PTAGIS

# PIT Tag Information System
Columbia Basin

# Newsletter

**June 2017**
**Volume 15**
**Issue 1**

The PTAGIS Newsletter is published periodically by Pacific States Marine Fisheries Commission.

We welcome input from the PTAGIS community, so email us at ptagis_newsletter@ptagis.org with your story ideas.

If you have questions regarding the contents of this publication, or about the PTAGIS program, please contact PTAGIS Staff.

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A Fisheries Data Project of the Pacific States Marine Fisheries Commission

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# New John Day Adult Ladder PIT Tag System

**Don Warf** (PTAGIS Kennewick Office)

John Day South Ladder Viewed from the North

Bi-Ops since the early 2000s have called for adult ladder PIT tag detections at John Day Dam. In 2017 this system will become operational.

Phase 1 of this project, the In-ladder work to install the antennas, was completed in the winter of 2016 / 2017. Phase 2, the construction of the PIT tag electronics rooms, is scheduled to be completed in the fall of 2017. Both John Day adult fish ladders are now collecting PIT tag data on a limited basis.

John Day is collecting data on a limited basis using weekly on-site manual downloads. This is due to several factors:

- Only one weir wall can be operated per ladder. The synchronization conduit won't be installed until Phase 2 is complete. Without the synchronization, the transceiver fields from one weir wall to the other would interfere, shutting both down.
- Timestamps aren't synchronized between transceivers. The fiber optics conduit to the data collection computers won't be installed until Phase 2 is complete. Without timestamp synchronization from the computers, running both weir walls could lead to incorrect directionality due to transceiver clock drift.

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# New John Day Adult Ladder PIT Tag System

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- Running the system disconnected from PTAGIS O&M disqualifies the data from being production quality data. At a full production site, PTAGIS is constantly in communication with the transceivers, pushing internet time to each transceiver keeping them synchronized, and constantly monitoring their health through online reports and alarms. The data is collected redundantly so that no single point of equipment failure results in the loss of data and meets the program's goal of 100% valid data in near-real time with downtime of less than 1%.

Both the north and south ladders are equipped with thin body ferrite-tile orifice antennas and thin body overflow antennas on two redundant weir walls per ladder.

Phase 2 of the project has moved past the design and solicitation stages and has recently awarded a contract to start construction. The second phase of the project will include building a free standing South PIT Tag Electronics Room and repurposing an existing room to become the North PIT Tag Electronics Room. The work will also include the electrical infrastructure to power the transceivers, provide routes for fiber optic links and run synchronization conduits between the transceivers.

Since Phase 2 of the project was projected to last into fall, it was decided to temporarily run the system as a Passive Recapture site. Currently both ladders are powered by extension cords and are not connected to data collection platforms.

Manually collected data is being loaded into PTAGIS as Passive Recaptures, which is a newly defined event type introduced with P4. A Passive Recapture event is one in which a previously PIT-tagged fish is opportunistically detected without being handled, where that detection does not occur at a defined interrogation site or the detection cannot be considered production interrogation data.

Passive Recaptures are currently reported in the **Recapture Detail** and **Complete Tag History Query Builder 2** reports in Advanced Reporting, as well as, in the Complete Tag History Quick Report.

To access the manually collected data, please follow these steps:

Go to www.ptagis.org and log in

1. Launch **Advanced Reporting**
2. Click **New Query Builder 2 Report**
3. Click **Recapture Detail**
4. Set the **Recap Site** to **JDALD1** for detections in the south ladder and/or **JDLAD2** for detections in the north ladder
5. Run the report

All data collected *after* Phase 2 is completed will be available through Interrogation and Complete Tag History reports under the site codes **JO1** (south ladder) and **JO2** (north ladder).

