



PIT Tag Information System

Columbia Basin

Newsletter

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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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P4 Tagging Software Production Release

JOHN TENNEY (PTAGIS Portland Office)

PTAGIS is very pleased to announce the production release of P4, our fourth-generation field tagging software. P4's rich set of data collection and management features are designed to support a variety of scenarios within the Columbia Basin by utilizing the new Mark, Recapture, Recovery (MRR) data model. Sporting a modern user interface, P4 runs on the latest Windows PCs, supports popular peripheral devices, and can be downloaded from the PTAGIS website: <http://www.ptagis.org/software/p4>

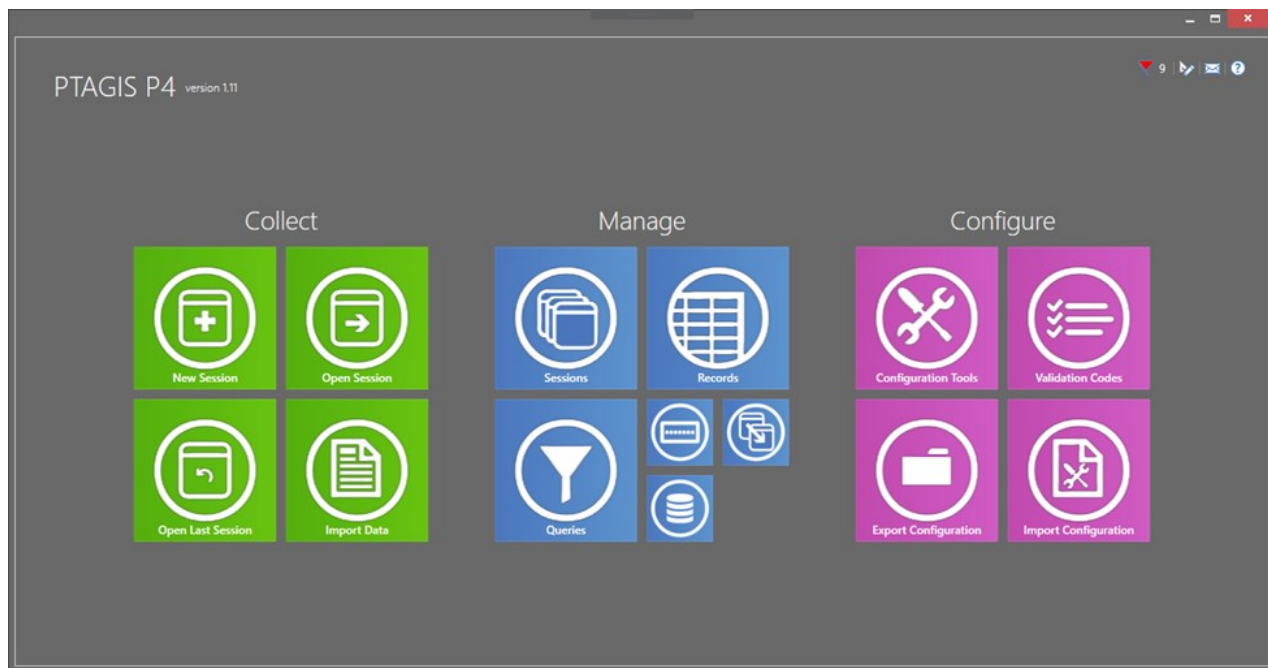


Figure 1. P4 Dashboard

Articles in this issue of the PTAGIS newsletter will further introduce this highly customizable software and the new MRR data model:

- [New Features in P4](#): presents a summary of P4 features that will most likely be new to those already familiar with P3.
- [Getting Started](#): describes how to import data and configuration from existing P3 installations into P4.
- [Overview of MRR Dataset](#): provides an overview of the new data model and highlights new fields that were requested by researchers to provide additional scope to their studies and to tie research to other fishery databases.
- [Event Type Overview](#): describes the core field data collection events captured by P4.
- [Dates and Times in P4](#): users can input their local date and time regardless of time zone or if daylight savings is in effect. P4 and the PTAGIS server will ensure standardization across the region.

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P4 Tagging Software Production Release

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The P4 installation includes basic context-sensitive help, which can also be [downloaded](#) from the PTAGIS website. Additional guidance such as online video tutorials, webinars, and live training events will be announced via the notification system embedded into P4 as well as subsequent emails to the community.

P4 is a replacement of the P3 tagging software that has been serving the community well during the last 16 years (a remarkable lifetime for any software system). Existing P3 tagging data files can be imported, modified and uploaded to PTAGIS using P4 to make use of the new MRR data model. Data contributors can continue to use the existing P3 tagging software to collect and submit data to PTAGIS but they will be restricted to the legacy data model. Support for P3 and the legacy data model will continue for another year.

