



Tributary PIT Tag Arrays in the Columbia Basin

October 16-17, 2018 · Portland, Oregon

911 Federal Building · Conference Room C

Notes · [PNAMP.org event page](#)

Workshop Objectives

Our goals are to share information, discuss current practices and standards, and set the stage for later work toward assessment and optimization of tributary PIT tag array implementation. We will address:

- protocols and standards for operation and maintenance of PIT tag arrays,
- protocols and standards for data management and communication of resulting information, and
- considerations for future applications of PIT tag arrays in the region.

Please see the [Agenda](#) and [Participant List](#) at the end of this document. During the two days, 104 people from 24 organizations attended. Visit [the pnamp.org event page here](#), to find the presentations on our YouTube channel.

Notes

Major take away points:

- Strong call for more frequent meetings and methods of ongoing communication among all involved entities.
- Critical topics were identified as needing ongoing exploration and support: for example, regional O&M inventories and integration, technical support and sharing of issues, identification of innovative techniques that could assist all monitoring efforts, standardized interchangeable equipment to minimize downtime, identification of essential, standard data management.
- A need for an organizing body to manage above points

Action Items

Suggested Actions **Session 1: Operation Protocols and Standards:**

- Meet as a group as often as every 6 months.
- Form a “quasi steering committee” to facilitate and manage suggested actions, future meetings, information flow, and knowledge sharing.
- Inventory and begin to explore standardization of tributary PIT tag arrays.
 - determine how to classify PIT arrays to help develop standards.
 - with the intent of reaching economy of scale, e.g. to promote better auto-uploading of data
 - while acknowledging concern about standardization without flexibility.
- Revise O&M survey with more precise questions, then send to the larger community at the organization level. Include a question for responder to identify their role in the organization.

Purpose: ID both common issues and innovative approaches to enable info sharing, and to more efficiently address problems. Possible new topics for survey:

- Permits, related costs
- Cost/benefit questions; Funding sources and their diversity
- Need for documentation of the crucial metric: Number of Down days (N. Tancreto). ID most common causes to address downtime?
- Downtime: Identify problems and causes leading to inoperative arrays and variable down time. Causes vary: antennae become unanchored, power supply or modem failures, electrical noise interference, power surges, stream channel flooding, shifting, or freezing.
- Innovative designs (barges, fins, floating panels) - develop catalog for sharing.
- Remote communication/data upload
- Topic for future seminars/workshops as discussed in session 4 of day 2 (e.g., juvenile/adult abundance, detection efficiency, etc.)

Suggested Actions **Session 2-Regional Status Assessments:**

- After 2018-002 site assessment report is released (note that the report will not include the entire basin):

- Use as a collaborative discussion tool and include input from this workshop,
- Update the spreadsheets,
- Timeline for review comments: before April
- During 2018-002 project, we've discussed how to manage O&M. Use one governing O&M body or multiple regional operators? (Planning Group: Discuss to determine.)
- Design an online portal in PTAGIS to update site, cost, and how to use specific user input forms or spreadsheets (PTAGIS crew)
- Look across all the sites in the region to give NOAA, BPA and others an assessment, link and communicate (Planning group to determine who/how).
- Feedback requested for Site Evaluation form, Related Analytical form, and Property Inventory O&M Prioritization Planning form. (All workshop participants' organizations). Draft form is posted on Google Docs (editable file: PIT tag array inventory_editable_2018-10-30)
- Determine how new metadata in PTAGIS aligns with Russell S's templates.

Suggested Actions *Session 3* - Data Management and Communications

- PTAGIS Steering Committee - needs to discuss strategic thinking so that there is consistent planning through time. Need on the ground expertise to help us adapt and evolve. Not necessarily volunteers, but a position or group that would report to the Steering Committee.

Suggested Actions *Session 4* - Future Focus

- Identify a committee to manage facilitation-considerations:
 - What outcomes do we want from a committee?
 - Ensure the committee is as inclusive as possible
 - Timeline: convene an initial group before the SC meets in Jan 2019, to interact with the SC
 - Reach out to PIT Tag Steering Committee before SC meeting in January 20 something-role?
 - In your organization nominate the liaison to PIT tag Steering Committee
- Explore with BPA: Fund a particular person as a PIT tag coordinator, suggesting it as a BPA contract work element.
- Strengthen current communication avenues. **Revive and promote ongoing and existing PTAGIS products** (offered by John Tenney):
 - Revive the now inactive PTAGIS [online forum for in-stream communication/upload documents](#). Add ability to provide anonymous comments for more privacy and more participation.
 - PTAGIS Newsletter- highlight this workshop; and provide shared information.

Notes Summary

Day One Summary: Moderators introduced the workshop objectives, included an overview of tributary PIT tag arrays in the Columbia Basin, and considered best practices for Operations and Maintenance.

