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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A Fisheries Data Project of the Pacific States Marine Fisheries Commission

IN THIS ISSUE

Destron-Allflex-Biomark
New Alliance for the Fisheries Community

SANDY DOWNING (NOAA Fisheries)

Over the years, the company name has changed frequently for the people who have developed and manufactured the transceivers and tags that the fisheries community has relied on for collecting data from PIT-tagged fish. For example, the name changed from Destron Identification Devices Inc. to Destron Fearing to Digital Angel and then back to Destron Fearing. However, a more significant change occurred in July 2011. At that time, Destron Fearing was bought by its competitor Allflex Corporation. Allflex has intermittently over the past 15 years sold products in the fisheries market and they finally decided to enter it in a more serious way in 2010. At that time, they started to design a new transceiver board and tag for the fisheries market and also bought an interest in Biomark Incorporated. Allflex realized the strength of the engineering staff employed by Destron and wanted to have them continue to develop products for the fisheries community. Therefore, the core of the engineering staff is still working together in Minnesota; however, they are now employees of Biomark. Consequently, Biomark has expanded the roles it serves in the fisheries community. It is now responsible for developing and manufacturing the products in addition to its more traditional tasks of designing and installing PIT-tag systems; providing fish marking services; and selling PIT tags and related accessories

The change in the alliance of these three companies means that tags and transceivers we buy will now be exclusively marketed and sold by Biomark. For instance, a new transceiver that Destron had been working on for the past year was finished in October and is now available. It will be sold as the Biomark FS2020. Any models of Destron PIT tags and transceivers will also now be sold under the Biomark brand name.

The FS2020 was designed to replace the stationary transceivers at the dams. Currently, it will work better than the FS1001A transceivers with large antennas and with longer cables (>100'). PSMFC installed these transceivers at the new Lyle Falls site where they needed 175-200' cables and antennas that measured ~3' by 10' (wire dimensions). PSMFC will be installing 20-30 FS2020 transceivers at numerous locations before the 2012 season, so that they and NOAA Fisheries can evaluate the performance of the transceivers under normal operating conditions. During this evaluation, the FS2020 will primarily be set to detect the full-duplex (FDX-B) tags (e.g., the SST-1 tags) that are used predominately by the fisheries community. However, unlike stationary transceivers developed and manufactured by Destron in the past, the FS2020 can also be set to detect both FDX and HDX tags.

See page 3 for an announcement by BPA on FDX tags.

See page 5 for a discussion of HDX tags.

See page 8 for a brief description of the 2020 transceiver.

PIT Tag Types Available to BPA Researchers

SHARON GRANT (Bonneville Power Administration)

PIT Tag Types

This fiscal year's PIT tag availability to Bonneville Power Administration (BPA) contracts include:

- Destron Fearing 12 mm SST-1 tag
- Pre-loaded 12 mm SST-1 tag
- Destron Fearing 9 mm tag
- (**NEW**) Pre-loaded 9 mm tag
- (**NEW**) Upon request, a 23 mm tag will be ordered as needed

Use PTAGIS' Tag Distribution System (TDS) (http://www.ptagis.org/tpw/login.htm) to place your requests. As the 23 mm tags are not currently listed on the TDS form, please contact Sharon Grant (sdgrant@bpa.gov; 503-230-5215) with your request or with any other questions.

PIT Tag Steering Committee

The PIT Tag Steering Committee (PTSC) wants the fisheries community and tag manufacturers to know that it needs to approve any FDX-B or HDX tag models that will be detected at sites where the data will be stored in the PTAGIS interrogation files. To get approval, a tag manufacturer needs to send a letter to the PTSC to indicate its interest in having its tag tested for approval. PTSC is considering a request to PTAGIS that it remove any tag records in its tagging or interrogation files from unapproved tag models.

PTAGIS Staff Update

JOHN TENNEY (PTAGIS Portland Office)

Dave Marvin & Nicole Tancreto

Dave Marvin, the PTAGIS Information Coordinator, retired from PSMFC April 1st of this year. To say the least, Dave was a principal part of the PTAGIS program and we wish him all of the best in his next endeavors. Nicole Tancreto, PTAGIS Data Management Specialist, has proven to be very capable taking over Dave's tasks relating to separation-by-code, data management, quality control, and technical coordination. She is also leading the development of web-enabled workflow to manage the separation-by-code approval process (see the related article in this newsletter). This workflow was requested by FPAC to make this activity more transparent to the community.

Sebastian Dudek

Last month Sebastian Dudek joined the PTAGIS team in Portland filling a vacant software engineering position. Some of you may already know Sebastian: he was a former PSMFC employee developing software in association with the USFWS LSRCP project a few years back. His primary responsibilities are developing and maintaining the next-generation PTAGIS web site. We are fortunate to find a programmer already familiar with PTAGIS and the nuances of developing software for a user base consisting primarily of fishery biologists. We are looking forward to leveraging Sebastian's talents in programming geospatial applications in our new server environment.

Doug Clough

On a sobering note, we are very relieved that Doug Clough, a principal consultant to the PTAGIS program, miraculously survived an airplane crash at the Reno air races last month. He was one of the spectators at ground zero and sustained non-life threatening injuries to his arms and hands requiring surgery and physical therapy. Doug has worked behind the scenes architecting and implementing much of the current database and related server systems over the last 15 or so years and has been providing on-going system maintenance and technical guidance. Just before he left on vacation for the air race he and Craig White completed a significant milestone in the server system upgrade allowing for the synchronization of data between the current system and the next generation database server. PTAGIS staff members have absorbed Doug's system maintenance duties and we remain in constant contact with him while he is convalescing at home.

Kennewick O&M Staff

Don Warf and the rest of the Kennewick O&M staff had a busy year. In addition to on-going operations and maintenance duties at interrogation sites maintained by PTAGIS, the staff has been keeping up with additional technical coordination workload including the installation of new interrogation sites on the Klickitat River, providing technical support for the BPA RFO Tag contract and the evaluation of the new Biomark FS2020 transceiver.

HDX Tags - Transition from Industrial to Animal Encoding

SANDY DOWNING (NOAA Fisheries), **JOHN TENNEY** (PSMFC), **WARREN LEACH** (Oregon RFID)

In the Columbia River and Willamette Basins, both full duplex (FDX) and half duplex (HDX) PIT-tag technologies are used effectively to yield important data on tagged salmonids and lamprey. Within these basins, Chinook salmon and steelhead are the species primarily tagged with FDX-B tags while bull trout and lamprey are the species primarily tagged with HDX tags. The decision to use HDX or FDX-B technology is outside the scope of this article, but we will provide a brief comparison. It is important to note that because the smallest HDX tags available prior to 2011 were 23-mm by 3.85 mm, FDX technology was the only one considered when PIT-tag systems were developed for the main-stem hydroelectric facilities. It would be inconceivable to consider tagging wild Chinook salmon smolts with a tag that large.

Both HDX and FDX-B are passive tags that require power at 134.2 KHz from a transceiver's antenna to operate. One of the main differences between these two technologies is how the tag message is transmitted to the transceiver. With HDX technology, the energy from the field is stored in a capacitor and then when the activating field is switched off, the tag transmits its code to the transceiver. A simplified description of the cycle with HDX transceivers is that the activating field is turned on for 50 msec and then turned off for 20-50 msec; consequently, a tag is read 10-14 times/second. With FDX-B technology, once the tag has received sufficient power to turn on its computer chip, the tag starts to modulate the field. In other words, the activating field is constantly on and the transceiver needs to interpret how the tag modulates the field to produce a tag code. As a result, once the tag is modulating, the tag code is repeated and if the field is strong enough, the tag is read up to 31 times a second. Under certain conditions (e.g., high flow or separation-by-code activities), the faster detection possible with the FDX tag is critical, but for many applications either technology would be successful.

The HDX technology has worked well for bull trout and lamprey because they are slower swimmers, few of them are tagged, and the technology allows for extremely large and simple antennas to be utilized. For example, a single HDX antenna can span a medium to large size river (50-200' wide) while the longest FDX antenna currently used for instream research is typically 20' long. Furthermore, an HDX antenna can be made from a single turn of wire while FDX antennas require multiple turns that are held in a rigid housing with an air gap (see photos).

