

**Fish Tagging Forum  
Meeting Notes  
Monday December 3, 2012  
Northwest Power and Conservation Council**

**Attendees:** see list on the Fish Tagging Forum website <http://www.nwcouncil.org/fw/tag/>

**Introductions/Meeting Objectives/Recap of Last Meeting**

Kevin Kytola provided an overview of the topics and work to be accomplished today.

**Management Question Spreadsheet (Nancy Leonard)**

Nancy provided a quick overview of the spreadsheet and the work accomplished through the phone work sessions. Nancy mentioned that the work session participants identified three levels of linkage between indicators and tag technologies: 'c' for currently being used to gather the data needed to inform the indicator; 'c/e' for currently used in a limited fashion but may expand in future; and 'f' for it may be used in the future.

Nancy went over the major issues that arose during these work sessions:

- The issue of whether there is a need to further refine the indicators to capture the geographic extent of coverage and specific species linked to the various tagging technologies, as needed on the various tabs, such as in the population status tab. The group decided to assign tag types as they are used generally across the basin, but recognized we may have to identify geographic extent and species use in some cases, particularly in the population status tab. Thus this issue would be best decided as the group begins analyzing and formulating their recommendations, e.g., any refinement will be informed by needs identified while developing recommendations.
- There was a question about whether to change the "fry-smolt" indicator to "parr-to-smolt" on the population status tab. The group thought it made sense to make this change, but it was decided it would be best to also allow NOAA Fisheries to weigh in on this issue so the group recommended that NOAA should be asked about this during its review of the spreadsheet, particularly in its review of the population status tab.
- Another question was whether to merge the indicators that appear to be similar. The group decided that these were best kept separate.

*Group Discussion*

- Kevin brought up the need to discuss if it is correct to have different tag technologies assigned to the same indicator that appears under different management questions. Kevin said he would show some tools developed by Sapere that may assist with this assessment after this agenda item.
- Therese Hampton restated that, as needed, the spreadsheet may be refined by folks contacting Nancy or Jim who will report any changes made to the Fish Tagging Forum.
- In the Hydro tab, "future use" means 1-5 years into the future. Also, the group agreed to add "adult reach survival" as an indicator in the Hydro tab.
- In the Harvest tab, the group agreed it was OK to include external tags in column off to right.

**Action:** Nancy Leonard (NPCC) and Blane Bellerud (NOAA) will coordinate on the issue of “fry to smolt” vs. “parr to smolt” and also confirm NOAA concurrence with spreadsheet entries related to Population Status and Recovery.

**Graphic Illustrating Linkage between Management Questions, Indicators and Tag Type (Kevin Kytola)**

Kevin walked the group through the work done by Sapere in visually presenting linkage between management questions, indicators and tag type: [Management Question Network Diagram](#) (aka Spider Chart). The colors surrounding the indicator box indicates that tag technology is a potential future use; whereas the colors within the indicator box indicates that tag technology is currently used.

*Group Discussion*

- Suggestion to use ‘size of colored area’ to indicate current tag usage. Perhaps better to use height of the color within the box as a scalar to indicate relative cost, number of tags used, etc.
- Suggest no more than 2 layers of information per sheet to make it less complicated.
- This includes cases where we use more than one type of tag for a particular indicator.
- This depiction presents possible future use, other depictions could inform on current and likely future use and recommendations from the group.
- This depiction only tells you many tag types are used for the same indicator, but not why we need to use these different tag types.
- Might need to explain that in some cases tags are value added but are not the original reason the tag was used, e.g., CWTs are used for ocean harvest but are also used opportunistically for some other indicators.
- If the main question is how to improve existing system, might want to focus on current use tags. But might be good to capture the future use if it is worth investing to get to that point.
- Why do we need to capture the future use? Might be a benefit to inform Council about future technologies that may arise. This could be a half page in recommendation to describe the emerging technology
- This diagram was done for each of the six Tabs’ indicators and it was also done for each of the 7 tagging technologies, so all these versions are in the document, and could be used to help us.
- Need to recognize that there is also a limitation on the tag type that can be used by a species or size of a fish. If we look at the impact of removing a tag type we need to recognize the impact might not be as visible as one would think from these diagrams. Removing a tag technology may result in no tag technology left for a given species or fish size since that may be the only tag that will work for that fish.
- The value added aspect needs to be acknowledged, since one tag type might answer a question better than another tag type. Depending on the question, the geographic area and the practicality of using a different tag technology might be better than another tag tech.
- There are also several indicators that may all be evaluated in the same study, so there is a lot of hidden multi-tasking not shown in the diagrams.
- Perhaps we need to figure out which areas we don’t agree on and focus on those areas.

