

Statement of Work

PTAGIS Project Description

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Bonneville Power Administration



PIT Tag Information Systems
Columbia Basin | ptagis.org

Prepared by:

Carter Stein

Ptagis Program Manager

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1. INTRODUCTION

1.1. Activity:

This is a project for the Administration and System Operation of the Columbia River Basin PIT Tag Information System (PTAGIS).

1.2. Agency:

Pacific States Marine Fisheries Commission (PSMFC).

1.3. Goal:

The goal of this project is to operate and maintain the Columbia River Basin-wide database for PIT Tagged fish and to operate and maintain the established interrogation systems. The data collected by this system is accessible to all entities.

The measurable goal for the system is to collect 100% valid data¹ and provide that data² in “near-real” time with downtime of any system component of not more than one percent as measured during the period of peak out-migration.

1.4. Background:

In 1984, Bonneville Power Administration (BPA) entered into an agreement with the National Marine Fisheries Service (NMFS) to research and develop a passive integrated transponder (PIT) tag for use in the Columbia River Basin (CRB) Fish and Wildlife (F&W) Program. The PIT tag system enables large amounts of data to be produced using relatively few tags, compared to traditional tagging and marking systems.

In 1988 and 1989, NMFS contracted with PSMFC to develop and operate a prototype database system to help NMFS meet, in a timely manner, its contractual and verbal agreements involving PIT tag data. The database was designed to meet immediate needs as well as provide a framework for a formalized database system for the Columbia River Basin PIT tag program.

In April 1989, NMFS announced its intention to phase out of the operation, maintenance and management of the PIT tag systems in the Columbia River Basin. Subsequently, BPA contracted with PSMFC because it was the only agency experienced in data management with no vested interest in the interpretation of data generated from PIT tags, while being independent of water or fish and wildlife management responsibilities.

¹ Valid Data is defined in the “2004 PIT Tag Specification Document” which is maintained by the Columbia Basin PIT Tag Steering Committee.

² This means PIT tag mark, recapture and release information provided by PTAGIS users in addition to interrogation data provided by PTAGIS or other system users.

The actions that PSMFC was directed to implement under the PTAGIS contract include:

1. Management of a long term Columbia River Basin-wide database system accessible to all entities;
2. Maintenance and documentation of fish tagging and interrogation software;
3. Operation and maintenance of equipment at the remote sites;
4. Provision of technical support for the software and hardware;
5. Provision of training to users; and
6. Purchase and distribution of PIT tags and associated equipment.

1.5. Location:

The PIT Tag Operation Center (PTOC) has been established at the PSMFC office in Portland, OR to house PTAGIS and to utilize the PSMFC data facilities.

The PTOC field office in Kennewick WA, is primarily responsible for equipment maintenance of 20 key PIT Tag interrogation sites, with a total of 321 PIT tag detection transceivers located throughout the BPA service area.

PSMFC provides operations and maintenance (O&M) support for the electronic data collection portion of the PIT tag interrogation systems at the Corps operated facilities, under a "Memorandum of Agreement" between BPA and the Corps. PSMFC maintains PIT Tag actuated separation (diversion) gates at various fish facilities. PSMFC also installs and maintains the programmable logic controllers (PLC's) used by smolt monitoring and facility personnel to collect daily sub-samples. Information related to the sub-sample is incorporated into the PIT tag interrogation files.

Remote interrogation sites are owned and operated by other entities, such as the US Army Corps of Engineers (USACE), Bureau of Reclamation (BOR) or Yakama Nation (YN). The major interrogation sites include:

Nbr.	Site Code	Location	Description	# Xcvrs	Owner
1.	GRJ	Lower Granite Dam	Juvenile Fish Facility	25	USACE
2.	GOJ	Little Goose Dam	Juvenile Fish Facility	28	USACE
3.	GRA	Lower Granite Dam	Adult Ladder and Trap	16	USACE
4.	LMJ	Lower Monumental Dam	Juvenile Fish Facility	31	USACE
5.	MCJ	McNary Dam	Juvenile Fish Facility	46	USACE
6.	JDJ	John Day Dam	Juvenile Fish Facility	26	USACE
7.	BIJ	Bonneville Dam	Powerhouse 1 Downstream Migrant Channel Flat Plate Detector	2	USACE

