PIT Tag Information System

Columbia Basin

Newsletter

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Issue 1

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

We welcome input from the PTAGIS community, so email or write us with your story ideas.

If you have questions regarding the contents of this publication, or about the PTAGIS program, please contact Carter Stein, PTAGIS Program Manager.

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A Fisheries Data Project of the Pacific States Marine Fisheries Commission

IN THIS ISSUE

2008 PIT Tag Distribution Change - PTAGIS Kennewick Field Office

CARTER STEIN (PTAGIS Portland Office) and **JENNIFER NIGHBOR** (PTAGIS Kennewick Field Office)

The PTAGIS Project is upgrading its Tag Distribution System. The following describes the process we will be using to distribute PIT tags until the new system is on-line. More information about the new system will be provided in subsequent newsletters.

Interim PIT Tag Distribution Process

1. Tags are requested through the online PIT Tag Forecast system.
2. Jamie Swan (Bonneville Power Administration) reviews and approves PIT Tag requests.
3. Jamie Swan sends approval email to Project Point of Contact (POC) with attached PIT Tag Distribution Request Form (PDRF) and copies email to Jennifer Nighbor.
4. Project POC completes PDRF and emails to Jennifer Nighbor.
5. Jennifer sends confirmation email to Project POC noting receipt of completed PDRF with a copy sent to Jamie Swan.

NOTE: PIT Tag shipments can not be processed until the completed PDRF has been received via email by Jennifer Nighbor.

6. PIT Tags are shipped out to be received before "Date Needed" listed on PDRF, through an insured UPS shipment.
7. Email confirmation of PIT Tag shipment with UPS Tracking # is sent to Project POC with an email copy sent to Jamie Swan.
8. Follow up email is sent to Project POC to verify receipt of PIT Tag shipment.
9. Project POC sends email confirming receipt of PIT Tag shipment to Jennifer Nighbor.

Jennifer is the new Administrative Assistant and supports the PTAGIS Kennewick Field Office staff Monday through Friday, 8 AM - 12 PM.

Due to the change in the PIT Tag distribution location, in person pick-ups may not be feasible; PIT Tags will be sent via an insured UPS shipment. PSMFC's PIT Tag distribution policy will remain as: **first in, first out.** The PIT tags that are received into inventory first will be the first tags shipped out to the community. This ensures that all researchers receive the newest supply of PIT tags.

In order for all shipments to be received in a timely manner please make certain that all contact information, including shipping address, listed on the PDRF is accurate. Should any pertinent contact information change throughout the season, please email the updated information to both Jennifer Nighbor and Alan Brower.

A special thanks to Renee Barrett and Kristiana Kroneck for their work with the previous years' PIT Tag distributions.

PIT Tag Distribution Contact Info

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Little Goose Full Flow Project

DARREN CHASE (PTAGIS Kennewick Field Office)

Project Summary

The objective of the Little Goose Full Flow project is to install four PIT Tag antennas on the primary bypass flume. These detection points are located upstream of the switch gate that controls the passage of bypassed fish, which allows for PIT Tag detection whether the fish are routed through the Juvenile Fish Facility (JFF) or around the JFF and back to the river.

The project originated with the design kick off meeting in November of 2006 and has progressed through 60%, 90% and the Biddability, Constructability, Operability and Environmental (BCOE) reviews of the Plans and Specifications. The project schedule is set to start the in-water work in December of 2007 with the project completion scheduled for March 31, 2008.

PSMFC has been involved with construction and installation of four other Full Flow systems within the Columbia Basin. PTAGIS maintains these systems at John Day, Ice Harbor, Lower Monumental, and Bonneville dams, as well as the Full Flow system at McNary Dam.

This project will be utilizing a custom fiberglass pipe, which is the same pipe that was used for the projects at Lower Monumental and John Day. The pipe is constructed in a manner that allows for a smooth fiberglass outer surface but with a corrugated inner lining. This is necessary to match the hydraulics of the metal "U" shaped corrugated flume section it will be replacing.

Figure 1 - John Day Corrugate Pipe

Figure 2 - John Day Flume Transition

The location that was selected to install the four PIT Tag detector antennas makes this project very similar to the John Day Full Flow project (pictured below). Both projects involve working on a section of flume that is elevated approximately 75 feet from the ground. The John Day Full Flow system operated at high efficiency throughout this season, and PSMFC is confident that the Little Goose Full Flow will operate at the same high level.