- Maybe we need to focus on where we get the biggest “bang for the buck” in tag usage. In Hydro acoustic tags are mainly used for dam survivals and behavior, and the other tag types are used opportunistically for addressing hydro questions.
- There are lots of assumptions and agreements made in the region, perhaps we need to ensure we are tracking what we need to answer the questions.
- Need to understand the inter-dependence of questions. If someone PIT tags fish in a tributary to assess habitat, these same tags will get used to answer other questions along the way. So it’s challenging to deal with the inter-relatedness of tags that are applied/inserted by some and then used by others, e.g., what are the interdependencies of various tagging technologies?
- Need to consider tag use for addressing ESU-level versus population-specific analysis when addressing questions arising in the shared migration corridor of the mainstem, i.e., when you take advantage of availability of tags inputted by others. When get into shared corridors of survival, it is more efficient to take advantage of available tags from other sources.
- The CSS study and the NOAA reach survival study, both of which PIT tag wild and hatchery fish—provide the bulk of the mainstem survival data. These studies also use available tags to augment their sample size.
- We need to be able to distinguish what indicator is required by a forum, to differentiate between tags used for required indicators and those that are nice to know but not required, e.g., BiOp-required survival studies vs. discretionary studies.
- Need to consider effectiveness of the tags, are the right tags used for each indicator, or would another tag be more efficient. If have more than one tag that are equally effective then perhaps look at the cost-effectiveness.
- Could the issue of Program Effectiveness be addressed by considering the tagging project instead of the tag technology? If we went that route, we would have to determine proportional input from the various studies and how this tag gap would be addressed if a project releasing a proportion of the tags were eliminated. Sometimes this change may result in a need to increase sampling rate to make up for the decrease in tags. Sometimes this results in a few years of decreased data quality until we can adapt the study to the lower tag amount.
- As mentioned above, there is the “free rider” concept of the tags in the system – the interrelatedness – some federal agencies also use tags opportunistically in their analyses (e.g., PIT tag data from utilities).
- Also need to consider if we remove one tag type, then it may increase the cost of using another tag type since we’ll need to make up for a loss of opportunistically using same crew and platforms that were built for the eliminated tags. We may need to build new tag infrastructure.
- Perhaps we should consider conducting a potential case study to help us figure out how to address this issue. We could do a case study to assess what happens if we remove CWTs (i.e., if we eliminate the BPA funding for it and not really the technology). Where do costs shift and what other tags would need to fill the information gaps?
- Perhaps we need to focus on just the feasible changes that might be made. It may not be worthwhile to see what happens if we remove PIT Tags since it’s infeasible to remove these tags given how widespread they are used throughout the Columbia River basin.
- Perhaps discuss what happens if we remove funding for the CWT program, or genetic markers?

