SMOLT CONDITION & ARRIVAL TIMING AT LWR GRANITE 8332300

SHORT DESCRIPTION:
Operate fish traps; monitor migration timing, relative passage index and smolt condition; tag groups of juvenile chinook and steelhead to provide in-season travel time information from traps through Lower Granite and Little Goose reservoirs.

SPONSOR/CONTRACTOR: IDFG
Idaho Department Fish Game
Edwin Buettner, Sr. Fisheries Research Biologist
1540 Warner Avenue, Lewiston, ID 83501
208/799-5010 ebuettne@idfg.state.id.us

SUB-CONTRACTORS:
N/A no subcontractor are used

GOALS

NPPC PROGRAM MEASURE:
5.9A.1

BIOLOGICAL OPINION ID:
NMFS BO RPA Sec. 13a and 13f

BACKGROUND

HISTORY:
Component of basinwide Smolt Monitoring Program, which is the basis of flow and passage management. Initiated in 1983 by the National Marine Fisheries Service (NMFS) who built and installed traps on Clearwater, Snake and Salmon Rivers. The Idaho Department of Fish & Game (IDFG) assumed work in 1984 and continues to operate traps as part of the annual coordinated regional Smolt Monitoring Program.

BIOLOGICAL RESULTS ACHIEVED:
Progress is measured by noting whether or not we are obtaining the necessary data. An evaluation of the effectiveness of downstream migration protection actions is contained in the annual reports of the FPC. The FPC reports analyze and synthesize the information from this project together with the information collected by all other SMP projects and other environmental information. Progress is measured by comparing the results of these reports over the years.

PROJECT REPORTS AND PAPERS:
Progress and Annual Reports 1983 until present.
Annual Report series under "Downstream Migration and Water Budget":
Title: "Smolt Monitoring at the Head of Lower Granite Reservoir and Lower Granite Dam"
1983 - DOE/BP 253 (NMFS); 1984 - DOE/BP 11631-1 (IDFG); 1985 - DOE/BP 11631-2 (IDFG); 1986 - DOE/BP 11631-3 (IDFG);
1987 - DOE/BP 11631-4a IDFG); 1988 - DOE/BP 11631-4 (IDFG); 1989 - DOE/BP 11631-6 (IDFG); 1990 - DOE/BP 11631-7 (IDFG); 1991 - DOE/BP 11631-8 (IDFG); 1992 - DOE/BP 11631-9 (IDFG); 1993-DOE 11631-10 (IDFG); DRAFT 1994 Report 11631-11.

ADAPTIVE MANAGEMENT IMPLICATIONS:
This project, as part of the SMP, provides important information on salmon and steelhead smolt movement at the upper end of the Snake River's series of dams. This information is used for in-season operational decisions relative to flow and spill management. Fish PIT-tagged at these sites are used to measure migration speed in key reaches of the Snake and Columbia rivers. The determination of the current year's migration timing of ESA listed Snake River wild chinook salmon stocks is a key

aspect of the year's in-season SMP management decisions.

PURPOSE AND METHODS

SPECIFIC MEASUREABLE OBJECTIVES:

1. Provide daily trap catch data and a smolt passage index at the head of Lwr Granite Reservoir and the lower Salmon River as part of the Columbia River Basin SMP and fish transportation management purposes.
2. Determine travel time of PIT-tagged smolts from the point of release to the smolt traps (index sites).
3. Provide an interrogation site for PIT-tagged smolts, marked on other projects, at the end of their migration in a riverine environment and the beginning of their migration in a reservoir environment and an intermediate site on the Salmon River.
4. Determine travel time for age 1 hatchery chinook and wild chinook, hatchery steelhead, and wild steelhead smolts from the lower Salmon River and the head of Lwr Granite Reservoir to Lwr Granite and Little Goose dams.
5. Determine the PIT tag detection rate at Lwr Granite, Little Goose, Lwr Monumental, and McNary dams during the spring outmigration period for PIT-tagged age 1 hatchery and wild chinook salmon, hatchery steelhead, and wild steelhead marked at both the Snake and Salmon River traps.
6. Correlate the smolt migration rate with river flow for fish moving in riverine and reservoir environments during the spring outmigration.
7. Evaluate timing of returning adult hatchery and wild steelhead crossing Lwr Granite Dam.
8. Analyze data and produce an annual report.
9. Provide fish collection (purse seining) in Lwr Granite Reservoir as requested by other agencies.
10. Maintain traps, boats, and other equipment prior to the field season to ensure minimal downtime during the field season due to mechanical failure.

