



***PTSC  
Columbia Basin  
PIT Tag Steering Committee***

***Minutes from***

February 19–20, 2003

Gladstone, Oregon

*Prepared for:*

**PTSC**

Prepared by:

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## 1. AGENDA

Please see <http://www.pittag.org/PTSC/agenda.html> for reference material.

1. PTAGIS Web Site -- Interpretive Section
2. PTAGIS Web Site -- Advanced Data Access Section
3. Digital Angel / Biomark
  1. SuperTag
  2. Generation 2 Transceiver
  3. ISO Upgrades to FS2002
  4. Pre-loaded, sterilized, tag delivery system
  5. Other Applications of Interest
4. Hi-Q PIT Tag Project at Bonneville II
5. Review PTSC Charter
6. Review Separation by Code Process
7. Review Tag Distribution and Inventory Process
8. Agency Marking Plans for 2003 / 04
9. Sandy Downing Adult Ladder Detections & Performance
10. Adult Data Reporting
11. Review PTOC Interrogation Site Support Model
12. Secondary marking of previously PIT tagged fish
13. 2004 PIT Tag Workshop Planning
14. Review Flag Code Analysis
15. Facility Sub sample Events & PLC notification
16. Review Spec Doc

## 2. PTAGIS WEB SITE -- INTERPRETIVE SECTION

Carter presented an overview of the PTAGIS Infrastructure Upgrade project which was initiated in 2002. An initial RFP was issued to initiate development of User Requirements for web based interface to PTAGIS data and system information. The results of this procurement action were 1) Initial Requirements Document; and 2) Interpretative Web Site.

FieldTrip, Inc, presented the PTAGIS "Interpretive" web site. The Committee offered several suggestions that FieldTrip Inc. is to incorporate.

The Interpretive web site will be deployed in conjunction with the advanced Data Access web site. Originally, the deployment scheduled called for production operation of the new site to begin in June, 2003. As of this writing, deployment is scheduled for September 2003.

## 3. PTAGIS WEB SITE -- ADVANCED DATA ACCESS SECTION

After much work and PTSC review, the finalized requirements were issued as a component of a second RFP to acquire consulting services for development of the

'PTAGIS Advanced Data" access web site. Science Applications International Corporation (SAIC) won the award and has initiated development of the new PTAGIS web site.

The RFP and Functional Requirements can be found at the link listed at the beginning these minutes.

The past and future expected of the PTAGIS service is the driving motivation for the data systems, software, and internet and basic infrastructure upgrades. The goal is to provide high quality data, in near real time in an effective and efficient manner to all PTAGIS users.

Originally, the deployment scheduled called for production operation of the new site to begin in June, 2003. As of this writing, deployment of the new web site is scheduled for September 2003.

#### **4. DIGITAL ANGEL / BIOMARK**

Sean Casey, Digital Angel (DA), introduced a new engineer, Jon Mueller.

##### **4.1 SuperTag**

Sean reported that DA is overcoming some technical difficulties related to the new tag machine (glue). He said that production is about 10K tags per day, and will be around 15K per day by April.

DA has commissioned the production of a second machine that is to be on-line in September.

Sean reported that DA has agreements to sell to US Army Corps of Engineers, Bonneville Power Administration, NOAA Fisheries and Pacific States Marine Fisheries Commission.

Biomark is DA's exclusive North American distributor for all tags and equipment for agencies not funded by the agencies listed above.

##### **4.2 Generation 2 Transceiver**

The Generation 2 Transceiver (G2 Xcvr) is a project that that was motivated by NOAA Fisheries and US Fish and Wildlife Service need for in-stream detection systems and additional functionality that is required, but impossible to implement into the existing FS2001 or FS1001 readers.

Sean reported that a project kick-off meeting was held in Minneapolis MN on January 22-23, 2003 to review the project plan and to gather high level user requirements.

##### **4.2.1 Teams for this development effort are:**

###### **4.2.1.1 Program Manager:**

Jon Mueller, Digital Angel

**4.2.1.2 Software:**

Mark Teskey, Logic Product Development

John Tenny, PSMFC

Jon Mueller, Digital Angel

**4.2.1.3 Mechanical Packaging:**

TBD, Logic Product Development

Don Warf, PSMFC

Anthony Carson, Biomark

Earl Prentice, NMFS

Jon Mueller, Digital Angel

**4.2.1.4 Electrical Design:**

Scott Wilken, Logic Product Development

Don Warf, PSMFC

Bruce Jonasson, NMFS

Jay McGown, Biomark

Jon Mueller, Digital Angel

**4.2.2 Requirements**

Sean reported that the discussion at the G2 kickoff meeting revolved around system requirements. Generally, the G2 system would be capable of replacing the current adult and juvenile systems, configurable by end-users specific to application domain, capable of driving and synchronizing four analog cards (multiplexing), provide data logging capability – including temperature, GPS, clock synchronization, time-stamping, diagnostics, additional I/O, etc.

