

PTAGIS

n e w s l e t t e r

Use Cyclic Redundancy Check (CRC) on Tag Readers

This year, Destron/Fearing introduced the "Generation 4" 400 kHz PIT tag. This tag features a larger, molded ferrite. Performance of this tag on stationary reading equipment is improved over prior generations of tags.

It was noted, however, during fish marking at Rapid River, that some of the tags (< 2%) mis-read. For example, some tags read more than one code per tag. This happened only when using the old style, blue loop Destron readers that do not incorporate CRC firmware.

In order for these tags to read correctly, the old style blue loop (or "radar gun") readers should be upgraded with "CRC NT" reader firmware.

This information was communicated to all tagging coordinators. If you need to upgrade your old style blue loop (or "radar gun") readers with the "CRC NT" firmware, please contact your tagging coordinator or Carter Stein at PSMFC.

Adult PIT Tag Interrogation

This article was submitted by Doug Marsh and Earl Prentice, of the National Marine Fisheries Service.

Since the first PIT tag was implanted into a juvenile salmonid, researchers have requested the interrogation of returning PIT-tagged adults. Reading range limitations of the current 400-kHz tagging system have restricted its use to the Lower Granite Dam fish ladder. The increased read range of the new ISO-based 134.2-kHz system will enable interrogation at other fish ladders. For FY 98, Bonneville Power Administration contracted National Marine Fisheries Service (NMFS) to investigate the interrogation of adult salmonids using the new ISO-based tagging system.

NMFS will install PIT-tag interrogation equipment in the Fisheries Engineering Research Laboratory (Adult Fish Facility) at Bonneville Dam's 2nd Powerhouse in early 1998. Within the adult facility, we will install tunnels on the two flumes that are currently used by various researchers to collect adults for radio-tagging and scale/tissue samples. The tunnels (30-cm diameter) will be similar to those used in the Lower Granite Dam adult ladder. The tunnels will be equipped with both 400-kHz and 134.2-kHz coils, although only the 400-kHz system will be active during the 1998 field season. The system will only be operational when researchers are working within the facility, so the number of adults interrogated will depend on how often the facility is used. Both the 400 and 134.2-kHz systems will be evaluated for tag reading efficiency using hatchery adult fish during the field season.

The PIT-Tag Steering Committee will be consulted as to the adult interrogation needs of the fisheries community. We ask that all researchers and managers share with their representatives what they feel are important considerations in this system's development process.

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1998 PTOC Operations Status

Data Center Operations

PTOC interrogation systems have been collecting “timer tag” data from all sites since the middle of February. As sites become operational, PIT Tag data will be collected and processed.

All ISO monitors at McNary dam have been included in the production configuration for the site.

Field Operations

Lower Granite Juvenile Bypass (GRJ)

The primary bypass became operational on 3/17/98 at 1:00 pm. The first PIT interrogations appeared on Friday, 3/26/98 at 7:00 am.

Lower Granite Adult Trap (GRA)

On 3/11/98 the adult trap was dewatered for repairs and maintenance. The adult trap was watered-up on 3/25/98 at 12:30 pm. The trap was shut down again on 3/30/98 for repairs, and became operational on 4/3/98 around 7:00 am.

Little Goose Juvenile Bypass (GOJ)

The primary bypass (all fish going from flume to river with no detections) was watered up on 3/2/98. Fish collection began on 4/1/98 at 7:00 am.

Lower Monumental Juvenile Bypass (LMJ)

This primary bypass was watered up on 3/23/98. Fish collection began 4/1/98 at 7:00 am.

McNary Juvenile Bypass (MCJ)

Primary bypass was watered-up 3/29/98 at 7:00 am. Sample collection began 3/29/98 at 7:00 am.

John Day Subsample (JDJ)

Tentatively scheduled to water up during week of 4/5/98.

Bonneville (BVJ, BVX, B2J, B2A)

BVJ: Sub sample operations began on 3/9/98.

BVX: The DSM1 flat plate detector has been in operation 8 hrs per day during swing shift since 3/20/98. On 4/1/98 at 8:00 am the BVX flat plate unit in Downstream Migrant Channel 1 (DSM1) began 24 hour operation

B2J: On 4/1/98 the four coil monitor in Downstream Migrant Channel 2 began 24 hour operation.

B2A: As of 3/30/98, NMFS has installed RF shields, conduit and cables for the 400kHz system in the adult lab on the Washington ladder. PSMFC has installed a WIN-95 based computer platform. Installation of coils, exciters, controllers is not yet scheduled.

PIT Tag Reading Efficiency

Statistical Method Used to Calculate Efficiency

Tag reading efficiency can be performed using direct or indirect methods. The direct method requires that a known number of fish be released into an interrogation system; after all fish have passed through the interrogation system, a comparison is made between the number of fish released and the number of fish monitored.

Direct measurement of coil efficiencies at all monitor locations in our Columbia Snake River system is not practical for operations and maintenance purposes. Instead, PSMFC utilizes an indirect statistical method. This method is described in “Statistical Method of Determining PIT-Tag Coil Reading Efficiency,” a paper which is available on our web site (under “Data and Reports”).

The paper explains in detail the indirect statistical methods used to determine PIT tag monitor tag reading efficiency. An associated link on the same page (http://www.psmfc.org/pittag/Data_and_Reports) contains reports on PIT Tag coil reading efficiency.