# P4 Version 1.16 Now Available

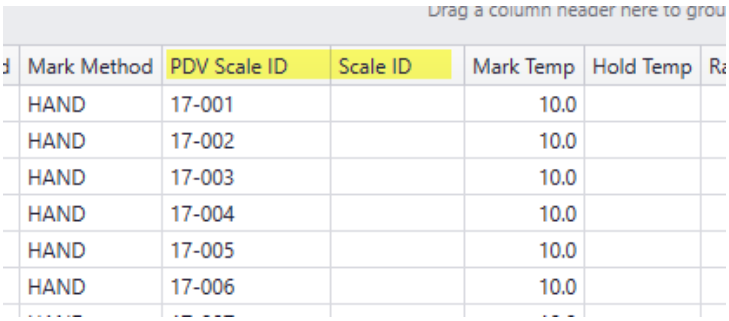
**NICOLE TANCRETO (PTAGIS PORTLAND OFFICE)**

P4 version 1.15 was released on May 24, 2017, with many new features that were requested during the P4 training sessions held earlier this year, along with numerous bug fixes and enhancements. Version 1.16 was released on June 12 and primarily contains bug fixes.

Some of the most-requested features that were implemented in v1.15 are highlighted below. There is also an 11-minute video demonstrating some of these new features. For a detailed list of changes in v1.15 and v1.16, be sure to read the complete P4 release notes.

### New Data Field for Scale Sample IDs

A new field, called Scale ID, has been added to P4 and to the MRR data model. This field is intended to hold a unique identifier for a scale sample taken during a data collection event and will be loaded into the PTAGIS database. If you have added a Project Defined Field named **Scale ID** or **ScaleID**, the field name will be changed when you upgrade to 1.15 to **PDV Scale ID** or **PDV ScaleID**. If you would like to move data from the Project Defined field to the PTAGIS field, you can use the Update Query Results tool in Query Management to do so.


Drag a column header here to grou

| Mark Method | PDV Scale ID | Scale ID | Mark Temp | Hold Temp | Ra |
|---|---|---|---|---|---|
| HAND | 17-001 | | 10.0 | | |
| HAND | 17-002 | | 10.0 | | |
| HAND | 17-003 | | 10.0 | | |
| HAND | 17-004 | | 10.0 | | |
| HAND | 17-005 | | 10.0 | | |
| HAND | 17-006 | | 10.0 | | |

### Auto-Increment Implemented for Genetic and Scale ID

Two new switches are available in the Profile to enable/disable auto-incrementing of the Genetic ID and/or Scale ID fields during data entry. Once enabled, you must seed the starting value in your data entry session. The right-most numeric portion of the ID will be incremented from that starting value. For example, if you enter 17-001 in the first record in your session where a genetic sample was collected, 17-002 will be added automatically to the next record in the session. If you need to skip a record or an ID number, the value can be cleared or edited manually. There is not a way to increment multiple portions of the ID number or to set an upper limit. When the right-most number reaches the top end of its range, it will flip back to zero.

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# P4 Version 1.16 Now Available

