Alaska Hatchery Research Group **Technical Document:**[1] 6

Title: Questions for Science Panel from December 16, 2014 Technical Meeting **Version:** 1.0
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Date: August 9, 2016

Science Panel guidance requests in RED
Participant action items in ORANGE

Issues identified that require Science Panel input:

- Sampling
  - Which fish should be sampled?
    - Issue: Should preyed-upon fish be sampled?
      - Solution: Tentative resolution, but looking for Science Panel guidance: Preyed-upon fish should be sampled. Rationale: 1) these fish are committed – they will not spawn in another stream, and 2) these fish count as escapement, regardless of whether they spawned or not. These fish will count as both the numerator (progeny) and as the denominator (adults potentially contributing) for reproductive success and should be sampled.
    - Issue: Should partial spawners be sampled?
      - Solution: Tentative resolution, but looking for Science Panel guidance: Continue to sample partial spawners as described in the Operational Plan. Rationale: Excluding partial spawners will, in some streams, drastically reduce the proportion and number of fish sampled. This risk outweighs the risk that fish are removed before they complete spawning, given the methods outlined in the OP. In general, any fish that is contributing gametes to the system ought to be sampled as a parent, and any fish that returns to the system ought to be sampled as offspring. Live partial spawners are allowed to continue spawning unless most of the gametes are expended (field guidance is: take sample if roughly less than 100 eggs in females or one white squirt from males followed by water or very little liquid).
- Presentations made at AHRP December 12, 2014 meeting
  - Issue: Presentations made at AHRP meetings are not available to all parties.

[1] This document serves as a record of communication between the Alaska Department of Fish and Game Commercial Fisheries Division and other members of the Science Panel of the Alaska Hatchery Research Program. As such, these documents serve diverse ad hoc information purposes and may contain basic, uninterpreted data. The contents of this document have not been subjected to review and should not be cited or distributed without the permission of the authors or the Commercial Fisheries Division

        - Solution: GCL and MTA will send presentations to Eric Knudsen. Eric Knudsen will send presentations to GCL and we will post them on the MTA SharePoint site. Will these presentations be made public on the website? Yes, they were posted not too long after the meeting.

Based on the power analyses presented by Kyle Shedd at the December 12 meeting, participants of the December 16 technical meeting identified the following recommendations to increase power to detect smaller relative reproductive effects:

- Increase number of fish sampled, given streams selected (from highest to lower benefit/cost):
    - Increase frequency of stream walks. Station crews at each stream or at two proximate streams so that they can be visited every day or every other day.
    - Install intertidal weirs: Advantages: Sample every fish for genetic tissues as the weir and sample high proportions of otoliths from the streams and washed onto the weir. Disadvantages: Need larger crew at every stream and may affect fish behavior as weirs tend to only allow upstream passage.

- Power analysis identified two criteria to obtain adequate statistical power: 1) a minimum **number** of families need to be sampled (>500 families; >1000 individuals) and 2) a minimum **proportion** of progeny need to be sampled (>33%).
    - Given these two criteria, it might be worth re-examining the target escapement size for streams
    - For streams where previous sampling efforts will likely result in low statistical power, participants recommend increasing the target escapement to 6,000 fish runs rather than the current 3,000 fish runs, given the high variation in run sizes among years. Steve Moffitt has recently reanalyzed pink salmon area under the curve escapement counts as derived from aerial survey data. This dataset will be useful in understanding the variability of pink salmon escapement across brood lines and years. This tool should be used in combination with stray rate information and on the ground knowledge of logistics to evaluate appropriateness of pedigree streams.
    - As always, selection of pedigree streams should consider:
        - Escapement size
        - Variability in escapement size
        - Likely stray rate
        - Logistics

What are the Science Panel recommendations relative to these issues? The panel's position was to maximize numbers of samples collected, however it was noted that guidelines for minimum number of families would not apply for finite population scenarios like we are dealing with for pedigree streams.

Alaska Hatchery Research Program
Technical Meeting Minutes

9:00am to 12:00pm, December 16, 2014
ADFG, Fischer Conference Room 333 Raspberry Road

Purpose: Raise, discuss, and look for solutions to technical issues and identify issues that require Science Panel guidance.

