

**Fish Tagging Forum
February 9, 2012
Portland, OR**

Draft Meeting Notes

Background

The Northwest Power and Conservation Council convened the Fish Tagging Forum (FTF) to address regional fish tagging issues (see July 13, 2011 Charter at <http://www.nwcouncil.org/fw/tag/charter.pdf>).

Notes from all meetings are available on the FTF web page under the “Past Meetings” section at <http://www.nwcouncil.org/fw/tag>.

The List of Attendees is included as Attachment A. The agenda and other materials presented, developed or modified during the meeting are available under the “Past Meeting – Feb 2012” section at <http://www.nwcouncil.org/fw/tag>.

Discussion Summary

1. Report Back on January Council Briefing

Therese Hampton (Forum Chair) and Tony Grover (Forum Manager) provided a brief account of their update on the FTF work to-date to the Council during the January 2012 full council meeting. The Council members were supportive of the approach developed by the FTF for addressing the FTF’s objectives and for inclusion of the ‘fair share’ objective. The Council members were pleased that the FTF is on track for meeting the Council’s July 19 2013 completion deadline.

2. Discussion of Genetic Marking

Matt Campbell (IDFG) and Shawn Narum (CRITFC) provided an overview of genetic marking with an emphasis on Parental Base Tagging (PBT) and Genetic Stock Identification (GSI). Their PowerPoint presentation is available under the “Past Meeting – Feb 2012” section at <http://www.nwcouncil.org/fw/tag>.

Following the PowerPoint presentation by Matt Campbell (IDFG) and Shawn Narum (CRITFC), the FTF participants benefited from a genetic marking Q&A discussion with input from a broader group of geneticists including: Christian Smith (USFWS), David Teel (NOAA), Denise Hawkins (USFWS), Kathleen O’Malley (OSU), Ken Warheit (WDFW), Lisa Seeb (UW), Michael Banks (OSU), Renee Bellinger (OSU), and Robin Waples (NOAA).

a. Current baselines

- GSI Baselines for Columbia River Basin:
 - i. Chinook baseline with 192 SNPs in place (will continue to expand with more populations in future years)
 - ii. Steelhead baseline with 192 SNPs in place (will continue to expand with more populations in future years)
 - iii. Sockeye baseline with 96 SNPs in progress (expansion planned)
 - iv. Coho baseline with 96 SNPs starting in 2012 (expansion planned)
 - v. No chum or pink salmon baselines planned
 - vi. Sturgeon baseline with 13 microsatellites in progress (expansion planned)
 - vii. Lamprey SNP markers are in discovery and baseline starting in 2012 (expansion planned)

- PBT Baselines for Columbia River Basin:
 - i. spring/summer Chinook parent database with 96 SNPs from 2008-present for Snake River hatcheries
 - ii. steelhead parent database with 96 SNPs from 2008-present for Snake River hatcheries
 - iii. fall Chinook parent database with 96 SNPs from 2011-present for Snake River hatcheries (Lyons Ferry Hat. & Nez Perce Tribal Hat.) is planned for 2012
 - iv. expansion of PBT broodstock sampling of all Chinook and steelhead hatcheries above Bonneville Dam is being coordinated for initiation in 2012

b. Occurrence of Out-of-Basin Origin Salmonids

Very low occurrence of out-of-basin origin salmonids have been detected within the Columbia River Basin but they have been detected. Typically less than 0.5% of the genetic samples analyzed, and research related to this topic will soon be published in a peer-reviewed journal.

c. Funding Sources for Genetic Marking

Shawn Narum stated that 90% of the baseline development for GSI was (is) funded by BPA, with other funding coming from annually renewed funds from the PSC-Chinook Technical Committee and Boundary funds. Shawn also subcontracts with the Pacific States Marine Fisheries Commission CWT program to have them collect some genetic samples which helps reduce the cost of sample collection.

Matt Campbell identified similar diversity of funding with 90% of the PBT and GSI project funding coming from BPA, although in the past they've received funds from the Salmon Recovery Fund, Idaho Power Company, and Dingle-Johnson funds.

There are also a lot of in-kind matches from the hatchery programs that collect the genetic samples for processing.

