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April 29, 2010

## MEMORANDUM

**TO:** Fish and Wildlife Committee members

**FROM:** Al Giorgi (BPA contractor), Jim Geiselman (BPA) and Jim Ruff

**SUBJECT:** Update from the regional PIT-tag coordination work group

### Background

One of the major recommendations in the ISRP/ISAB's Tagging Report (ISRP/ISAB 2009-1) is to improve regional coordination of fish tagging projects. Development of a regional tagging/marking plan, of which PIT<sup>1</sup> tagging would be one component, would be an important step to help improve coordination. Additionally, the NOAA Fisheries 2008 FCRPS Biological Opinion (BiOp) calls for the federal action agencies, in collaboration with fishery agencies and tribes, to formulate an action plan for conducting hydrosystem status monitoring that coordinates tagging efforts across the 4-H's (RPA 52.6).

As part of that overall plan, federal managers have requested an inventory of recent and planned PIT tagging be provided as a first step. Furthermore, they have requested the numbers of fish tagged in each ESU/population unit be assembled and linked to specific projects, with the intent of fostering coordination among projects.

Archiving and sharing of PIT tag data are coordinated by the Pacific States Marine Fisheries Commission under PITAGIS. Currently most PIT tagging is associated with specific studies. When tagging project designs are robust and well coordinated, PIT tagged fish from one project can be used by others, e.g., NOAA Fisheries uses fish tagged by the Comparative Survival Study when appropriate. There is regional interest in employing PIT tags for integrated life-cycle monitoring of hydrosystem survival, hatchery straying, and estuary and tributary habitat restoration effectiveness studies.

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<sup>1</sup> PIT stands for Passive Integrated Transponder tag system, which are 12.5 mm long and 2 mm wide glass encapsulated tags weighing about 0.1 gram. PIT tags are passive in the sense that the tag is energized as it passes through or near a transceiver antenna, which are located in many mainstem federal juvenile and adult fish passage systems.

The ISRP/ISAB report stated that opportunities exist to refine the data collections to support salmon management in the Basin by coordinating PIT tagging across management domains. However, the magnitude of the required data collections due to the large numbers of juvenile fish tagged, the number and location of detection sites required, and trade-offs between the precision of estimates of vital statistics and sampling and recovery efforts may be impediments to coordination and standardization. In addition, it will be important to avoid obsolescence of the data base and PIT detection methodologies as new tags and detection methodologies develop in the future.

Adequate detection of PIT tags is important because it relates directly to the number of fish needed to be tagged to produce a survival estimate with a desired level of precision. That is, a system with higher detection probability allows for tagging of fewer fish, relative to a system with lower detection probability, to produce a survival estimate with the same level of precision. Due to the wide range of PIT tag detection capabilities in the basin (ranging from 5% to 70%),<sup>2</sup> large numbers of juvenile salmonids must be PIT tagged and released into the Snake and Columbia rivers each year to produce reasonably precise survival estimates.<sup>3</sup>

### **Status of PIT Tag Inventory**

The purpose of assembling an inventory of PIT tag information is to determine if fish from particular salmonid populations are being tagged in sufficient numbers to acquire fish passage metrics of interest as specified in both the NOAA Fisheries 2008 BiOp and the Council's 2009 Fish and Wildlife Program (Program). This inventory database would be a component of the tagging action plan as identified in the 2008 BiOp. To date, most fish managers in the region have responded with their current and projected PIT tagging needs for their projects. However, X and Y have not yet responded with their PIT tagging needs, so the inventory is incomplete.

**The objectives** of this PIT tag inventory are to:

- Determine if the population coverage and sample sizes are adequate to satisfy 2008 BiOp and Program needs.
- Facilitate efficient coordination of tag use among assorted investigations (across H's).
- Scope the magnitude of the collective effort so that opportunities for cost savings (through tag sharing) can be ascertained.

### **Status of the Regional PIT Tag Plan**

As noted above, RPA 52.6 calls for development of a comprehensive, long-term regional PIT tag plan that identifies current and future tagging needs and actions. Tagging effort and detection requirements would be described in the plan.

The regional PIT tag plan is being formulated now and should be completed later this year. An outline of the plan is attached. It will address objectives, stock coverage, analytical methods and design, precision and numbers of fish to be tagged. Such a plan is central to many RM&E efforts in the basin and will ensure efficiency across all-H, PIT tag-based projects. The regional PIT tag plan is the first step and a critical component of a broader "Regional Tagging Plan," as recommended by the ISRP/ISAB.

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<sup>2</sup> The proportion of PIT tagged fish detected at each dam varies depending on the features of each project's juvenile fish bypass system and dam operations, i.e., higher levels of spill result in fewer PIT tag detections at a project. The Corps has research underway to evaluate the feasibility of installing PIT tag detectors in a spillway at a dam.

