

PTAGIS

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ISO Transition Project Update

On September 9, 1998, the ISO Transition Planning Team (TPT) met in order to make a decision on deployment of the new (ISO-based 134.2 kHz) tag frequency in the Columbia River Basin for the year 2000 out-migration.

The team concluded that the key components of the new system meet or exceed the performance of the existing 400 kHz system. The key components are the tag, the portable readers, the stationary readers and other necessary support infrastructure.

One critical element of this decision was the stationary transceiver field tests that were conducted in August at the McNary and John Day Dam Juvenile Fish Facilities (MCJ and JDJ). See the article "Apples to Apples" at right for a summary of these tests.

The technical decision to proceed with the new system was communicated in a letter from the Co-chairs of the TPT to the directors of the Columbia Basin Fish and Wildlife Authority, Bonneville Power Administration Fish and Wildlife Program, and to the Chair of the Anadromous Fish Managers. The letter is included in this newsletter on page 4. ♦

"Apples to Apples" Comparison of ISO PIT Tags

The following article was submitted by Dr. Sandy Downing, NMFS Manchester.

During August 1998, a multiple agency team conducted fish tests at McNary (MCJ) and John Day (JDJ) Dams to determine if the ISO-based stationary PIT-tag interrogation system performed as well as or better than the current 400-kHz system. This information was critical for helping to decide whether the fisheries community should proceed with the transition for the year 2000 smolt migration.

Tag-Comparison Test

Test fish (fall chinook salmon) were tagged at Priest Rapids Hatchery. The tag comparison test at MCJ compared four types of ISO tags—12 mm and 13.5 mm tags produced by Destron-Fearing and Datamars (abbreviated as DF12, DM12, DF13, and DM13) to 400 kHz tags using the same monitor (the B-raceway ISO monitor whose coil IDs are A1-A4) so that hydraulic conditions would be equal. All other conditions were also kept as constant as possible.

All fish were scanned before they were released so actual numbers could be used to calculate reading efficiencies (REs) for the different coils and monitors instead of relying on the estimated cumulative RE values that PSMFC publishes daily (see the April 1998 *PTAGIS Newsletter* for more information of cumulative RE values). RE for a monitor is calculated by determining the percentage of tagged fish read, by at least one coil, out of the total number of PIT tags used for a test that transited the monitor. For an individual coil, RE is the percentage of tagged fish read by that coil out of the total number of tags used.

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Fish and Wildlife Program FY2000 Proposal Process

Fish and Wildlife project proposal request forms were sent out by BPA last week. As was the case last year, there is a space in this form for PIT tagging projects to identify PIT tag requirements. Please write the number of PIT tags that your project requires for FY2000 in the space provided in Section 5, Budget on page 3 of the form.

Also, if you haven't upgraded computers that you will be using for PIT tagging, please plan for these upgrades as well. See page 5 for computer requirements for the new windows-based tagging program, PITTAG2.EXE. ♦

Thank You, Everyone! 1998 ISO Transition Field Tests

The ISO Transition Planning Team extends its thanks to everyone who helped to make the 1998 field tests successful. The project was a model of inter-agency cooperation. Everyone who helped should feel proud to have been a part of the accomplishment.

The marking and release phases of the project provided special challenges due to the over 100 degree temperatures.

Thank you to PSMFC office staff: Liza Bauman, Teresa Fairchild, Genna Golden, Todd Kaehler and Kathy Shimojima. These people provided overall support during tagging by performing such tasks as cleaning, sanitizing and loading needles, setup and clean-up, making travel arrangements and even tagging fish. Special thanks to Dave Marvin who coordinated resources for the tagging at Priest Rapids. Thanks to Liza Bauman, Dave Marvin, Scott Livingston and Don Warf for setting up and tearing down the awnings for the tagging event. Thanks to Kevin Rubesh and Gary Vermeulen who provided technical support for the new tagging software.

Thanks to Dave Wills and Dan Magnuson of US Fish and Wildlife Service for supplying tagging stations, equipment and coordination and labor.

Thanks to Washington Department of Fish and Wildlife and their people, Diane McKissick, Charles Morrill and John Serl. Thanks to Ron Pederson, manager of the Rapid

New Policies and Procedures in Place at the PTOC

In order to comply with the Northwest Power Planning Council (NPPC), Columbia Basin Fish and Wildlife Authority (CBFWA), Bonneville Power Administration's Fish and Wildlife Program (BPA), the PIT Tag Operations Center (PTOC) is developing new policies and procedures to deal with PIT tag requests and distributions. We ask that you keep this in mind when submitting your PIT tag forecasts and distribution requests in the coming year.