The release of this software caps a multiyear effort led by the PTAGIS staff and the PIT Tag Steering Committee to evolve the technology of this 27-year program in order to meet the current and future needs of the research community. A lot of effort has gone into testing this software and the related database server systems to ensure data integrity, compatibility and overall performance. We see this release as a starting point for further refinement and, as always, we welcome your feedback.

New Features in P4

NICOLE TANCRETO (PTAGIS Portland Office)

Some of the new and enhanced features included in P4 are described below.

New MRR Dataset

PTAGIS has implemented a new MRR (mark/recapture/recovery) dataset model for P4 that allows each individual record in a Session to have different values for most of the standard PTAGIS fields. This allows for sessions with multiple Release Sites and/or Release Dates, for example.

See the [MRR Dataset article](#) for more information.

Data Entry Features

For those that don't need to have unique information for each record, there are tools available to fill in the fields that will have the same values across all records. Repeating Values allow you to set the values that will go in each record as it is created, or can be used to complete information post-data collection.

The Data Entry Form (Figure 2) in P4 can be customized by creating a custom Data Entry Layout. Fields can be added or removed to the data entry form and/or rearranged as needed.

Explicit Event Types

One of the new fields in P4 is called *Event Type* and it is required to be completed for all records. This field is used to specify the type of data collection event that generated the record, whereas in P3 all records were assumed to be mark events unless a specific Conditional Comment code was included to denote otherwise.

See the [Event Types article](#) for more information.

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New Features in P4

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SRR Code	Recoveries	Recaptures	Dot Outs	No PIT Tags	Marks	Totals
(11H) Hat. Spring C...	0	35	0	0	575	610
(11W) Wild Spring C...	0	1	0	0	136	137
(25H) Hat. Coho	0	2	0	0	108	110
(25W) Wild Coho	0	0	0	0	2	2
(32W) Wild Summer	0	1	0	0	11	12
Total:	0	39	0	0	934	973

Figure 2. P4 Data Entry Form

Explicit Date Time Values

PTAGIS expected that all date/time values submitted in P3 data were entered in Pacific Standard Time, which is the PTAGIS standard for timestamps. P4 uses a more precise data structure such that the value always unambiguously identifies a single point in time regardless of the local time zone or if Daylight Saving Time is in effect. All times in P4 will be entered and displayed in local time as indicated by the field computer's system settings, but stored with the time zone offset. This will allow PTAGIS to display all timestamps in Pacific Standard Time in the reporting system.

Please see the [Dates and Times in P4 article](#) for more information.

Customizable User Interface

Different themes can be applied to P4 to change the colors of backgrounds, text, and other user interface elements. Data Entry, Record Management, and Query all support dockable panels, which allows the elements to be minimized, closed, and rearranged to suit your requirements.

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New Features in P4

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Project Defined Fields

While P3 included a single field (Additional Positional) that could be used for storing project specific data, P4 allows the creation of up to 10 session-level and 10 event-level Project Defined Fields. These fields will not be loaded into PTAGIS, and will only be available in the P4 installation in which they are created. If multiple computers need to use the same fields, there are tools for importing and exporting the field definitions.

Enhanced Validation Tools

P4 includes powerful real-time validation which always runs in the background while data is being collected to check the validity of tag codes and ensure the minimum required fields are being completed. This standard real-time validation can be augmented by the user by setting up customizable Validation Constraints based on species-run-rear type.

Post-data collection validation has been enhanced significantly in P4. Whenever a Session is validated, field requirements and domain limits will be checked. Any validation failures will be reported in detail to allow the user to more easily locate and correct potential errors. Custom Validation routines can also be created by the user to enhance the standard PTAGIS validation checks.

Data Management Tools

Robust data management tools are available in P4 for post-data collection editing. Most of these are available in Record Management, where Sessions can be opened into a tabular view and records can be edited individually or in groups. There are also tools for editing records across multiple Sessions, such as dotting out records based on a tag list or updating values from a session.

In addition to the powerful editing tools, P4 includes a flexible Query tool that allows complex queries of all data in the P4 database to be constructed and saved for future use. The query results can be exported to Excel or delimited file formats.

