

## **Participants**

Madeline Thomson, DFO Co-Chair

Kelsey Campbell, Co-Chair

Sally Hope, Seabird

Brittany Jenewein, DFO

Marc Labelle,

Jessica Moffatt, IMAWG

Kim Charlie, Sts'ailes

Pete Nicklin, Tsilhqot'in

Aidan Fisher, LFFA

Michael Staley , FSMC

Nicole Frederickson, IMAWG

Colin Schwindt, DFO

Nathan Lustig, SFC

Ann Marie Huang, DFO

Sharmayne Page, FSMC

Andrew Maybury, LFFA

Richard Bailey, UFFCA

Damon Nowosad, QARS

Elinor McGrath, ONA

Kaitlyn Dionne, DFO

Michelle Walsh, SFC

Max Veilleux, DFO

Bernette Laliberte

Cory Lagasse, DFO

Jacob Omajali, DFO

Don Simpson, LFE-LP

Sydney Cappus, DFO

Dawn Steele, Note taker

## **Welcome, Agenda Review**

Following introductions, Maddy reviewed the draft agenda.

## Review of Action Items

In reviewing action items from the last meeting, the following were noted for further follow up:

- Labelling of unplanned/rights based fisheries, breakdown of sockeye catch: more discussion/clarity needed.
- Re sockeye mortalities, interest in seeing more detail of the data that DFO provides to the Fraser Panel — e.g. regional distribution of mortalities.
- Reference Fishery summary, Area 19 MSF impacts — Maddie to follow up.
- Run reconstruction: Maddie to share info; interest in half-day JTWG meeting, following the next Forum.

## 2024 Pre-season Forecast: Fraser sockeye

*Kaitlyn Dionne, DFO*

Highlights of DFO presentation included:

- DFO welcomes advice on how to better communicate technical info.
- Different approach for forecast vs. miscellaneous stocks.
- Data used for models, compiled annually in November.
- Biological data: returns and productivity trends for this cycle line.
- Chilko freshwater survival: not a good indicator for recent trends; marine survival (down) is a more accurate indicator.
  - Q/A: Re how Chilko predation has affected freshwater smolt estimates, have not observed excessive bull trout predation in recent years at the weir.
- Environmental data: freshwater and marine; total Pacific salmon abundance.
  - Q/A: Greg Ruggerone prepares these forecasts annually for the NPAFC based on marine commercial catches (pink, chum and sockeye). **ACTION:** Kaitlyn to share Ruggerone report for NPAFC on total annual Pacific salmon abundance.
- “How” of forecasting: 23 Bayesian models; naive models; biological models — 3 stock recruit models, sibling model.
  - How models are chosen: ranking based on best fit from retrospective analysis; expert opinion (annual December meeting).
- Forecasting examples: Chilko (models typically work well) and Quesnel (challenging to model).
- Chilko retrospective Taylor diagrams: for age classes and overall.
  - Q/A: Given floods, drought and wildfires, what is being done to test whether past assumptions still hold true?
    - DFO: It does create additional uncertainty. We’re looking and how to add more data/environmental co-variates in future, but meanwhile erring on the side of caution.

