Alaska Hatchery Research Program Science Panel meeting March 26, 2025

Virtual meeting via Microsoft Teams

Summarized meeting notes and decision points

Attendees

Science Panel

Milo Adkison, Alaska Department of Fish and Game (ADF&G)

John Burke, ADF&G and Southern Southeast Regional Aquaculture Association (SSRAA; retired from both)

Peter Westley, University of Alaska

Bill Smoker, University of Alaska (retired)

Bill Templin, ADF&G

Alex Wertheimer, NMFS (retired)

Lorna Wilson, ADF&G

Kristen Gruenthal, ADF&G

Chris Habicht, ADF&G (retired)

Samuel May, United States Department of Agriculture (USDA)

Unable to Attend

Ron Josephson, ADF&G (retired)

Jeff Hard, Northwest Fisheries Science Center, National Marine Fisheries Service (NMFS; retired)

Finance Committee

Mike Wells, Valdez Fisheries Development Association

Geoff Clark, Prince William Sound Aquaculture Corporation

Tina Fairbanks, Kodiak Regional Aquaculture Association

Katie Harms, Douglas Island Pink and Chum, Inc (DIPAC)

Scott Wagner, Northern Southeast Regional Aquaculture Association (NSRAA)

Julie Decker, Pacific Seafood Processors Association

Susan Doherty, SSRAA

Other Attendees

Ron Heintz, Sitka Sound Science Center (SSSC)

Garold V. "Flip" Pryor, ADF&G

Eric Prestegard, DIPAC (retired)

Sara Gilk-Baumer, ADF&G

Kyle Shedd, ADF&G

Erica Chenoweth, ADF&G

Introductions and Planning 2025-2026

- Introductions – Welcomed three new members onto the Science Panel:
  - Kristen Gruenthal, Lorna Wilson, and Sam May
- Meeting Purpose –Bill T.
- Answer questions raised during the January meeting regarding "Docking the Ship"
  - Does the estimated funding complete the product originally envisioned by the Science Panel in the established timeline?
  - Will additional help be necessary to meet the timeline in a cost-effective manner?
  - Should a larger science base audience be targeted for the final product roll out and how will that be funded?
  - What is the role of the Science Panel after the original project is completed, specifically regarding the data, project identification, and funding?
- Discussion points on primary goals
  - Peter W.: Proposed the formation of a smaller, formal working group focused on the technical aspects of accomplishing the goals set in the larger meetings
  - Milo A.: Supported technical working group idea, especially for sharing the analysis burden
  - Kristen G. and Kyle S.: GCL welcomes collaboration

Financial Review

- Flip P. reviewed the Proforma budget (largely the same since January meeting)
  - Project is currently solvent but will run out of money by the end of FY25 without additional funding:
    - Sara G.B. confirmed Gene Conservation Lab (GCL) FY25 projected expenses are for personnel and supplies and equipment costs between meeting date and the end of June for genotyping and lab analysis of chum samples.
    - Projected management costs will be limited to publication expenses, if there are any in FY25 (less than expected $30k)
    - Total FY25 shortage estimate will be sent by Sara G.B.*
      - *Post-meeting shortfall was approximately $8,000
  - If FY26 wraps up the project
    - GCL projected expenses are nearly all personnel time (pedigrees, data analysis, archiving, and writing publications).
      - Further discussion needed on timeline
    - Projected management costs include funding for a final presentation like past public meetings in association with Board of Fisheries meetings
    - Total project shortage for entire project of approximately $260k.
  - Discussion Points:
    - **Action needed**: get a documented sense of "actual cost" and not just what was funded for the whole project; in-kind expenses in addition to funding across the entire project for both ADF&G and the University (Sam Rabung had done some of this calculating in the past)
    - All project components done by 2026 is an exceedingly unlikely scenario, at existing analysis capacity

Update on Outstanding Analyses / Products

- Kyle S. on the **archive of analyzed/unanalyzed samples**
  - Discussion of the physical archiving of otoliths and tissue samples is tabled until GCL Collection Manager Heather Hoyt is available to join the conversation.
  - After the effort to repair otoliths and tissue matches (PGOD event) is completed (very soon), database repairs will be completed*
    - *As the final meeting summary was prepared, PGOD event analysis was completed; merge with GCL database LOKI near completion
  - PWS Pink salmon genotypes have been finalized, next step is completing pedigree analysis
    - Pedigree analysis method depends on new computing cluster
      - Technical notes: analysis approach will begin same as with pink salmon (Franz) and will change gears (to Sequoia method) if needed, which results in the loss of some power for parent analysis; primary goal is to try the computing cluster first before simplifying the data set
  - Discussion points
    - Reminder that all DNA for chum salmon samples has been extracted and genotyping is in progress
    - The current plan for chum (after pink RRS paper published) is to roll everything into a single RRS paper, without a standalone chum panel development and validation paper (similar to pinks).
- Kyle S. led the overview of an **archive of unpublished data**
  - Unpublished Hatchery Wild Interaction (HWI) data is currently available through ADF&G Mark, Tag, and Age (MTA) website of which Kyle S. and Eric Lardizabal (ADF&G) are gatekeepers
  - Requesting a username and password from Kyle or Eric provides full access to the raw data and same 3 reports previously available on hatcherywild.org website
  - As with the previous publications, all otolith reads, field data, and genotypes will be available in an online repository once final reports published
  - Discussion points
    - SP and Technical committee have quick data access through HWI MTA portal
    - For outside requests, SP revisited the letter drafted for data access requests 5 years ago whose purpose was to create a protocol for handling data requests in an efficient, trackable manner, and ensure some context goes out with the data set
    - Discussion
      - Differences of opinion included the drafted language as being in the spirit of helpfulness to presenting concerning optics of the SP requiring involvement in the interpretation of data
      - Kristen G. shared the recent example of the Purdue University team's challenges (pink whole genome project) in understanding