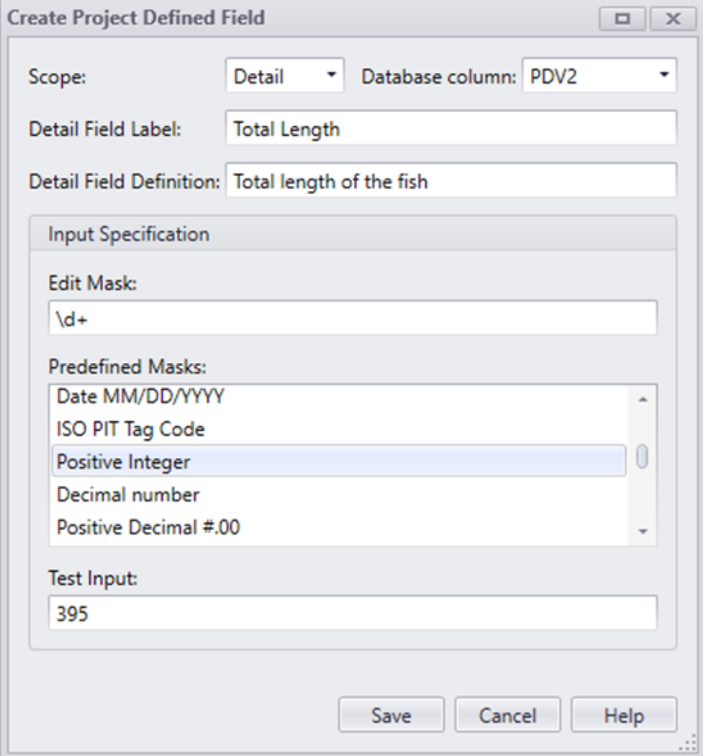


Figure 3. Project Defined Field Editor

Getting Started with P4

NICOLE TANCRETO (PTAGIS Portland Office)

This article gives an overview of getting started using P4, with a focus on transitioning from P3.

For more information, view the context sensitive help system included with P4 by clicking the Help button on the dialog or page for which you need more details.

Installation

P4 can be installed alongside P3 as long as the computer meets the following requirements:

Operating System: Windows 7 or higher

Available Hard Drive space: 6GB

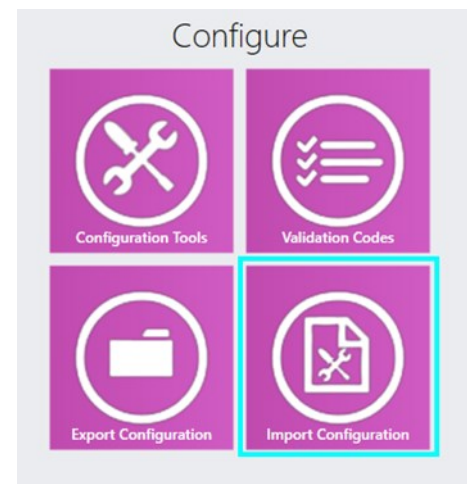
Installation requires administrator rights, but once installed it can be run by any user who has an account on the computer or domain. There are two prerequisites included with the P4 installer: SQL Server Express 2014 and .NET Framework 4.6.1. If one or both of these do not exist on the computer, these prerequisites will be installed by the P4 installation executable.

The P4 installation executable can be downloaded from the [P4 software page](#). While there, you may also want to download the [PDF version of the help](#) system and take a look at the [release notes](#).

Importing P3 Configuration Settings

When moving from P3 to P4, many of the P3 configuration settings can be imported directly from the **P3.mdb** database file. The imported configuration tools will likely need to be edited before using P4, but importing will jumpstart the configuration process for you.

1. Click the **Import Configuration** tile on the main P4 dashboard
2. Click **the Open P3 Files** button and select the **P3.mdb** file from which you wish to import (ensure the **secured.mdw** file is located in the same directory)
3. Configuration tools that are available to import will be displayed on the next page (check this [FAQ](#) if it appears to be empty)
4. Use the checkboxes to select the tools to import – if any related tools exist those will also be selected for import
5. View the Import Configuration help topic for more details



Note: templates and default repeating comments from P3 will be imported as Repeating Values.

Once the import has completed, go back to the P4 dashboard and click the **Configuration Tools** tile to view and edit the imported tools.

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Getting Started with P4

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Peripheral Devices

Start by checking that imported peripheral devices are configured and communicating with P4 correctly. The Test Terminal (Figure 4) allows you to open a connection to the device, view raw data as it is received by P4, and the values that are parsed from it. Readers can be set up to communicate with P4 via serial, USB, or Bluetooth connections.