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- Table of forecasting outputs illustrating model selection.
  - Q/A: How do you incorporate qualitative input?
    - DFO: Look at past trends, including past tendencies to under/over-forecast.
  - Q/A: Numbers shown are for total returns (run size, adjusted). Values shown are adjusted up to 2021.
  - Q/A: When 2023 RSAs are available, we would adjust. In the past, they weren't regularly updated, but the plan is to have it all CSAS reviewed and to regularly update the retrospective after all the cycle line returns (so every 4 years).
    - Q/A: RSA = Run Size Adjustment. Have a meeting annually to reconcile differences between in season and spawning ground estimates.
- Quesnel: Just look at total forecast, not age specific. Sibling models work pretty well, but don't rank well for some populations.
  - In reviewing model results, we have to compare those to what seems most realistic, given productivity trends, so that's where expert opinion comes in.
- 2023 forecast:
- Time series: forecast was performing well and then started diverging, and that was a period where we hadn't updated the retrospective, so we were comparing to an earlier period where conditions were quite different, which highlights the importance of updating regularly.
- Age composition of Fraser sockeye: important to consider the age 4 and age 5 components, e.g. many stocks in 2023 were predominantly 5-year olds, with Early Stuart as the most stark example (won't have that for this year, unfortunately).
- 2024 Fraser Sockeye forecast: 567K — lowest on record.
  - Forecast table for MUs and individual populations.
  - Harrison: most abundant stock in 2020. The extremely high abundances in early 2000s skew results and make the model results unreliable.
  - Chilliwack: dominant cycle line, high uncertainty.
  - Early Stuart hatchery forecast is a best guess. Numbers shown are returns to the lower river and don't include in-river migration challenges.
- Key messages: (968K in 2020), very low brood, but recent marine conditions have been quite favourable.
- Key uncertainties: forecast returns for 10 stocks are equal/less than 1,000.
- Future work: plan to formalize this updated retrospective analysis via CSAS. Will propose that this should be updated every 4 years.
  - Also propose to test additional models and environmental covariates; reconsider stock groupings (haven't updated since 2002).

### Discussion

- Thanks for good presentation. Great start to sharing the technical process.

- Q/A: Juvenile data have not been good for forecasting adult returns. Lake conditions have improved, so the bottleneck seems to be marine productivity.
- Wondering about accuracy of test fisheries in 2020, given low run sizes, and how to consider this challenge during in-season management.
- Slide 22 is very helpful for illustrating the seriousness of the situation.
- In looking at Upper Fraser stocks, some of the smaller stocks were likely under-estimated in 2021/9, especially with COVID challenges.
- Q/A: If people want to participate in/observe the process, contact Kaitlyn — welcomes additional perspectives, traditional/local knowledge.
- Q/A: Plan CSAS for next fiscal (2025).

## **Salmon Bycatch in Trawl Fishery**

*Cory Lagasse, DFO*

Highlights of DFO presentation included:

- PPT focus is on 2022/23 data.
- Groundfish trawl fishery overview.
  - Q/A: Mostly fish for hake and pollock, at various depths.
  - Q/A: All gear types means they can use mid- or bottom trawl.
- Groundfish trawl catch monitoring. No specific monitoring related to salmon prior to 2022.
  - Enhanced monitoring began in 2022: Key changes and program objectives.
- Groundfish trawl salmon catch by species, 2008 to 2022.
  - Q/A: Will DFO attempt to reverse-calibrate the earlier estimates to get a better understanding of actual impacts in previous years?
    - DFO: Unclear how we would do that. The methods are comparable, but the key change is mandatory retention, so unclear how to quantify that.
  - Q/A: Prior to 2020, the data are from fisher logbooks or at-sea observers (salmon were a prohibited species that they were required to release). After 2019, there was a shift to electronic monitoring due to COVID/pausing at-sea observers.
  - Q/A: Steelhead are also tracked — no encounters since enhanced monitoring in 2022.
  - Q/A: Under enhanced monitoring, they should not be releasing any salmon bycatch.
- Map of the five harvest areas.
- Salmon bycatch by month and area: 2022/23 groundfish year, showing times, areas with relatively higher bycatch.
  - Q/A: There is some similarity to previous years' reported bycatch patterns, although fishing patterns shift based on market conditions.
  - Comment: Data shows inter-annual variability but also broader trends.

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- Summary of total catch by area, fresh and frozen.
- CWT analysis: Codes for CWT stocks (note that 2019 brood not tagged for most Chinook indicator stocks).
- Chinook CWT exploitation rate indicator stock total catches: Sept 26 - Dec 31, 2022.
  - Q/A: Plan to issue another report later this year with the 2023 stock ID data.
- Table: Stock composition by SMU (based on GSI or CWT).
- Summary of key results.
- Changes for 2024/25 fishery year: some implemented, some still under development.
  - Includes 9,500 salmon bycatch cap for trawl fisheries, with individual vessel accountability, mandatory retention and salmon status reports by vessel.
- Link to report: <https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/41221618.pdf>