- We would need more details to be able to do this type of exercise. Since losing CWTs won't impact steelhead since we don't rely on those tags for that species. But for Chinook salmon we rely on CWTs to answer various management questions. So we might need to know if we can switch to genetic or PIT tags, since in some areas, such as below BON, we don't have the PIT tags infrastructure to allow using PIT tags instead of CWT. Also will need to consider species and geographic area to determine impact of "removing" a tag technology.
- Perhaps can start at a macro-scale assessment and then decide on where to focus efforts to decide where need more refinement, such as for what tag technology or for which indicators do we need more refinement/more details?
- Perhaps this process will dispel the myth that CWTs aren't important to the F&WL Program by showing how CWTs are used for various non-harvest management needs.
- Although the primary purpose of the CWT is for harvest management, these tags are also used to assess effectiveness of hatcheries in meeting their return rate objectives. A third purpose may be to assess the stray rate of those hatchery fish.
- Perhaps need to focus on the "Direct responsibility" (DR) linked to the NPCC Forum and the FCRPS BiOp Forum to help focus our exercise on a certain set of indicators / tag technologies.
- We need to capture why a given tag is used in the first place (i.e., what is the primary use, not the opportunistic, secondary uses). Then we can also identify the secondary value of that tag. Then we can look at what is significant to the Council's Program. From this we can then assess what tag technology is needed to inform Council even if it's not directly funded for that purpose. The purpose would need to be at a higher level than indicators to do this exercise, e.g., the purpose is to get juvenile fish survival from point A to point B and this will result in using this many tags put into the system.
- Do we also need to capture the quality of the data collected for the secondary and tertiary purposes, such as having CWTs in the system helps to improve the quality of the data for productivity and diversity indicators? May also need to capture if this quality of data varies depending on species and the area. Also may need to capture what happens if for some species and areas there is no backup tag information source.
- Also important to know if you are fully answering the question of interest.
- Tagging cost is also important information to capture. For instance, it is cheap to insert CWTs. If we remove CWTs from use, it might be more expensive to fill the gap with another tag technology.
- We need to think through the consequences of removing funding for a particular tag technology. This analysis of tag removal consequences, would include:
  1. Management Questions and Indicators that may no longer be fully supported. Significance of this consequence would be based on:
    - a. Whether or not the indicator is a priority for compliance,
    - b. Who has the responsibility versus who has an interest in data,
    - c. Primary purpose versus secondary value,
    - d. Whether the tag provides complete versus partial information needed,
    - e. "societal cost" of not having "quality" data upon which to make decisions.
  2. Species impacted
  3. Geographic scope or coverage

4. Shared resources
  5. Net cost consequences (tag elimination savings minus plus-up costs for replacement tags)
  6. The group's recommendation related to the consequences and merits of changing funding strategies for particular tag types.
- The FTF agreed to test the top-down concept of analyzing consequences of removing tag funding by working through Genetics, Coded Wire Tags, and PIT Tags over the course of the next two meetings. Participants identified the following considerations/concerns associated with this top down approach:
    - It may be difficult to do a 'drop tag' approach given complexity and time, , perhaps we need to more narrowly focus this exercise on a specific species and geographic area to illustrate the impact of losing a tag type (e.g., for Chinook). Drilling down to the details in some case studies would add value.
    - Could conduct such an evaluation using either a top-down or from a bottom-up approach. Perhaps we have a balance of a high level (macro) and detailed (micro) analysis, with the micro level being at the ESU level.
    - The group also suggested evaluating the net tag cost issue first without directly addressing the fair share issue.

**Action:**

1. NPCC (Tony, Nancy, Jim) will identify priority indicators associated with the F&W Program
2. Sapere (Kevin) will generate a cut of the diagram with F&W Program priorities identified.

**Tagging Technology Summary Table and Tagging Infrastructure Summary Table (Kevin Kytola)**

See draft summary table on the FTF webpage ([FTF Tag v Objectives](#))

See draft summary table on the FTF webpage ([Tagging Infrastructure](#))

Kevin provided an overview of these two tables.

*Group Discussion*

- There seem to be many objectives to this table: 1. Identify where infrastructure is needed 2. Identify where data can be obtained and 3. Whether fish handling is involved in the data collection.
- The PIT tag and adult migration rows could be split to include the sort-by-code (SBC) option for either the juvenile or adult life stage.
- Fish handling indication (blue shading) may be misleading that fish have to be handled at a particular life stage. Handling is only required at that life stage if data is desired at that point.
- A separate, but similar graphic could be developed to better illustrate infrastructure shared by multiple technologies for activities related to Insertion, Detection, and Analysis. Further discussion of this concept is warranted.