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HDX Tags - Transition from Industrial to Animal Encoding

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Based on the recommendation of a multi-agency panel and the PIT Tag Steering Committee (PTSC), the PIT-tag systems at the main-stem sites were transitioned from a 400kHz- based system to the ISO-based system in 2000. This new ISO-based system was built on the standards (ISO 11784 and 11785) established for RFID identification of animals by the International Organization for Standardization (ISO). Although these standards applied to both half and full duplex technologies, we chose to only adopt the FDX-B portions for the main-stem sites as we wanted the fields to be active continuously. ISO 11784 defined the 64-bit code structure for the tag code, while the entire telegram is 128 bits. Manufacturers of animal PIT tags have to get their tags approved by the International Committee for Animal Recording (ICAR) to ensure that they followed the approved code structure.

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HDX Tags - Transition from Industrial to Animal Encoding

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In 2001, ISO-based systems for adult salmonids started to be installed into the orifices of fish ladders. In 2004, the PTSC requested that lamprey researchers use an alternative PIT tag technology because they were concerned about the long time it takes lampreys to pass through orifices. If lampreys remained in the field a long time, they could prevent FDX-tagged salmonids from being detected in the orifices due to tag collisions. The lamprey researchers chose to use HDX technology as the equipment already existed and they could get support for their projects from a local company, Oregon RFID. At that time, Oregon RFID could only provide them with non-animal, or industrial, HDX tags. The 23 and 32mm industrial HDX tags worked with the ISO FS1001 transceivers (yellow bricks) manufactured by Destron Fearing because they had zeroes in the application field. Therefore, most users did not know they were using industrial tags. It became known to the PTSC during its 2009 annual meeting; however, nothing could be done about it since those were the only HDX tags available locally.

Beginning in 2010, the situation changed when Texas Instruments started manufacturing prototypes of a small HDX tags (13 mm); these tags were coded differently than the tag code structure defined in ISO-11784. In July 2011, Texas Instruments released the small tag as a finished product (12 mm by 2.15 mm). Oregon RFID has received its own ICAR manufacturing code and it will be producing these HDX tags with the correct ISO-defined animal coding by the end of 2011. ICAR has run out of unique manufacturing codes and so they are now assigning all manufacturers the 384 manufacturer's code and ranges for their tags. For example, the 12-mm HDX tags for Oregon RFID will cover the range (384.349EA65400 – 384.49EB5963F).

During a September conference call, the PTSC decided that because animal-encoded HDX tags will soon be available that they will no longer accept industrial HDX tags into the tagging database maintained by PTAGIS after 2012. Since many of the fish tagged with the industrial tags will continue to live after 2012, PTAGIS will continue to accept their tag records in the interrogation files. The new Biomark FS2020 transceiver will be able to read both the industrial and the animal-encoded HDX tags. This will be true for their future transceivers as well.

Biomark Announcement

KIRSTYN MCKAY (Biomark)

Biomark Inc. is now the exclusive distributor of all Destron Fearing and Allflex products for fisheries and wildlife applications.

Biomark offers a full range of high performance FDXB & HDX ISO animal tags including the TX1411SST and the HPT12. The highly experienced engineering and R & D staff from Destron Fearing are now a part of the Biomark team rounding out the staff at Biomark to provide full level services in RFID.

New Product – The FS2020 Stationary Adult reader is now in full production after thorough development and testing by PSMFC and Biomark. Please visit our website for more information.

www.biomark.com/FS2020

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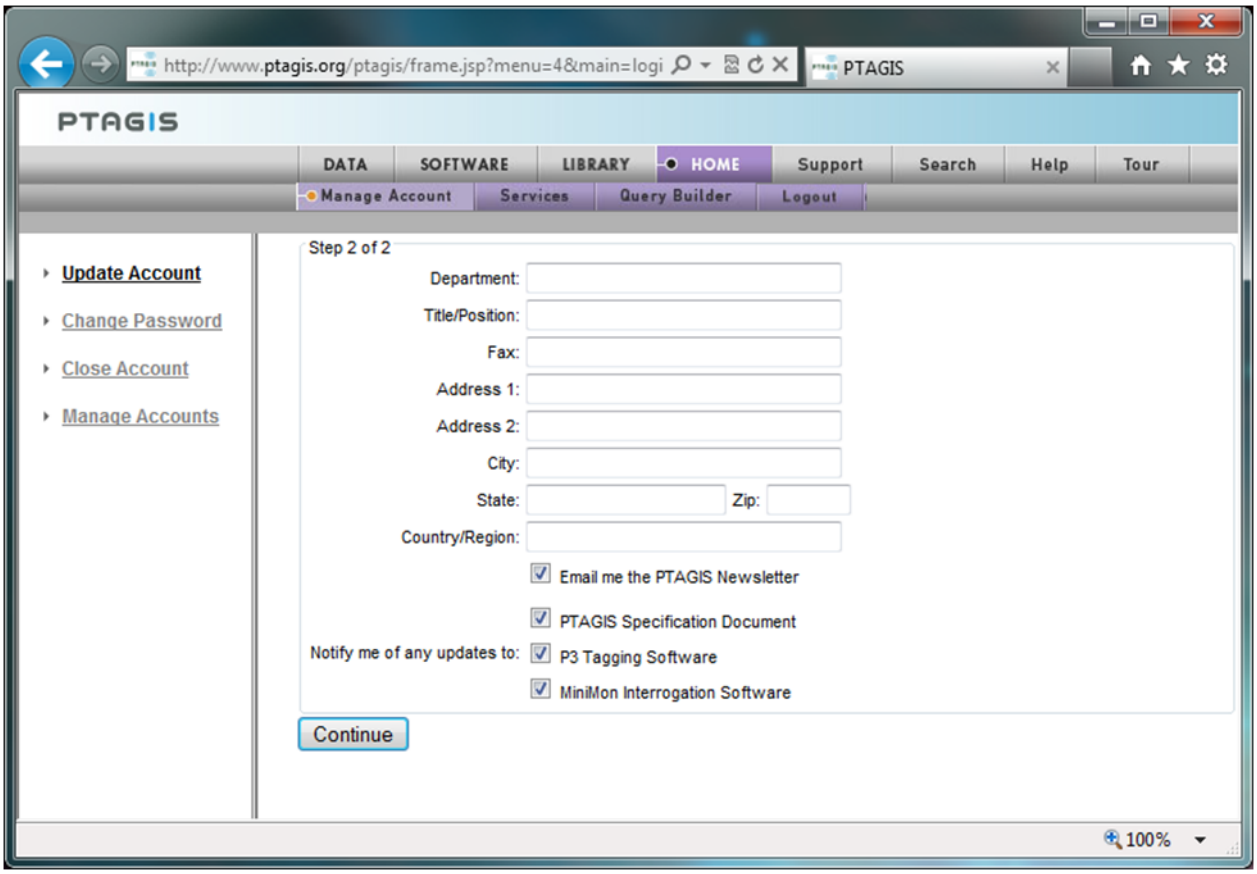
Fix for Email Newsletter Distribution

JOHN TENNEY (PTAGIS Portland Office)

Some of you may be wondering why after all of this time you're finally receiving a link to this newsletter via email. We've corrected a problem with our workflow that prevented some of you from being added to the email distribution list.

You can opt out of getting an email notification for newsletters by logging into the PTAGIS website (www.ptagis.org) and selecting **Manage/Update Account;** pressing the **Continue** button will take you to *Step 2 of 2* of an account management page and simply uncheck '*Email me the PTAGIS newsletter*' shown below.



Separation by Code Update

NICOLE TANCRETO (PTAGIS Portland Office)

2011 Separation by Code Activities

PTAGIS provides researchers in the Columbia Basin the opportunity to target specific PIT-tagged fish as those fish pass through the detection facilities at six main-stem dams on the Snake and Columbia rivers. Researchers can choose to collect the selected fish for further sampling at juvenile or adult facilities. They can also choose to route selected fish towards transportation facilities at the four collection sites, where PIT-tagged fish are normally returned to the river by default. This process of selecting and diverting individual PIT-tagged fish is called Separation by Code (SbyC). In 2011, the PTAGIS project implemented 18 Separation by Code projects for twelve organizations at seven of the eight SbyC sites, and managed around 1.7 million PIT tag codes.