### Discussion

- Most bycatch is occurring in the large freezer boats (6 licences). DFO closed Area 12 in 2023 because that's where the bulk of bycatch was occurring.
  - DFO: Area 12 closure no longer in effect since February.
- Q/A: Bottom trawl vessels also required to report all salmon bycatch but don't appear to be encountering salmon.
- Q/A: New 9,500 bycatch cap was based on average from 2013 - 2021, and is a significant reduction from 2022/23. Documentation/rationale will be provided (initial focus is on getting new measures in place in time for the new licence year).
  - Q/A: 9,500 is fleet-wide cap; individual vessels have their own caps (ITQs, so transferable within some limits).
- Not surprising that the fall period report saw mostly late-run fish; will be interesting to see full-year results.
- Q/A: Avoidance/compliance will be driven by industry. They are concerned about implications for access, so there is strong incentive.
- Q/A: Electronic monitoring program also looking at potential changes to address incentive for unreported salmon discards.
  - There should be audits to ensure compliance, as there is a lot of time that is not covered by EM audits.
- Q/A: Industry pays for dockside monitoring — DFO hoping for funding for additional work re CWT/head collection, though funding not secured yet.
- Q/A: Bycatch counts are available within a week; GSI and CWT results take longer.
- Q/A: Trawl bycatch noted in the FMI memo, but not included in the FMI estimates, given the limited time series.

## Update: FSAR

*Ann Marie Huang, DFO*

Highlights of DFO presentation included:

- National context: new Fish Stock Provision requirements, Fisheries Science Advice Report (FSAR) template.
- Overview of report template, components.
- Pacific Salmon implementation: salmon sprint weeks, twice a year in spring and fall.
- FSARs may/may not have an associated working paper; intent is to have smaller documents produced more frequently (iterative approach).
- Focus so far has been on trying to get organized internally; next steps include how to engage and include indigenous technical reps.
- Plans for cross-branch FSAR teams.
- CSAS can send out invites once ToRs are ready (still working on those).
- Ways to get involved; Contact CSAS (Canadian Science Advice Secretariat) office, contact DFO if want to get more deeply involved.

### Discussion

- Q/A: Re determining which optional report components to include, some will be obvious (e.g. no hatchery question for pinks).
- Q/A: Terms of reference will be determined for each individual FSAR. For future, expect that 95% of the terms of reference will be the same, with additional individual questions for each SMU.
  - What if indigenous groups have different thoughts re priorities?
  - DFO: The idea is that the iterative process will allow you to add/improve on a regular basis, instead of the old approach of one RPA (Recovery Potential Assessment) and then nothing else. The intent is to get indigenous reps involved in each of the author groups in time for the next group to be processed in the fall.
  - Having indigenous fishery managers involved from the start will help avoid potential issues.
  - For WCVI and Okanagan Chinook, indigenous reps have been involved, hoping to set up the same for Fraser Chinook.
- FSRR: Fisheries Science Response Report.

## FRSSI 101

*Ann Marie Huang, DFO*

Highlights of DFO presentation included:

- Terms: MSE (Management Strategy Evaluation); FRSSI: (Fraser Sockeye Spawning Initiative), which is a form of MSE.
- MSE: Modelling what not to do in fishery management, i.e. gives an idea of probably safe vs obviously dangerous zones. MSE includes both a process and a model.