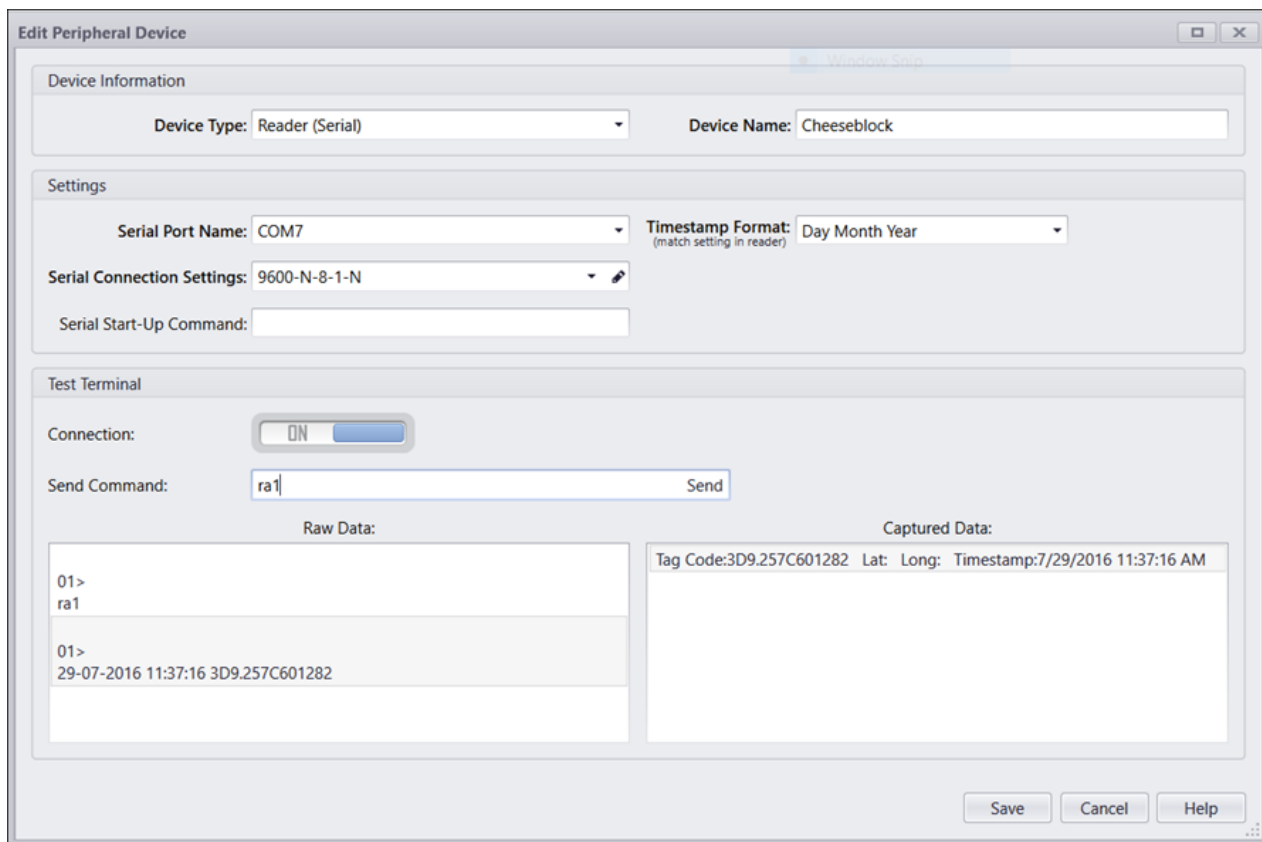


Figure 4. Peripheral Device Editor for a Serial Reader.

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Digitizer Maps

Imported digitizer maps need to be reviewed, edited, and calibrated before use. Some commands that were available in P3 are no longer available in P4. These will show on the imported map with the text NOT SUPPORTED. To edit a command square, click to select it and use the Selected Command Details to edit it (Figure 5).

