

Alaska Hatchery Research Program Science Panel meeting January 19, 2022

Virtual meeting via Microsoft Teams

Summarized meeting notes and decision points

Attendees

Science Panel

Milo Adkison, University of Alaska
David Bernard, ADF&G (retired)
John Burke, ADF&G and Southern
Southeast Regional
Aquaculture Association
(SSRAA; retired from both)
John H. Clark, ADF&G (retired)
Chris Habicht, ADF&G
Jeff Hard, Northwest Fisheries
Science Center, National
Marine Fisheries Service
(NMFS; retired)
Ron Josephson, ADF&G (retired)
Bill Smoker, University of Alaska
(retired)
Bill Templin, ADF&G
Alex Wertheimer, NMFS (retired)
Peter Westley, University of Alaska

Other Attendees

Sam Rabung, ADF&G
Chance Gray, Sitka Sound Science Center
(SSSC)
Alex McCarrel, SSSC
Chris Barrows, Pacific Seafood Processors
Association
Kristen Gruenthal, ADF&G
Kyle Shedd, ADF&G
Garold V. "Flip" Pryor, ADF&G
Erica Chenoweth, ADF&G
Mike Wells, Valdez Fisheries Development
Association (VFDA)
Tina Fairbanks, Kodiak Regional
Aquaculture Association (KRAA)
Ron Heintz, SSSC
Katie Harms, Douglas Island Pink and
Chum, Inc (DIPAC)
Eric Prestegard, DIPAC
Geoff Clark, Prince William Sound
Aquaculture Corporation (PWSAC)
Samuel May, Postdoctoral fellow at UAF
Chris Barrows, Pacific Seafood Processors
Association (PSPA)
Charlie Waters (NMFS)
Scott Wagner, Northern Southeast Regional
Aquaculture Association (NSRAA)
Tessa Frost, Southern Southeast Regional
Aquaculture Association (SSRAA)
Adam Zaleski, DIPAC

2022 Field Sampling Decision

- Estimates of Sampling Proportions
 - **Ron H.** reviewed a handout on the estimated proportion of the run sampled by field crews in 2021
 - Number of fish per stream (mark/release/recapture) by sex, reviewed
 - Goodness of fit (chi-squared analysis) on the observed sex ratios by stream to evaluate potential bias in all periods of sampling (marking/recapture/carcasses)
 - Sawmill: some selectivity among releases
 - Fish Creek: selectivity during carcass surveys
 - Prospect Creek: no selectivity evident
 - Size selectivity was evaluated by Kolmogorov Smirnov tests comparing length frequency distributions for (marked/recaptured/carcasses)
 - Sawmill Creek: selectivity in both periods
 - Fish Creek: small selectivity
 - Prospect Creek: no bias evident
 - Further Kolmogorov Smirnov tests for bias in lengths among marked, recaptured, and carcasses examined on surveys in Sawmill Creek broken down by sex showed no significant selectivity bias
 - Petersen estimate used on the unstratified data sets for Prospect and Fish Creeks, with Sawmill being done separately for each sex. f
 - Mean proportion sampled estimates ranged from 42% to 59% depending on creek and sex
 - Sawmill, all sexes 42% (females 54%, males, 55%)
 - Fish Creek, 48%
 - Prospect Creek, 59%
 - Discussion
 - Reminder, other studies on RRS have not had our exact challenge because they've had weirs or dams and gotten full coverage of fish entering streams; this is the first estimated population of chum in this project
 - Reminder, Chums don't stage at the mouth before they move up, more challenging to catch
 - Reminder, these sampling proportions are key to understand our statistical power to detect differences in RRS (**Kyle S.**'s presentation later today)
 - **Ron H.** just got the age data, so rather than assuming we're getting equal sampling rates across different rates of returns, will explore how age affects picture (results forthcoming)
 - **John H. Clark** Even though there is indicated potential bias for females and males, not meaningfully different, not uncommon to see that with Peterson mark/recapture estimates, see potential for bias, then run them separately, and they're not meaningfully different, would recommend pooling and doing a single estimate