Kevin asked if folks still needed to review this summary table and provide comments? Yes, at least one person would like to review it and provide comments.

## **Data Collection & Management Summary Table (Kevin Kytola)**

See draft summary table on the FTF webpage ([Tagging Data Collection and Management](#))

### *Group Discussion*

- Do folks need to still review the summary table and provide comments? Yes, at least one person would like to review it and provide comments.
- On the data management systems page, we included where the data is stored and we would like to include the timeframe of data storage. For example, CWT data is uploaded and stored at least once per year per species.

**Action:** We will send *all* these summary tables out to all the tag technology presenters to obtain their input/feedback on the tables.

1. Kevin Kytola (Sapere) and Therese Hampton (River Partners) will discuss an additional graphic to illustrate where there is shared infrastructure.
2. Kevin Kytola (Sapere) will request additional review of synthesis documents by the subject matter experts who presented to the forum.

## **BPA Cost Information (Rick Golden)**

See draft BPA project cost summary for FY 2012 on the FTF webpage ([Tagging Costs Summary](#)) and the accompanying PowerPoint ([BPA Tagging Cost Estimates](#))

Rick Golden discussed the five basic tag types with their associated tagging project costs. He noted the cost estimates for all the LSRCP hatchery projects are uncertain. The cost estimates also doesn't include the cost of adipose fin clips (~\$35 per 1000 fish clipped).

- FY12 total CWT costs are ~\$6.653 million for 21 total tagging projects.
- FY12 total PIT tag project cost is ~\$20.083 million for 76 total projects.
- FY12 total genetic project cost is ~\$5.60 million for 14 projects.
- FY12 total radio tag project cost is ~\$1.842 million for 11 projects.
- FY12 total acoustic tag project cost is ~\$950,000 for 4 projects.
- FY12 total other tag projects cost is ~\$1.22 million for 10 projects.
- FY12 total tagging project cost is ~\$36.35 million for ~100 projects.

### *Group Discussion*

- Are all the PIT tag infrastructure investments captured in this cost analysis? Not entirely, because historically the Corps has paid for installation of PIT detection systems at its dams, whereas BPA has funded all the electronics and O&M costs of the PIT detection equipment.
- Is it fair to include the LSRCP tagging costs, which are also reimbursable costs? These costs are part of the Sec. 4h(10)(D) requirement, but also included in each project's authorizing legislation as required. Should we also include the Corps' FY12 tagging project costs at the 80% reimbursable level? The FTF agreed it wants to also consider the Corps' tagging costs.
- Maybe we should consider the average insertion cost of each tag?

- There is a need to “true up” whether the BPA cost estimates for all CWT projects is 13% or 25% of the total cost for the CRB or the Pacific region, depending on what is included in PSMFC’s total CWT cost estimate.
- Thus, the FTF needs: a) the BPA project costs, b) the Corps’ tagging project cost (using an 80% reimbursement level), and c) LSRCP tagging cost.
- It was stated the true, or total costs, including the entire tagging infrastructure, may not be fully included in these estimates. In addition, there may be some cost sharing by NOAA Fisheries and others, as well as sunk costs for existing infrastructure.
- Thus, do we also need to identify the infrastructure costs of past PIT tag detection investments? PSMFC could provide that info for the mainstem projects, but not for the tributary detectors.
- Do we really need to define the size of the tag cost pie for the CRB?
  - For CWT, we will define it for the CRB. PSMFC will provide the total cost estimate for CWTs.
  - For acoustic tags, we can simply describe in narrative the coordination with PUDs using acoustic tags.
  - For PIT tags, couldn’t we get that other info from PITAGIS?
- How are we going to utilize this cost information, and at what level? The Council members nearly always ask for this type of cost information.
- A standard economic framework would want to include all the tagging costs, including levelized costs, plus the social costs. Do we have actual numbers of tags used?
- A manager will want to know what key management questions are being addressed and answered by using each of the high cost tagging technologies.
- What is the cost per tag of using JSATS tag? It cost the Corps about \$13M using 24,000 acoustic tags for last year’s lower Columbia River survival study, which works out to an average cost of about \$540 per fish tagged.