The requirements discussion included technical topics such as digital signal processing (DSP) integration with the analog boards, system interconnects, port drivers, expansion memory options, opto-coupled gate outputs, power requirements, system CPU, antenna and driver options, etc.

Contact Jon Mueller for details of the requirements of the G2 system.

**4.3 ISO Upgrades to FS2001-F**

Sean announced that the FS2001F is discontinued. It is replaced with the FS2001F-ISO. The upgrade provides the following advantages:

- Faster
- Increased Read Range
- Works well with custom antennas using external tuning box

- ISO Compliant (reads FDX-A – i.e. the ‘old 400kHz’ tag and the FDX-B ISO tag)

Users can have their FS2001-F’s upgraded to the FS2001F-ISO model.

The cost of the upgrade is \$700.00 plus shipping. The upgrade includes

- New Antenna;
- Two meter cable;
- Analog board replacement;
- New lithium battery with new battery holder;
- Software upgrade; includes date/time stamping in memory log
- Production test (traveler attached).

FS2001F-ISO readers are available from Biomark. Cost is \$2750.00.

#### **4.3.1 FS2001F – FS2001F-ISO Upgrade Procedure**

Follow these instructions to upgrade your FS2001F reader. This upgrade requires five weeks, and Digital Angel should be provided 3-4 months advance notice of your intention to upgrade.

1. Call Digital Angel (1-800-328-0118) and request an “**RMA Number**”.
2. Provide the **Serial Number** of your FS2001F reader.
3. Mail the FS2001F unit (the ‘brick’ only) to Digital Angel.

#### **4.4 Pre-loaded, sterilized, tag delivery system**

NOAA Fisheries marking program at Lower Granite Dam motivated a fresh look at this old topic.

Sean provided diagrams and distributed a wooden model for a new tag injector. Other components of the pre-loaded, sterilized, tag-delivery system include pre-loaded sterilized needles, minimized storage space for needle/tag assembly, ultimately HDPE needles that can be incinerated for disposal.

Comments related to the wooden model include:

- Need to shorten ‘throw’
- Need to shorten bevel on needle
- Need to shorten and thin handle
- Needs a smaller hub to minimize storage space
- Maybe octagon needle mount or trapezoid shape to align tag / bevel in needle

DA would like user input. Contact Sean with your ideas.

#### **4.5 Other Applications of Interest**

Dean Park from Biomark showed multiple sizes and shapes of antennas that his company uses for many applications around the world. He showed antennas up to 30

inches in diameter, submersible antennas, a triangular antenna used to traverse an area of a stream or ground by a mobile user.

He showed an 'Adult Trough Antenna' in use at Rapid River Hatchery.

For more information about these applications contact Dean Park at Biomark.

## **5. HI-Q PIT TAG PROJECT AT BONNEVILLE II**

Sean reviewed project status for deployment of a PIT tag detection system for the new High-Q bypass flume for the Bonneville Dam Power House II Corner Collector.

The flume will require an antenna about 18 feet tall by 20 feet wide. Water in the flume flows over 30 feet per second, and flow is about 6,000 feet per second.

Regional decision makers (FFDRWG) have set a target goal of 60% detection efficiency of the system on the flume

Development of the Hi-Q system may include tag improvements (adding ferrite?), modifying the tag telegram (reduce number of bits required for transmission), antenna upgrades to improve signal to noise ratio, upgrade to transceivers – implementation of DSP technology among other things.

Contact Jeff Hurt at US Army Corps of Engineers for project details.

## **6. REVIEW PTSC CHARTER**

The Committee reviewed the PTSC Charter. The Committee agreed that it is still pertinent and no further action is required.

## **7. REVIEW SEPARATION BY CODE PROCESS**

The Committee reviewed the Separation by Code process (see [www.pittag.org/Ptoc\\_OM](http://www.pittag.org/Ptoc_OM)). The Committee agreed that the process seems to be OK.

There are issues related to project coordination between the AFEP process and the FPAC process, but these issues are worked through by NOAA Fisheries agreement with FPAC.

The Committee acknowledged that PTAGIS can not provide enforcement for any of the Coordination Requirements identified in the existing procedure.

The group agreed that the US Army Corps of Engineers "Fish Passage Plan" should include specific work plan, schedule and emergency repair plan for the PIT Tag separation gate hardware, pneumatics, and mechanics.

The Committee agreed that a category of 'Other Researchers' should be added to the existing SbyC procedures.