Overview of Workshop Objectives

Russell Scranton, BPA

Applications of Tributary PIT Arrays

Chris Beasley, Biomark

Session 1: Operation Protocols and Standards

Andrew Murdoch, Jay Hesse, moderators

Discussion: Towards Identification of Best Practices for Operation and Maintenance

Andrew M and Jay H, moderators, presented the results of a preliminary, though extensive, survey sent to a representative 12 organizations to assess common issues with tributary PIT tag arrays and highlight innovative work.

See suggested actions for Session 1 above on page 1 that are a consolidation of the discussion points

Day Two Summary: Day two had session 2, 3 and 4. In session 2, region-wide status assessments of tributary PIT tag arrays in the Columbia Basin were considered. Session 3 was a consideration of data management and communications. Session 4, Future Focus, provided the opportunity to identify and prioritize topics for future workshops and next steps.

Session 2: Regional Status Assessments: Identify information needed to yield an improved O&M inventory and guide future assessments, starting with review of existing assessment frameworks

Russell Scranton, BPA, moderator, presented BPA assessment informed from ISEMP site audit to determine optimum location, with Tim Copeland presenting Idaho Fish and Game's assessment as an example.

Discussion: What Information is necessary for Regional Status Assessments and how do we prioritize O&M concerns?

1. What info to include?

- ID if one of these sites/arrays are part of a network or stand alone
- Include a field to identify objective of the array
- The targeted fish tagging/tagging strategy is really important
- Recommendations: quantify details, site operations (e.g. what type of antennae, how it's anchored, etc.)
- Location: Agree on a convention on site locations, such as start at a dam and move upstream to a certain location (improve PTAGIS location data)
 - Need a better way of organizing the ordering the arrays than River KM, which is not that accurate
 - lat/long is not always accurate either
 - make a layer on an ESRI map (ArcGIS)
- More refined HUCs, or more HUC information to a finer scale
 - What species are recorded within a HUC
 - Auto-populate population names as they are associated with lat/longs
- Information on the hydrograph and gradient of the stream
 - probably a strong correlation of hydrograph and gradient with the success of the site
- Russ sees three different tables or forms - site evaluation form, and Related Analytical Form, and A Property Inventory O&M prioritization planning form.
 - This preliminary form is posted on Google Docs (editable file: [PIT tag array inventory editable 2018-10-30](#)) to get some feedback

2. How? Spreadsheets vs. relational tables

- Spreadsheet logistics
 - Could be a monster of a spreadsheet (Tim C.): Suggests linked tables and auto-population wherever possible; spreadsheets are time intensive
 - Spreadsheets should come from a bottom-up approach (Rishi); Rishi concerns:
 - Who will be populating spreadsheets, how much time will it take?
 - These need to be living documents that need to be updated regularly
 - Need to think about people pulling data from our sites - [we need] guidance for using the data
- Determine what information/fields we need before discussing what PTAGIS can contain.
- We don't have a definitive timeline for a programmatic approach across the basin. This will be a long term approach

3. Challenge: Array removal. What if we believe it is not necessary to maintain an array

- It would be good to know who is using what, how are they using it, and whether there is collaboration
 - Can one query PTAGIS for number of users at that location? NO. You can download data from PTAGIS but you don't know who downloaded.
 - Can cross-reference who logs in to build reports with reports to see who is using sites from specific parameters. Might help ID who's using an array
 - May be able to rank sites by usage, to evaluate the value of each of the sites
 - Dan R cautions: many people use DART
 - If an array is removed, analyse how that has affected counts for everyone in the region
 - How to ensure removing an array won't adversely affect someone's study (data)?
- Engage with the community; if taking an array offline, give the public a chance to take over the O&M.

See suggested actions for Session 2 above on page 1

Session 3: Data Management and Communications:
Features of Biomark (BioLogic) and PTAGIS data collection
and management: Similarities and Differences.

*Chris Beasley, Biomark and
John Tenney, Pacific States Marine
Fisheries Commission, moderators*

Discussion: Data Management and Communications

- Chris Beasley presented Biologic Site (answers to questions follow)
 - It was designed to have a site owner who can grant access for viewing with two way APIs so that you could submit corrections to your data.
 - Endpoints can be expanded
 - There is a lot of value to leveraging that environmental data, but you need to help us make sure that things are standardized, it would be good to get a group of you all to determine what we need to expand on and refine
 - We'll be able to get the data into our system with data submission forms by early next year
 - The portal will be built; we'll show everyone what is editable and circle back to address what everyone needs.
 - Software development is in house, it worked really well with P4
 - If you stopped using Biologic would you still have access to the historical data even if you haven't logged in in a while? Yes
 - Important that transceiver IDs are preserved
- Biologic and PTAGIS
 - Similar but not duplicative, great dialogue and great relationship, very compatible systems
 - Why would I go with Biologic rather than just PTAGIS? There is a fair amount of data repair that has to happen. Supports accurate data input and formats correctly. Eliminates the burden [of cleaning data] from biologists
- You've done some requirements analysis? We need a user group to create the basic requirements and then have flexibility for individuals