8.	B2J	Bonneville Dam	Powerhouse 2 Juvenile Fish Facility	19	USACE
9.	PRO	Chandler Canal at Prosser	Adult Ladders and Yakima River Fish Diversion from Irrigation Canal	11	BOR
10.	CFJ	Clark Flat	Acclimation Pond	4	YIN
11.	ESJ	Easton	Acclimation Pond	4	YIN
12.	JCJ	Jack Creek	Acclimation Pond	4	YIN
13.	GRA	Lower Granite Dam	Adult Ladder and Fish Trap	16	USACE
13.	RPJ	Rapid River Hatchery near Riggins, ID.	Volitional Release Outfall	8	BPA
14	BO1	Bonneville Dam Bradford Island	Adult Ladder	36	USACE
15.	BO2	Bonneville Dam Cascade Island	Adult Ladder	16	USACE
16.	BO3	Bonneville Dam, Washington Shore	Adult Ladder and Adult Lab	32	USACE
17.	MC1	McNary Dam Oregon Shore	Adult Ladder and Counting Window	18	USACE
18.	MC2	McNary Dam Washington Shore	Adult Ladder and Counting Window	19	USACE
19.	SUJ	Sullivan Dam	Willamette River Sub-sample	1	PGE/ODFW
20.	ICH	Ice Harbor Dam	Adult Ladder and Full Flow Bypass	20	USACE
21.	RCX	Rattlesnake Creek	In-Stream	6	NOAA/USGS
22.	TMJ	Three Mile Dam	Juvenile	2	ODFW
23.	BO5	Bonneville Dam Corner Collector	Juvenile	1	USACE
24.	BO4	Bonneville Dam Washington Shore Slots	Adult	4	USACE
TOTAL Coils Operated and Maintained by PTAGIS				383	

PTAGIS collects data and provides transceiver diagnostic information for more than 60 other detection transceivers operated and maintained by others in the Columbia Basin:

Nbr.	Site Code	Location	Description	# Xcvrs	Owner
1.	WEA	Wells Dam	Wells Dam Adult Ladders	8	Douglas Co. PUD
2.	RIA	Rock Island Dam	Rock Island Adult Ladders	4	Chelan Co. PUD
3.	PRA	Priest Rapids Dam	Priest Rapids Adult Ladders	8	Grant Co. PUD
4.	RRJ	Rocky Reach Dam	Rocky Reach Juvenile	4	Chelan Co. PUD
5.	VCx	Valley Creek 1 & 2	"In-Stream Detection" near Stanley, ID	2	BPA
6.	WWx	Walla Walla River 1 & 2. NBA	"In-Stream Detection" near Milton-Freewater, OR	4	USFWS
7.	AB1	Abernathy Creek USFWS	USFWS Research & Development	3	USFWS
8.	AB2	Abernathy Creek USFWS	USFWS Research & Development	2	USFWS
9.	CRx	Chinook Creek 1, 2 and 3	USFWS Research & Development	3	USFWS
10.	CCP	Catherine Creek Pond	ODFW	4	ODFW
11.	ESX	Estuary Towed Array	NOAA	2	NOAA
12.	GRP	Grand Rhonde Pond	ODFW	2	ODFW
13.	HLX	Hemlock Creek In-Stream	USFWS	2	USFWS
14.	LOP	Lostine River Pond	ODFW	2	ODFW
15.	NBA	Nursery Bridge Adult	USFWS	2	USFWS
16.	TMA	Three Mile Dam Adult	ODFW Adult Ladder with racket readers	2	ODFW
17.	TWX	Towed Array	NOAA	2	NOAA
18.	UM1	Umatilla River	USFWS	1	USFWS
19.	Other facilities operated ad-hoc by others such as Snake River Trap (SNJ), Imnaha River Trap (IMJ), Salmon River Trap (SAJ), and others			12	Estimated
Estimated number of coils operated and maintained by Others with data collection and diagnostics provided by PTAGIS:				69	

1.6. 2006 Changes

- PTAGIS will perform final installation work for Full Flow Bypass PIT Tag detection at Lower Monumental and John Day Dams in 2006 -2008 (TLA).

- PTAGIS will provide support for Bureau of Reclamation and Oregon Department of Fish and Wildlife to install adult detectors at Three Mile Dam on the Umatilla River.
- PTAGIS will continue to provide support for Digital Angel Corporation for development and operation of the Bonneville Corner Collector PIT tag prototype. The Hi-Q project is funded via FWP 198331900.
- PTAGIS will continue efforts to develop and implement data models that can represent PTAGIS user activities in a more consistent way, and to associate these activities with latitude and longitude location information.
- PTAGIS will contract the construction of an automated PIT tag tester.
- PTAGIS will provide support to the USACE The Dalles Dam Ice & Trash Sluiceway detection system.
- PTAGIS will provide technical input on the Passive / Active tag development.
- PTAGIS will perform final installation and inspection for the B2 juvenile full flow PIT-Tag system.
- PTAGIS will provide technical input on the remodel of the juvenile fish facility at Lower Granite Dam.