Attendees:

Anchorage (Fisher Conference Room):
- Eric Knudsen
- Andrew Munro
- Kyle Shedd
- Chris Habicht

Juneau (MTA Lab)
- Dion Oxman
- Tim Frawley
- Bev Agler
- Lorna Wilson

Cordova Regional Office (CRO)
- Steve Moffitt
- Elena Fernandez

Sitka Sound Science Center (SSSC)
- Tory OConnell

Prince William Sound Science Center (PWSSC)
- Kristen Gorman

Science Panel guidance requests in RED
Participant action items in ORANGE

Technical issues raised and solutions:

- Sampling
  - Which fish should be sampled?
    - Issue: Should very rotten fish be sampled for genetic tissue?
      - Solution: All dead fish where otoliths are sampled should be sampled for genetic tissues. Level of decay will continue to be recorded in the field allowing for the exclusion of rotten fish from statistical analysis if their genotypes are considered unreliable.

The collection of both tissue types regardless of the level of decay will allow maximum flexibility in later analyses.

- Issue: Should preyed-upon fish be sampled for genetic tissue even though their gametes may not have been deposited?
  - Solution: Tentative resolution, but looking for Science Panel guidance: Preyed-upon fish should be sampled. Rationale: 1) these fish are committed – they will not spawn in another stream, and 2) these fish count as escapement, regardless of whether they spawned or not. These fish will count as both the numerator (progeny) and as the denominator (adults potentially contributing) for reproductive success and should be sampled.
- Issue: Should partial spawners be sampled?
  - Solution: Tentative resolution, but looking for Science Panel guidance: Continue to sample partial spawners as described in the Operational Plan. Rationale: Excluding partial spawners will, in some streams, drastically reduce the proportion and number of fish sampled. This risk outweighs the risk that fish are removed before they complete spawning, given the methods outlined in the OP. In general, any fish that is contributing gametes to the system ought to be sampled as a parent, and any fish that returns to the system ought to be sampled as offspring. Live partial spawners are allowed to continue spawning unless most of the gametes are expended (field guidance is: take sample if roughly less than 100 eggs in females or one white squirt from males followed by water or very little liquid).

- Labels
  - Issue: Ink is chipping/rubbing off the labels and affecting the scanability of barcodes.
    - Solution: Gene Conservation Lab (GCL) will evaluate the following before next season:
      - Add clear tape over the barcodes. Purchase different labels and/or print on different printer types.
      - Produce barcode-only labels and cover with clear tape before going in the field. Produce field-filled information labels without clear tape. Alternatively, the barcode portion can be covered with clear tape. Either solution will protect the barcode for future scanning, but allow the addition of sampling information to the label post-sampling.
  - Issue: Barcodes on the otolith-only 96 SWP cannot be read in the lab without tipping the trays.
    - Solution: MTA will evaluate attaching labels so that the barcode is visible on both the side and bottom of the trays.
  - Issue: Is there a possibility for barcodes overlap among projects within DWP and between SWP and DWP – do sets of DWP barcodes need to be maintained separately?

            - Solution: Bartender software is used by both the GCL and MTA to manage barcodes so that no duplicates are printed. DWP and SWP have different formats, so they will never have duplications. DWP barcode labels can be used interchangeably among projects since no duplicates will be printed.
    - Ethanol evaporation
        - Issue: Ethanol evaporates from the 48DWP even after they are plastic wrapped.
            - Solution: GCL will evaluate tightly wrapping the plates, replacing the wrap with tape, and/or chilling samples.
    - Improving sampling methods for pedigree streams
        - Issue: Some plates have more or less otoliths/beads than they should. This discrepancy may be due to losing track of what sample is being processed within rows.
            - Solution: Evaluate a change the methods: fill DWP with ethanol and wrap in plastic before starting to sample. As samples are collected the wrap is punctured over the cell being filled. This method will: 1) allow the samplers to better track what cell to fill, 2) keep samples and ethanol from falling out should the tray be bumped, and 3) reduce the amount of rain that gets in the wells. GCL and contractor will evaluate this method with fish in the spring before contractor staff are trained.
    - Improving sampling methods for otolith-only streams
        - Issue: The 96 SWP used in the otolith-only streams are 1) difficult to fill, 2) prone to tipping over (which can result in total loss of samples), and 3) exposed to the elements during collection.
            - Solution: Contractor will evaluate methods that retain the 96 SWP layout but reduce the issues. These methods might include developing a holder or case (Pelican cases were used in PWS and seemed to work) for the plate and/or switching to a deeper well plate that can accommodate individual or strip covers. Solutions will be vetted by the MTA lab before implementation.
    - QA process
        - Issue: Under current QA, data are checked in the field at the end of each row filled. If a discrepancy is found between samples physically in wells and samples electronically in the database, and the sampler is not sure what occurred, the entire row is discarded.
            - Solution: General consensus that this method was best.
        - Issue: Under current QA, data are checked at the end of the season. If a discrepancy is found between samples physically in wells and samples electronically in the database, the entire plate is discarded. This event has been very rare.
            - Solution: General consensus that this method was best.