Organization	Project Title	Project Description	Number of Tag Codes
CRITFC	Evaluate video counting box	Divert PIT tagged fish through a video counting box equipped with a PIT tag detector off the A-separator gate at McNary Dam.	10,367
FPC	CSS - Comparative Survival Study	Treat PIT-tagged fish similar to the untagged population when detected at transport sites.	371,654
IDFG	ISEMP - Lemhi River watershed monitoring and evaluation and Idaho Fish Screening and Passage Improvements.	Collect returning Chinook originating from the Lemhi River watershed at the Lower Granite adult trap.	10,352
IDFG	Clearwater, Sawtooth, Pahsimeroi hatcheries spring/summer Chinook	Treat PIT-tagged fish similar to the untagged population when detected at transport sites.	95,619
IDFG	Dworshak Hatchery returning steelhead	Collect returning Dworshak Hatchery steelhead at the Lower Granite adult trap to measure length.	819
NMFS	Monitor wild Salmon River Chinook salmon migrations	Collect fish at Little Goose Dam that were marked in various Salmon River drainages in 2009 and 2010.	29,556
NMFS	Chinook salmon transportation and life history studies.	Transport wild and hatchery yearling and subyearling Chinook; sample smolts at Bonneville JMF; collect adults at Lower Granite adult trap.	930,544
NMFS	A Study to Evaluate Survival of Adult Spring/Summer Chinook Salmon Migrating from the Mouth of the Columbia River to Bonneville Dam	Avoid collecting tagged fish in the Bonneville AFF fish trap; collect up to 9 tagged fish the Lower Granite adult trap.	629
NPT	Imnaha River wild Chinookand wild steelhead, Nez Perce Tribe hatchery Chinook, and Clearwater hatchery coho.	Treat PIT-tagged fish similar to the untagged population when detected at transport sites.	25,096
ODFW	Smolt outmigration timing and survival for LSRCP Wallowa and Imnaha stock steelhead.	Treat PIT-tagged fish similar to the untagged population when detected at transport sites.	30,277
PNNL	Acoustic Telemetry, Evaluation of Dam Passage Survival and Associated Metrics at John Day, The Dalles, and Bonneville Dams, 2011	Collect up to 20 fish at the Bonneville JMF from each of at least 5 cohorts tagged at John Day Dam.	4,953
QCI	ISEMP Previously spawned steelhead	Collect up to 100 steelhead at the Lower Granite adult trap to collect additional scale samples.	8,460
UFWS	Evaluation of Kooskia Spring Chinook Releases	Treat PIT-tagged fish similar to the untagged population when detected at transport sites.	12,969
USACE	A Pilot Study to Develop a Snake River Sockeye Transportation Plan.	Treat PIT-tagged fish similar to the untagged population when detected at transport sites.	43,345
USFWS	Research, monitoring, and evaluation related to recovery of the Snake River fall Chinook salmon ESU	Collect tagged fish at Lower Granite JFF.	10,900
WDFW	Estimate SARs for endemic stock hatchery steelhead released in SE Washington and NE Oregon rivers.	Treat PIT-tagged fish similar to the untagged population when detected at transport sites.	65,994
WDFW	Asotin Creek RM&E Project	Treat PIT-tagged fish similar to the untagged population when detected at transport sites.	14,607
YINN	Energetics and morphology of Wenatchee River coho salmon	Collect PIT-tagged fish at the Bonneville AFF.	34,453

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Separation by Code Update

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SbyC Services Application

We are working with FPAC to develop a Separation by Code (SbyC) Services application by which researchers can request a new project, FPAC can review that project, and PTAGIS can implement it. Proper coordination is essential for a successful SbyC project. This application will streamline the coordination between researchers, FPAC, and PTAGIS. Researchers will still need to coordinate with all other necessary entities and will need to certify that such coordination has been completed before PTAGIS will implement a project.

The SbyC Services web-application will allow different functionality for different users. Someone who is not logged in will be able to view current and past SbyC projects that have been implemented, where they are/ were implemented, and which separation by code actions were scheduled to be taken. A researcher who is logged in will be able to view all the implemented projects, request a new project, edit an existing project, and view the status of a project that has been submitted for review. Once a project has been submitted for review, emails will be sent to both FPAC and PTAGIS to notify them of the new project request. After FPAC has reviewed the project request, the FPAC chairman will log in to the application and approve the request (or ask for more information), which will trigger another round of emails to PTAGIS and the researcher. The PTAGIS SbyC coordinator will then confirm that all information necessary to implement the project has been received, and will notify the researcher of any outstanding items. After the project has been implemented, the SbyC coordinator will mark the project as implemented, triggering a notification email back to the researcher.

We have completed wireframe mockups for the SbyC Services application, and development has started. Some of the features of the application are listed below:

- Copy a previous year's project information, edit as needed, and submit as current year's project request.
- Save your work and come back to it later.
- Upload one or more lists of tag codes to define the target group of fish for the project.
- View the status of your request (e.g. Saved, Submitted for Review, More Information Requested, Approved, Implemented)
- Automated notification emails about the status of your request.
- Guidance documentation and contact information for coordination.

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Separation by Code Update

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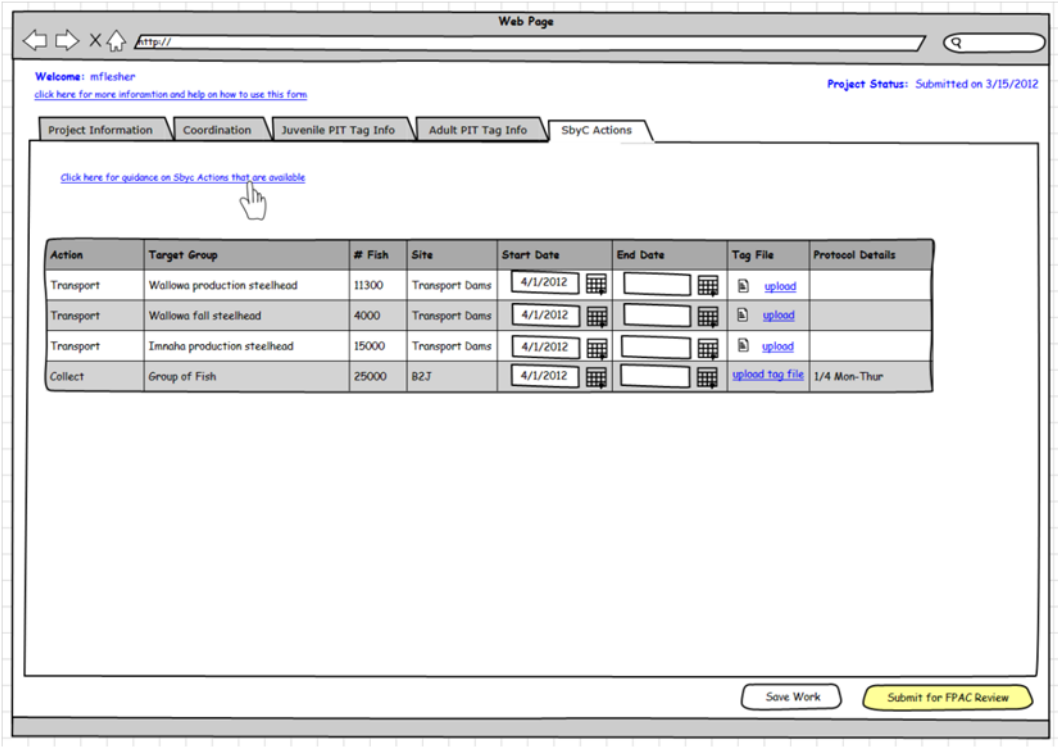

PTAGIS Field Operations Maintenance Summary for 2011

ALAN BROWER (PTAGIS Kennewick Field Office)

Figure 1. Castile Falls Fishway PIT tag system under construction.

Since 1993, the PTAGIS Kennewick Field Office staff has worked behind the scenes to keep PIT tag detection efficiency as the “gold standard” of fish detection. These detection sites include Corps of Engineers dams on the Snake and Columbia, Bureau of Reclamation (BOR) sites on the Yakima and various other sites throughout the region. Details of all 2011 field system operations can be found in the event logs: http://www.ptoccentral.org/Ptoc_OM/event_log/index.html

The PTAGIS Field O&M Staff utilizes daily operational reports, which are monitored multiple times each day, 365 days a year. During the portions of the season with high fish migration, PTAGIS field staff performed weekly, on-site, standard maintenance checks at each facility. In periods with lower migration, these maintenance checks were performed every other week. These visits include tuning all readers, inspecting and timing diversion gates and meeting with site operators and biologists.