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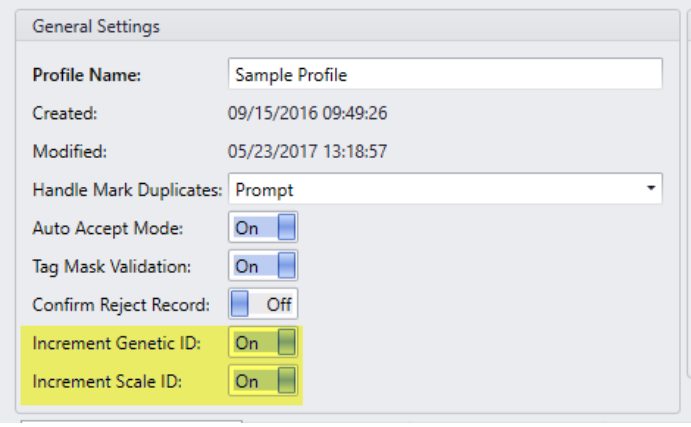
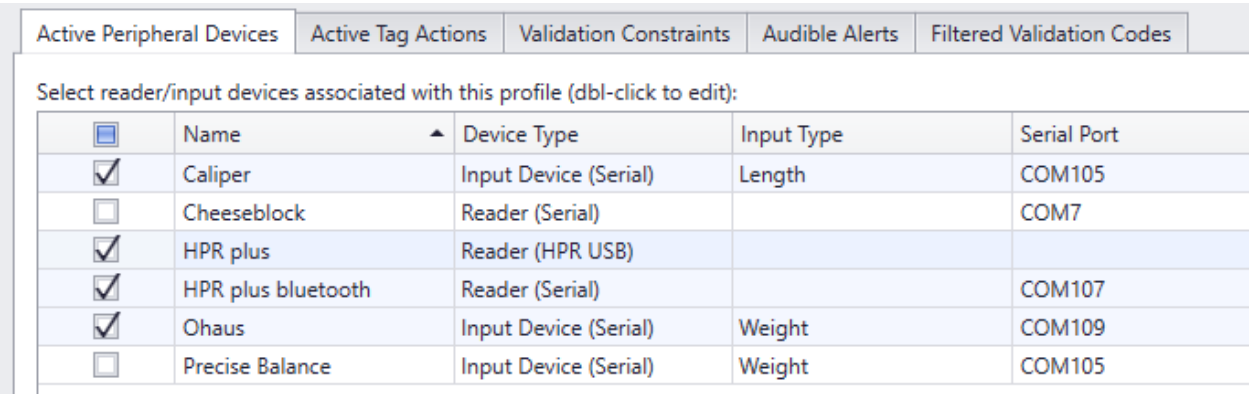



### Support for Multiple Readers and New Peripheral Type

The Balance peripheral type has been converted to an Input Device peripheral. This supports the use of any peripheral that can send information through a serial port, such as digital calipers, to set a value in almost any P4 field. The new Input Device type allows you to specify the type of value it will be sending and the field to which it should be sent.

The Profile has been updated to allow multiple readers and input devices to be active during a data collection session, instead of just one device of each type. Only one digitizer tablet can be active at a time.




### Filtered Validation Code Lists

For those using mouse and keyboard for data entry, you can now filter the validation code lists during data entry. A new tab in the Profile allows you to limit the list of values shown in a drop-down list while a session is open for data entry. The list will be filtered to the values selected in the Filtered Validation Codes tab of the profile, plus any values already contained in records in that session or in the Repeating Value that is active for that session.

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# P4 Version 1.16 Now Available

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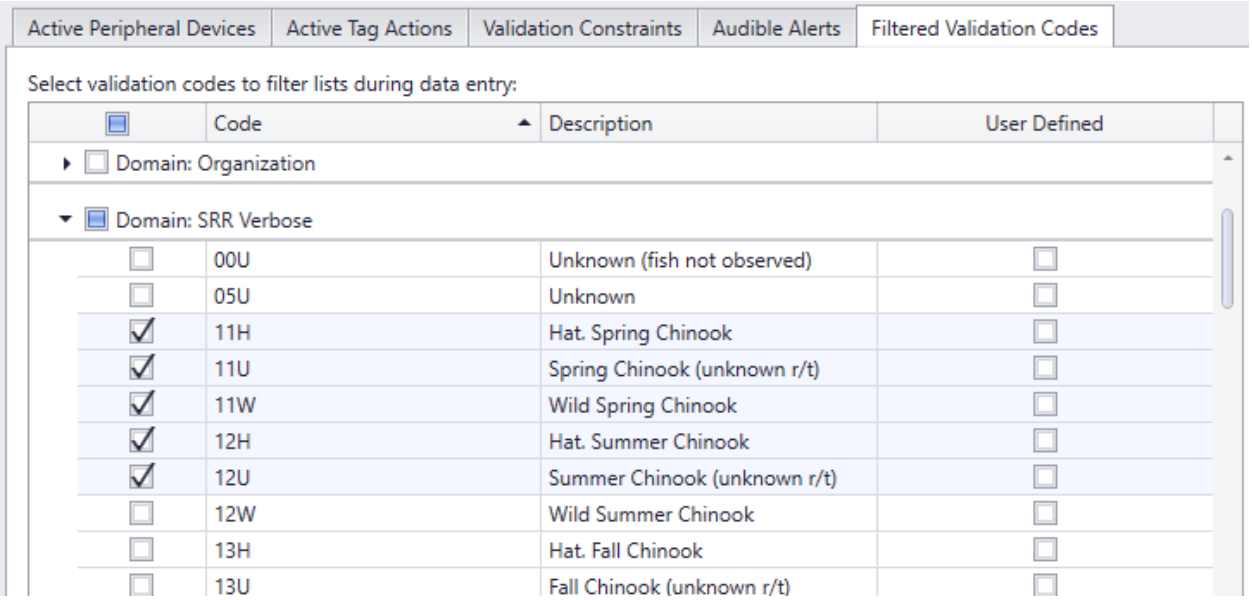