- Shipping
    - Hazmat logistics

        - Issue: Contractor needs directions and ordering information for shipping hazmat.
            - Solution: The GCL will provide the contractor with shipping directions and catalogue order information. - Done
    - In-season delivery
        - Issue: Contractor wants to know frequency and speed wanted to send samples to MTA and GCL during the season.
            - Solution: For the otolith only trays, the contractor will continue sending otoliths in-season as in 2014. For the pedigree DWPs, the contractor will try to send 2 shipments over the season from both SEAK and Cordova. Cordova samples will be sent on the ferry and SEAK samples will be sent by air. Shipment can occur any time after field data has been QCed.
    - Inventory lists
        - Issue: Samples are sometimes arriving without inventory lists which makes it challenging to determine if all the samples arrived and slows processing.
            - Solution: Both hard copy and electronic copies of inventories will be sent in every shipment. This includes shipments from the contractor and among department labs. Contractor and department will identify the fields required for these inventories. Once a format is agreed upon, inventories will be generated from the respective databases using a list of DWP or otolith tray barcodes. The list of barcodes will be obtained by scanning DWPs or otolith trays as they are packed for shipping.
- Data
    - Barcode linking data:
        - Issue: Finsight data have extra characters within fields and need to be cleaned-up before the data can be placed into the data warehouse
            - Solution: Tim Frawley, Eric Lardizabal, Eric Knudsen and Rick Bush will get together to identify the issues in the Finsight HW database.
        - Issue: The same field-collected data are being entered into multiple databases and these multiple entries may result in errors. Field data should be entered into the Finsight data in the field. Finsight data should be downloaded into the department data warehouse. Other databases should be pulling field data from the warehouse using the sample barcode as a key.
            - Solution: Lab personnel will use field/inventory data from the Finsight report to enter data into respective department databases rather than relying on handwritten labels on the otolith trays/DWPs.
        - Issue: Field and lab data are not available from the 2013 or 2014 season.
            - Solution:
                - Field and otolith/scale lab data for 2014 will be in the data warehouse by March, 2015.

    - Field and lab data for 2013 will be available before March 2015, as soon as the contractor has resolved discrepancy issues.

- Training
    - Issue: Otolith labs (MTA and CRO) and GCL are interested in helping out with training but the contractor is concerned that training will be inconsistent because department staff may not all train the same way or may introduce new methods that have not been fully vetted.
        - Solution: CRO/MTA, GCL, and contractor staff meet in Cordova and Juneau or Sitka in mid to late June (before field crew training) to settle on sampling methods. MTA and GCL staff may also help with subsequent field crew training.
    - Issue: Contractor staff does not know what happens to the samples after they are shipped. Lack of understanding leads to lower vesting.
        - Solution: GCL and MTA will send slides that describe the laboratory and statistical analysis that are performed on the samples.
- Scale lab participation
    - Issue: Anne Reynolds and Iris Frank have not been included in AHRP meetings or email distributions.
        - Solution: GCL will add them to the email distribution lists so that they are at least in the loop.
- Presentations made at AHRP December 12, 2014 meeting
    - Issue: Presentations made at AHRP meetings are not available to all parties.
        - Solution: GCL and MTA will send presentations to Eric Knudsen. Eric Knudsen will send presentations to GCL and we will post them on the MTA SharePoint site. –Done. Will these presentations be made public on the website?
- Ocean Test Fishing
    - Issue: Why are species other than pink and chum salmon being collected, analyzed, and reported under AHRP?
        - Solution: Steve Moffitt will check with management staff in Cordova to see if these data are useful. If so, other funds should be identified for their analysis. If not, these samples should not be analyzed and samples should only be collected if the cost is nominal and there is potential for value in the future.

RESEARCH GROUP REVIEW AND COMMENTS

This technical document was reviewed by email exchange.

This document is a helpful summary of the meeting. Some comments were added to explain a few points.

This document is acceptable to the AHRG.