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PTAGIS Field Operations Maintenance Summary for 2011

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As in previous years, the juvenile fish bypass facilities on the Snake and Columbia Rivers began operating on or before April 1, 2011. Prior to these operations, the PTAGIS Kennewick staff performed all the necessary pre-season tuning and maintenance to ensure peak performance of the juvenile fish detection and diversion equipment. Detection efficiency rates for 2010 were kept at a very high level as listed in this report: http://php.ptagis.org/wiki/index.php/CEA_YTD_Efficiency_Tallies

The efficiency of the diversion gates at the Separation by Code interrogation sites were improved by PTAGIS upgrades to the Programmable Logic Controller (PLC) programs that control the gates. The addition of remote monitoring capabilities included the addition of automated email notifications of potential gate problems. Another benefit of the PLC improvements is the very low number of mechanical gate failures causing unscheduled site visits. Mechanical longevity of the gates has greatly increased due to these efforts. Diversion efficiency rates for 2010 were outstanding as listed in this report: http://php.ptagis.org/wiki/index.php/DGE_Gate_Efficiency_YTD_Summary

Other PTAGIS Field Office projects in 2010 that continued into 2011 include the following:

- Data collection platforms and critical-location transceivers at all sites are being upgraded with higher capacity uninterruptible power supplies (UPS) to cover power outages lasting up to two hours.
- Automated site monitoring has been deployed at Lower Granite and Little Goose dams.
- Flat plate antennas that incorporate ferrite tiles were developed and deployed at Roza Dam for the Yakama Nation and BOR. These antennas are the first of its kind that can be installed on a metal surface with no performance degradation. This development opens the door for deployment of PIT tag detectors at many locations that were thought unsuitable in the past.
- New Yakama Nation interrogation sites at Lyle Falls and Castile Falls are nearing completion. On August 27, 2011, the first tag, 3D9.1C2D34706F was detected at the new Lyle Falls Fishway.
- PTAGIS continues to support the Klickitat River Passage Improvement Project with ongoing technical advice. Our prototype slot antenna for Castile and Lyle Falls proved worthy and production antennas were manufactured and deployed. PTAGIS teamed with the NMFS shop in Pasco to construct 12 antennas for the Lyle Falls Wet Lab. Now, in the final stages of construction, PTAGIS is installing all PIT tag equipment including antennas, readers, computers and communication equipment. PTAGIS will assume ongoing O&M responsibilities once the construction phase of the project concludes.
- PTAGIS performed extensive testing for the BPA Request for Offer (RFO) to help select the next production PIT tags for distribution to researchers.
- PTAGIS continues to provide QA for new and production PIT tags for all BPA projects.

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PTAGIS Field Operations Maintenance Summary for 2011

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- PTAGIS continues to repair all failed transceivers in our Kennewick lab.
- PTAGIS continues to refine facility controls for all COE main-stem juvenile fish facilities.
- PTAGIS continues to provide researchers with Separation by Code capabilities.
- PTAGIS continues to receive, house, inventory and ship PIT tags to all BPA funded projects.
- PTAGIS continues on the design team with NOAA and the COE for the Ice Harbor Ogee Pit Tag Project.

PTAGIS Field Software Update

JOHN TENNEY (PTAGIS Portland Office)

While much of the PTAGIS effort in the area of field software is dedicated to the development of M4, our team also maintains and supports other field software systems such as P3 and MiniMon. This article provides an update for all PTAGIS field software to date.

M4

M4 is the next-generation field interrogation software and a presentation of this software was given last January at the 2011 PIT Tag Workshop. This section of the article provides a little background and a summary of progress on this project to date.

A primary function of PTAGIS interrogation software is to capture real-time observations of fish marked with a PIT tag at a particular site and upload the data to our regional database in “near real-time”. This observation data is joined with site metadata, which includes the numbers, location and layout of detection equipment, to provide the additional context required for researchers to perform data analysis.

Data Management Features

The version of M4 beta demonstrated at the 2011 PIT Tag Workshop used a local database to facilitate the creation of interrogation site metadata in the field that would be automatically joined with real-time observation data and uploaded to PTAGIS unabridged. Upon learning at the workshop the extent data loggers and other types of data collection systems already deployed at in-stream interrogation sites, we decided to leverage the new PTAGIS database server and web portal systems to provide stewards with the ability to manage site metadata from the web. The system architecture was simplified and a local database is no longer needed now that M4 is no longer responsible for collecting site metadata in the field.

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PTAGIS Field Software Update

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M4 logs observation and related diagnostic data to extensible and well-defined formatted files (XML files defined by an XSD schema) to be batch uploaded to PTAGIS on a specified interval similar to how MultiMon and MiniMon currently submit data. Stewards managing interrogation sites without a data collection platform (transceiver only) will log into the new PTAGIS web portal and manually upload raw interrogation data files captured from transceiver buffer downloads. These raw observation data can be validated against the current site metadata and any issues are reported to the steward immediately so the data can be corrected and uploaded again.

Separation-by-Code Features

M4 supports Separation-by-Code (SbyC) operations that target fish to be diverted by code. As of last week, most of the features required to support SbyC have been implemented and unit tested. One of the challenges of SbyC was to design an intuitive user interface (Figure 1) and storage mechanism to manage the complex configuration requirements.

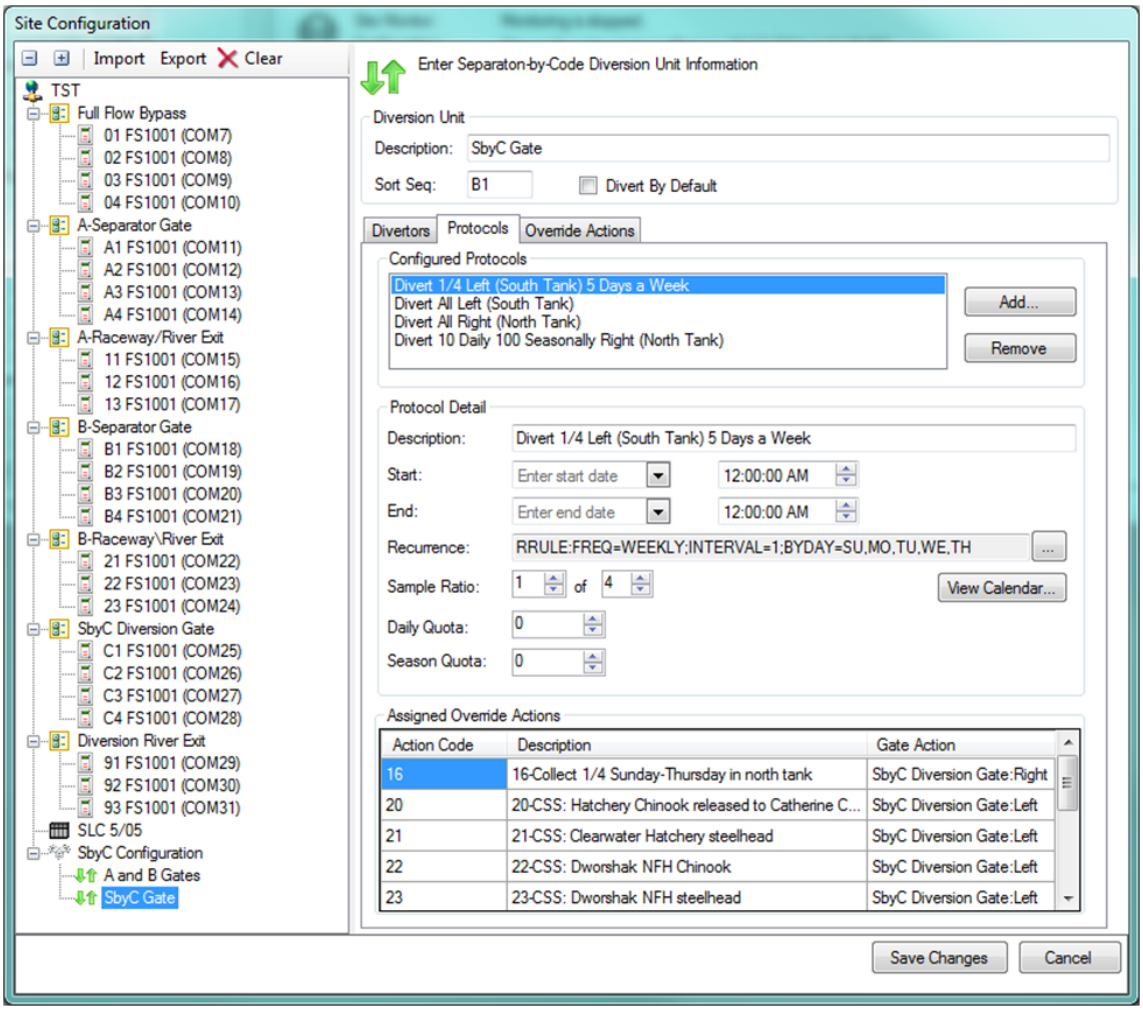

Figure 1: An example of a protocol configuration in M4 SbyC

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PTAGIS Field Software Update

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The M4 SbyC features require extensive regression testing to ensure fish can be diverted in real-time while processing on a general purpose computer platform. To better emulate real-world conditions of fish passage in a virtual environment, PTAGIS developed additional emulation software (Figure 2) to playback the contents of one or more interrogation files generated from either MultiMon or MiniMon using the reported timestamps with an accuracy of 15.6 milliseconds (the default timer resolution in Windows 7).