### Set a Password to Restrict Access to Configuration and Management Features

A password can now be set in Utilities (under Manage) to restrict access to any of the features under Configure or Manage. Data entry will be accessible without a password, but modifying the Profile during data entry will require that the password be entered. There are no length or complexity requirements for the password and once set, it will remain in effect until cleared or changed. To reset a lost password, you must contact PTAGIS.

### Export Session to File From Data Entry

A new button added to the data entry tool bar exports the currently open session to file with one click, as long as the default export path has been set in Utilities. Otherwise, the user will be prompted to select an export folder when this button is clicked the first time. A corresponding digitizer command has also been added to support exporting from data entry. Unlike P3, P4 allows exporting of invalid and incomplete sessions to file to support data redundancy and portability.

### Expanded Duplicate Record Search and Correction Tools

The Dot-out button in Record Management has been expanded to allow dotting out all but the first or all but the last duplicate record in a session, and the tag code can be optionally appended to the text comments.

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## P4 Version 1.16 Now Available

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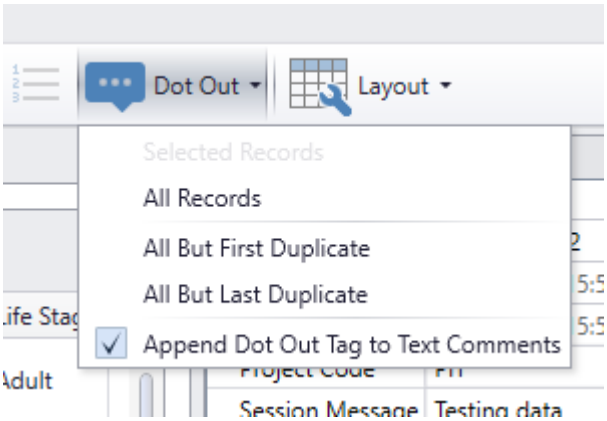
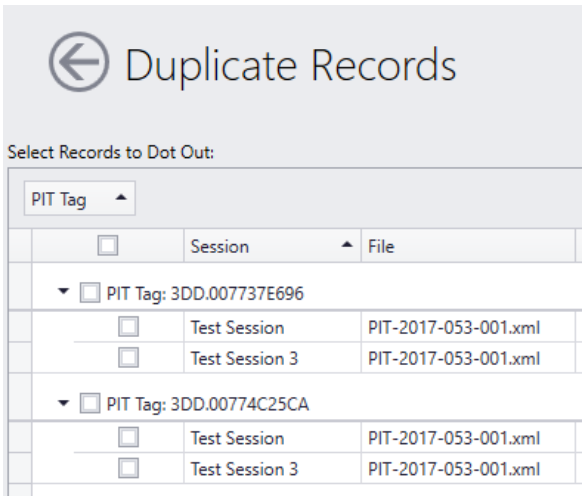



In Session Management, a new Duplicate Record tool has been implemented that will search the entire local P4 database for records that are duplicates of those in the selected sessions. This tool also allows you to correct duplicate records by editing the Event Type or dotting out unnecessary records.