<sup>3</sup> Roughly two million PIT tagged juvenile salmonids are released annually in the Snake and Columbia rivers.

## **Developing a Regional Plan for PIT tag-based RME (Giorgi April 23, 2010)**

**Background:** The regional PIT tag plan is one component (section) of an even broader Regional Tagging Plan that has been recommended by the ISRP. The focus here is on the *PIT tag-based RME plan*.

**Objective:** Produce a blueprint specifying PIT tagging and detection requirements and analytical methods that satisfy the management needs of all 4-Hs, and ensure coordination among user groups to maximize efficiency of tag use for multiple purposes.

**Strategy:**

1. Adapt a pre-existing BiOp RME plan organization framework and terminology, refocusing it on only RME activities requiring PIT tags.
2. Draft the section addressing Hydrosystem needs as a model for other H-groups to follow.

**Hydro section issues:**

1. Incorporate BiOp RPAs that need PIT, and address NOAA Needs as specified in March 2010 “NOAA draft objectives for using PIT tags to monitor listed fish populations- Blane Bellerud.” The Corps’ AFEP, Council’s FWP and Accord projects will also be incorporated into the plan.

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## **Regional PIT tag-based RME Plan for 2010-2020**

### **Introduction**

Purpose of plan  
RME Programs/Needs PIT based- BiOp, FWP, Accords, AFEP, PUDs, other  
Species/ESUs- listed and unlisted anadromous salmonids, lamprey, resident fish  
Plan components

### **Hydro/Estuary PIT RME**

Management Questions/Objectives  
Performance Standards/Measures  
Species/ESU

- Status Monitoring (objectives, performance measures, analytical methods, N)
- Action Effectiveness Monitoring(objectives, performance measures, analytical methods, N)
- Critical Uncertainty research(objectives, performance measures, analytical methods, N)

## **Habitat PIT RME**

Management Questions/Objectives  
Performance Standards/Measures  
Species/ESU

- Status Monitoring (objectives, performance measures, analytical methods, N)
- Action Effectiveness Monitoring(objectives, performance measures, analytical methods, N)
- Critical Uncertainty research(objectives, performance measures, analytical methods, N)

## **Hatchery/Harvest PIT RME**

Management Questions/Objectives  
Performance Standards/Measures  
Species/ESU

- Status Monitoring (objectives, performance measures, analytical methods, N)
- Action Effectiveness Monitoring(objectives, performance measures, analytical methods, N)
- Critical Uncertainty research(objectives, performance measures, analytical methods, N)

## **Coordination across H's**

- Data management- Upgrading PTAGIS
- PIT tag inventory and coordinating planned future tagging efforts among all projects across H's.
- System improvements- detector site coverage, tagging effects-implications
- Balancing the scale of RME tagging effort against tagging and handling effects on host fish.

# Update on Regional PIT-tag Coordination

F&WL Committee Meeting

May 11, 2010

Portland, Oregon



# Background -- Need for a Regional PIT Tag Plan

- ISRP/ISAB's Tagging Report (2009-1) recommends improved coordination of fish tagging projects
- A regional tagging plan addresses NMFS 2008 BiOp RPA 52.6 and Council's FWP

# Goal of Regional PIT Plan is to:

- Develop a PIT-tag action plan, as an element of a more comprehensive regional action plan for tagging & marking projects for RM&E
  - Ensure adequate estimates or indices of metrics are being obtained
  - Improve efficiency & cost effectiveness by coordinating tagging among user groups in H-categories

# Applications of PIT-Tag Technology

- Mainstem/hydro related studies:
  - Monitoring survival and migration rates of both juvenile & adult fish per BiOp
  - Smolt Monitoring Program under F&WL Program
  - Action effectiveness/life history research studies
- Lower Columbia River & estuary RM&E
- Hatchery effectiveness evaluations
- Habitat action effectiveness evaluations
- Harvest impacts
- Population monitoring – VSP
  - Status and trend analysis