1.7. Annual Report:

An annual report, which includes a summary of key accomplishments, problems, and solutions or considerations, will be submitted with 30 days of the completion of the project period (March 31, 2007).

2. PERFORMANCE OBJECTIVES AND REQUIREMENTS

The following sections provide the details of the PTAGIS program.

3. OPERATE, MAINTAIN AND ENHANCE THE PTAGIS SYSTEM

Schedule: On Going

Work Element 160: Create/Manage/Maintain Database

Description

3.1. Server Systems Development, Operations and Maintenance

Acquire and process data from remote interrogation sites.

Receive and process input files containing PIT tag mark and release data.

Update database in a timely manner. All files will be validated upon receipt by PTAGIS and immediate notification of errors shall be made to data providers. Valid data should be loaded to the database within the hour it is received

Perform backup and other database and operating systems management and general operation services on the PSMFC computers, in support of the PIT Tag database.

3.2. Client Systems Development, Operations and Maintenance

Continue work to incorporate separation by code SbyC capability into PTOC developed interrogation monitoring software, "MiniMon".

Support and maintain "Minimon" Interrogation software.

Support and maintain "P3" Tagging software.

Support and maintain "MobileMon" Remote interrogation software.

Support and maintain "TDI" Tag Distribution and Inventory.

3.3. Web Systems Development, Operations and Maintenance

Continue limited development of the next generation PTAGIS data model for planned 2006 production deployment.

Deliverable: Near-real-time PIT Tag mark, recapture and interrogation data and data collection / data retrieval tools, available to all entities.

4. OPERATE AND MAINTAIN SEPARATION BY CODE SYSTEM (SBYC)

Schedule: On-Going

Work Element 160: Create/Manage/Maintain Database

4.1. Create and Enhance Database Schema and Application

Develop seasonal modifications to the Separation by Code database support tables and processes depending upon new and existing user requirements.

4.2. Update Database

Update database to represent user requests and to assure that user requests have been satisfied;

4.3. Coordinate

Manage and coordinate user requests for SbyC support. Provide daily monitoring of SbyC activities and take corrective or adjusting actions based upon system activities and user interaction.

Work Element 158: Mark/Tag Animals

4.4. SbyC Calibration Test

Coordinate development and implementation of a simple fish mark and release study to verify the successful operation of the Mustang (M4) prototype in production field operations.

Work Element 70: Install Fish Monitoring Equipment

4.5. Install and Enhance SbyC Instrumentation

Design, install and operate controls for diversion-gate operation at remote sites. This includes the development of ladder-logic programs for programmable logic controllers (PLCs) and operator interfaces.

5. INSTALL, OPERATE AND MAINTAIN INTERROGATION SYSTEMS IN FIELD LOCATIONS

Schedule: On-Going

Work Element 70: Install Fish Monitoring Equipment

5.1. Install interrogation equipment at new and established sites;

Install traditional juvenile systems, and full flow Bypass PIT interrogation systems that have completed the standard research and development cycle.

Assist Corps of Engineers in planning and performing final installation tasks required for Full Flow Bypass system at Lower Monumental Dam during fall and winter 2006 – 2007.

Assist Corps of Engineers in planning and perform final installation tasks required for Full Flow Bypass system at John Day Dam during fall and winter 2006 – 2007.

NOTE: For Tasks 5.1 and 5.2 Corps is to provide installation of power, communication, EMF shields access and other infrastructure to support PIT tag detection at interrogation sites.

Deploy Marathon High Availability Servers in support of M4 (Mustang).

5.2. Lab Test Field Equipment and PIT Tags

Perform various tests in the Kennewick lab as required or requested, directly relating to PIT-tag interrogation systems and or PIT-tags themselves.