Figure 3 - John Day Before Full Flow

The John Day bypass flume prior to installation of the Full Flow PIT Tag Detection System.

Figure 4 - John Day After Full Flow

There are four antennas in the Full Flow detection system at the John Day juvenile fish bypass.

Figure 5 - John Day After Full Flow wide view

The John Day Full Flow system is elevated about 75 feet above the ground.

New Interrogation Site on the Yakima River at Roza Dam

SCOTT LIVINGSTON (PTAGIS Kennewick Field Office)

Summary

Early, this year, the Pacific States Marine Fisheries Commission (PSMFC) in a cooperative effort with the Yakama Nation (YN) and the U.S. Bureau of Reclamation (USBOR), started design work on a new PIT tag detection system for the adult fishway at Roza Dam. Roza Dam is located on the Yakima River approximately 10.3 miles North of Yakima, WA, at river kilometer 206. The interrogation site code for the Roza Dam fishway is "RZF".

Given a conceptual design provided by PSMFC and approved by the YN, Biomark Inc. was contracted to manufacture the antennas and assisted with their installation. The installation of the antennas, transceivers and miscellaneous infrastructure was completed on September 7, 2007 and PIT tag interrogation began that day at 1100 hours.

The installation has proven to be extremely stable (low noise levels) and is operating at a very high detection efficiency that meets or exceeds the expectations of PTAGIS and the PIT Tag community.

Currently, PIT Tag data is being recorded in the transceiver buffers and manually retrieved on a periodic basis. The completion of the PIT Tag room and fiber optic communications will make up the third and final phase of the installation scheduled to be completed by November 1, 2007, at which time automated data submission to PTAGIS will be implemented. Communications to and from the new RZF will be transmitted over a satellite link and will provide a stable and consistent means of communication.

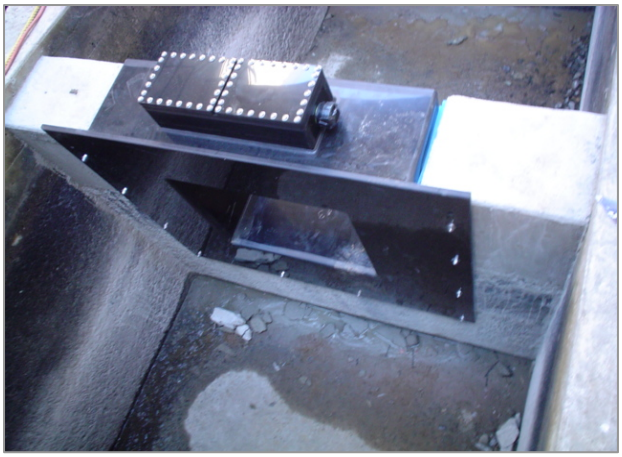

Figure 1 - A close-up of one of the PIT tag antennas installed in the fish ladder at Roza Dam.

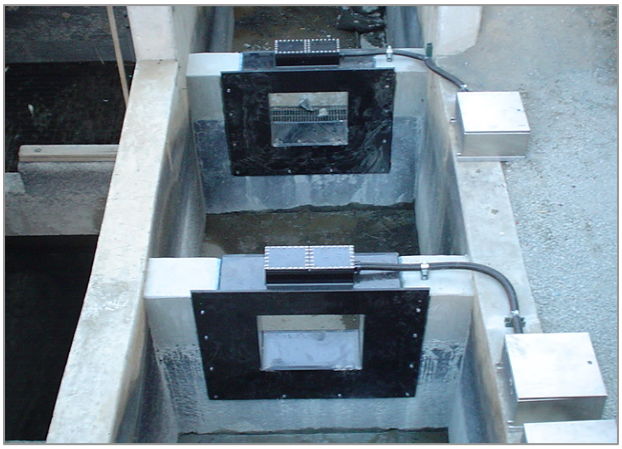

Figure 2 - All fish ascending the ladder must pass through these antennas.

Figure 3 - There are three antennas, in adjacent weirs, in the adult ladder at Roza Dam.

