Project Number	200830600
Project Title	Deschutes River Fall Chinook Research and Monitoring
Proposer	CTWSRO
Short Description	The project intent is to access multiple methods and develop new methods, if necessary, in order to accurately estimate Deschutes River Fall Chinook escapement. Weather and turbidity during fall Chinook upstream migration and spawning has made accurate estimates difficult. We will also assess the feasibility of developing a full duplex PIT tag array to span the width of the Deschutes River near the mouth. Development of a PIT tag array would allow us to assess escapement using a non-visual method.
Province(s)	Columbia plateau
Subbasin(s)	Lower Deschutes River
Contact Name	Jen Graham
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ISRP Review History:

Narrative submitted: November 01, 2008
ISRP Review Comments Received: December 15, 2008
ISRP Recommendation: Response Requested –Does not meet scientific Review Criteria.

ISRP Review results: *[Check appropriate box]*

☐ Meets scientific criteria.

☐ Meets scientific criteria (qualified).

☐ Response requested - meets scientific criteria (qualified).

X Response requested – does not meet scientific criteria.

Response to ISRP Summary: [P*lease check appropriate box and respond below in: Response to ISRP Comments]*

☐ The narrative will be revised and resubmitted by (insert target date).

X A response to ISRP comments are provided in this document below.

[*Your response should include 1) areas of agreement with ISRP comments, i.e. additional information, and/or any changes in the project scope of work and, 2) areas of disagreement, i.e. state why you believe there is sufficient data or sound science to proceed, and/or provide additional information which supports your perspective].*

Response to ISRP Comments

Comments:

ISRP Comment: "…. *The title of the proposal is misleading in that the establishment of biologically based escapement goals is never addressed…Rather, the proposal is to improve the procedures for enumerating adult fall Chinook salmon in the Deschutes River.."*

The intent of the project is to improve and/or develop new methods for estimating escapement for Deschutes River fall Chinook. The project title has been changed to "Deschutes River Fall Chinook Research and Monitoring". The goal of this project is not establishment biologically based escapement goals.

Following is clarifications for Objectives 1 – 3 and 5:

Objective 1 -- Genetic Analysis:

ISPR Comment*: "…ISRP recommends that the justification for the determination of genetic composition of spawners needs more detail and data as described…"*

Accurate escapement estimates are essential to fall Chinook management in the Deschutes Basin. Higher than expected rates of out-of-basin fall Chinook entering the Deschutes River may unduly influence the accuracy of these estimates. Naughton et al. (2008) suggest fall Chinook escapement may be overestimated by 20 – 30%.

Pilot efforts by CTWSRO, University of Idaho, and Columbia River Inter-Tribal Fish Commission to characterize straying and dip-in rates suggest there may be a significant upward bias in escapement estimates for wild Deschutes River fall Chinook. From 2005 – 2007, University of Idaho radio tagged 131 fall Chinook captured at rkm 32 and tracked their movements. Twenty four percent of marked fish did not remain in the Deschutes River to spawn (Naughton et al. 2008). Baker et al. (2008) found strays or dip-ins comprised a significant proportion of fall Chinook sampled (N = 132) at Deschutes River rkm 32 during the 2006 and 2007 spawning migration. Combined mid/upper Columbia River (2006 = 46%; 2007 = 45%) and Snake River (2006=28%; 2007 = 20%) fall/summer Chinook were the largest proportion of fish captured followed by Deschutes River summer/fall run (2006 = 23%; 2007 = 34%) (Baker et al. 2008)

Objective 2 -- PIT Tag Array Feasibility

ISRP Comment: *"The objective to examine the feasibility of installing a PIT tag detector/array in the lower Deschutes River is an excellent idea but also needs more details (e.g. design and size of array? specific potential location(s)? power availability? etc.) to be fully justified"*

Installing a PIT tag detection array (PTA) in the Deschutes River will be challenging because it would be the fastest, deepest, widest river channel in which an array has been installed. Because of the complexity of installing an antennae in a river the size of the Deschutes, we are requesting funds to identify logistical constraints (e.g., is the technology available adequate for the

Deschutes?). The installation would provide a wealth of data on migration timing, survival, escapement, and straying for many stocks of salmon, including fall Chinook.