- These capture/recapture studies are observational, can show small differences that are not meaningful relative to final estimate of abundance, support pooling
- Age Structure of Chum Salmon
 - **Lorna W.**, the hatchery assistant program coordinator presented (PowerPoint) on the analyses of age structure, by year, incorporating return data for 2021, and broodyear (BY2016) for hatchery chum salmon returning to Southeast Alaska.
 - Mean Hatchery Chum returns for 2 DIPAC projects
 - Gastineau: 228,942 (2002-2021)
 - Amalga: 331,928 (2001-2021)
 - Mean Hatchery Chum returns for 2 NSRAA projects
 - Hidden Falls: 268,127 (2002-2021)
 - Medveji: 330,448 (2009-2021)
 - Percent of returns in 2021 for 5-year-olds were 4-7% of return
 - For Brood Year (BY) 2016, 6-13% were 5-year-old
 - Expect Gastineau Channel BY17 to be 8% age 5
 - Expect 36,295 age 5 chum returns to Gastineau channel in 2022
 - Based on these hatchery returns, possible to expect similar or slightly higher return of age 5 to Fish Creek than 2021
 - Discussion
 - Reminder that summer and fall stocks have different age of return for those two stocks
 - Keep in mind differences for hatchery and wild and within populations for stocks at hatcheries in age data
 - If not a significant difference in recapture probabilities between large and small fish then probably not a difference in recapture probabilities between ages 3/4/5
- Age Determination of Concordance Between Otoliths and Scales
 - **Bill T.** reviewed an Excel sheet with data based on **Bev Agler's** analysis to examine scales-based aging error rates using otolith marks.
 - Ages that were assigned to individual hatchery-origin adults using scales and then compared to ages determined from the otolith thermal mark
 - The age determined from the otolith mark is considered the known (correct age)
 - Agreement between them is in 95-97% range across all years; scale reading error is low but otolith information is also not without small error
 - Bev noted that there were some instances such as in 2017 where a higher number of fish that were aged in error compared to otoliths
 - some of this might be due to reusing thermal marks every 3 years, additional analysis will occur after the meeting
- Power Analysis

- **Kyle S.** presented (PowerPoint) an updated sensitivity/power analyses to show how the sample size of potential parents from the 2017 SEAK chum collections might affect our ability to detect RRS value of 0.5 (original objective) and 0.8 (comparable to some of the values observed with pink salmon in PWS), should they exist (F1). Note: simulations do not incorporate multiple age-of-return information but provide guidance
 - Reviewed samples collected to date since 2013 for project perspective
 - Initially 4 fitness streams, evolution of sampling methods by field crews, years with pause in sampling due to not expecting offspring
 - 2017 was by far the best sampling year: combination of good productivity off brood years and cooperative weather for sampling which would lead to 2020–2023 offspring
 - Simulations (distribution, resampling exercise) looked at RRS values 0.5 (RFP benchmark) and 0.8 “high” benchmark given sampling numbers for all three streams and by Female/Male
 - Power increases when many parents sampled, proportion of offspring sampled, and overall stray rate and productivity of the system; not all variables in our control
 - Simulations indicate that we’d need a high proportion of sampling in 2022 of offspring to detect differences, but 0.5 difference might be possible to detect, ability to detect 0.8 is unlikely
 - Fish Creek is most likely stream for F2 analysis (parents sampled in 2014, offspring back in 2018/19, and again in 2022–2024), but still marginal
- Discussion
 - Males have larger variance in reproductive success; simulations were kept simple
 - Did not incorporate any age structure information
 - Can’t focus on just one age at return because of the possibility that progeny from hatchery and wild fish might have different age distributions as well
 - Simulations were single cohort power analysis
 - Since study has replicates, could improve power to detect small differences or help overcome small sampling sizes potentially with something like hierarchical modeling, rather than non-parametric test, between different streams, getting at overall success rather than individual streams (RRS for hatchery strays in southeast streams, not just these ones)
 - Complications from having low sampling 2 years in a row in different streams in 2013/2014; sample sizes for chum are an order of magnitude smaller than pink salmon
 - While last couple of years have been lower 5-year-old returns, forecast is predicting those to come back in 2022 to be a little stronger
- Review/Update of the Financial Proforma
 - **Flip S.** presented (Excel sheet)