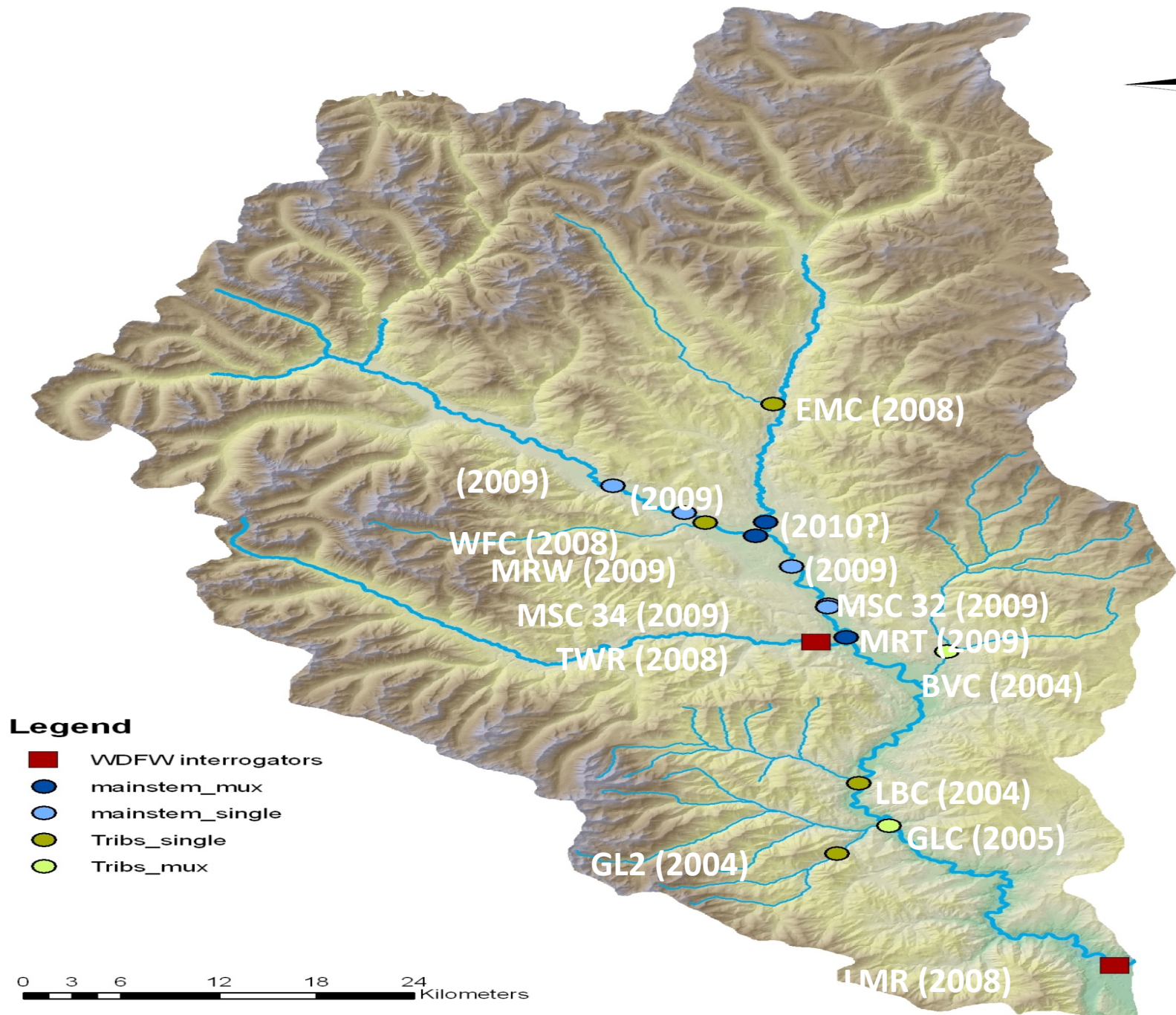


# Regional PIT Tag Plan: All-H

- Plan outline in review by the Planning Group and the 4-H Work Groups.
- It covers BiOp, FWP, Accord and HCP needs.
- Input from Feds and NPCC; CBFWA will also provide input in the collaboration process.
- The PIT Plan covers: analytical methods, N, precision targets, population coverage, database upgrade, detection site needs, & inventory of PIT tagging efforts anticipated into the next decade.
- Looming Issue- Need to balance monitoring desires (# tagged for improving performance indices) against tagging/handling impacts on stocks.

# Regional PIT Tag Inventory

- Objective: Efficiently coordinate and integrate tagging and detection efforts among Hatchery, Habitat, Harvest & Hydro RME studies.
- Tasks:
  - Inventory current and future (decade) tagging efforts across the basin.
  - Map existing, planned and desired detection sites throughout the basin.



# Status of Regional PIT Tag Inventory

- December 2009- Inventory template was sent out to all agencies to populate (feds, states, tribes & PUDs).
- All but three to four agencies have provided the requested information, i.e., a gap in database.
- QC has been conducted.
- Data Management Group is determining who will manage, update and archive the database.
  - During the interim UW is archiving this information and providing a user-friendly interface to query the information.

# Questions for 2010 and Beyond

- Does the AMIP alter Hydro RME needs or shift the emphasis of future PIT-tagging needs?
- In the future, what fish populations should be tagged, and in what numbers?
- PIT-tag detection capability is a key factor
  - Trade-off between improving detection rates & reducing the number of fish needed to be tagged
- How can the region efficiently coordinate and integrate the various tagging efforts among hatchery, habitat & hydro studies?