### Excel-style Filtering in Record and Query Management

A new method for filtering has been implemented in Record and Query Management. It allows filtering based on rules or values with a single click on a column header. Filter Rules uses comparison statements, such as Between or Equals, while Filter Values allows the selection of values contained within the selected field.

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# P4 Version 1.16 Now Available

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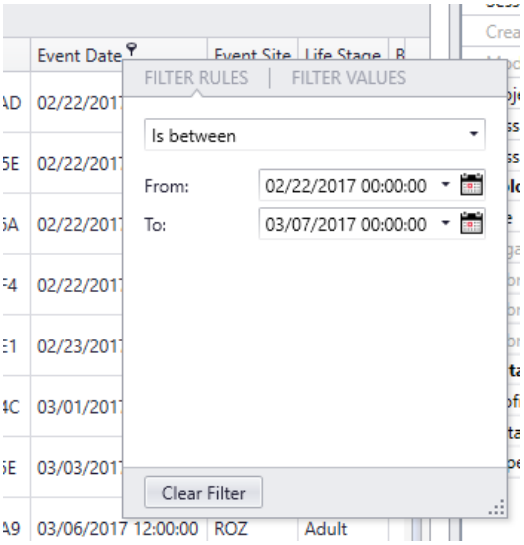
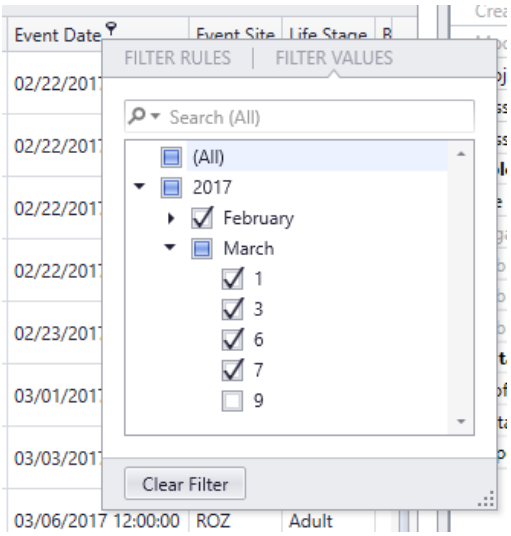
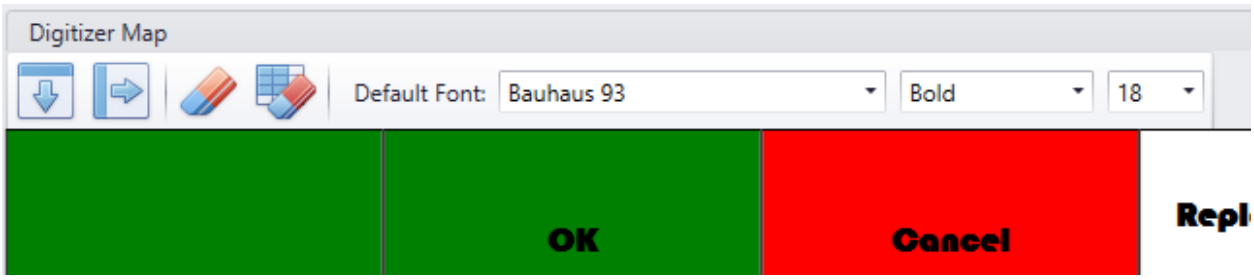



### Changes to Digitizer Maps

The interface for editing digitizer maps has been updated to include buttons for merging, unmerging and clearing command squares. To make a command square larger, simply select it and then click the Merge Right or Merge Down button, depending on the desired size and shape. You can now change the default font for the entire digitizer map, or edit font settings per command square.