## **8. REVIEW TAG DISTRIBUTION AND INVENTORY PROCESS**

The Committee reviewed the Tag Distribution and Inventory process.

The Committee was reminded to advise their agencies of the process. Specifically that Fish and Wildlife Project Sponsors need to respond to the 'Forecast' process late summer or early fall and to request tags using the 'PDRF' or PIT Tag Distribution

Request Form. PDRFS should be submitted at least four weeks prior to the tag delivery date.

## **9. AGENCY MARKING PLANS FOR 2003 / 04**

Carter provided The Committee of the FWS PIT Tag Forecast Summary.

Doug Marsh reviewed NOAA Fisheries / Corps of Engineers / AFEP Marking plans. However, the plans may change so don't trust any of the numbers.

## **10. SANDY DOWNING ADULT LADDER DETECTIONS & PERFORMANCE**

Sandy Downing participated via a teleconference and reviewed a set of graphs showing three methods used to monitor the performance of the individual antennas for the new Adult interrogation systems installed at Bonneville and McNary Dams during 2002.

Although the orifice antennas containing moisture performed comparably to the antennas that did not contain moisture during 2002, their presence did force NMFS, Digital Angel, PSMFC, and BPA to recognize that criteria needed to be developed that when satisfied would mean that the antenna would need to be replaced during the next dewatered period. The question, did any interrogation unit consistently perform so poorly (i.e., it missed too many tagged fish) that its antenna needs to be replaced during the next dewatered period is a big-picture question. Although we cannot presently define what are unacceptable standards, we did come up with three methods to identify interrogation units that needed to be investigated further. These methods were applied using a yearlong time scale because we needed to determine if any degradation in performance was substantial or whether the problem was intermittent and therefore was corrected via normal O&M activities.

### **10.1 *Relative weir count***

The 2002 data for fish counts by individual weirs were separated into half-month periods. Because there are usually uneven fish numbers for the weirs in the same ladder, to compare the performances, relative weir count values were calculated. The relative weir count values were based on using the highest weir count for each half month as the denominator.

### **10.2 *Antenna current values***

Normally, once an antenna is tuned, the value of the antenna current is fairly stable. When the value of antenna current, which is part of the status report sent out by the transceivers, drops by 0.2 amperes, PSMFC then goes to the dam and retunes the transceiver. Normally, retuning returns the antenna current back to its previous level. If the antenna current keeps dropping over the season in a stair-step pattern, this usually means that the antenna contains moisture, although there are other reasons for the current to drop.

### **10.3 *Reads per fish***

This certainly is the most direct method for telling us how well a unit is reading fish; however it does vary with fish behavior and tune of the transceiver (the difference between a perfectly-tuned transceiver and a well-tuned one can be 1-3 reads per fish).



This can only be calculated when a transceiver is set up with the unique read feature turned off.

Sandy then went over graphs showing the results for the five fish ladders at Bonneville and McNary Dam indicating antennas that intermittently gave low results for the three methods and a few antennas that consistently yielded low results. However, she also pointed out that all three methods did not identify the same units. Until the performance of the antennas deployed in the fish ladders degrade more than they have, we will not know which method will be the best predictor. Nor until they degrade further can we determine how poorly an antenna must degrade before it becomes useless, but finding methods that identify potentially degrading antennas is an important first step.

The other take-home message was that it is important to remember that we are still learning about these PIT-tag systems and with experience, we will be better at identifying the causes of both intermittent and long-term poor performances (e.g., the negative impact of the summer heat on performance, broken antenna-cable conduits, bad grounds, local EMF, leaking antenna).

Sandy provided a list of antennas to watch. We also discussed ways that these three methods could be incorporated into the O&M tools used by PSMFC.

## **11. ADULT DATA REPORTING**

Doug Marsh raised the issue that the existing PTAGIS reports (which were defined and created specifically for the Juvenile detections) are insufficient for the adult PIT tag data.

Carter suggested that people come up with report formats they would like to see from the PTAGIS system and let him know. In the mean time, PTAGIS is initiating a project to update the core PTAGIS data model to better support researcher's use of the PIT tag in 'modern' times. The project is referred to as G2-DM. The new data model will provide a better foundation for reporting on the adult data.

## **12. REVIEW PTOC INTERROGATION SITE SUPPORT MODEL**

Carter reported that PTAGIS continues to develop a document to communicate various types of interrogation site support that PTAGIS can provide, and the associated tools and service levels associated with each of the support types.

Types of support include:

- Main Stem Dams and Acclimation Pond Outfalls supported by PTAGIS – include near-real time data feeds, daily monitoring, weekly maintenance checks, etc. to provide > 99.0 % uptime of any system component through the peak of the outmigration.
- Similar support level as first bullet, but support provided by other than PTAGIS.
- PTAGIS backup and consulting for a site installed, operated and maintained by other than PTAGIS.
- Other

A Standard Operating Procedure document is being developed by PTAGIS to refine this concept.