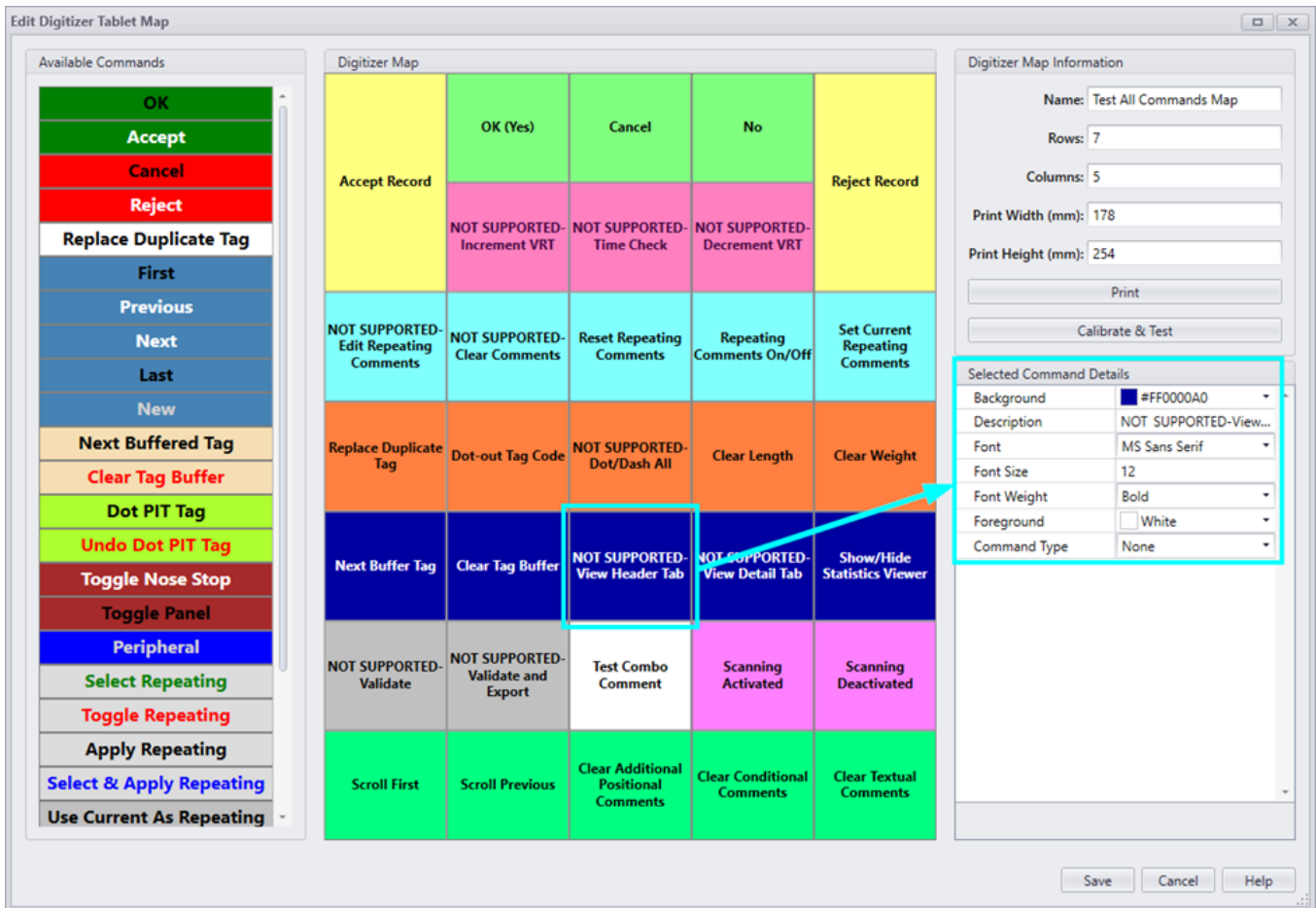


Figure 5. Edit Digitizer Map

Repeating Values

If you used templates or default repeating comments in P3, they will be imported into P4 as Repeating Values, and will likely need some editing before use. If you did not use them in P3, you may want to create one or more sets of Repeating Values to fill in the values that repeat across all the records in a Session. Repeating Values also allow you to use the computer clock as the timestamp for Event Date and Release Date.

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Getting Started with P4

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Profile

Check imported Profiles to make sure they reference the correct peripheral devices and to set up the New Session Default values. You may want to enable Tag Mask Validation, as well, so that operators will get notified of any tag misreads.

Tag Actions and Tag Lists

Tag Actions from P3 are split into Tag Actions and Tag Lists upon import. These have been separated to allow reuse of Tag Lists in other areas of P4. Tag Lists can be imported from files or readers, created from Sessions in P4 or created from Queries in P4. They can also be used to dot-out records across Sessions.

Data Entry Layouts

New to P4 are custom Data Entry Layouts, which allow the data entry screen to be customized to the needs of the project. The default data entry screen (Figure 6) can be edited to rearrange, remove, or add any field available in P4, including Project Defined Fields.

Create Data Entry Layout

Layout Name: New Data Entry Layout 1

Initial Field: Length

SRR Tag:

SRR Verbose:

Length: Weight: Event Type:

Conditional Comments:

Text Comments:

