discarding and drop-outs from gillnets has been shown to be very high. Compounding this is the fact these fisheries do not have independent monitoring of catch, discards, or compliance in place. Eliminating gillnets also has the benefit of

making enforcement easier. C&P has reported high levels of illegal fishing and abandoned gillnets. Making any use of gillnets or set nets illegal, based on conservation, would reduce the enforcement challenges on the river.

It is critical that in transitioning to selective fisheries that they not be selective in name only. Selective gear must have scientifically defensible levels of independent monitoring of catch, discards, and compliance in place at all times.

DFO should promote transitioning the bulk of the catch to more terminal in-river fisheries outside of the main stem where fish could be caught selectively, avoiding the risk of any interception of steelhead or Chinook. The MCC supports the concept of traps being installed in such areas. This has the benefit of increasing fishing opportunities and catch.

7.0 Hatcheries

7.1 Risk Assessments

The MCC is again calling for all existing hatcheries and planned increases in production undertake an updated and science-informed risk assessment. Despite a decade old commitment from DFO to implement a hatchery risk assessment tool, this has not materialized. Hatchery risk assessment must consider genetic (including objectives for PHOS and PNI that are consistent with the WSP), ecological interactions in freshwater, estuarine and marine environments, and the implications of mixed stock fisheries that overharvest weak, wild populations that co-migrate with hatchery fish.

7.2 Objectives

Hatchery purposes identified in the SEP production plan need to align with harvest and fisheries management actions. For example, if the purpose of hatchery supplementation is rebuilding, management measures that reduce harvest must be implemented concomitantly with this objective, or the rebuilding goal is simply harvest supplementation. Rebuilding supplementation must have clear time lines for ending (i.e. < 3 generations), as ongoing supplementation renders the objective meaningless and compromises the wild salmon gene pool. If the purpose of enhancement is prey for SRKW, this must be linked with management measures that will further the availability and accessibility of these fish to whales.

Example: Increased production of Lower Fraser Chinook with no evaluation

The decision to enhance Lower Fraser fall run-timing Chinook salmon was made with no assessment of the implications from an additional one million Chinook juveniles on Fraser Estuary rearing capacity, where these fish rear, the estuary's declining quantity and quality as a rearing environment, or competition with wild fry from the Harrison River or South Thompson. As the two remaining wild CUs of Fraser River Chinook not listed as endangered by COSEWIC, Harrison and South Thompson Chinook rely heavily on the Fraser estuary for rearing. Individual fish from the Harrison reside for 1-2 months on the delta (and up to 3 months), growing roughly 0.6 mm a day during this period (Chalifour et al. 2020). Given the existing threats to the juvenile rearing habitat in the Fraser estuary, implications for survival of Harrison Chinook from additional competition should be carefully weighed.

Additionally, the basis for this pursuit (prey for Southern Resident killer whales) was done without an assessment of whether fall abundance of Chinook was actually a seasonal limitation for whales. Was this also considered in the context of a massive increase in hatchery production from Puget Sound that may also come at a cost to natural production in the Salish Sea? There was also no discussion on whether harvest would be managed to ensure that if any increase in prey from such an initiative was to materialize, that these fish wouldn't simply be allocated to the fishery. Without these assessments, this increase in production cannot be viewed as anything more than providing more hatchery fish to the fishery.

7.3 Mark Selective Fisheries

The production of Chinook from hatcheries in Canada and the US has failed to recover Chinook salmon, contributed to overfishing of wild, threatened and endangered populations, contributed to the changes in population structure and run timing, and likely exacerbated competition with wild Chinook in a food limited environment of the North Pacific. Further, the public funds spent on these hatchery programs and facilities takes funding away monitoring and recovery of wild populations. Pursuing a hatchery strategy with mass marking and Mark Selective Fisheries will not address any of this. It simply reinforces that hatchery Chinook salmon are produced to subsidize commercial and sport fisheries. It is likely to further undermine recovery efforts for wild Chinook and the needed rebuilding of their age structure, their run-timing, their diversity, their productivity and their abundance. Restoring these attributes is not the objective of hatcheries. If it was, corresponding fishery closures would be implemented to help recovery efforts.

As such, the MCC does not support the proposal for mass marking and Mark Selective Fisheries until the above outstanding hatchery issues are resolved, comprehensive GSI monitoring of catch and releases is introduced, and scientifically defensible estimates of FRIM incorporated.

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