Dan Rawding (WDFW) pointed out that a lot of existing infrastructure and programs are assisting the genetic marking effort. It is not simple to quantify the value of these, such as taking advantage of the CWT and PIT-tag collections to also take genetic samples.

d. Cost of Genetic Marking / Use of Existing Infrastructure for PBT and GSI

In general, it costs about \$45 to \$50 per sample. However, this does not capture the in-kind and 'subsidized' cost by obtaining genetic samples from existing sampling efforts and infrastructures other purposes (e.g. CWT, weir, hatchery etc).

Randy Fisher provided the example that although current cost estimates for genetic marking appear low, shifting from CWT to genetic marking would be more costly as this would require a big change in technology/tools currently used on the sampling boats, and would require some thought as to how best to make the shift over time.

It can take as quickly as 72 hours to process 300 fish samples using SNP in a 'test' scenario. Sustaining short turn around on an ongoing basis for real time management would require an increase in labor force in the labs to ensure adequate quality control necessary for formal "results".

e. SNP, Microsatellites and other Genetic Tagging Application (non-PBT and GSI)

David Teel commented that the NOAA-NWFSC lab has 20 current projects that use various genetic methods that are focused on Columbia River Salmonids funded by ACOE, and others. These projects fit within 3 broad categories of which PBT and GSI is only one component. These 3 broad categories consist of: (1) pedigree studies such as matching up offspring to parents, (2) reproductive success of hatchery and wild fish, and (3) genetic monitoring such effects of population size and immigration. About 50% of the NOAA projects have GSI and PBT capabilities especially for sampling ocean and estuary. It was also noted that much information can be gained by using both genetic information and information from other tagging types, such as PIT-tag and acoustic tags, e.g., genetic tagging is complementary to these other tag types.

Therese Hampton: are we moving away from microsatellites to SNP?
Shawn Narum stated that there is a large microsatellite baseline in the coastal areas developed/used by many agencies and used for Ocean-related questions. SNPs are used to address more regional questions,

such as in the Columbia River Basin or Puget Sound, that may not easily be answered by microsatellites given that SNPs can be processed more rapidly than microsatellites.

f. Genetic database/library

Shawn Narum: There currently exists a database for localized needs in the Columbia River Basin area. It serves a very minimalistic need and would require a larger financial investment and effort to make it useable for the general public, e.g., development of tools, functionality, and maintenance.

Lisa Seeb described the work undertaken to develop a common genetic marking database has been ongoing since the mid-2000s, but with a slow rate of progress due to lack of funding for a SNP database. There is broad recognition for the need to have a database but the challenge is the lack of funding and the desire to have a cross-jurisdictional database. However, the desire to have a multi-jurisdictional database is supported by other geneticists such as David Teel and Shawn Narum

A microsatellite database currently exists due to financial support by NOAA to develop it.

Randy Fisher mentioned that his organization is working on exploring the cost of developing a genetic database.

Pete Hassemer mentioned that when discussing development of a genetic database we must recall that there was a start-up cost to the data base we currently have for CWT and PIT-tag and likely a similar cost will be incurred for start-up of a genetic database.

g. Genetic Marking Coordination/Standardization

Ken Warheit: The standardization with SNPs is well coordinated within the Columbia River Basin by the genetic labs represented today at the FTF. Lots of other genetic labs are not using the same SNPs that we are using, but we have found there is a lot of overlap among the SNPs being used by geneticists.

Currently, the geneticists participating in this meeting meet on an ad hoc basis as needed, informally reaching out to one another as questions arise, collaborating on joint projects, and sharing our SNPs data with each other.

Caution was voiced about pushing standardization too far and squelching innovation. Although, in general, there is support for having access to a common database and belief that this would not squelch innovations.

h. Limitations/Potential of Genetic Marking

GSI is best for population/wild fish questions; whereas PBT is best for hatchery-based questions.

Identification of fish to MPG or population level with SNP may be possible but there is a limit to the level of refined sorting that can be done since at some point the natural migration between populations/stocks renders them the same. In general, the more refined sorting, the more SNP you need. A similar idea is being tested/done at the Lower Granite Dam trap to detect unclipped hatchery fish from wild fish. Matt Campbell mentioned that they are able to distinguish between steelhead MPGs but it's harder within the TRT populations.

Is it possible to use genetic tag/marking to do mark-recapture estimates for populations? Yes this is possible as long as you have juvenile and adult genetic samples (even carcass samples). You can also use it within a rearing season to track growth of a juvenile fish you remove a genetic sample at different times within that rearing season.