the sample collections to inform their interpretation of the run timing data correctly as a recent example of context needing to be correctly communicated with the data, otherwise could have led to a large-scale retraction.

- Sam M. gave the reminder that all of this is a long-term issue and most of these are more short-term solutions. He recommended a published, formal database (perhaps in Molecular Ecology Resources) be done as part of the docking of the ship for people to use going forward, perhaps in two installments by species, as opposed to living on ADF&G website, several SP members expressed interest and support for this idea.
- Kyle S. reminded the SP that the pink data published in 2022 is in the dryad repository, with all the code that went into the analyses; they are anticipating a similar framework for the final pink paper and chum paper as well; the analysis will be fully reproducible with the data that was used.
- Bill T. sees value in both: a central database for raw data, citable and highly visible with methods included, in addition to having the data linked to a published paper fully available; there are decisions made from the starting point (full raw data set) to data set that was used in analysis.
- This point will be further explored in the new technical working group to be formed (further discussion below)

Reports and Publications

- 2 key large publications remain: (1) pink relative reproductive success (RRS) with all 5 streams/more years and (2) chum RRS, with other related publications (baselines) in the process of being reviewed/near publication
- Publishing a perspectives paper was a topic revisited that would involve SP working together; sharing/collating different views
    - Lorna W. agreed that a perspectives paper would be valuable to put RRS values in context, given the diversity of hatcheries and stocks in Alaska
    - Sam M. was curious whether more technical analysis needs done before perspectives paper versus speculation
    - Alex W. suggested a perspectives paper in this format 1) the 3 initial questions, each in their own sections with direct answers, 2) a summary of results as a whole and 3) identify issues and problems (such as putting the data into context) and identify areas that need further investigation, analysis, modeling
- Discussion:
    - Chum baseline – range wide baseline with genetic stock identification (GSI) focus on Sara G. B.'s desk with intent to submit for publication soon
        - **Action item/request**: Please circulate publications to the SP when they are submitted
    - Pink baseline - A full update on reports led by Wei Cheng (GCL) was requested

- Odd-year lineage – technical report on the website: "Population Genetic Structure of Odd-Year Pink Salmon from Prince William Sound, 2013" (https://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/research/population_genetic_structure_oddyear_pink_pws_2013.pdf)
- Even-year lineage – on Bill T's desk; intent for it to be a technical report on the website as companion to odd-year report: "Population Genetic Structure of Even-Year Pink Salmon from Prince William Sound Based on a Single Year (2014)"
- Historical and contemporary population structure – Wei's work with Tony Gharrett using microsatellite loci, results are done and still working on discussion: "Investigation of the Influence of Hatchery Straying on the Population Structure of Pink Salmon in Prince William Sound, Alaska"

- Discussion
  - These have been running in background, last few years SP haven't seen much on them
  - Their purpose is to address population structure (Question 1)

- Target timeline for pink and chum baseline and pink salmon RRS (larger data set) report is to submit for peer-review by year end (2025)
  - Further discussion on chum baseline publication
    - Current publication in the works is a coastwide, global perspective; relevant for high seas GSI work;
    - SP sees value in having a publication that puts the local complexity of SEAK stocks (summer/fall run timing, hatchery locations) into context, separate from range wide
      - Possible publication outlets were discussed; depends on goals of publications whether they are technical documents on NPAFC or another location
    - **Action item/request:** Bill T. will help work on assembling a team this summer to create a local and focused document (as opposed to a range wide baseline) that provides context for SEAK chum data, without disrupting work on the existing publications
- Further Discussion
  - Kyle S. – Final overview of the repairing of otoliths and tissue matches (PGOD event)
    - 11,000 samples affected
      - Concentrated in streams/years: Erb 2015-16, Gilmour 2015-2018, and Paddy 2016
      - Impact especially high for Gilmour Creek, bridging years between F1 and F2 generations
      - Reminder that GCL created and refined methods for acquiring DNA from otoliths
      - Technical publication on otolith DNA methods being worked on by Jodi Estrada (GCL)
      - Salvage ~50% of affected samples