In-stream PIT Tag Detection Taken to the Next Step

Investigation of adult salmon and steelhead straying in the John Day River

SANDRA L. DOWNING (NOAA Fisheries) and **STEVE ANGLEA** (Biomark)

To help the federal Action Agencies, Bonneville Power Administration (BPA), U.S. Army Corps of Engineers (USACE), and U.S. Bureau of Reclamation (USBOR) determine whether they are meeting hydrosystem performance standards, they need to monitor adult fish passage fallback and delays to help estimate adult survival rates. Straying is a key component in adjusting adult survival estimates. However, the only straying data that have been collected used radiotelemetry during the 2000-2003 migration years. The radiotelemetry studies conducted by the University of Idaho and NMFS used around 3,200 known-origin salmonids (Fish PIT Tagged as juveniles) and identified the Little White Salmon, White Salmon, Deschutes, and John Day Rivers as the tributaries in the lower Columbia River that have the highest straying rates for salmonids.

Regional biologists and resource managers want to determine the normal annual variations for straying in these tributaries for different salmonid populations. Because of advancements in PIT Tag technology, the development of PIT Tag detection systems to monitor movement of known-origin adult salmon and steelhead into these tributaries seemed like a viable approach to answering that question. Between 2000 and 2003, approximately 23,000 PIT Tagged adult Chinook salmon and steelhead were detected at Bonneville Dam; therefore, tributary PIT Tag detection systems could provide information for a broad range of ESUs as every returning PIT Tagged adult would have the potential to be detected compared to the limited number of fish that would be radio tagged.

For FY2006, NOAA Fisheries (NMFS) and Biomark submitted a proposal to the USACE to investigate the feasibility of designing a PIT Tag detection system for one of the rivers. After visiting the rivers listed above to find an appropriate site for installing the equipment, we decided on a location near McDonald Ferry (mile 20) on the John Day River (Figure 1).

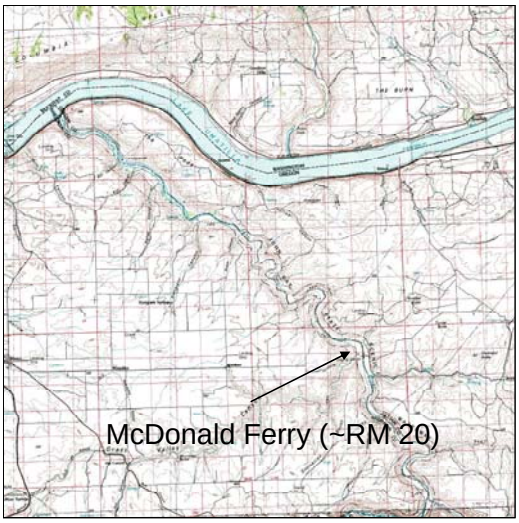

Figure 1. Map showing where the PIT Tag detection system on John Day River was installed

This river was chosen for several reasons. For one, it was a manageable size for the current set of PIT Tag technologies; although, it is a significantly larger river than has previously been covered with in-stream PIT Tag detection systems. Equally important, it has the largest intact wild population of summer-run steelhead trout in the Columbia River Basin that potentially is being negatively impacted by straying. Although no hatchery-reared steelhead smolts are released in the John Day River watershed, Oregon Department of Fish and Wildlife (ODFW) is currently identifying 25-30% of the carcasses in its spawning ground surveys as hatchery fish (Tim Unterwegener, ODFW District Fish Biologist). Obviously, these hatchery strays could potentially impact the genetic integrity and natural production of the wild population (which is another critical management uncertainty that requires investigation). The site was also chosen due to being downstream from all but one steelhead spawning tributary in the John Day River.

Although the river was a manageable size, Biomark and NMFS still needed to investigate designing larger antennas. The team determined that an antenna 20-25 ft. long with an 18" read range would be necessary to yield sufficient detections.

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In-stream PIT Tag Detection Taken to the Next Step

Through hard work, we developed antennas that were 25' by 4' long, but for ease of installation purposes, we fabricated 20' by 2.5' long antennas. The other concern was whether we could hold the antennas in place during the spring runoff period. To test this, we hired a hydraulic firm to analyze the forces on the antennas and installed some non-functioning antennas into the river (Figure 2). Unfortunately, the spring runoff was minimal this year, but the hydraulic analysis indicated that the antenna housings would be held in place against normal spring flow conditions. Based on the analysis and observation of the river, we decided on using pass-by or flat plate antennas as the antenna design that would hold best in this river.