- Project remains solvent through FY24
 - PNP and Processor funds are potential; might be smaller or not happen
 - DIPAC is able to contribute again, but not NSRAA, will be in by the end of the month
 - Northern Fund grant for FY22 coming soon
 - \$150,000 requested; application being reviewed soon
- Discussion
 - Important information relative to potential difference in age comp
 - Cost for sampling all three creeks the same since presented in 2021: estimated \$445,000 (SSSC).
 - Study goal is to get at F2 numbers; trying to detect whether RRS is a transitory phenotypic phenomenon from being cultured in a hatchery versus a persistent genetic phenomenon; some SP thought that it's worth taking a gamble; power analyses were suggestive if 2022 has reasonable numbers, chance at getting significant results
 - If only focused on F2s, could reduce sampling to only Fish Creek
 - Still need to define RRS as best we can to the F1s so sampling across all 3 creeks is useful; more insight to be gained from 3 streams rather than only Fish Creek
 - Could add genetic recapture study to field methods but would introduce a longer time delay for results; taking genetic samples during mark/recapture would be complementary and samples could remain dormant until student/funding available to use them
 - **Decision point:** unanimous consent to move forward with sampling of all three creeks again in 2022; same field methods including mark-recapture methods.
 - **Decision point:** Circulate sampling plan to **SP** by email when its available

Hatchery Committee and Informational Meeting

- Update on the Board of Fisheries Hatchery Committee Dates and Contents
 - Informational meeting currently scheduled to be on March 9th
 - Could consider April meeting (March busy for F&G staff for SE BOF from 10th to 22nd)
 - Current date is during spring break for university staff/students
 - Unlikely to have any board attendance if in the middle of SE BOF; evening sessions also not likely to be attended
 - Publishing of 2014-16 Hogan/Stockdale paper is anticipated around or before March, so informational meeting in March would help answer questions on publication as well
 - Intent is also to have it before the Hatchery Committee meeting
 - Hatchery Committee meeting is on March 23
 - AHRP update overview only; limited details
 - Important to have an info meeting in 2022 so public is updated, transparency, clear communications in addition to BOF
 - Meeting would have some hybrid nature allowing virtual attendance in addition to in-person attendance

- March 24th is a possibility as well
 - Prefer before meetings so info is carried through BOF
- **Decision point:** Keep informational meeting on March 9, considering moving to the 24th if plans change.
- Content Ideas for the Informational Meeting
 - Intended audience is public, BOF members, others
 - Send topics to Chris by email; back and forth will help establish content
 - Could combine “glossy” overview sheet with annual synopsis process; also have available at info meeting
 - Request that **Ron H.** and **Chance G.** have information ready to share on field methods and how adaptive project has been to real life experiences
 - Science Panel members interested in participating
 - **Peter W., John B., Chris H., Bill T.** – yes
 - **Milo A. and Bill S.** – maybe
 - Potential for covering costs of SP members

Manuscript Update

- RRS paper – (reporting Hogan & Stockdale 2013–2016, *Evolutionary Applications*)
 - Final minor revisions will be submitted by the end of this week
 - Expected publication date is end of February or early March

Potential Paper Ideas Based on AHRP

- **Chris H.** reaffirmed this as a standing topic for consideration
- After more data for pinks comes in
- Subcommittee could be formed to consider
 - Interested members include **Peter W., Alex W., Bill T., Chris H., Jeff H.**

Science Panel Membership Suggestions

- **Chris H.** proposed onboarding **Kristen G.** (Chris H. retirement approaching)
- Consensus that Kristen G. will be great addition
- No formal protocol in place; evolving for new members as needed
- **Decision point:** Add this agenda item to the next SP meeting for finalization