Work Element 159: Submit/Acquire Data

5.3. System Setup and Shutdown

Perform data system setup (Site Configuration, SiteScape, Support) activities for all new sites;

Perform pre-season site activation and shutdown procedures as required;

5.4. Routine Daily Monitoring & Repair

Perform daily on-line report monitoring of supported interrogation systems;

Perform General Maintenance Checks (GMC) for detection system equipment at supported sites;

Document maintenance activities in Event Logs for maintenance performed at supported sites;

Provide timely repair of defective equipment at interrogation sites in response to problems detected through daily on-line report monitoring;

Operate and maintain interrogation site communication systems including telephones, telephone lines, I/P connections / peripherals devices and power backup equipment.

Implement modifications to detection equipment and software as required to optimize data integrity and systems operations. Seasonal system modifications shall be in place by March 15, of the out-migration year.

Work Element 122: Provide Technical Review

5.5. Develop and Review Technical Documentation

Write Standard Operating Procedures relating to the Operations and Maintenance of PIT-tag interrogation systems.

Attend technical review meetings and provide feedback to project managers during the design and implementation phases of new interrogation sites.

5.6. Provide Technical Support

Provide technical support and training assistance to users (NOAA, ODFW, IDFG, WDFW, YN, USGS, USFWS and others) of interrogation systems;

Work Element 119: Manage and Administer Projects

5.7. Manage and Administer Field Systems Support

Supervise and manage field systems staff and resources;

6. ADMINISTRATION, MANAGEMENT AND COORDINATION:

Schedule: On-Going

Work Element 119: Manage and Administer Projects**6.1. Manage and Administer PTAGIS Program**

Provide the day-to-day management, supervision and administrative support for the PIT Tag Operations Center;

Develop the Annual Work Plan for the following out-migration year;

Write and distribute Annual report.

Work Element 122: Provide Technical Review**6.2. Overall PTAGIS Program User Coordination**

Provide overall strategy and architecture to support the continued growth of the Columbia Basin PIT Tag Information System available to all entities.

Act as central contact (liaison) between PTAGIS system users.

Produce a Newsletter for periodic, general distribution ([view link](#));

Provide requested data to casual, ad-hoc users as needed;

6.3. PIT Tag Procurement, Quality Assurance and Distribution

Coordinate purchase and distribution of PIT tags for BPA funded projects

Develop and maintain a Tag Specification in coordination with other entities ([view link](#)).

Develop a quality control mechanism to screen purchased tags for conformance to the Tag Specification.

Develop an automatic PIT-tag tester.

Continue to automate (via World Wide Web application) PIT tag forecasting and distribution as resources allow ([view link](#)).

6.4. Overall PTAGIS Technical Coordination

Coordinate operational issues with facility operators and interested agencies;

Coordinate end user and data system requirements;

Coordinate the operational deployment of new PIT Tag Technologies with system users and the “technology innovators”;

Coordinate with BPA Technical Management Team development staff and contractors to provide access to customized dataset based upon TMT requirements ([link to TMT files](#)).

Coordinate with PIT Tag Steering Committee (PTSC) to update system codes. Document these codes and distribute via the PIT Tag Specifications Document (see [PDF link](#)) by February 1st of the out-migration year;

Maintain the list of available PIT Tagging equipment, documented in the PIT Tag Tagging Procedures Document (see [PDF link](#)) Changes to this document shall be approved by the PTSC;

Update, automate and distribute tagging system documentation;

Provide training and informational pointers to users on tagging and validation and system analysis software as needed;

7. ADDITIONAL SUPPORT ACTIONS

Schedule: On-Going

Work Element 122: Provide Technical Review

7.1. Adult System Coordination

Assist BPA in the planning, coordination, evaluation and management of the Adult PIT Tag Interrogation System Development effort, especially as it relates to operations and maintenance viability issues such as installation and on-going support, as requested.

7.2. Extended Range Systems

Assist BPA and U.S. Army Corps of Engineers in developing a PIT tag detection system at the Bonneville Dam Corner Collector flume by providing advice, consultation and assistance.

Configure data collection platform in coordination with efforts being conducted by Digital Angel Corporation through FWP 198331900.

Modify interrogation monitoring software modules to conform to new output data formats used by Digital Angel Corporation in development of the 2nd Generation Reader System or the Hi-Q Reader system

Provide support for efforts to utilize PIT technology to characterize straying rates of adult fish.

7.3. Other Non Traditional Systems

Assist non-traditional PIT Tag users with data collection and submission.

Provide special assistance to researchers performing work related to providing PIT tag data from bird nesting colonies.

Provide special assistance to researchers collecting PIT tag data as an adjunct to the Northern Pike-minnow Sport Reward Program.

Provide other special assistance to non-traditional users upon request.

Develop and Implement PIT tag sport recovery award system.