Figure 2. Installation and monitoring of the non-functioning antennas at the John Day River site.

After attending an update on the status of the project, the fish managers approved the installation of the equipment. The antennas, transceivers, satellite system, and other equipment were ordered for the September installation. The tracks for holding the antennas were excavated in August and the antennas themselves were installed during the week of September 17 (Figure 3). The antenna configuration for the new John Day River site (JD1) has six antennas, installed in two 3-antenna arrays. The two-array design will provide directional information on the fish detected on both arrays. The river is too wide for six antennas to cover the entire span completely when it is full of water and so we designed the system to cover the thalweg portion of the river.

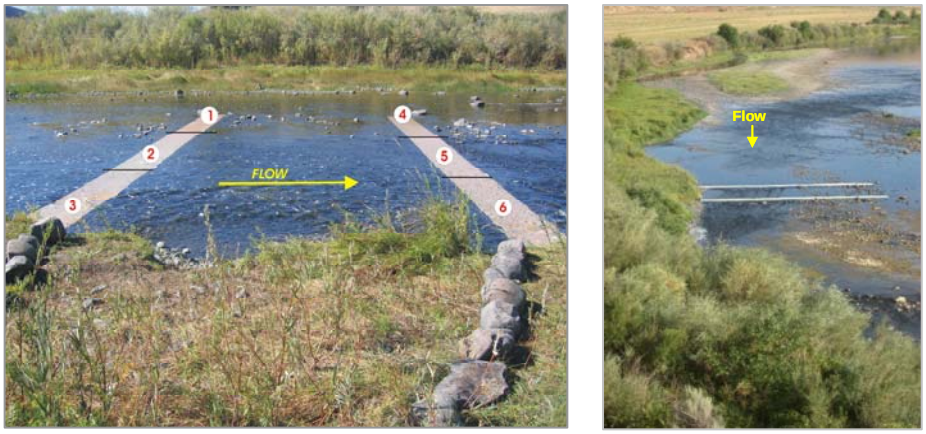

Figure 3. Photos showing the six antennas in the two 3-antenna array configuration

The AC power, data collection, and the communication systems were installed on 27 September for the new JD1 site (Figure 4).

Figure 4. Photos showing work being done during the installation at the John Day River site (JD1). On the right, Steve Anglea is taking tag-reading measurements on one of the antennas.

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In-stream PIT Tag Detection Taken to the Next Step

Biomark installed the permanent MUX transceiver on 2 October when they conducted tag-read-range tests (Figure 4). The AC power, data collection, and the communication systems were installed on 27 September for the new JD1 site (Figure 4). Biomark determined that the system could read the new SST model PIT Tags consistently at 18" vertically from the antennas and ST tags at 12"-15". Being able to read the ST tags at that height is important because many of the adults returning over the next few years would have been tagged with ST tags as juveniles.

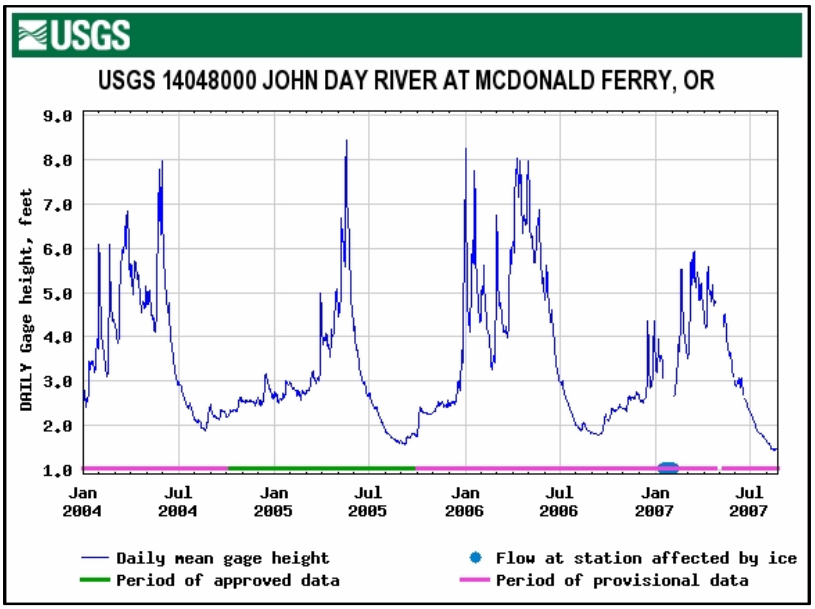

Figure 5. Water depth values from the USGS gauge at McDonald Ferry (January 2004 - July 2007).