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- Difference between regular modelling and MSE: latter involves managers and others to identify a management procedure that is robust across a wide range of plausible scenarios. It's about strategy, not tactics. One you identify "go" zones, socioeconomic factors can also be explored.
  - Q/A: Danger zones include extinction, falling below benchmarks, not maintaining long-term ability to harvest.
- Robust: Identifying places where we can safely fail (i.e. avoiding catastrophic fails) — not about trying to aim for an absolute fail-safe (which in reality does not exist).
- MSE flow diagram (in reality, the path is not always as neat).
- MSE: Quantitative objectives.
- MSE model schematic.
- MSE evaluates strategy, not tactics.
- MSE can test anything, but not everything at once (too messy).
- FRSSI as an MSE: How many should we catch vs allow to spawn? Depends on biological and socioeconomic factors.
- Milestones in model development, reviews, adjustments, addressing new questions.
- Management procedures for FRSSI.
- FRSSI: Quantitative objectives (3 components: state, probability and time); each objective is described using a performance measure, and benchmarks.
- Current FRSSI work: evaluating harvest control rules and testing for robustness. (Not doing annual forecasts, fishery planning, or evaluating allocations).
- FRSSI process: Groups (tech group, internal, steering and workshop groups). Workshops help to review model outputs and ID priority FRSSI work.
- FRSSI and IFMP/fisheries planning cycle and where FRSSI fits in/informs that.
- Annual management cycle and where various models inform decisions.
- Explanation of TAM concepts.

### Discussion

- Where does the annual process of comparing planned management approach to objectives (like herring) occur.
  - FRSSI is not intended to be used to evaluate annual management "tactics". Workshops (not annual) are where they address specific new questions.
- This is a very useful refresher and orientation for newcomers. FRSSI is based on 4 run-timing SMUs. Has any thought been given to reorganizing rules based on productivity.
  - DFO: No, because then how would you come up with harvest rules, which are based on the SMUs (which are set under PST).
  - So it's important to be aware that this is constraining our options and that these SMUs were set when things were more predictable.

- DFO: In the past, there was more random variability, whereas recent years it has been a declining pattern.
- We need to do some homework re looking at this in a different way, i.e. more conservation focus, stock-specific approach and the need for tools that are better suited to modelling that.
- Also concerned that very few people understand the background enough to provide informed advice on the IFMP options. We need more due diligence (i.e. open the hood and set the bar higher than avoiding extinction events).
- This approach (tools, objectives) was developed for an era of large commercial marine fisheries. It's not geared to a current/future context where there may be more interest in stock-specific exploitation primarily for FSC fisheries.
- Herring MSE runs every 2 years and the model outputs probabilities, but the model is updated annually with new data. Model runs are now also informed by quantitative indigenous objectives (developed by NTC over 5 years), but those have updated the results.
  - DFO: It is possible to do the same for FRSSI. We have invited such input.
  - DFO: For sockeye, some indigenous fisheries are interested in mixed stock fisheries.

Presentation, continued:

- Purpose of FRSSI model and process is to evaluate harvest control rules.
- All models are wrong, some models are useful: Data and uncertainties.
- FRSSI model schematic.
- Simulation trajectories.
  - Q/A: Important to understand that where you set the operational control points can affect future catch here or there.
  - DFO: The model can do geographic location of catch to some extent (because changing operational control points may affect specific stocks in the SMU).
- FRSSI - current and future: Not much happening currently; future work depends on interest from Fishery Management; potential interest in FRSSI-pinks.
- Summary points: MSE in general and FRSSI in particular.
- Potential future FRSSI topics for JTWG presentations, if there is interest.
- Q/A: Re concern that standard IFMP escapement option format does not support informed IFMP advice, it's important for everyone to understand that FRSSI was designed to manage mixed stock fisheries, so if people have other stock specific-objectives, they need to bring those forward to have those conversations. Also to think in terms of both the long-term and annual implications.

## **2024 Sockeye Escapement Planning**

*Colin Schwindt, DFO*

DFO presentation highlights included:



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- 2023 end of season run size and escapements for individual stocks and SMUs relative to pre-season.
  - Run sizes higher than expected, but escapements lower than expected, so look at where we may have gone wrong (test fishery estimates, en route losses, spawning ground counts).
- 2024 pre-season forecasts — informs management/escapement options.
  - Lowest forecast on record (both 4- and 5-year olds were affected by Big Bar).
- Escapement planning process: This year, JTC reps were involved in technical planning. Escapement options typically are like brood, plus a more conservative alternative, with consultation via the draft IFMP and other engagement processes.

### Discussion

- If DFO considers adopting a third option that wasn't in the draft IFMP, DFO really needs to consult on that.
- Note that the draft IFMP options were agreed by FSMB, not the JTC reps.