On October 2, 1998, the PTOC sent out a forecast letter and new Distribution Request Forms (DRFs). These letters were addressed to the "Proposal contact person or principal investigator" (PCP) listed for each BPA project number that plans to use PIT tags in FY99. If you are not the PCP for your project, and you are the person who will be submitting DRFs to the PTOC, please keep in touch with your project's PCP, as all official PTAGIS project correspondence will be directed to the PCPs at the addresses given in each proposal.

If you are unsure about who the PCP is, you can look it up at the following website: <http://www.streamnet.org/aiwp99/viewcompletelist.html>. Find your project number (listed in numerical order in the second column). Click on the project name in the left-most column, and launch Adobe's Acrobat Reader to view the proposal. The PCP will be listed on the first page.

New Procedures:

1. When submitting DRFs to the PTOC, please allow two full weeks for us to process your request.
2. Only original forms will be processed. You may fax a copy of the DRF to the PTOC as a "heads-up" to us that the DRF is on its way. Keep the pink copy for your records, and mail us the white original and yellow copy.
3. All tag requests are compared to a list prepared by NPPC, CBFWA, and BPA. If a request for tags exceeds the available balance for the project, it may take us extra time to process the DRF. It is also possible that the full amount of tags requested will not be distributed.

If you have any questions concerning your available tag balance, please contact Liza Bauman at 503.650.5400 or via e-mail at liza_bauman@psmfc.org. ♦

'Thank You' continued on page 6...

... 'Apples' continued from page 1.

As you can see from Figure 1 (below), all of the individual coils had RE values above 95% for DM12, DF13, and DM13 ISO tags, but not for the DF12 and the 400 kHz tags. However, all of the two-coil combinations for DF12 and the 400 kHz tags had RE values above 97%. Thus, the ISO-based system performed as well as or better than the 400 kHz system in this test.

Figure 1. REs by Tag Type.

Tag Type	Overall RE* (%)	Individual REs (%)			
		A1	A2	A3	A4
DM12	99.5	95.7	97.4	96.2	95.9
DM13	99.4	96.1	96.5	96.3	95.5
DF12	99.8	93.1	95.8	92.3	94.3
DF13	100.0	96.3	96.3	96.3	95.9
All ISO	99.7	95.2	96.4	95.2	95.3
400	99.5	86.7	96.7	92.2	95.4

* (all 4 coils combined)

Whole-Dam Test

In the whole-dam test at MCJ, fish tagged with DF12, DM12, and DM13 tags were released above the fish-and-debris separator and mostly were allowed to transit the bypass/collection facility volitionally. Again, all fish were scanned first. The 12 individual coils or stationary transceivers installed at MCJ read the three tag types equally well with an average RE of $92.8\% \pm 1.04\%$ (\pm standard deviation). The RE values for individual coils were lower than in the tag-comparison test. Most likely this was due to groups of fish going through the coils together (two tags cannot be read if they are in the electromagnetic field simultaneously)—we had carefully avoided grouping during the tag comparison test. In fact, the effect of grouping was obvious when the separator was lowered at the end of the second day of testing and high numbers of tags transited the coils simultaneously (this significantly reduced the instantaneous RE values computed by PSMFC). This reduction is similar to what normally happens when the PIT tag head tanks are lowered at the bypass/collection facilities.

Fish Tests at John Day Dam

The tests at John Day Dam determined RE values for the six installed ISO coils (coil IDs of 20, 21, 22, 23, 90, and 91) and for two 400 kHz coils (coil IDs of 94 and 96). For the ISO-based system, only DF12 tags were used.

Except for one ISO coil that had a RE of 94.5%*, all of the individual coils had RE values above 95% for both systems (shown in Figure 2 below). The ISO-based stationary transceivers performed as well as the 400-kHz system and they had not been touched since they were installed in June.

Conclusions

The ISO-based system performed as well as or better than the 400-kHz system in all of the fish tests. Therefore, the results support proceeding with the transition for the year 2000 smolt migration. In addition, the results demonstrated that the shorter DF12 tag should be satisfactory for fisheries research (BPA has a contractual agreement to purchase these tags through 2001). Furthermore, the results support installing 3 coils instead of 4 coils in monitors previously identified as less critical.

The results also suggested approaches for improving RE values: 1) the flumes should be covered above, between, and below the installed shields to reduce sudden changes in fish behavior due to changes in light-dark conditions and 2) to avoid high tag densities, the PIT tag head tanks should be emptied more often than once an hour. ♦

*No adjustment or maintenance was performed on these ISO coils from the time they were installed on June 26, 1998 until this test on August 12, 1998. On September 21, 1998 coil 22 was adjusted approximately one inch away from the electromagnetic field (EMF) shield box. This reduced EMF noise levels to between 3-6 percent, and may account for the lower RE for this coil during the August test.