BIOLOGICAL NEED:

This project documents the arrival timing at the head of Lwr Granite pool of anadromous smolts and the migration timing and rate through the Snake and Salmon rivers and Snake River reservoirs by pit-tagging juvenile salmon and steelhead captured in the Snake and Salmon River traps. This information is critical for in-season management decisions relative to operstions of the FCRPS for fish protection, flow augmentation, facility power operations, fish collection, and transportation programs.

METHODS:

1. To determine the timing of smolt arrival at the head of Lwr Granite Reservoir we propose to continue the operation of a migrant dipper trap located on the Snake River at Lewiston, Idaho and a scoop trap on the Salmon River near Slate Creek, Idaho. Trap operation will begin in mid-March and will continue until June 15. Fish will be enumerated by species and rearing type. This information will be reported to the Fish Passage Center daily. Hatchery chinook Salmon, wild chinook salmon, hatchery steelhead trout, and wild steelhead trout will be PIT-tagged daily at each trap to provide travel time information through Lwr Granite Reservoir. PIT tag tagging files will be submitted to PTAGIS daily. Daily PIT tag groups will be used to determine the relation between migration rate and discharge. Both trap sites will act as PIT tag interrogation sites for PIT-tagged fish released upstream of the traps.

2a. Smolt migration rate/discharge relations through Lwr Granite Reservoir are investigated using linear regression analysis after both variables are stratified into 5-kcfs discharge intervals and log transformed. The 0.05 level is used to determine significance. This analysis is performed for the PIT-tagged hatchery chinook, wild chinook, hatchery steelhead, and wild steelhead groups marked at the Snake and Salmon river traps.
2b. The migration rate/discharge relations for PIT-tagged hatchery chinook, wild chinook, hatchery steelhead, and wild steelhead are individually examined from 1988 to present using analysis of covariance to determine if there are groups of years with common slopes and intercepts. Plots are used to help identify years that differ when non-homogeneous slopes between years are found. If the final hypothesis of common intercepts is not rejected, then the years of data are pooled and a linear regression analysis is conducted on the combined years data.

3. The traps collect approximately 0.5 to 1.5% of the salmon and steelhead smolts that pass the traps. Of the fish that are collected up to 300 fish of each species and rearing type will be PIT-tagged per week over a minimum of three days and a maximum of five days totaling 1,800 smolts each for hatchery and wild steelhead and yearling chinook will be PIT-tagged (7,200 tags total at each trap).

PLANNED ACTIVITIES

SCHEDULE:

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:
There is a small risk of mortality associated with trapping and/or pit-tagging fish. Annual mortality levels generally run about 1.0% for hatchery/wild chinook salmon and less than that for hatchery/wild steelhead trout.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:
Improved information base for management of hydrosystem operations to improve protection and the passage survival of all Snake River anadromous stocks of salmon and steelhead through the FCRPS.

Contribution toward long-term goal:
Improved information base for managemment of hydrosystem operations to improve protection and the passage survival of all Snake River anadromous stocks of salmon and steelhead through the FCRPS.

Coordination outcomes:
1. Documents migration timing and rate through the Snake and Clearwater rivers and Snake River reservoirs through tagging juvenile salmon and steelhead captured through operations of the Snake, Clearwater, and Salmon River traps.
2. Provides daily fish capture and tagging data, as well as other environmental data to the Fish Passage Center (FPC) as input for in-season management decisions relative to operations of the FCRPS for fish protection, flow augmentation, facility power operations, and fish collection and transportation programs.

MONITORING APPROACH
(See Methods section)

RELATIONSHIPS

RELATED BPA PROJECT	RELATIONSHIP
9107300 Basin wide Smolt Monitoring Program (SMP) provides in-season management information for flow and passage management. Project 9107300 uses data generated by project 8332300 in estimating survival from point of release to the head o	
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OPPORTUNITIES FOR COOPERATION:
An ESA section 10 permit authorizing a take of listed Snake River salmon for scientific research and enhancement is required. The permit #822 has been issued by NMFS and expires December 31, 1997.

COSTS AND FTE

1997 Planned: $341,000

FUTURE FUNDING NEEDS:

FY	$ NEED	% PLAN	% IMPLEMENT	% O AND M
1998	$359,000			
1999	$377,000			
2000	$396,000			
2001	$415,000			

PAST OBLIGATIONS (incl. 1997 if done):

FY	OBLIGATED
1983	$605,717
1985	$261,100
1986	$201,993
1987	$62,881
1988	$110,000
1989	$162,500
1990	$221,400
1991	$199,200
1992	$535,300
1994	$300,000
1995	$450,000
1996	$308,679
TOTAL:	$3,418,770

Note: Data are past obligations, or amounts committed by year, not amounts billed. Does not include data for related projects.

1997 OVERHEAD PERCENT: 19%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:
[Overhead % not provided so BPA appended older data.]