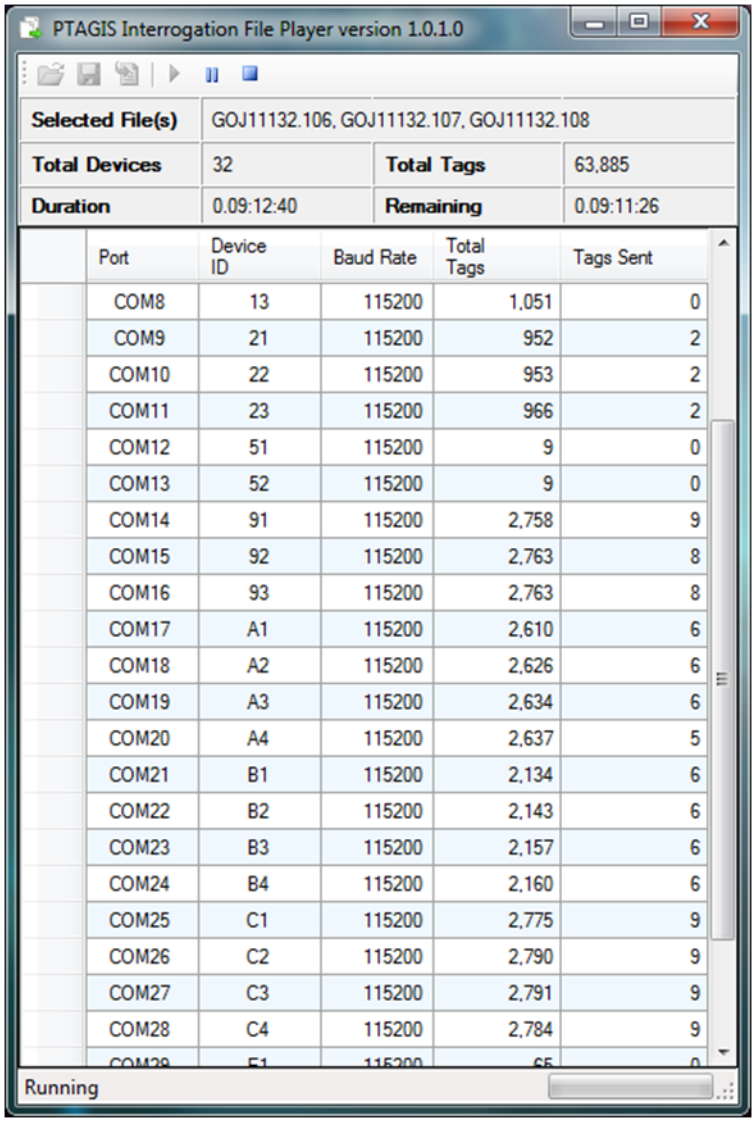

Figure 2: PTAGIS Interrogation File Player Software

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As an example of one of the regression tests, staff configured M4 for one of the larger mainstem sites (GOJ: Little Goose Juvenile) using a lookup file containing over 5 million tag codes and the emulation software played back a series of data files from one of the peak periods of fish passage (Figure 3). Code analysis software was used to profile M4 performance and provided encouraging results.

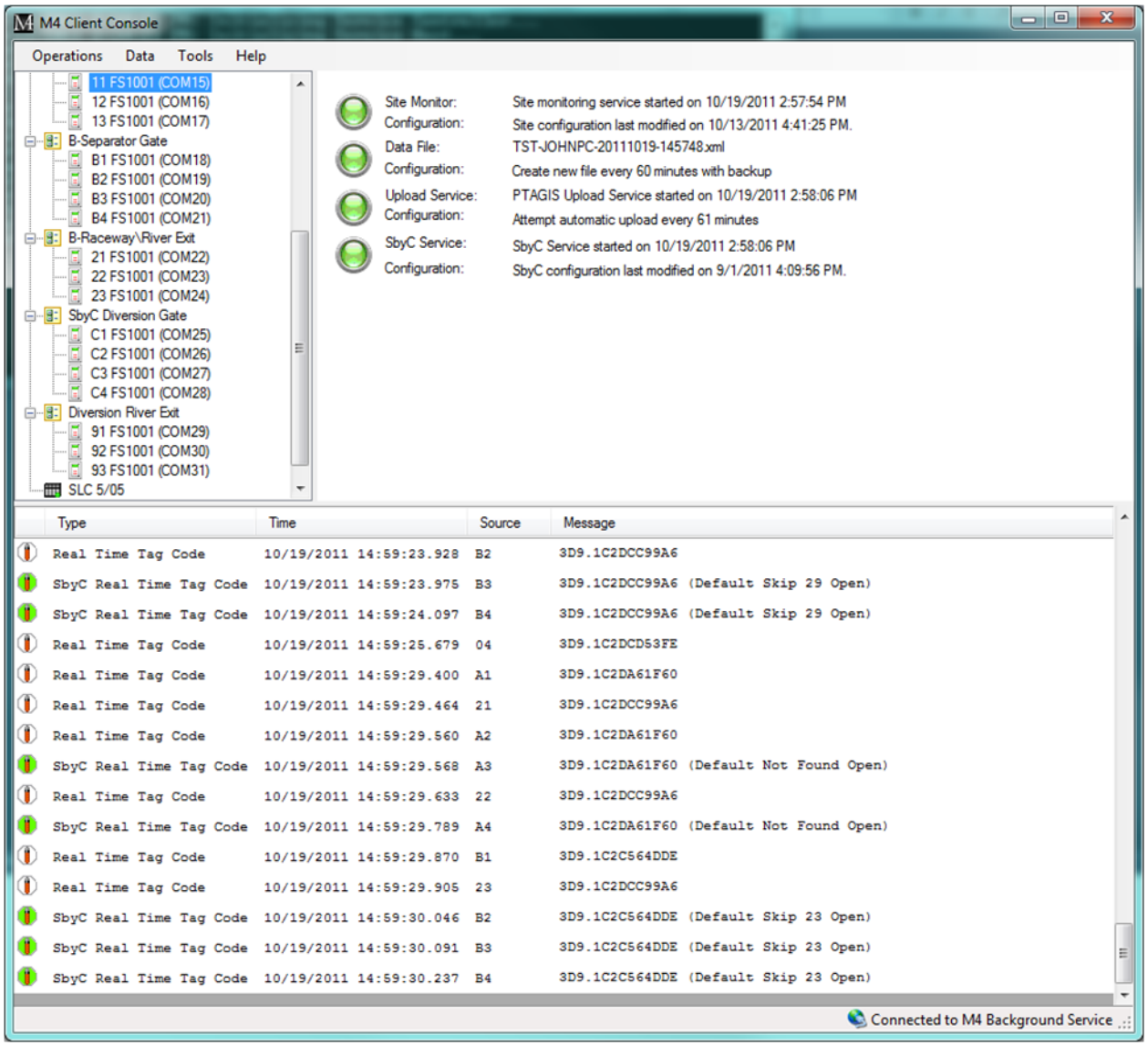

Figure 3: M4 Client Console displaying output while testing SbyC performance

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PTAGIS Field Software Update

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Additional performance analysis will be required as SbyC features are revised and optimized. A more robust laboratory performance analysis is scheduled in November at our Kennewick lab to measure precise latency between transceiver tag output to the M4 application and the subsequent diversion gate activation over several iterations. We also will be working with our NOAA counterparts to conduct live fish tests early next year at one or more facilities that should ultimately confirm if M4 SbyC features are ready for production deployment in 2012.