See suggested actions for Session 3 above on page 2

Session 4: Identifying Future Focus. Identify and prioritize potential topics for future workshops *Jim Ruzycki, Oregon Dept of Fish and Wildlife and Andrew Murdoch, Washington*

- Future Focus: NOAA R&D. Gabe Brooks presented new technical innovations
 - Advancement in In-stream antenna, Alternative Satellite Communications, Power failures, options and improvements. To prevent trouble at a site, do a site survey up front and find out the capabilities of a site
 - Second polling of group may be able to identify data gaps
 - Questions
 - Regarding the PIT array at LGR. It's being placed on the false weir. Can that be used to expand for the other spillways or would there be a need for a PIT array in one of the other bays?
 - Juvenile passage is different between the two weir types
 - What will be the array focus at other spillways?
 - We are focusing on this first spillway to see if it works, and from there we will move on
 - Can you replace those modems with a tablet?
 - Yes, but it would have to be in a shielded box, but this would create one more point of failure; the issue is probably in that particular modem or in the antenna
 - Sometimes equipment deteriorates because of exposure to dirt, water, snow, cell areas will deteriorate because cell phone companies move their antennas to point at more populated regions, and it could be specific to a modem or a type of modem

Discussion: Input from PIT tag array operators and data users on topics ranging from antenna configuration to data analysis (e.g., detection efficiency, migration direction or abundance estimates)

NEXT STEPS discussion

- **Future Sessions Suggestions-Formats**
 - Webinars can be an alternative to in person - short quick 2 hour presentations
 - More frequent workshops; Format- People seem to like this workshop's two ½ days format-though wanted more in-depth exploration of topics
 - How To Workshops
 - Jim R - suggests get a PIT tag coordinator, one suggestion- we can build a model with BPA, a work element to get funded work with a particular person. To manage future communications and priority topics
 - Is anyone following up on submitting a proposal? With timelines, budgets? is there a model out there?
 - More formalization is necessary and doubt that any one agency currently has budget or time to do this

- Ongoing forum for this group so people can share ideas, issues, and suggestions - to provide info for people who can't come to workshops and need help today (not in 6 month during next workshop)
 - John Tenney (PTAGIS): **This exists in PTAGIS - Two avenues:** PTAGIS Newsletter (twice/year); can highlight this workshop; and provide shared information. PTAGIS can revive the now inactive [online forum for in-stream communication/upload documents](#). We can add anonymous comments for more privacy
 - Can incorporate the concern from the in-stream community
 - People requested to YES revive it, and noted it would be useful if people are using it and engaging
 - If you see a lot of discussion on a topic that could be a newsletter item
 - It will help Gabe if people post their issues to the forum, and he can in turn answer the same FAQs once
 - The sharing can help build common practices
- Use the electrofishing forums as an example. The global electrofishing community can take training, post questions and other forum experts can respond. It is managed through [electrofishing.net](#)
- **Future Sessions Suggestions-Topics**
 - Many current topics are to understand data and data resources needs
 - Be aware that this is unfunded so when planning for future, cost is very similar to O&M, it is costly
 - Regional O&M communication, integration is a common desired theme
 - Jim R - Data addressing Migration Direction/Location: How much do people actually use personal screening of the data to interpret it the way they want to interpret it? There is a lot of professional judgement that goes into this. What kind of rule sets do we use to sort this out?
 - Jim R - Juvenile Abundance Estimation. Need to share and discuss novel approaches further
 - Rick - Used known number of fish released, using flat plate arrays produced biased estimates of juveniles as a recapture detection, but using an array and a different recapture method like screw traps produced unbiased estimates
 - Algorithms needed for repeat juvenile spawners
 - Troubleshooting: Murdoch has staff in watershed that are first responders(tier 1), it is not their only job but a big chunk, they go out and diagnose and fix problem - next tiers (tier 2) are people who built them and know the issues, they lean on each other to fix problems
 - Where do you go if you don't have expertise in house?
 - Bill Schrader and Eric Stark think that from the Priority Topics slide - their priorities are: Detection probability, Migration, Study Designs, Adult Abundance, Juvenile Abundance, and Juvenile Survival with focus on steelhead
 - How abundance is estimated for adults. Seems like different methods are used.
 - compare and contrast across basins if this can be standardized
- How-To Workshop: Tagging for example
 - Need a tagging demonstration, ensure there is an understanding of a common technique
 - We put a high currency on what tagged fish do, but we almost never talk about how fish are tagged. Having a short discussion on the physical application of the tag could also be useful (tag equipment, tag orientation, tagging environmental conditions, are all tagged the same, etc.). We have the PIT tag marking procedures manual, but is everyone following that guidance the same way? Just a thought.
 - Tagging manual has some things people are doing different ways. I think this is a community discussion
 - Gap: tag retention and tag-induced mortality across the full life cycle for adult estimation.
 - Representation tagging we need to discuss, how do we know this is representational?