If you are upgrading from version 1.13 and use a digitizer tablet for entering data, you may need to check your map to ensure it is still functioning as you expect. Version 1.14 included a change to how the Set Multiple Field Values command handles setting values in comment fields. Please see the news item from April 14 for more details.

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# P4 Version 1.16 Now Available

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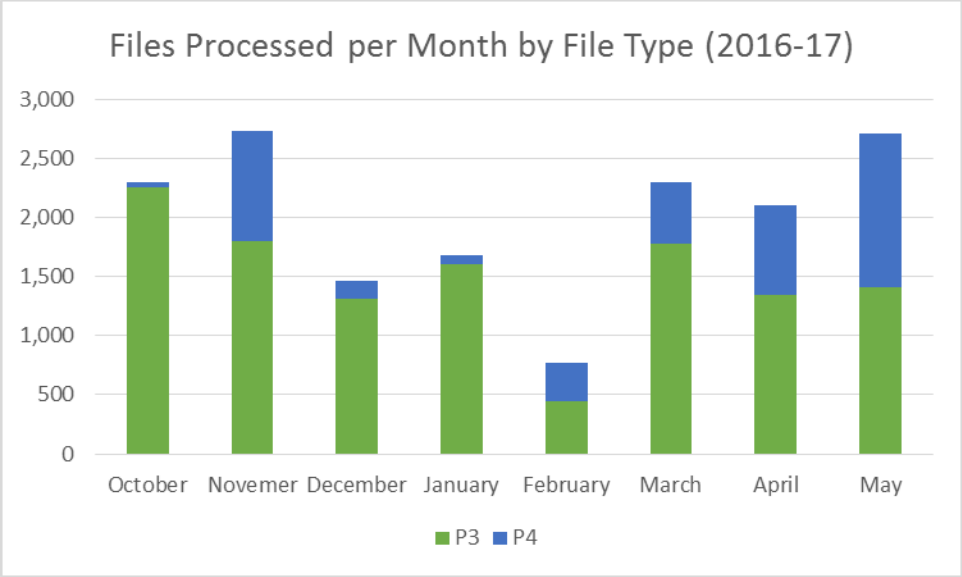
### Installation Improvements

The P4 installer has been improved to help resolve issues that some users have experienced when installing P4. As part of the prerequisite phase, the installer will now check to make sure that your computer does not need to be restarted to complete Windows updates. A warning will be displayed if a reboot is pending, giving you an opportunity to restart the computer before continuing with installation. In the event that the installation fails, the installer will now attempt to gather useful installation log files in a zip file that can be sent to PTAGIS for troubleshooting.

### Community Adoption of P4

These are the 5th and 6th releases of P4 since it went into production last year and demonstrates our commitment to making this software fit the needs of the regional community. We appreciate the feedback from users to help us improve our systems. The usage of P4 continues to grow and we encourage those that have not tried it out yet to do so as we look to retire the legacy P3 tagging software sometime next year.



## P4 Training Events

**JOHN TENNEY** (PTAGIS Portland Office)

Earlier this year staff conducted training sessions for the P4 tagging software at five locations throughout the Columbia Basin in addition to a webinar for those unable to travel. Each session consisted of a four-hour walkthrough of new features in P4 and a guidance for upgrading from the legacy P3 software. The new Mark Recapture Recovery (MRR) data model that provides the foundation of P4 and PTAGIS was also covered. We had over 300 participants attend the training and received positive feedback.

The final P4 training session was held via webinar on February 15, 2017, and was recorded for PTAGIS community members that were unable to make it to any of the training sessions. This video is now available on the video tutorials page (http://www.ptagis.org/support/tutorials); scroll to the bottom of the page to find video **#15 - P4 Training Webinar**.