Save Cancel Help

Figure 6. Create Data Entry Layout

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Getting Started with P4

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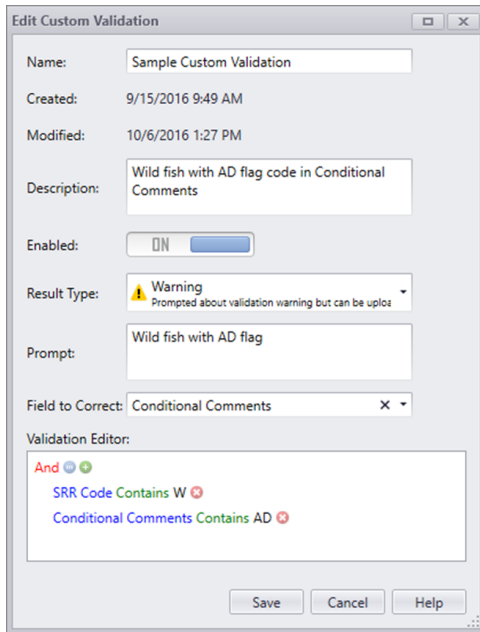


Figure 7. Custom Validation

Project-Defined Fields

Project defined fields are customizable fields for project-specific needs. It is possible to define up to 10 Session and 10 event fields. They can be used during data entry and the values will be stored in P4 alongside the standard PTAGIS fields, but they will not be loaded into the PTAGIS database. The one project defined field that was available in P3, Additional Positional Comments, is included in the original P4 installation by default.

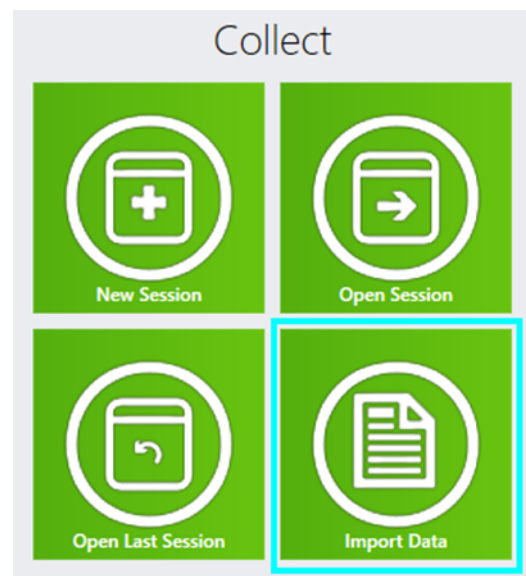
Custom Validation

Also new to P4, Custom Validations (Figure 7) allow you to define conditions that will trigger an error or a warning when a Session is validated post-data collection. This gives you the opportunity to look for inconsistencies in the collected data prior to submission to PTAGIS. If you are looking for custom real-time validation during data entry, use the Validation Constraints tab in the Profile.

Importing P3 Data

P3 data can be imported into P4 from both tagging files and the P3.mdb database file. P3 files can be corrected with P4 files, but once a P3 file is corrected with a P4 file, the P3 file can no longer be submitted to PTAGIS. To successfully correct a P3 file with a P4 file, the Legacy File Name field must contain the P3 file name to be corrected.

1. Click the **Import Data** tile on the main P4 dashboard
2. Click the **Open P3 / P4 Files** button and select one or more tagging files or P3 database files
3. After the files are parsed, a preview of each available session will be displayed
4. To import the sessions into a folder, either select an existing folder from the drop-down list or enter a new folder name to create one
5. Use the checkboxes to select the sessions to import and click the Import button



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Collecting Data

To create a new session and open it for data collection, click the New Session tile on the main P4 dashboard. The first time you do this the New Session Properties will be blank, except for the Session name field. At this point you have some choices:

1. Create the Session with no Session Properties specified
OR
2. Select a Profile and then create the Session

If you use Option #1, the Session will be unable to connect to any devices and will not use any of the Configuration Tools you may have imported or created. It will also have blank values for the required Session fields (Project Code, File, and Session Message) and will not use any of the Configuration Tools you may have imported or created. You will be able to enter data using a mouse and keyboard and significant post-data collection editing will be necessary to complete the Session for submission to PTAGIS.

If you use Option #2 you will be able to use the Peripheral Devices, Validation Constraints, Tag Actions, and Audible Alerts configured with the selected Profile. If the selected Profile also has the New Session Default section completed, those values will be used to fill in the Session Property Values here. If the Profile does not have any values set for the New Session Defaults, you can enter them manually before you create the session allowing you to specify a set of Repeating Values, a custom Data Entry Layout, etc.