The water depth when the steelhead are migrating during the fall to early winter ranges from 1.5-3.0 feet at this section of the John Day River (Figure 5). With these depths and if, as people predict, the fish stay near the bottom of the river and within the thalweg where we installed the equipment, then we think we will be able to detect most of the migrating fish. In 2008, we plan to determine the detection efficiency of the system using steelhead double-tagged with PIT and radio tags.

As of 10 October, the site is now fully operational and automatically uploading detection data to PTAGIS. We have been surprised that over the first 12 days, we have already detected 12 PIT Tagged steelhead (Figure 6). Ten of these fish were tagged as parr or smolts in the upper John Day River watershed; the other two tagged steelhead may have strayed into the John Day. This makes everyone associated with this project excited about what we will learn at this new site that truly takes in-stream PIT Tag detection to the next step.

PIT Tag Detections at JD1 This Year

Tag-ID	Fish Type	Tag Site	Release Site	Date Released	Date Detected
3D9.1BF201CE58	Wild Summer Steelhead	JDAR2	JDAR2	05/08/06	09/28/07
3D9.1BF25D068E	Wild Summer Steelhead	JDARSF	JDARSF	05/13/06	10/03/07
3D9.1BF1FFF98A	Wild Summer Steelhead	JSFMC	JSFMC	08/17/05	10/06/07
3D9.1BF2590E9D	Wild Summer Steelhead	JDARNF	JDARNF	05/11/06	10/06/07
3D9.1BF22EA762	Hat. Summer Steelhead	LGR	LGRRBR	04/24/06	10/07/07
3D9.1BF20011E2	Wild Summer Steelhead	JDARSF	JDARSF	05/07/05	10/07/07
3D9.1BF2000D12	Wild Summer Steelhead	JSFMC	JSFMC	08/09/05	10/07/07
3D9.1BF24FCB3A	Wild Summer Steelhead	LGR	LGRRBR	05/06/06	10/07/07
3D9.1BF25DB163	Wild Summer Steelhead	JDARSF	JDARSF	04/28/06	10/07/07
3D9.1BF262D319	Wild Summer Steelhead	JDARMF	JDARMF	05/15/06	10/08/07
3D9.1BF1B105B2	Wild Summer Steelhead	JDAR2	JDAR2	04/22/04	10/09/07
3D9.1BF22AE038	Wild Summer Steelhead	JDARSF	JDARSF	05/06/05	10/09/07
3D9.1BF2000580	Wild Summer Steelhead	JSFMC	JSFMC	09/05/05	10/12/07
3D9.1BF242B0A6	Hat. Summer Steelhead	LGR	LGRRRR	05/05/06	10/14/07
3D9.1BF2003DBA	Wild Summer Steelhead	JSFMC	JSFMC	08/22/05	10/14/07
3D9.1BF22EC055	Hat. Summer Steelhead	LGR	LGRRBR	05/24/06	10/15/07

Figure 6. PIT Tag information for fish detected at the new JD1 site through 15 October 2007.

We want to take this opportunity to thank the USACE for funding this project and specifically David Clugston for his support. We want to acknowledge Darren Chase and Scott Livingston from PSMFC for installing the satellite system and for getting the remote access program to work on the laptop. We also thank Gabriel Brooks from NMFS for overseeing the installation of the power system.

Slide Gate 2007 Season Summary

TROY HUMPHREY (PTAGIS Kennewick Field Office)

Slide Gate Background

2004 through 2006 were difficult times for the PIT Tag Separation-by-Code slide gates at Lower Granite, Little Goose and Lower Monumental dams. In 2006 alone there were 27 gate-related issues between the three sites. The issues ranged from gates sticking open or closed to gates breaking due to slamming.