Device Features

In addition to the new data management and SbyC features, M4 was recently updated to support a new Biomark FS-2020 transceiver which includes serial, USB and Ethernet communication. A terminal utility feature in M4 (Figure 4) was used by PTAGIS staff to evaluate this new transceiver.

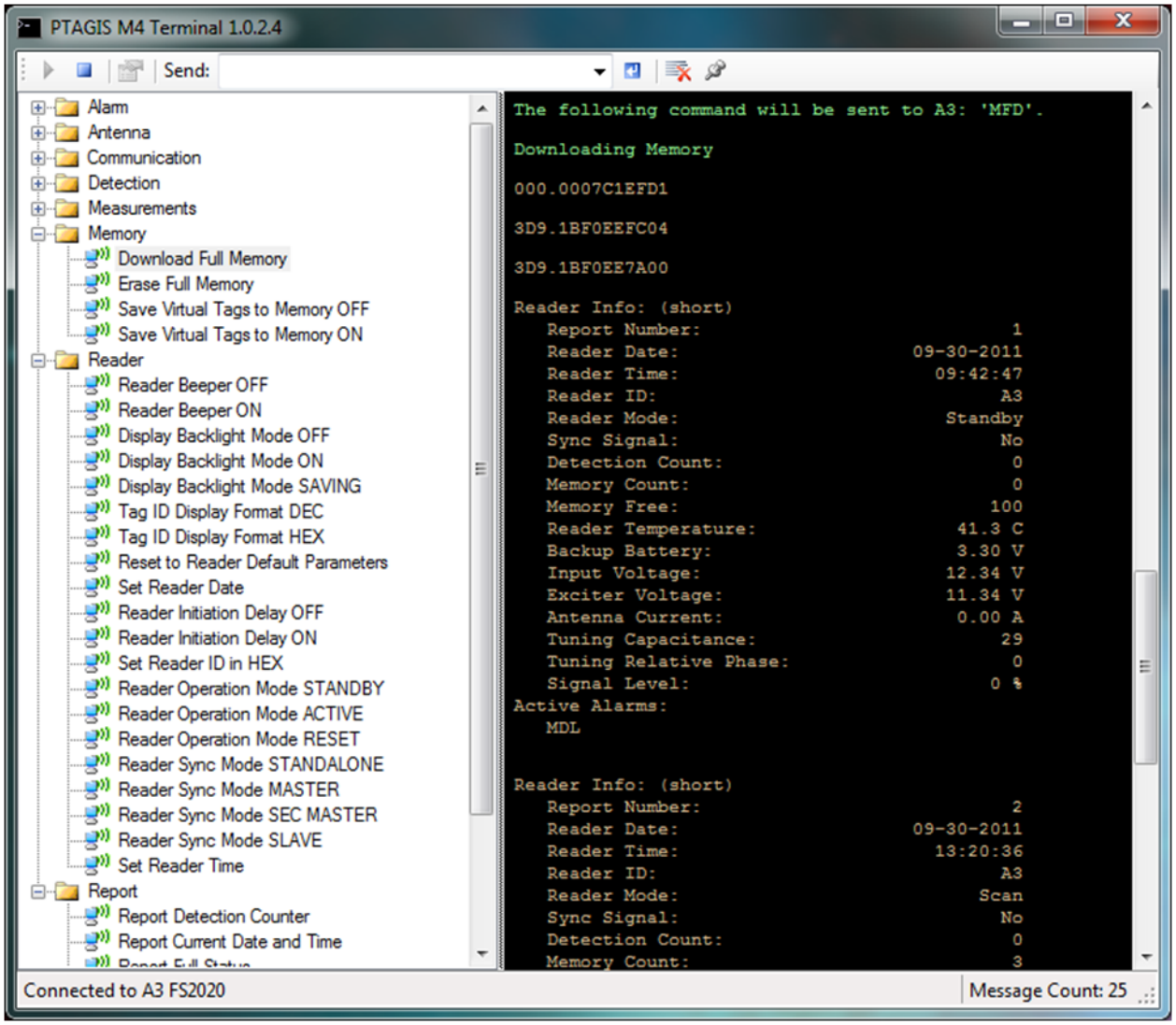

Figure 4: M4 Terminal connected to the new Biomark FS2020 Transceiver

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PTAGIS Field Software Update

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Production Release Schedule

There are still remaining challenges ahead before M4 will be released for production data collection. Once the SbyC features are tested and deemed complete, a full development cycle will be dedicated to updating the user interface and integrating cluster-aware features from a previous version to support high-availability environments. PTAGIS staff will continue working with the PIT Tag Steering Committee and an ad-hoc In-stream PIT Tag Steering Committee to refine interrogation site metadata so new web management tools can be implemented and deployed next year. If the new server deployment schedule cannot align with M4 production release, we may have to modify the software to support the current database server system. We will have a better feel for a firm release date of M4 early next year.

MiniMon

MiniMon software continues to collect and upload significant portion of PTAGIS interrogation data. A new version of this software (version 1.6.1) was recently released to add support for the Biomark FS-2020 transceiver.

Workaround for FS-2020 Downloads

Please note that when downloading the memory buffer on the FS-2020 from the high-speed port can result in line-status errors due to MiniMon not able to keep up with translating dozens of stored status messages (see the output in Figure 4 and note that M4 does not have this issue). The result is that all tag codes will be captured by MiniMon from a download but some stored status messages may not, especially when there are over 25 or more. The workaround is to always download data from and FS-2020 using the local port (USB) set to ASCII mode and a 9600 baud rate.

HDX Support

Also updated in this release was how half-duplex (HDX) tags are formatted. Per PIT Tag Steering Committee recommendations, MiniMon (and M4) will no longer replace the country code portion of half duplex tags with an ‘HDX’ identifier. Instead, HDX tags will be formatted in the standard 3.10 hexadecimal format as they are decoded and a country code of ‘0’ will be translated to ‘000’, *e.g.* 000.0007C1EFD1.

Allflex Prototype Stationary Transceiver

This new release of MiniMon was validated with sample output from an Allflex prototype stationary transceiver. This transceiver was designed to emulate the ASCII output from an FS-1001A adult transceiver. To configure MiniMon with this transceiver, select the *Stationary Transceiver* as the **Type of Device** and set **Type of Filter** to *Adult ASCII* as shown in Figure 5.

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PTAGIS Field Software Update

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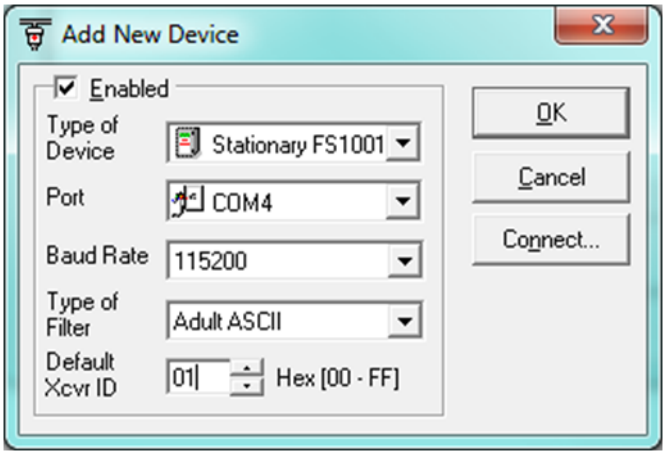

Figure 5: MiniMon device configuration for Allflex prototype transceiver

P3

P3 continues to be popular software for submitting mark, recapture and mortality data into the PTAGIS database. A minor release of this software, version 1.4.9, was issued in March of 2011 to correct the font color for a repeating comments dialog window that could cause the text to become transparent on some of the newer Windows desktop themes.

PIFF

The PTAGIS Interrogation File Formatter (PIFF) utility offers interrogation site stewards a way to format raw transceiver or data logger output into a standard interrogation file format that can be uploaded to the PTAGIS database. A new release of this software, version 1.1.0.5 was issued in July of this year to modify the default date handling rules to always use a transceiver timestamp when available.

PTAGIS Server Upgrade

JOHN TENNEY, CRAIG WHITE AND SEBASTIAN DUDEK (PTAGIS Portland Office)

As past newsletters have noted, we are in the middle of a major server system upgrade and continue to make progress while maintaining the current systems. A datamart and a web portal are the two major system components of this upgrade. The datamart (or reporting database) and related processes provide a high-performance foundation for extracting, transforming and loading (ETL) field data into an operational database which is then subsequently processed (or published) into a feature-rich reporting environment allowing researchers “near real-time” access to PTAGIS data. The new web portal will eventually replace the current ptagis.org web site and hosts the datamart reporting environment in addition to other features described later in this article.