Presentation, continued:

- Escapement planning considerations.
- Escapement planning inputs: time series of harvest control rules, 2014 - 2024.

### Discussion

- Q/A: Altering the lower fishery reference points for this year is very unlikely to impact management, since returns are expected to be below the cut-offs anyway.
- Important point about whether there should be additional distributional goals, in addition to the overall SMU targets, because some of the individual stock numbers are at the point where we need to start considering how to conserve genetics.
- It would be good to review the reasons for adjusting benchmarks in 2019, to see if that rationale still stands. Important to be sure that any changes being made from year to year are justified.
- Important to communicate that what will matter this year is what we do with the LAERs.
  - Agree Forum PPT should include analysis of difference between 10% and 5% LAERs.

Presentation, continued:

- Draft sockeye escapement options. Important to understand that DFO tries to manage to achieve ER well below LAER (i.e. it's not a target).

### Discussion

- That's a flaw in the consultation, if you're consulting on one number but managing to something less.
  - DFO: Managing within the 10% LAER has typically been achievable in recent years.
  - How DFO implements these management actions has been an ongoing concern for Lr Fraser nations.

Presentation, continued:

- Draft escapement options: implications under different return scenarios.
- Table: results for individual stocks, compared to cycle average and brood year/weighted brood year (to address skewing where there is a strong 5-year component).

**Discussion**

- Need to consider actual status as well (e.g. where using green colour for stock with very low status).

Presentation, continued:

- Draft escapement options summary.

**Discussion**

- Need to consider implications of hitting LAER limits (e.g. if test fisheries use up the 5% for Early Stuarts) and which fisheries could be impacted.
  - DFO: Should bring this up at Forum, but assume this would constrain any other fisheries expected to hit those stocks.

## **2024 Management Issues**

*Colin Schwindt, DFO*

DFO presentation highlights included:

- Proposed window closure (for sockeye directed fisheries).
- Window closure extensions.
- Window closure dates.
- Key considerations and questions to stimulate discussion.
- TAM rule.

## **IMAWG PPT: SC Marine Rec & MSFs**

*Nicole Frederickson, IMAWG*

Highlights of IMAWG presentation included:

- Overview of SC IFMP area, PFMAs and sub-areas.
- Creel sub-areas, which do not always match PFMAs.
- Types of anglers: resident (Canadian) or non-resident anglers; guided (generally more productive) or non-guided.
- Licence types: all licences apply to the entire coast for all species.
- Time series: number of licences sold per year.
- Catch monitoring: creel survey, iRec survey, Avid Anglers and guide/lodge reporting.
- Creel survey: generally runs May to September; expanded to include non-salmon species.

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- Aerial overflights to estimate effort, creel dockside interviewed to estimate CPUE (catch per unit of effort).
- Number of dockside interview sites decreased over time.
- Sites now chosen based on risk, e.g. chinook and halibut catch in recent iRec surveys.
- DFO produces monthly and annual creel bulletins: provide catch estimates but not stock composition.
  - Note that for 2023, total kept Chinook, total Chinook releases, total kept Coho and total released coho were all higher than the 5-year average.
- Effort: fairly stable since 2019 measures; some increase in 2023.
- 2023 effort in June was significantly higher.
- Significant increase in released Chinook since 2019, so total chinook mortalities are again similar to pre-2019 levels.
- Also significant increase in sub-legal releases for both Chinook and Coho.
- Proposed next steps: Detailed review of creel data by JTWG, including legal vs sub-legal, release ratios by time and area, stock composition.

### Discussion

- May have been a redistribution of Coho stocks in 2023 — i.e. more in SoG.
- May be some updates coming to the CTC's Exploitation Rate analysis for the last few years, with respect to these mark selective fisheries.
- Very important to better understand stock ID and the timing of sub-legal encounters, given the vulnerability of rearing Fraser Chinook. We also need to ask why we are allowing several thousand Chinook to be killed in June, while FSC needs in-river are not being met.

## Next JTWG meeting

Co-Chairs thanked everyone, especially presenters, and invited suggestions for the April meeting agenda.

*Adjourned: 4:30 pm*