These difficult years resulted in a meeting held on October 25, 2006 at Lower Monumental Juvenile Facility to discuss the gate problems that occurred throughout the 2006 season and possible ways to mitigate future problems. Each site was represented by the site biologist and lead mechanic. Also in attendance were Dave Hurson and John Bailey from the Walla Walla Corps of Engineers (WWCOE) district office, Carter Stein, Don Warf and Troy Humphrey from Pacific States Marine Fisheries Commission (PSMFC), and Jim Simonson from National Marine Fisheries Service (NMFS).

Many topics were discusses, as summarized here.

1. Responsibilities
   a. It was re-established that the WWCOE is responsible for the gates and the solenoids. PSMFC is responsible for the Programmable Logic Controller (PLC) and wiring to the solenoids.

2. Documentation
   a. PSMFC will provide links to gate information on the PSMFC website and keep that up to date. Included on the web page:
      i. Standard Operating Procedures
      ii. Electrical Schematics
      iii. Mechanical Drawings
      iv. Solenoid Sequence of Events
      v. Photos

Figure 1 - A PTAGIS diagnostic test (stick) tag activating a typical slide gate.

      vi. Recommended maintenance procedures and a spare parts list.(Gate Maintenance WW District-1.pdf)
      vii. Memorandum of Agreement, USACE-BPA
      viii. Updated spare parts list with items that would be most helpful to have in stock at all times. (This includes a new slide for each site)

3. Pilot Air for Solenoids
   a. PSMFC recommended that the site mechanics review the Standard Operating Procedure provided on the PSMFC web page (SOP Solenoid Porting Required for Pilot Air) prior to changing out solenoids. In the future pilot air will be added to the side-to-side gate at Little Goose and to all WWCOE district slide gates (except for McNary).

4. Anti-Slam Sensor Installation and Testing
   a. PSMFC inquired about the possibility of having the gates pulled and delivered to NMFS Pasco shop so that sensors could be tested and installed.

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Slide Gate 2007 Season Summary

5. Training
    a. PSMFC was asked to meet with the site biologists and the mechanics prior to water up each season and go through the operation of each gate and provide troubleshooting and maintenance tips along with things to look for when testing a gate.

The following is a brief description of what was done as a result of the meeting.

1. Site personnel addressed all issues that fell under their responsibility. PSMFC addressed all issues that fell under their responsibility. On the very few instances where there was a gate-related issue both organizations work well at resolving the issue.
2. PSMFC created the following web pages that encompass all that was requested.
    a. Fish Diversion Gate Documentation, Operation and Maintenance
    b. Gate Maintenance WW District
3. No solenoids were changed this year so Pilot Air was not an issue. The following link is to documentation concerning pilot air.
    a. SOP Solenoid Porting Required for Pilot Air
4. The following actions were taken at each site.
    a. Little Goose and Lower Granite pulled and delivered their gates to the NMFS shop. Jim Simonson and crew in conjunction with PSMFC performed the following on each gate:
        i. Replaced the slide.
        ii. Replaced the cylinder.
        iii. Replaced the guide rails.
        iv. Upgraded and replaced the shocks.
        v. Attached a mounting bracket for the sensors.
        vi. Added a mounting bracket for the sensor control wire box.
        vii. Added a flag for the sensors.
        viii. Installed a guard to protect personnel from the flag.
        viii. Re-worked the mounting holes for GRJ's slide gate cylinders.
        x. Re-programmed the PLC.
        xi. Thoroughly tested the sensors and PLC program.
        xii. Installed trouble lights in two locations at each site that flash when the PLC logic determines there is a problem with either the gate or the sensors.
    b. Lower Monumental mechanics in conjunction with PSMFC and NMFS performed the following for each gate:
        i. Jim Simonson and crew built new slides that were installed by Lower Monumental mechanics.
        ii. Replaced the shocks.
        iii. Replaced the cylinders.
        iv. The gate structure was modified by Lower Monumental mechanics to accommodate the sensors.
        v. Re-programmed the PLC.
        vi. Thoroughly tested the sensors and PLC program.
        vii. Installed trouble lights in two locations that flash when the PLC logic determines there is a problem with either the gate or the sensors.

Slide Gate 2007 Season Summary

5. PSMFC met with site personnel prior to the season start up and trained them on possible causes of a trouble light and how to respond to a trouble light.