Don Warf and Scott Livingston replace ISO coils with 400 kHz coils for the "apples to apples" test at McNary Dam.



Figure 2. REs for Individual Coils

Tag Type	REs (%) for Individual Coils							
	20	21	22	23	90	91	94	96
DF12	96.1	97.4	94.5	97.4	97.1	95.4		
400							97.7	95.9

The following letter was sent to the addressees on September 30, 1998.

MEMORANDUM

To: Brian Allee, CBFWA, Si Whitman, AFM, and Bob Lohn, BPA
From: PIT Tag Systems Transition Team Co-Chairs: Charles Morrill, WDFW, John Rowan, BPA, and Carter Stein, PSMFC-PTOC
Re: PIT Tag Systems Transition Team's recommendation for the proposed transition from the current 400 kHz PIT Tag detection system for juvenile salmonids to a new ISO based (134.2 kHz) detection system for the year 2000 smolt migration.

The PIT Tag Systems Transition Team met on September 9, 1998 and reviewed progress to date on all components (portable and stationary transceivers, tags, infrastructure needs, installation schedules, and systems management tools) essential to meet the proposed year 2000 time line. The System Transition Team concurred that all of the components essential to the transition are or will be available in time to complete the changes required for the transition. *Therefore, we recommend that the transition proceed and the new system be on-line for the year 2000 smolt migration.*

The initial field phase of the transition has already begun as juvenile steelhead, expected to migrate in the year 2000, were tagged this summer using new ISO (134.2 kHz) portable readers and tags.

Beginning in 1999, all projects will use the new tags and portable readers to tag juvenile salmonids expected to migrate out in the year 2000 or later. Implementation details for the transition will be identified and coordinated through the PIT Tag Systems Transition Team, BPA, U.S. Army Corps of Engineers (COE), PIT Tag Operations Center (PTOC), and the PIT Tag Steering Committee (PTSC). Pertinent information and updates on the transition will be communicated regularly on PTOC's web site and included in the PTAGIS newsletter.

In order to accommodate critical infrastructure modifications (installation of system electrical and communication lines) on time, it will be necessary to turn off the 400kHz PIT tag systems at the Snake River dams (LGR, LGO, LMO) on September 1, 1999. At McNary Dam the 400kHz system will be turned off October 1st. Installation of the new transceivers and electromagnetic shields on-site at LGR, LGO, LMO, MCN, JDA, BON dams and the diversion system at Prosser (Yakima R.) will begin as soon as the facilities at these sites have been dewatered. Installation and testing is scheduled for completion by mid-March of 2000.

Members of the Systems Transition Team would be happy to provide additional details and information. We ask that you contact Carter Stein, PTOC at (503) 650-5400 and he will work with the appropriate team members so we may respond to your request(s).

The Systems Transition Team's work has focused only on the juvenile detection system. We wish to point out to the fisheries community that a team from NMFS, BPA, and the COE is working on and overseeing the development of a detection system for adult salmonids based on the new ISO tags. Lab testing by NMFS of available ISO equipment is on-going. Field tests are scheduled to begin at Bonneville Dam in 1999 to evaluate different antenna designs, electronic configurations, and fish responses to the installed equipment. The goal is to provide adult detection in the orifice passages in the fish ladders at Bonneville Dam as soon as is feasible.

CC: CBFWA, AFM, CBFWA, CRITFC, FPC, PTTT, PTSC

PIT Tag System Transition Team Members: John Rowan, BPA, Carter Stein, PTOC, Sandy Downing, NMFS, Dave Hurson, COE, Blaine Ebberts, COE, Ed Buettner, IDFG, Dave Wills, USFWS, Charles Morrill, WDFW

Adult Salmon PIT-tag Interrogation in the Columbia River Basin

The following article was submitted by Earl Prentice, NMFS Manchester.

The capability to interrogate returning PIT-tagged adult salmonids at Federal dams throughout the Columbia River Basin (CRB) is called for in both the Power Planning Council's 1994 Fish and Wildlife Program and in the National Marine Fisheries Service's (NMFS) 1995 Biological Opinion on operation of the Federal Columbia River Power System (FCRPS). The 1995 BiOp states that the "COE, BPA and NMFS shall complete the design and development of adult fish PIT-tag detector systems in adult fish passage facilities at mainstem dams immediately, followed by installation with no adverse effect to adult passage."