The video is just over 4 hours in length and contains the following sections:

| *Timestamp* | *Training Section* |
|---|---|
| *000:20* | Introduction |
| *002:28* | New Features and Concepts in P4 |
| *031:16* | Configuration |
| *118:33* | Data Collection |
| *161:35* | Importing Data |
| *177:03* | Data Management and Submission |
| *241:05* | Validation |
| *247:37* | Questions/Discussion |

## New Event Types in Reporting

**NICOLE TANCRETO** (PTAGIS Portland Office)

As described in the P4 help documentation and during the training events earlier this year, P4 uses an explicit Event Type field to assign the type of data collection event for each record. These Event Type designations are now being exposed in the PTAGIS reporting system, along with other data processing driven event types. You will see these in the Complete Tag History Quick Report and Query Builder 2 Report, and in the Recapture and Mortality Detail Query Builder 2 reports. The definitions for these event types are shown below.

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# New Event Types in Reporting

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| Event Type | Definition |
|---|---|
| Mark | The event during which a fish is initially marked with a PIT tag and released (or planned to be released). Only one mark event is allowed for each PIT tag code. |
| Mark Duplicate | Assigned when a file is loaded if a record already exists in PTAGIS with the same PIT tag code and with a Mark event type. |
| Recapture | The event during which a previously PIT-tagged fish is recaptured, scanned by hand, handled and released (or planned to be released). Multiple recapture events are allowed for each PIT tag code as long as the dates are different. |
| Recapture Duplicate | Assigned when a file is loaded if a record already exists in PTAGIS with the same PIT tag code and Release Date (Event Date if Release Date is null) and with a Recapture event type. |
| Recovery | The event during which a previously released PIT tag is recovered from or detected in a dead fish, or is recovered or detected as a bare tag, or is removed from the possibility of being recaptured or detected in the future. Multiple recovery events are allowed for each PIT tag code as some PIT tags, while obviously no longer in a living fish, may be detected multiple times without a physical recovery (e.g. carcass surveys, avian nesting sites). |
| Recovery Duplicate | Assigned when a file is loaded if a record already exists in PTAGIS with the same PIT tag code and Event Date and with a Recovery event type. |
| Passive Recapture | The event during which a previously PIT-tagged fish is detected by unattended or remotely operated detection equipment at a location other than an interrogation site and is not handled. It differs from a Recapture event in that the fish is not handled, only detected. Multiple passive recapture events are allowed for each PIT tag code as long as the dates are different. |
| Passive Recapture Duplicate | Assigned when a file is loaded if a record already exists in PTAGIS with the same PIT tag code and Release Date (Event Date if Release Date is null) with a Passive Recapture Event Type. |
| Observation | The event during which a previously PIT-tagged fish or bare tag is detected at a registered interrogation site. |
| Disown | This event type is assigned to a record that was previously loaded with a Mark event when that record is dotted out or removed from a subsequent version of the original tagging file. |
| Orphan | This event type is assigned to tag if it is reported to PTAGIS as an Observation, Recapture, Recovery, or Passive Recapture before the Mark event record has been reported to PTAGIS. |

# Spillway Ogee PIT Tag Detection System

**STEVE ANGLEA & ALEX ARTYUKHOV** (Biomark)

Biomark, under contract with the National Oceanic and Atmosphere Administration (NOAA) and with funding provided by Bonneville Power Administration (BPA), recently completed a long-term project to develop a system for detecting PIT-tags passing through spill. In 2005, the Northwest Fisheries Science Center (NWFSC) contracted Digital Angel Corporation (DA) to conduct a study to determine the feasibility of developing an antenna that could potentially be used to activate and detect a new Active Passive Integrated Transponder (APIT tag) for long range application. In February 2006, the NWFSC, after visiting DA and observing the recent advances in the Corner Collector project and the new SST passive tag prototype, made a request to change the emphasis of the study from detecting battery operated APIT tags to detecting PIT tags like the SST tag, the predecessor to the current 12-mm FDX-B tag used in the Columbia River Basin. The study concluded that it appeared feasible to develop an antenna system for a spillway application.