Preview Launch

A preview of the new web portal combined with the datamart (Figure 1) was released last June to a focus group of PTAGIS users letting them establish a login and interact with ad-hoc reporting environment populated with a complete snapshot of PTAGIS data. A low-cost online feedback forum was integrated into the portal to capture feedback. Overall the preview was a success and we’ll continue a trend of releasing additional previews/betas in the oncoming months to wider audiences as we integrate new technology and refine the system.

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PTAGIS Server Upgrade

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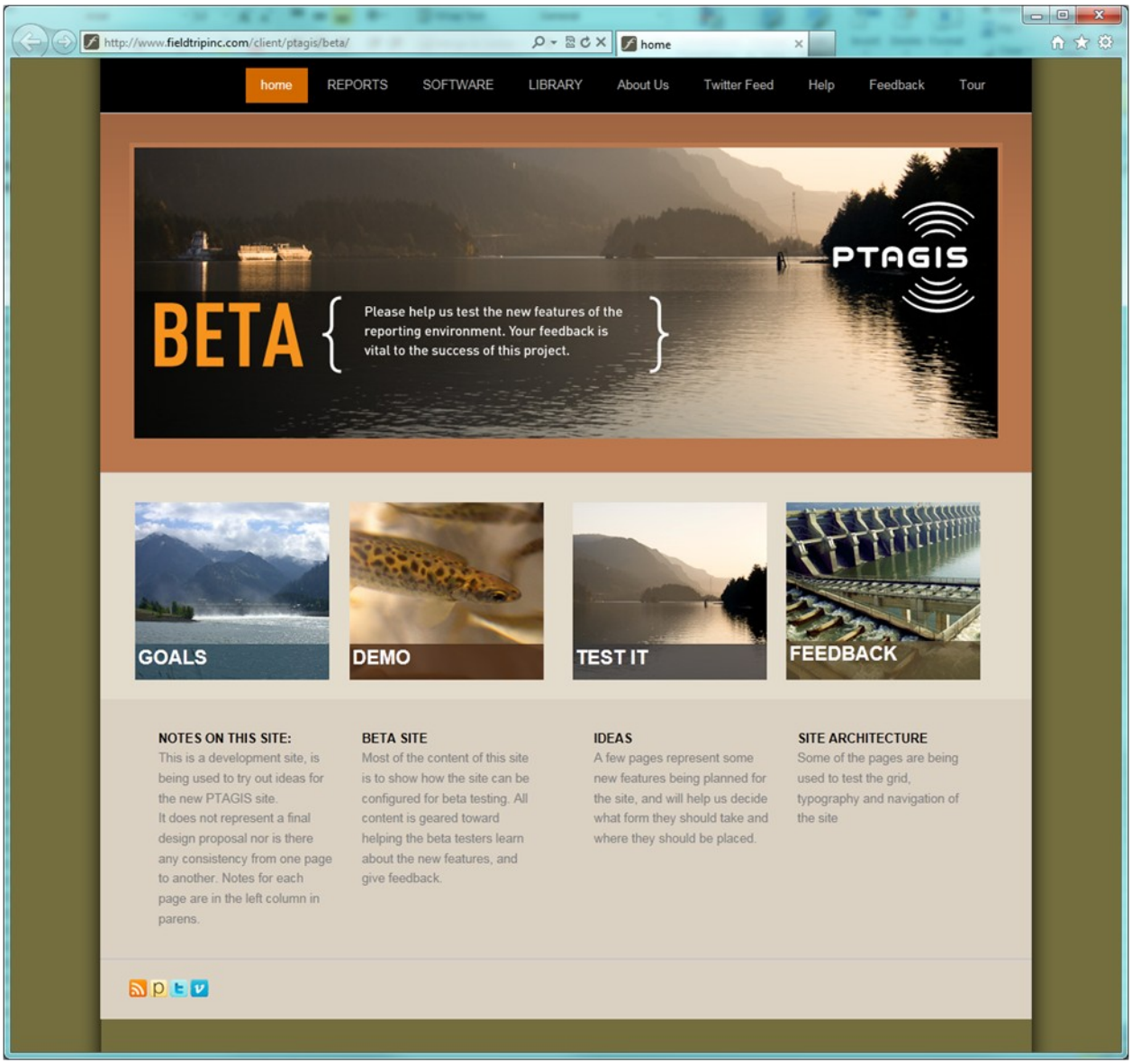

Figure 1: Preview of Next-Generation PTAGIS Web Portal and Reporting Server

Recent Datamart Developments

Since the June preview, we've synchronized the datamart with the current database system so that it is continually updated with near real-time field data. The datamart structure is designed using a star-schema (dimensional data model) that allows for rapid data retrieval and simplified user navigation. The web reporting environment offers numerous options for data reporting, data understanding, and data extraction including pre-cached data cubes that allow for aggregate operations on very large sets of data (100 million rows +) with immediate response times. The web reporting environment exposes a super-set of data that is not currently available through the current PTAGIS QueryBuilder interface including decodes on all values, site type categories, and richer metadata.

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PTAGIS Server Upgrade

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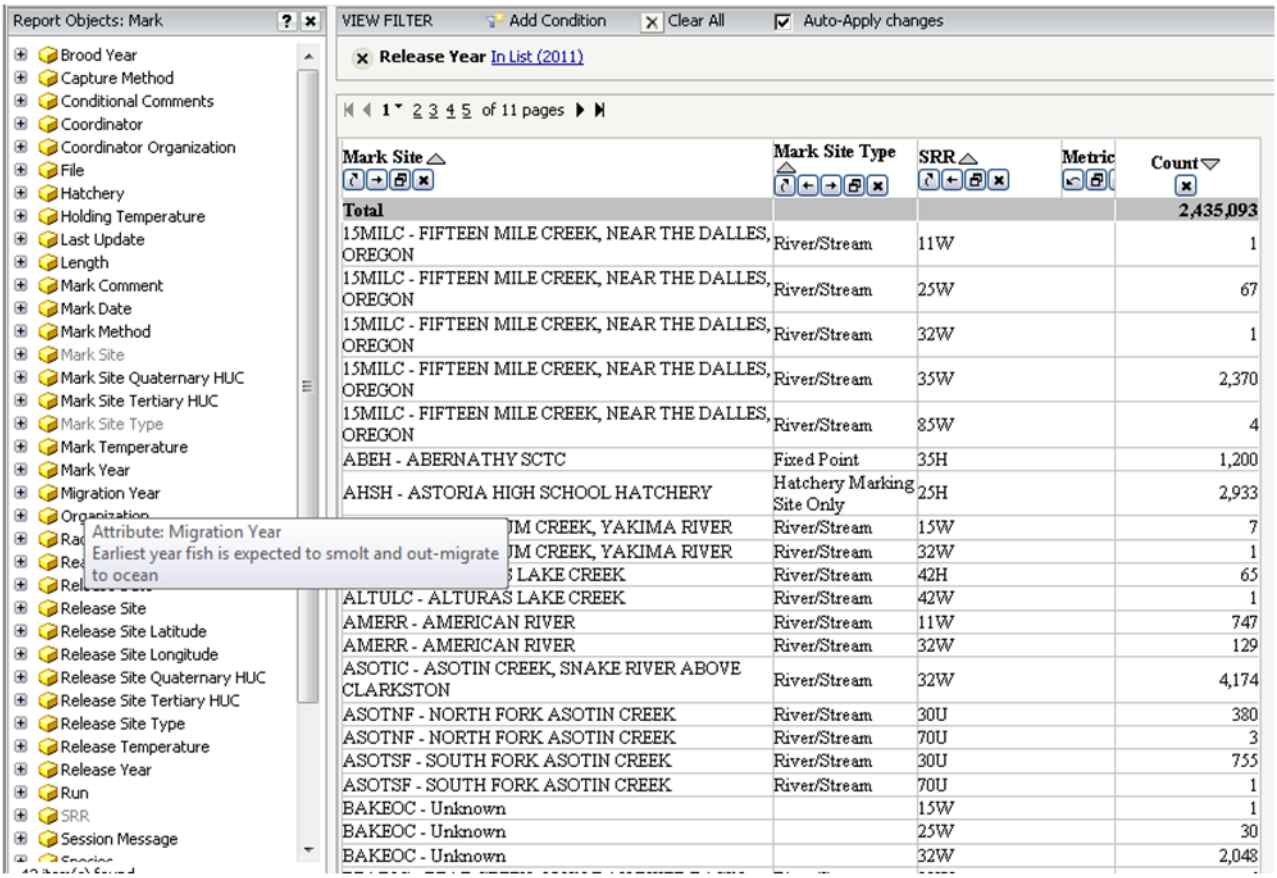
Self-serve reporting (Figure 2), dashboards (Figure 3), directed reports, data visualizations, and geo-spatial visualizations are just some of the features being developed for the next release. Additional data sets will be added to the datamart in the coming months including tag distribution information.