Presently, there are two Passive-Integrated-Transponder (PIT) tag interrogation systems for adult salmon in the CRB. The first is located at Lower Granite Dam (GRA) and the second in the adult monitoring facility at Bonneville Dam (B2A). The latter system was installed during the 1998 field season. Both of these systems operate using traditional 400-kHz interrogation equipment that is identical to that used for interrogation systems for juvenile salmon in the CRB. Unfortunately, the 400-kHz

system has several performance limitations (e.g., a short tag-read range) that limit its usefulness for interrogating adult fish in fish ladders.

In the year 2000, the network of interrogation systems for juvenile salmon within the CRB will be converted from the 400-kHz system to a 134.2-kHz system that is based on standards established by the International Standards Organization (ISO). One of the benefits of this new ISO-based system is that the tag-reading range is expanded. This expanded tag-reading range should enable certain areas (e.g., orifices) within adult fish ladders to be equipped with PIT-tag interrogation systems. Research by NMFS electrical engineers to adapt the ISO-based technology for detecting fish transiting orifices is on-going. To oversee and guide the work necessary to install PIT-tag detectors in fish ladders at the COE's mainstem dams, a multi-agency Adult PIT-tag Development Team (APTDT) was established in July 1998 that consisted of representatives from COE, BPA, and NMFS. The APTDT membership was expanded in October to include representatives from Pacific States Marine Fisheries Commission and the PIT-Tag Technical Steering Committee.

The APTDT was specifically chartered with planning, reviewing technical issues, and providing guidance during the development, evaluation, and installation of PIT-tag systems for adult salmon throughout the CRB. The team to date has focus on developing conceptual designs for placement of adult detectors in existing fish ladders. Several designs were considered with those showing the greatest promise from technical, operational, maintenance, hydraulic, structural, and biological standpoints being earmarked for further investigation. Drawings of the selected designs have been drawn and will shortly undergo review by COE and NMFS engineers. The COE and NMFS have budgeted money to cover the engineering work associated with this task. If the concepts still look feasible after this phase of review, they will be presented to the fisheries community and Tribes for further review and comment.

Assuming all interested parties agree that these approaches are satisfactory, the schedule developed by APTDT calls for the installation of engineering design (prototype) detectors in an orifice in the Cascades Island Fish Ladder at Bonneville Dam during the ladder-maintenance period (December 1998-January 1999) and in an orifice at the adult monitoring fish ladder during its dewater period (November 1998-February 1999). ♦

PITTAG2 System Requirements

Please keep in mind that the new PITTG Workstation Software (PITTAG2) will run on the Microsoft Windows '95 or Windows NT operating systems only. PITTAG2 will be ready for use in January 1999.

Performance of the machine will depend on the clock speed of the machine and the amount of RAM available. The minimum requirements for running a PIT Tag station with the new software will be:

Processor: Pentium, PentiumPro or PentiumII
Clock Speed: 100 MHz
Memory: 16 Megabytes
Disk Space: 5 Megabytes

Remember these are the minimums. For optimal performance, additional memory (32 Megabytes or higher), speed (133 MHz or higher) and disk space (10 Megabytes or more) are highly recommended. Please contact Dave Marvin with any questions. ♦

... 'Thank You' continued from page 2

River Hatchery for supplying and caring for the study fish. In the smolt monitoring office, thanks to Paul Hoffarth and Rosanne Tudor.

Thanks to Ed Buettner of Idaho Department of Fish and Game for tagging more than his share of fish and training others to do the same.

Thanks to all the people from NMFS, Study Director, Dr. Sandra Downing, the John Day contingent of Rick Martinson, Randy Absolon and the fish transport crew from Pasco, Scott Davidson, Ron Marr and Bill Wassard.

Thanks to John Rowan of Bonneville Power Administration who hoisted his share of buckets.

Thanks to the US Army Corps of Engineers: Dave Hurson, Lisa Hetherman and the McNary Crane Crew.

Thanks to Datamars SA and to Destron / Fearing for supplying tags for the tests. And thanks to Sean Casey

for fish handling, counting and other technical support for the tests.

Thanks to all of the supervisors and managers of all of these people for lending a hand to the overall PIT tag system transition study program. And thanks to anyone else who helped, but I forgot to mention here. ♦

Announcement

PTAGIS currently has an opening for a Computer Software Engineer. If you or anyone you know might be interested in applying for the position, please go to the Pacific States Marine Fisheries Commission's web page, located at <http://www.psmfc.org>. Under the personnel section are copies of the announcement, a detailed position description, and an application form. The deadline for submitting applications is 5 pm on Friday, October 30, 1998. ♦

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. Unless otherwise noted, contributors include Carter Stein (carters@psmfc.org), Dave Marvin (dave_marvin@psmfc.org), and Liza Bauman (liza_bauman@psmfc.org). Date of issue: 10/22/98.

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