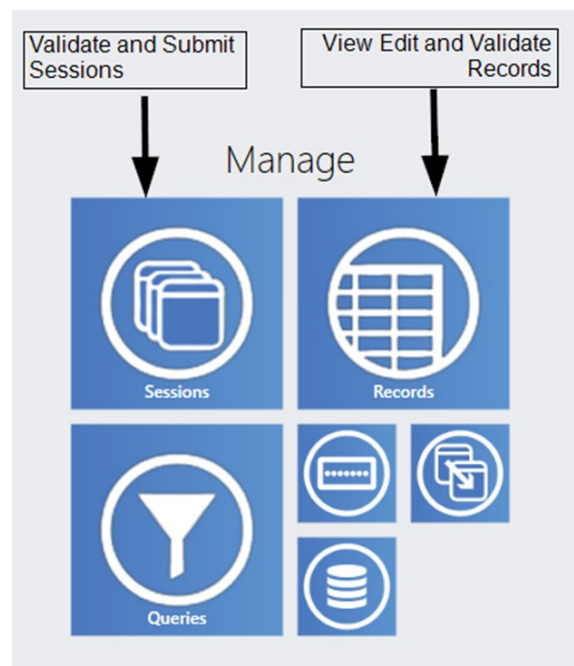
Whichever option you use will be remembered the next time you create a Session.

Managing Data

The data management features in P4 have been enhanced significantly from what was available in P3, and will not be described in detail here.

To get started, you need to know that once a Session has been created by importing or collecting data, it can be viewed, edited, and validated in a tabular interface in Record Management. To submit Sessions to PTAGIS, go to Session Management. A few things to note about submitting data to PTAGIS:

- There is no limit on the number of Sessions that can be submitted at one time
- Sessions are validated automatically when submitted and if any validation errors are found in any of the selected Sessions, the submission will be canceled until the errors are corrected, or those Sessions are omitted from the submission



Event Types Overview

NICOLE TANCRETO (PTAGIS Portland Office)

PTAGIS has always been centered around an event data model, but with P4 we have refined the events which can be reported to PTAGIS. The Event Type of a record determines the minimum required fields that must be completed for that record and is used to determine if a record is a duplicate or not.

Because it is central to the real-time validation that occurs during data entry, Event Type must be completed before a record can be *Accepted*. An often requested feature is now supported in P4: the ability for a single Session to contain both a mark and one or more recaptures of the same PIT tag.

The Recovery event is taking the place of mortality events. Due to the long life of PIT tags, there can be multiple opportunities to find or detect a PIT tag after the fish in which it was implanted has died or shed the tag. After considering these nuances, a new definition for recovery events was crafted which allows for multiple recoveries of a single PIT tag.

A completely new event type is the Passive Recapture, which was created to explicitly record when a fish has been detected at a location other than an interrogation site, but not handled. This could be from a temporary or experimental instream antenna array, or roaming surveys with an antenna on the end of a pole, for example.

Finally, the Tally event was created to facilitate data collection on fish that will not be marked with a PIT tag. Tally events are only stored in P4 and will not be loaded into the PTAGIS database.

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. If additional mark events are submitted for the same PIT tag code, they will be categorized as Mark Duplicates during the loading process.
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 Event Dates are more than 5 minutes apart. If an additional recapture is reported with an Event Date within 5 minutes of a previously reported recapture for the same tag, it will be categorized as a Recapture Duplicate during the loading process.
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). A recovery event that is reported for the same PIT tag with an Event Date within 5 minutes of a previously reported recovery event will be classified as a Recovery Duplicate during the loading process.
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. It differs from an interrogation record in that the detection occurs opportunistically in a location that is not a registered interrogation site. Multiple passive recapture events are allowed for each PIT tag code as long as the events are more than 5 minutes apart.
Tally	The event during which an un-tagged fish is sampled or counted without being marked with a PIT tag. Tally events must have 10 dots as the PIT tag code and will be ignored when submitted to PTAGIS for loading.

MRR Dataset Overview

NICOLE TANCRETO (PTAGIS Portland Office)

The MRR (mark recapture recovery) data model describes the new data structure that is used in P4 and the PTAGIS database. The structure has been flattened to allow for more flexibility for submitting mark-release, recapture and recovery data to PTAGIS. A simplified view of the relationship between Session and Event records is shown in Figure 8.

The Session is a container for a set of event records. With P3, the Session container was limited to events collected at the same location on the same date. With the MRR data model, you can decide the limits of the Session container. It can contain records for one day of tagging at a single location, or it can contain records for an entire year of tagging at many different locations, using different capture methods.

Allowing this type of flexibility comes with a few challenges, primarily the need to enter the same value in many records across a Session. In P4, this challenge has been addressed with Repeating Values. Repeating Values are analogous to repeating comments in P3, except that they can be saved for use across tagging sessions and they can be used in post-data collection editing. If you decide that your Sessions will contain all the tagging at a single trap location for a single season, then the Event Site, Release Site, and Capture Method values (among others) will be the same for all records in that Session. You can create a Repeating Value that has all the field values which will be the same across the Session. It can then be enabled during data collection to automatically fill in those values as records are created for each new fish that is sampled. The same Repeating Value can also be used to fill in empty values after data collection, if necessary.