3. Continued Discussion of Forum Process

Pat Frazier (WDFW) and Dan Rawding (WDFW) presented a draft excel spreadsheet template to propose tackling the need of identifying common management questions and supporting indicators/metrics to guide the evaluation of the various tagging techniques being discussed by the FTF. The draft template is available under the "Past Meeting – Feb 2012" section at <http://www.nwcouncil.org/fw/tag>.

Action items -- the FTF participants agreed to support this effort by:

- a. FTF participants will provide Pat Frazier and Kevin Kytola with names of participants for each of the subcommittees by Wednesday, February 15.
- b. FTF participants will submit comments for improving the management questions and supporting indicators/metrics to Pat Frazier by February 24, 2012.
- c. FTF participants agreed to identify representatives, or volunteer to participate, in various subcommittees that would assist Pat Frazier in sorting through the comments received on a category-by-category approach (e.g., hydro, predation, tributary habitat, estuary habitat, ocean habitat, hatchery, recovery status, etc). Currently assigned names and roles include:

- Lead – Pat Frazier

- Hatcheries – Peter Paquet, Rick Golden
- Hydro – Jim Ruff, Rick Golden
- Harvest
 - In river – Nancy Leonard, Rick Golden
 - Ocean – Nancy Leonard, Rick Golden
- Habitat
 - Tributary – Nancy Leonard, Rick Golden
 - Estuary- Patty O’Toole, Rick Golden
 - Ocean-Patty O’Toole, Rick Golden
- Recovery/Status – Nancy L, Rick Golden

d. Predation (avian, fish, marine mammal)– Jim ruff, Rick Golden

The subcommittees will focus on achieving agreement on the management questions and supporting indicators/metrics in each category. The outcome of the subcommittee meeting(s) will be used by the FTF for subsequent discussions (i.e., there will not be a second iteration of review and acceptance).

e. The subcommittees will meet prior to the next FTF meeting in March over 1-2 days.

f. Pat Frazier will report back on progress on finalizing the management questions and indicators at the next FTF meeting on Thursday March 22.

g. FTF will continue review of technologies with this MQ/indicator construct.

4. Review of Tagging Program Cost and Information

Rick Golden (BPA) presented a spreadsheet that summarized BPA’s current investment in tagging-related work. This BPA spreadsheet is available under the “Past Meeting – Feb 2012” section at <http://www.nwcouncil.org/fw/tag>.

Jim Ruff (NPCC) presented a spreadsheet that summarized the USCOE-AFEP programs’ current investment in tagging-related work. This AFEP spreadsheet is available under the “Past Meeting – Feb 2012” section at <http://www.nwcouncil.org/fw/tag>.

A few modifications to columns and column headings were suggested. After the management questions are refined, the projects in the cost spreadsheets may be able to better aligned to specific management questions. The FTF participants noted that parsing out costs for specific tagging efforts is very complicated due to the integrated nature of data collection and analysis. Before significant additional effort is expended compiling cost information, the basis for the cost FTF cost comparison should be better defined. It was suggested that perhaps the cost comparison could be focused on management questions where there are clear tagging choices identified

5. Recap and Plan Next Meeting

Next meeting will be on Thursday March 22, 2012 in the NPCC Portland office.

FTF participants agreed to continue with the current format of the FTF meetings, with an overview of a tagging technology being presented for part of the day and continuing the discussion on the FTF process for the rest of the meeting.

Topics for next meeting:

- Update by Pat Frazier on the management question subcommittee.
- Overview of the PIT-tagging technology. FTF members will provide names of experts to lead the overview discussion and engage in the subsequent discussion. Potential names include:
 - Hydrosystem passage, survival and transportation
 - Perhaps covered by Michele DeHart (FPC-CSS) and Bill Muir (NOAA) Predation
 - Avian predation perhaps covered by—someone from Real-Time Research or IDFG could do this
 - Piscivores
 - Pinnipeds
 - Tributary real time fisheries management
 - Pete Hassemer (IDFG) and/or NPT Hatcheries
 - ODFW, WDFW?
 - Potential uses by hatcheries such as assessing hatchery effectiveness
 - Pit-Tag data management (PITAGIS)
 - Staff from PSMFC
 - Emerging technologies
 - Doug Marsh will ask Sandy Downing
 - Possible briefing on the regional Pit-tag Plan
 - Jim Geiselman, BPA
- Dan Rawding – suggested discussing how PIT-tags from one project can be used for multiple management questions. Doug M. suggested perhaps one slide could cover an example as part of the Hydro system use.