PSMFC has developed two tools to monitor detection system efficiencies. The Cumulative Efficiency Analysis tool produces the Cumulative Efficiency report (see below). This report computes efficiencies over an accumulated time interval.

The second tool is the instantaneous efficiency analysis tool. This tool provides a near real time histogram of both coil and monitor efficiencies for the last 1000 distinct tags. Each point on the histogram represents the efficiency of the system (coil or monitor) for twenty fish. By viewing this histogram, one can identify changes in reading efficiency due to random events. We will describe this tool in more detail in a future article.

Reading the Cumulative Efficiency Report

The Cumulative Efficiency Analysis report computes both a coil-by-coil efficiency and a monitor efficiency. We define a “monitor” as a collection of one or more coils at a point within an interrogation system.

As described in the paper, “Statistical Method of Determining PIT Tag Coil Reading Efficiency”, the monitor reading efficiency is, simply stated, the product of the individual coil efficiencies for the monitor. Take the following extract of the Diversion Exit monitor at Little Goose Dam for 1997 as an example (Please refer to Figure 1 on the next page).

Figure 1

LITTLE GOOSE DAM JUVENILE, DIVERSION EXIT			
	TOTAL	MISSED	ESTIMATED EFFICIENCY
Individuals:	74177		
Coil 54	71627	2550	96.56%
Coil 56	71166	3011	95.94%
Coil 58	71515	2662	96.41%
Coil 5A	72094	2083	97.19%
The number of fish seen on 1 coils = 244			
The number of fish seen on 2 coils = 1807			
The number of fish seen on 3 coils = 5960			
The number of fish seen on 4 coils = 66166			
The estimated probability of missing fish is :			
1.406e-004% +/- 1.077e-005% (at 95% confidence)			

The report at left shows that a total of 74,177 distinct PIT tags were “seen” by at least one coil in this monitor. It also shows the number of fish seen by each coil in the monitor, along with the estimated efficiency of each coil. It then shows the number of distinct PIT tags seen on only one coil, exactly two coils, three coils, or four coils.

Finally, the estimated probability of missing a fish is listed in scientific notation, along with the associated variance at a 95% confidence level.

New Feature: Retrieve Clip Files

When PIT tags are distributed, a diskette is sent with the shipment that contains the list of PIT tags and the associated box numbers. This information can be used by the PITTAG.EXE program for verification purposes. If you don't have the diskette, you can still get the clip files, as outlined below.

We would like to introduce a new WWW-based tool for getting PIT tag clip files, it is called “Retrieve Clip Files”. To download clip files using our new tool, follow the steps below:

- 1) Go to the PIT Tag Home Page at PSMFC (<http://www.psmfc.org/pittag>);
- 2) Follow the link to “Data and Reports”;
- 3) Choose “PIT Tag Clip Files” and the screen shown in Figure 2 will appear.

You can query the system by entering the number of one clip file, or you can do a wildcard search (using an asterisk, *) to return multiple clip files. If you search for only one clip file, then the file is returned to you in its original format. If you use a wildcard search that returns more than one file, then the application uses PKZIP to zip all returned clip files into one file, which can then be downloaded.

You may see the file names returned from your search by selecting “click me to see the file(s) found”. To download the zip file to your PC, select “click me to download your zipped file”, as shown in Figure 3 below.

If you run into problems or have questions, please contact Gary Vermeulen (garyv@psmfc.org) or Jennifer Mead (jen@psmfc.org) at (503) 650-5400.

Figure 2



Figure 3



Announcements

- The PIT tag project has hired a new programmer: his name is Gary Vermeulen. Gary will be assuming primary responsibility for deployment of the new Windows '95 based PIT Tag program, PITTAG2. He will also be working on applications for the database and the WWW. Gary is also available to answer any questions that you may have. His e-mail address is garyv@psmfc.org.
- Jennifer Mead has taken a new position the Oregon Graduate Institute as a Database Administrator. April 17th will be Jen's last day at PSMFC. We thank Jennifer for her contribution to the PTAGIS program, and wish her the best of luck in her endeavors. She will be missed!
- The new PITTAG workstation software (PITTAG2 for short) has been released to the PIT Tag Steering Committee in beta form. They are currently in the process of finding and registering bugs and suggesting enhancements to incorporate. Please refer to the January 1998 issue of the *PTAGIS Newsletter* for details on the program. You can also access that article on our web site at http://www.psmfc.org/pittag/Software_and_Documentation/Newsletter.
- The *1998 User Manual* and *Specification Document* have been mailed out to all PIT tag system users. If you have not received your copies, or need additional copies, please contact Liza Bauman.

We welcome input from the PIT Tag community, so feel free to call (503/650-5400), fax (503/650-5426), e-mail, or write us with your story ideas. If you have any questions regarding the contents of this publication, or about the PTAGIS program, please contact Carter Stein, PTAGIS Program Manager. Editing and layout by Liza Bauman (liza_bauman@psmfc.org). Unless otherwise noted, contributors include Carter Stein (carters@psmfc.org), Liza Bauman (liza_bauman@psmfc.org), and Jennifer Mead (jen@psmfc.org). Date of issue: 4/6/98.

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