2007 Season Results

The 2007 season showed marked improvement in gate efficiencies and overall gate performance. Gate banging was virtually eliminated due to the sensors and anti-slam PLC logic. PSMFC was on site weekly and sometimes twice a week during the peak of the season. The operation of the gates during the peak was exceptional. Not one single gate failure occurred during the 2007 season.

The trouble lights gave site personnel and PSMFC early warning when there was a potential problem, which was followed by a joint effort to resolve the issue. Early on in the season there were some nuisance alarms that occurred while the PLC program was being fine tuned; once those issues were resolved the trouble lights became a very useful tool. The following is a breakdown of the gate issues that occurred at each site during the 2007 season.

GRJ 2007 Slide Gate Performance

- Lower Granite had two viable gate trouble alarms, both on A Gate.
- The first was instance where a separator operator inadvertently set the gate travel open time to 0 as a result of a PSMFC screen being left open. The gate remained closed until PSMFC arrived and set the parameter back to the proper value.
- The second pointed to an issue with the cylinder for A Gate. There is a slight air leak, most likely on the rear seal of the cylinder. Re-timing the gate has eliminated the major issue but the gate cylinder still needs to be replaced. During a long sample the gate creeps completely open throwing the travel close timing off.

GOJ 2007 Slide Gate Performance

- Little Goose had three viable trouble lights, two on B Gate and one on A Gate.
- The cylinder on B Gate had developed a leak on the front side of the cylinder which caused a weak and erratic soft close and resulted in a trouble light. Site personnel replace the cylinder; PSMFC was on site to assist.
- The second B Gate trouble light may have been due to the soft close/open regulator being closed too far. The trouble light was cleared by site personnel but no report as to the cause was phoned in.
- The A gate trouble light was due to a sensor that had lost its alignment and was missing the flag. The sensor was repositioned and the problem was solved.

LMJ 2007 Slide Gate Performance

- Lower Monumental had one viable trouble light.
- The A Gate trouble light may have been due to the soft close/open regulator being closed too far. The trouble light was cleared by site personnel but no report as to the cause was phoned in.

Important Update to MobileSync Manager 1.0.20

JOHN TENNEY (PTAGIS Portland Office)

We've made an important update to MobileSync Manager 1.0.20 (MSM) to support the exporting and creation of PTAGIS interrogation files. If you are sending or planning to send data to PTAGIS from a MobileMonitor interrogation site, please download and install this version before doing so. Because very few MobileMonitor users submit data to PTAGIS, the bug was not discovered until recently.

Important: PTAGIS is considering discontinuing support of MobileMonitor/MobileSync Manager applications for a variety of reasons:

- Very few MobileMonitor users actually submit data to PTAGIS.
- Impact of supporting/maintaining these applications is delaying the development of core PTAGIS applications, (M4 and next version of P3 called P4).
- A new interrogation data model introduced in the next generation of interrogation software (M4) will require extensive modifications to MobileMonitor.
- Eroding market share of the PDA platform has limited the availability, raised cost and created rumors of discontinuing support for the Windows Mobile PDA platform.
- Possibility of an alternative low-power, XP-Embedded interrogation platform that can run M4 (we'll keep you posted on this).
- Difficulty and expense of enabling serial communication on PDA devices.

If we do discontinue support for MobileMonitor, the software will remain available "as is" and can be downloaded from the PTAGIS website. Please email John Tenney (John.Tenney@ptagis.org) with any concerns so we can gauge the impact of dropping support for this application.

PIT Tag Symposium planned for next Western Division AFS Meeting

DAVE MARVIN (PTAGIS Portland Office)

The Western Division of the American Fisheries Society (AFS) will hold their next annual meeting in Portland on May 4-9, 2008.

One of the planned symposia proposes to address the advances, adaptations, and aggravations of current PIT Tag mark/recovery applications in fisheries research and monitoring projects. Participants are encouraged to share the various successes and/or setbacks of their tagging, detection, study design, and data analysis activities.

The symposium will encompass all members and interests represented in the AFS Western Division. Researchers using PIT Tags to study lamprey, sturgeon, non-salmonid teleosts, and aquatic invertebrates are encouraged to participate.

Please contact Dave Marvin (Dave.Marvin@ptagis.org, 503.595.3100) if you are interested in contributing a presentation.