Based on available designs for PTAs, we identified the Biomark flat panel duplex system, consisting of a series of flat panel weir antennas (4' x 20' x 8") permanently secured to the bottom of the river, as having the highest probability of success. A similar Biomark system constructed in the lower John Day River in 2007 has performed well. Based on conversations with BioMark, there is a potential to install a PTA in the Deschutes River. Prior to requesting the funds to install the PTA, we need to determine its feasibility. In order to determine if its feasible, we will need to determine:

- A location for installation and consult with BioMark about the sites potential for installation;
- What permits will be necessary;
- If any portion of the array would be on private property and if so contact landowner for permission;
- If we will need a hydraulic engineering consultation;
- Any special needs due to the increased complexity of installation in the Deschutes River (e.g., underwater crew for installation, different hardware for installation, new technology); and
- The best available energy source to power the array (e.g., thermoelectric generator, solar power, wind power)

Objective 3 – Developing Escapement Methods

ISRP Comment: *"…As noted above, it is not certain that the PTA is even feasible. Therefore, requesting funding for Objective 3 before determining if the equipment required for its completion will be available seems premature…"*

This project, and specifically this objective, was planned with a scope of 10 years. While the PTA is not currently installed in the Deschutes River, it is probable the funds, technology, and installation will occur within the lifetime of the Accords. Further, a PIT tag detector in the John Day demonstrates promise for installation of a PTA in the Deschutes River.

Objective 5 -- Carcass Surveys

ISRP Comment: *"… no information about these releases is provided. Where were they released? What was the origin of these fish? It appears that they were Lyons Ferry fall Chinook? Was the impact on wild fall Chinook juveniles measured?"*

Since 2002, CTWSRO has been capturing wild juvenile fall Chinook salmon in the lower Deschutes River (rkm 0 – 161) using stick seines. Captured fish are coded wire tagged (CWT), fin marked (adipose clipped) and released in the Deschutes River. A total of 231,857 wild juvenile Deschutes River fall Chinook have been CWT in the Deschutes River (Table 1). The number of tagged fish was adjusted for handling mortality and tag loss. Short term (24 hr) mortality is assessed, however, long term mortality is unknown.

Table 1. Number of juvenile fall Chinook salmon coded wire tagged with an adjusted release based on 24-hr mortalities and tag retention, Deschutes River, Oregon, 2002 – 2008.

Tag Year	Brood Year	Tag Location*	Tag Code	No. Tagged	24-hr Mortalities	24-hr Tag Retention	Adjusted Release
2002	2001	Below SHF	61-72-00	3,802	42	99.8%	3,752
2002	2001	Below SHF	61-72-01	3,476	40	99.5%	3,419
2002	2001	Above SHF	61-72-02	1,265	12	99.0%	1,240
2002	2001	Above SHF	61-72-03	2,917	8	99.4%	2,892
		Brood Year Totals		11,460	102		11,303
2003	2002	Below SHF	61-72-04	9,704	61	99.4%	9,585
2003	2002	Below SHF	61-72-05	11,430	79	99.2%	11,260
2003	2002	Below SHF	61-72-06	1,438	7	99.8%	1,428
2003	2002	Above SHF	61-72-07	8,294	0	100.0%	8,294
2003	2002	Below SHF	61-72-08	11,803	39	99.4%	11,693
		Brood Year Totals		42,669	186		42,261
2004	2003	Below SHF	61-72-09	22,699	284	99.7%	22,348
2004	2003	Below SHF	61-72-10	7,538	100	99.7%	7,416
2004	2003	Above SHF	61-72-11	17,008	34	98.3%	16,685
		Brood Year Totals		47,245	418		46,449
2005	2004	Below SHF	61-72-12	30,438	1,379	98.7%	28,681
2005	2004	Below SHF	61-72-13	5,953	200	98.6%	5,672
2005	2004	Above SHF	61-72-14	5,927	4	97.0%	5,745
		Brood Year Totals		42,318	1,583		40,099
2006	2005	Below SHF	61-72-15	3,268	1	100.0%	3,267
2006	2005	Above SHF	61-72-17	5,404	4	100.0%	5,400
		Brood Year Totals		8,672	5		8,667
2007	2006	Below SHF	61-72-18	22,256	68	99.9%	22,166
2007	2006	Below SHF	61-72-16	8,296	27	99.9%	8,261
2007	2006	Above SHF	61-72-21	11,078	15	99.3%	10,986
		Brood Year Totals		41,630	110		41,412
2008	2007	Below SHF	61-72-19	22,220	151	98.8%	21,804
2008	2007	Below SHF	61-72-20	7,027	56	98.8%	6,887
2008	2007	Above SHF	61-72-22	8,616	3	100.0%	8,613
		Brood Year Totals		37,863	210		37,305
		Total Brood Years Tagged since 2001		231,857	2,614		227,496

*Below SHF=Downstream of rkm 70.4; Above SHF=Upstream of rkm 70.4

Literature Cited

Baker, C., J. Graham, and S. Narum. 2009. Origin of Out of Basin Stray Fall Chinook Salmon in the Deschutes River, Oregon. Final report to the Pacific Salmon Commission.

Naughton, G. P., M. A. Jepson, C. A. Peery, C. Brun, and J. Graham. 2008. Effects of temporary straying on escapement estimates of adult fall Chinook salmon in the Deschutes River, Oregon. University of Idaho, Moscow, ID