### 13. SECONDARY MARKING OF PREVIOUSLY PIT TAGGED FISH

It was noted that Chris Perry (University of Idaho working on US Army Corps of Engineers contract), radio tagged 14 of 56 adult fish which were part of a study by Project Sponsor Allan Burns. There were significant differences between the data from the PIT tagged data versus the PIT Tagged & Radio Tagged fish. The Committee agreed that it should issue a note to the Fish Passage Advisory Committee to approve language related to handling of PIT tagged fish. The language would be along the lines of:

***“If your research will utilize PIT tagged fish from studies other than your own, you must obtain permission from the project leaders for projects whose PIT tagged fish you plan to handle in the course of your research.”***

### 14. 2004 PIT TAG WORKSHOP PLANNING

The Committee agreed to produce a Workshop for the PIT tagging research community. The workshop will be January 12, 13 & 14 at Skamania Lodge in Stevenson Washington.

Joe Z., Doug M, Charles M and Carter will be the Workshop Subcommittee.

### 15. REVIEW FLAG CODE ANALYSIS

See the reference for this agenda item at the web link at the top of these minutes. Fundamental revision of the ‘Flag’ indicators will be addressed during the development of G2-DM.

### 16. FACILITY SUBSAMPLE EVENTS & PLC NOTIFICATION

See [http://www.psmfc.org/pittag/Ptoc\\_OM/PTOC\\_OM-Main.html#ISS](http://www.psmfc.org/pittag/Ptoc_OM/PTOC_OM-Main.html#ISS) .

### 17. REVIEW SPEC DOC

#### 17.1 ***The Committee agreed to the following new species codes:***

- **A** = Pacific Lamprey
- **B** = White Sturgeon
- **C** = Green Sturgeon
- **D** = Northern Pike Minnow

#### 17.2 ***The Committee discussed dropping Temperature as a requirement (tagging / release?) – Anyone know what the result of this was?***

- Noted that Doug Taki is combining several days tagging files ... key issue for information in Tagging File Header.
- Much discussion by The Committee regarding deficiencies in Specification Document guidelines. PTAGIS is developing a proposal for a new generation data model, G2-DM.

- The Committee agreed with Ed Buettner that consistence in the Specifications Document is essential and that we must avoid change just for the sake of change. PTAGIS is not to change the rules, language or wording in the Specifications Document without the consent of the PTSC.

## 18. MISCELLANEOUS

- PTSC agreed that PTAGIS should update the “PIT Tagging Best Practices” video and convert it to DVD format and potentially make it available over the web.
- PTSC agreed that PTAGIS should provide language with all data requests related to the Professional Responsibilities incumbent upon users of the data. Users will be reminded that they need to contact the Project Sponsors or Tagging Coordinators of PIT tags used in any published study or analysis.
- **Charles said that he would work to have the PIT Tag Diversion Gate Operations and Maintenance Plans included into the Corps of Engineers “Fish Passage Plan” for the 2004 migration year.** The Committee agreed this is a good thing to do.
- Russell Porter, PSMFC reported that up to 2000 Northern Pike Minnow (NPM) would be tagged with PIT and spaghetti tags. This is being done to monitor origin of NPM turned in for the reward program. John Hon (WDFW Pasco) is lead on this project.
- Charlie reported on a meeting held in November in Pasco concerning the fact that the fish enumeration between the full flow bypass experiment (MCX) at McNary had detected fish that were not seen at the McNary Juvenile facility (MCJ). The consensus at the meeting was that fish may be bypassed to the river through the adult fish return line off of the fish and debris separator when and adult fish is trapped and then released. The Committee agreed that this is a common occurrence at all Snake river projects and there is very high likelihood of losing PIT tag detections over the course of seasonal operations here: **Action – Memo to FPAC identifying this concern and suggesting that to improve detection they may want to consider adding detection to the exit line directly to the river from the separator.**
- Doug Marsh suggested adding GPS location to G2-DM. There are requests from researchers to put RFID onto the barges in order to determine where and when they arrive at dams, and when they arrive downstream from Bonneville dam. The committee took no action on this comment.
- Ann (not sure about this from Charles notes) “Any updates / changes to algorithms used to calculate performance statistics”
- Joe discussed data access, coding – issue of permission and protection of research data, responsibilities disclaimer, professional ethics. **Action: Carter to send Joe last language developed by PTSC related to this issue (was printed in PTAGIS Newsletter after PIT Tag Workshop 2000). Joe will revise and submit to The Committee for consensus.**
- **Doug Marsh and Joe Zydlewski are new PTSC co-chairs.**