See suggested actions for Session 4 above on page 2

Full transcript available upon request.



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Day 1 - Tuesday, October 16, 2018

12:00 pm	Sign in	12:30 pm	Welcome	<i>Sheryn Olson, USGS/PNAMP</i>
12:40 pm	Overview of Workshop Objectives And some lessons learned from the ISEMP and BPA project: "Integrated In-stream PIT tag Detection System Operations and Maintenance"			<i>Russell Scranton, BPA</i>
12:50 pm	Applications of Tributary PIT Arrays			<i>Chris Beasley, Biomark</i>
1:10 pm	Session 1: A Synthesis of Organizations' Protocols for Tributary PIT Tag Arrays Across the Columbia Basin Part 1: Operations			<i>Andrew Murdoch, Washington Department of Fish and Wildlife and Jay Hesse, Nez Perce Tribe, moderators</i>
1:35 pm	BREAK			
1:55 pm	Part 2: Maintenance			
2:25 pm	Part 3: Novel approaches			<i>Jay Hesse, Introduce</i>
2:30 pm	Floating Fin Array and Operations and Maintenance			<i>Travis Olsen and Craig Contor, Confederated Tribes of the Umatilla Indian Reservation</i>
2:40 pm	Streams with Highly Variable Discharge Patterns			<i>Brian Knoth and Brett Bowersox, Idaho Department of Fish and Game</i>
2:50 pm	Unique Installation Techniques			<i>Derrek Faber, Oregon Department of Fish and Game</i>
3:00 pm	Flexible Antennas			<i>Gabriel Brooks, NOAA Fisheries</i>
3:10 pm	BREAK			
3:30 pm	Discussion: Towards Identification of Best Practices for Operation and Maintenance			<i>Andrew Murdoch, Jay Hesse, moderators</i>
4:30 pm	Wrap-up and Introduce Day 2 Sessions			<i>Andrew Murdoch, moderator</i>
4:45 pm	Adjourn	6:00 pm	Optional Off-site Gathering of Workshop Participants	

Day 2 - Wednesday, October 17, 2018

7:30 am	Sign in	8:00 am	Welcome	<i>Sheryn Olson</i>
8:05 am	Session 2: Regional Status Assessments: Identify information needed to yield an improved O&M inventory and guide future assessments, starting with review of existing assessment frameworks			<i>Russell Scranton, BPA</i>
8:15 am	* Example I: Idaho assessment			<i>Tim Copeland, Idaho Dept of Fish and Game</i>
8:25 am	* Example II: BPA assessment informed from ISEMP site audit to determine optimum location			<i>Russell Scranton, BPA</i>

8:35 am	Discussion: Information Necessary for Regional Status Assessments	<i>Russell Scranton, moderator</i>
9:20 am	BREAK	
9:35 am	Session 3: Data Management and Communications: Features of Biomark (BioLogic) and PTAGIS data collection and management: Similarities and Differences. Opportunities for Coordination.	<i>Chris Beasley, Biomark and John Tenney, Pacific States Marine Fisheries Commission, moderators</i>
10:05 am	Discussion: Data Management and Communications	<i>Chris Beasley and John Tenney, moderators</i>
11:05 am	Session 4: Identifying Future Focus. Introduction. Session Goal: Identify and prioritize potential topics for future workshops.	<i>Jim Ruzycki, Oregon Dept of Fish and Wildlife and Andrew Murdoch, Washington Dept of Fish and Wildlife, moderators</i>
11:15 am	Future Focus: NOAA and R&D Program	<i>Gabriel Brooks, NOAA Fisheries</i>
11:25 am	Open discussion to gather input from PIT tag array operators and data users on topics potentially ranging from antenna configuration to data analysis (e.g., detection efficiency, migration direction or abundance estimates)	<i>Jim Ruzycki and Andrew Murdoch, moderators</i>
12:20 pm	Wrap-up and Next Steps	<i>Jim Ruzycki, moderator</i>
12:30 pm	Adjourn	

Participants*

During the two days, 104 people from 24 organizations attended. Two remote participants are not included in this list because they signed in with an alias.

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