Additional Financial Review, Products, and Timelines for Program Finalization

- Funding Sources Discussion
    - Katie H.
        - Hatchery operators are coping with difficult market conditions and are still committed to seeing AHRP through to conclusion
        - Piecemeal funding is possible; clear line items and year-to-year updates will help
        - Desire to roll out in time for Board of Fish meeting is real but the study is independent of board cycles
    - Bill T. – clarity is needed on what the final product(s) need to look like to gain direction on where to look for other sources of funding
        - Federal funding is not anticipated in the foreseeable future (has played a role in the past)
    - Julie D.
        - Processors are also interested in providing support, even in difficult market, to help AHRP conclude
        - 2 scenarios (at least) envisioned
            - $260,000 needed to finish
            - $??? to increase capacity and increase timeline of deliverables
    - Sam M.
        - End of 2026 seems more realistic as the earliest finish date (not March 2026)
        - Relying on in-kind contributions will not be fast
        - Adding 4-6 staff (post docs and grad students) isn't realistic in the current funding climate
        - 1 post doc and 1 grad student might help
        - Technical committee helping strategize and prioritize will help
    - Sara G. B. and GCL
        - Funding shortfall for FY25
            - Additional funds ($8K) needed to support personnel generating chum genotypes in the lab
            - SP agrees this is a top priority
            - Different fiscal year cycles between different funding sources affect availability of funds
            - Minimum 2 week delay for funds given to state being available for distribution
        - Funding for FY26
            - Pedigree/Statistical analysis
            - Reporting
    - Ron H.
        - SSSC often works with post docs and are usually partnered with universities
        - Postdoc costs around $130,000 annually

- Support expressed for bringing some of the analysis outside of GCL in the form of a postdoc, grad students are not a fast option
- Technical committee will help spread the FY26 load, potential for people to be contracted, such as former GCL employees now freelancing
- Additional timeline and funding ideas:
    - Spring or summer of 2026 wrap up of all pink (including perspectives paper)
    - Fall of 2026 into 2027 wrap up chum, final perspectives paper as late as 2028
    - Regional chum baseline report could be worked on in parallel summer/fall 2025
        - SSSC would like to be a part of this regional report
    - Alternatively, could focus on data housing before analysis: databases being published with DOIs once data is generated, do analysis over several years after as funding is possible
    - Bring PWS to a close, have a perspectives paper complete before rest of the project, possible to have done by March 2026 (though perspectives paper might be incomplete at that early time)
    - Need clear lists for short-term and long-term fiscal years, difficulties identifying how much can happen in parallel
    - Currently, genotyping SEAK chum and pedigree analysis for PWS pinks are priorities happening concurrently (since resolution of PGOD); then technical committee could come in to assist with pink RRS analysis and write-up while chum pedigrees completed
    - $95,000 would finish genotyping of chums and pedigree analysis for pinks, but not the write-ups
- General conclusion is small $$ needed to finish FY25, and larger $$ needed for FY26; Finance committee will consult later with more specific numbers from GCL

o Technical Team "Tiger Team" – Peter W.

- self-identified team (Sam M., Lorna W., Milo A., Kristen G., and Kyle S.) for those involved in the bulk of the technical analysis to provide support for current and future analyses for the program; meeting every couple of weeks to begin, then spacing out as needed.
- SP supports this idea; requests email updates be sent to the group after meetings
- **Action item**: Peter W. will create and lead; scheduling the first meeting soon after this meeting (first meeting 4/25)

o National Rollout out of the project and estimated additional cost

- This discussion mostly tabled due to number of unknowns
    - Bill T. confirmed the effort will likely be a symposium at an AFS meeting (western or national)
- SP recognizes the study provides information for the people of Alaska and is landmark work that affects the west coast and entire nation; likes the idea of traveling road show within AK as well (outside of BOF)

- Peter W. – Center of Salmon Society might be renewed and could host something like a town hall, for data interpretation and discussion;
- Timeline difficult to pin down, but would anticipate planning around same time as last perspectives paper (2027–28)

- Continuation of Research: If projects continue
  - Milo A. – future RRS results will likely mirror previous results demonstrating negative effects of hatchery straying on wild fitness, encouraged hatcheries to continue research on minimizing strays or move towards integrated broodstock
    - Several SP members reviewed present and past hatchery mitigation measures and active collaborations
  - Peter W. – thinking position that is part of a research center or an endowed chair to encourage new research and mining of the existing data, maybe SSSC/university collaboration
  - Other program comments:
    - Other variables than RRS potentially responsible for decrease in population sizes,
    - Result of some of this data have opened minds (such as realizing the replacement hypothesis is incorrect) and indicated importance of spatial scale for donor rates (hatchery level seems right scale)
    - Low hanging fruit of analysis needs to get done
    - Finding that straying is heritable (in other research)
  - Notes from 2011 meeting between hatchery operators, commissioner's office, Commercial Fisheries, and more will provide information for further conversations and perspective papers
    - **Action item:** Bill T. will provide the document and Flip will send to the AHRP group (Flip e-mailed 4/17)
    - Peter W. suggested also sharing the first proceedings of salmon aquaculture in 1970 in Cordova, will also be shared with the group (Flip e-mailed 4/17)

Next Meeting

- Date
  - October works best for full group
  - Email communications and committee/workgroup meetings can happen between now and then
  - Next meeting goals will continue to focus on clarification of existing timeline, potential costs, another round of discussions on perspectives