**Action:** Next steps for cost information? We need to get the Corps FY12 tagging costs, including the cost for Corps’ mitigation hatchery tagging. We’ll also need better information about the critical interdependencies of various tagging technologies, e.g., CWT recovery plus PIT/other tag detection, or CWT plus adipose fin clipping.

1. Mike Langsley (USACE) will provide Rick Golden (BPA) updated 2012 cost information. Specific items discussed in the meetings include CWT for hatcheries and “80% reimbursable” costs for F&W Program related activities (accrued/expected but not necessarily submitted for reimbursement).
2. Rick Golden (BPA) and Pete Hassemer (IDFG) will coordinate on costs for the Lower Snake.
3. Randy Fisher (PSMFC) will coordinate an update to the CWT cost information (i.e., proportion of BPA funded efforts relative to all CRB CWT efforts and proportion of BPA funded efforts relative to all Regional CWT efforts).
4. Rick Golden (BPA) to develop an estimate of “sunk costs” associated with existing PIT tag infrastructure in the CRB.
5. Rick Golden (BPA) to coordinate with Randy Fisher (PSMFC) on compiling CRB and Regional cost information for PIT tags to develop pie-charts similar to those developed for CWT in Item #3

above. PSMFC should be able to provide information from Mainstem projects to augment BPA's information on tributary projects.

### **Example Council Recommendations (Tony Grover)**

Tony Grover summarized the steps for developing a Council recommendation. Tony also went over two recommendation examples. The first was a simple example showing RRS in the Methow Basin. The second, a more complex example is the RME AP process, with both "A" list and a "B" list projects, as well as the 4h(10)(D) analysis (see [here](#)).

#### *Group Discussion*

- Will the FTF's recommendation require an ISRP review? Not necessarily, unless the group wants to have ISRP review, or if the Council's Fish and Wildlife Committee wants Science review.
- Does this group want to address fish tagging at the programmatic level, or get down to the project level? The group agrees that working at the programmatic level is preferred.
- Timing for a FTF decision is for a recommendation from FTF and/or Council staff due to the Council in May 2013. A simplistic approach would be to make a programmatic recommendation with a list of relevant projects covered under each tagging technology.

### **Identify Critical Information Gaps (Kevin Kytola)**

#### *Group Discussion*

- We should focus on both the NMFS FCRPS BiOp and Council management questions identified in the Management Question Network Diagram.
- We should also reference the Anadromous Salmonid Monitoring Strategy for background information.
- To get at societal costs, we should focus primarily on those tagging projects which provide information supporting the mainstem spill program and harvest management activities which are two high cost programs.
- What are the consequences if we "turned off" one of the tagging technologies, what information would we lose and what are the societal consequences of making an incorrect management decision?
- Should we also include efficiency of obtaining research results to answer the study objectives, e.g., the quality of information? Probably best to assume that trading one technology for another would not jeopardize quality. The cost effectiveness evaluation will be based on relative costs to achieve the same outcome.

**Action:** Council staff will post the [Anadromous Salmonid Monitoring Strategy](#) on the FTF web page.

### **Recap and Plan Next Meeting**

#### *Group Discussion*

Agenda items for the January FTF meeting include:

- Tony said Council staff will likely update the Council again on the FTF progress in February 2013.



- It will be important to discuss the “tag takeaway” scenario analysis and what the consequences would be for the region for removing genetic marks then CWTs and lastly PIT tags (at the February meeting).
- Discuss the approach to cost effectiveness evaluation with the IEAB. (Bill Jaeger-IEAB, 90min)
- Update the cost data, e.g., size of the pies.
- **Next meeting is scheduled for January 7, 2013**, in the Council conference room.