Mark Site	Mark Site Type	SRR	Metric	Count
Total				2,435,093
15MILC - FIFTEEN MILE CREEK, NEAR THE DALLES, OREGON	River/Stream	11W		1
15MILC - FIFTEEN MILE CREEK, NEAR THE DALLES, OREGON	River/Stream	25W		67
15MILC - FIFTEEN MILE CREEK, NEAR THE DALLES, OREGON	River/Stream	32W		1
15MILC - FIFTEEN MILE CREEK, NEAR THE DALLES, OREGON	River/Stream	35W		2,370
15MILC - FIFTEEN MILE CREEK, NEAR THE DALLES, OREGON	River/Stream	85W		4
ABEH - ABERNATHY SCTC	Fixed Point	35H		1,200
AHSH - ASTORIA HIGH SCHOOL HATCHERY	Hatchery Marking Site Only	25H		2,933
[illegible]IM CREEK, YAKIMA RIVER	River/Stream	15W		7
[illegible]IM CREEK, YAKIMA RIVER	River/Stream	32W		1
[illegible] LAKE CREEK	River/Stream	42H		65
ALTULC - ALTURAS LAKE CREEK	River/Stream	42W		1
AMERR - AMERICAN RIVER	River/Stream	11W		747
AMERR - AMERICAN RIVER	River/Stream	32W		129
ASOTIC - ASOTIN CREEK, SNAKE RIVER ABOVE CLARKSTON	River/Stream	32W		4,174
ASOTNF - NORTH FORK ASOTIN CREEK	River/Stream	30U		380
ASOTNF - NORTH FORK ASOTIN CREEK	River/Stream	70U		3
ASOTSF - SOUTH FORK ASOTIN CREEK	River/Stream	30U		755
ASOTSF - SOUTH FORK ASOTIN CREEK	River/Stream	70U		1
BAKEOC - Unknown		15W		1
BAKEOC - Unknown		25W		30
BAKEOC - Unknown		32W		2,048

Figure 2: Example of a Self-Service Report from the PTAGIS Datamart

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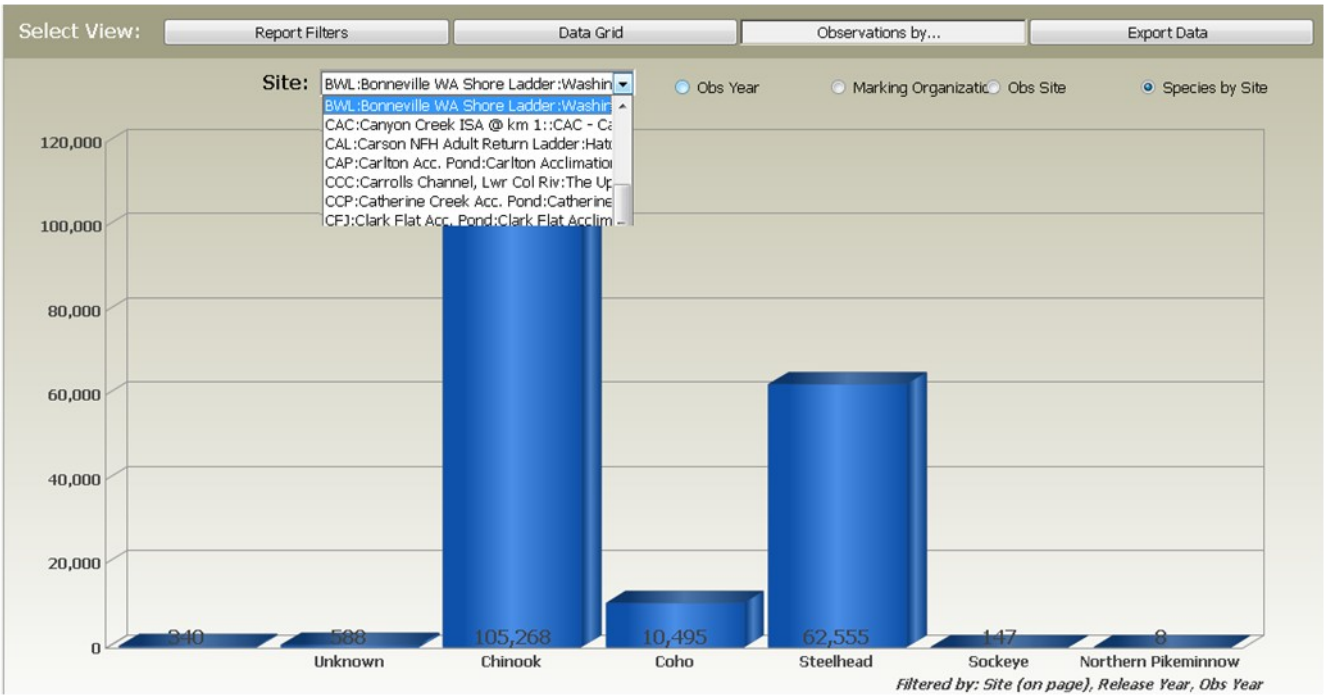

Figure 3: Example of an Interactive Dashboard Report from the PTAGIS Datamart

Web Portal

The new web portal system will replace the current ptagis.org site blending additional features to enhance the user experience and make information much easier to find. Some of these additional features are:

- An integrated content management system providing a more structured set of PTAGIS documentation and content (documents, pictures, videos, news items etc.) that can be related to each other via tags. For example, common documents, photos and news items can be tagged to a particular observation site that end users can easily navigate between.
- Time-sensitive content, such as newsletter articles, can be published more frequently and efficiently.
- A newsgroup forum to foster feedback and community collaboration as well as enhance technical support with a searchable knowledgebase.
- Dashboard reports (Figure 3) that can provide data visualization and insight to the uninitiated.
- Updated ‘Interpretive Center’ to provide program background and additional context to the data.

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PTAGIS Server Upgrade

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The *Field Services* section of the new web portal will provide self-service features to PTAGIS users such as allowing a steward to log in and update metadata related to an interrogation site assigned to them. *Field Services* will also provide a request/approval workflow for adding new interrogation sites, Separation-by-Code (SbyC) projects and requesting new/updated metadata definitions. Members of the PTAGIS governance committees (PTSC, FPAC) will be alerted via email about new requests assigned to them and will log in to the portal to take action. Similarly, the requester will be alerted via email whenever the state of their request is changed and/or processed.

We are excited to leverage the capabilities of the new server systems with the GIS (Geographical Information System) expertise of our staff allowing users to view and query spatially tied data. We'll have some basic GIS reporting features in the next release with more enhanced features and layers to come.

Coordination

PTAGIS staff has met with some of the largest consumers of PTAGIS data to ensure the new system will meet their current and future needs. We reassured them the same formatted datasets will be available in the new system as they are in the current system. We also discussed opportunities for linking their value-added data using features of the new datamart system rather than recreating the entire PTAGIS database within their local environment.

Schedule

Given the complexity and scope of this upgrade combined with fixed program resources it is difficult to estimate a precise release date other than saying most likely it will be mid-to-late 2012. As mentioned, future beta versions of the web/datamart systems will be released in the oncoming months to allow end users to interact with the same "near real-time data" of the current system.

The new system components have dependencies upon each other that may require simultaneous deployment into production. For example, M4 captures and uploads observation data from a field site to be joined in the database with site configuration metadata maintained by site stewards via the web portal (see related M4 article in this newsletter).

We understand PTAGIS users will require some time to learn and adjust to the new systems. At the cost of maintaining and synchronizing two environments the community will be given ample notice before the current system is disabled. Once the upgraded systems are more complete, we're planning on conducting regional training seminars next year to provide a more intimate look at the systems and in turn generate valuable feedback so we can refine the systems further.