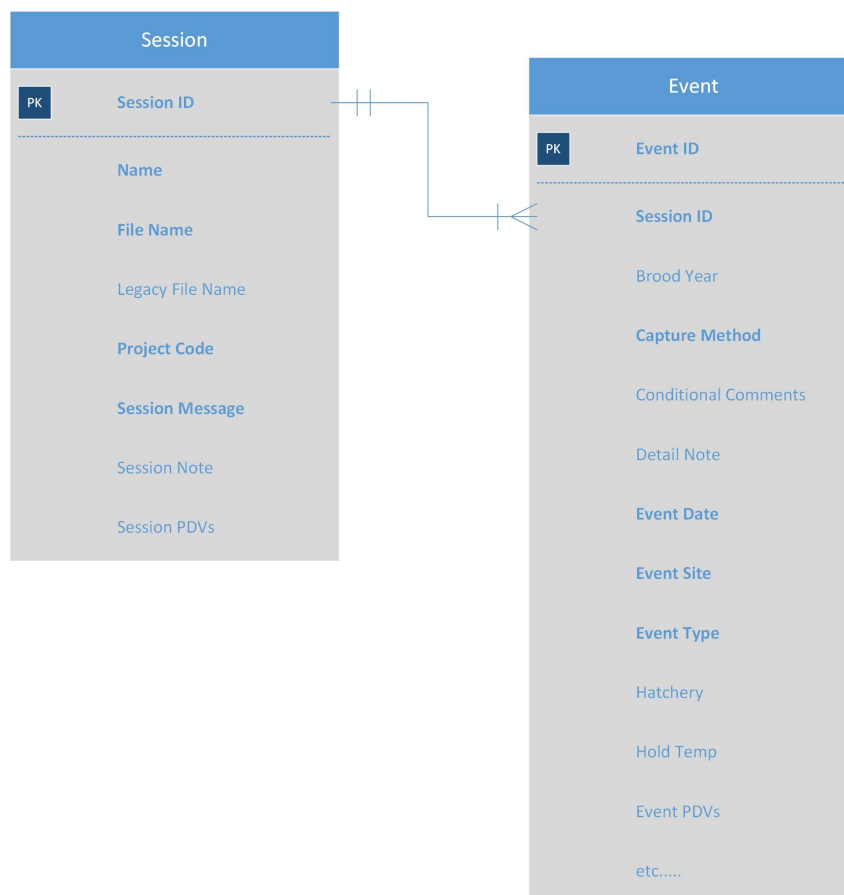


Figure 8. Simplified MRR dataset model.

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MRR Dataset Overview

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In addition to this restructuring of the data model, proposed expansions to the PTAGIS dataset were reviewed and approved by the PIT Tag Steering Committee. New fields have been added to the dataset and some changes have been made to existing fields. Fields newly available to use:

- Acoustic Tag
- Coded-Wire Tag
- Event Type
- Genetic ID
- Latitude
- Longitude
- Lat/Long Source
- Life Stage
- Other Tag
- Radio Tag
- Second PIT Tag
- Spawn Year

Changes to existing fields:

- Detail Note will now be loaded into the database from P4 files
- Session Note will not be loaded into the database from P4 files
- Tag Site has been changed to Event Site
- Tag Date has been changed to Event Date
- Release RKM has been changed to RKM Ext and only stores the final distance measure

Validation requirements have also been refined based on Event Types. For example, Mark Method is only required for Mark records and will be ignored if specified for all other event types. A complete list of the session and event fields available in the MRR dataset, along with their definitions, domains and requirements by Event Type can be found in **Appendix A** of the [P4 help document](#) and will be included in a new specification document along with details about the XML file structure.

Dates and Times in P4

DANIEL WILSON (PTAGIS Portland Office)

All timestamps entered into P4 are stored with an offset that represents the time zone in which an event took place. This offset, which comes from the current PC's time zone setting, is used to accurately capture when events occur regardless of location. Simply enter the local date and time into P4, and PTAGIS will automatically convert it to Pacific Standard Time (PST) for reporting purposes.

The convenience of using the date time offset can present a complication: P4 displays timestamps relative to the current system time zone setting, which may not be the same time zone setting that was in use when an event was recorded. While the original timestamps are preserved, they will appear to be different when viewed from a different time zone.

For example, if an Event Date of 11/1/2016 11:25:00 is entered while in Mountain Daylight Time (MDT), viewing this record in P4 while in Mountain Standard Time (MST) would display the same Event Date as 11/01/2016 10:25:00. This relative time shift is also observed when importing and exporting Sessions between computers that are using different time zone settings.