In August 2006, NOAA contracted DA to conduct a study to determine the feasibility of developing a PIT-tag detection system for spillways at hydroelectric dams where the water speed is up to and can exceed 70 feet per second (fps). For this application, in the extreme environment of the hydroelectric spillways, Digital Angel, also known as Destron Fearing developed and tested a new high power PIT tag transceiver. Biomark took over management and execution of the project in 2012 and ultimately produced the Biomark FS3001 transceiver. Additional aspects of the project included development of a half-telegram PIT tag and ogee antenna. The half-telegram tag transmits its code in 16 milliseconds (ms) compared to 32 ms required for a standard length telegram. The transceiver and tag tasks were completed in 2016 after multiple iterations of testing and development. Biomark developed a custom power supply for the FS3001 transceiver to provide isolated power to the CPU and antenna circuitry.

Initial antenna tests were conducted at Bonneville Dam. Antenna coils were attached to the trailing edge of a spillway gate in the gate repair pit. Ferrite tiles were used to shield the field from the steel gate and enhance performance of the antenna. Ultimately, it was concluded that this approach was too difficult to implement mechanically due to excessive vibration and it would not work for Removable Spillway Weir or Temporary Spillway Weir types of gates. Later, the ogee surface of a spill bay was selected as a location to establish detection. Antennas would be placed in a trench that was approximately 5 ft deep x 5 ft wide and spanned the 50 ft spill bay, detecting PIT tags traveling up to 70 fps as they pass over the antennas. Biomark developed an upright antenna that met the performance goals, but the approach of a deep trench mined out of the ogee was deemed too costly.

In 2016, at the request of NOAA and the US Army Corps of Engineers, Biomark developed a “flat plate” style antenna that had an overall height of only 12 inches and detection range of 50” at the center of the antenna. Biomark produced seven prototype flat plate antennas and seven FS3001 Ogee transceivers. Use of a flat plate antenna eliminated the need to mine concrete from the ogee and greatly reduced project cost. The final antenna would be placed on the ogee surface and secured by adding a layer of non-ferrous concrete to the ogee.

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# Spillway Ogee PIT Tag Detection System

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This approach allows installation without any excavation, as the ogee surface is going to be raised by only 18 inches in the area of the antennas. The complete system (i.e., transceivers, antennas, and tags) was tested at the NOAA Fisheries Pasco Field Station in the fall of 2016. The Pacific States Marine Fisheries Commission (PSMFC) developed, constructed, and operated a pneumatic tag shuttle to allowing testing of standard and half-telegram tags traveling at speeds in excess of 70 fps. Testing was also conducted to determine the minimum separation required between antennas in a row and between rows as the antennas will be scanning continuously.

Testing of the complete system in the fall of 2016 demonstrated the effectiveness of the complete system: reader, tag, and antenna, and now the effort shifts to implementation. NOAA Fisheries and the PSMFC will continue testing of a completed prototype antenna to evaluate the influence of the proposed concrete mix on system performance and EMI in the vicinity of Spill Bay 1 at Lower Granite Dam. The current schedule is to install the ogee detection system, which will consist of 11 antennas arranged in three rows, at Lower Granite Dam in the winter of 2018-2019 in time for the spring 2019 outmigration.


Figure 1. Biomark FS3001 transceiver. ogee

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# Spillway Ogee PIT Tag Detection System

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Figure 2. Yuri Smirnov measuring read range of initial ogee antenna.

Figure 3. Pneumatic tag shuttle and prototype flat plate antennas.

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# Spillway Ogee PIT Tag Detection System

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Figure 4. Completed ogee antenna and external aluminum shield.