

LOWER SNAKE COMPENSATION PLAN PRESENTATION
WASHINGTON DEPT. OF WILDLIFE
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I. INTRODUCTION

A. Background

1. Historical Perspective
 - a. Snake River and tribs. famous for salmon and steelhead fishing.
 - b. Well documented declines in run sizes brought about the negotiation of LSRCP between States and COE.
2. Washingtons Management Objectives for LSRCP
 - a. Washingtons portion of LSRCP would be based on replacing 4,655 adult steelhead "in place" and "in kind" to streams in SE Washington.
 - b. Mitigation for 67,500 lost angler days of resident fishing opportunity will be provided by the rearing of 93,000 pounds of catchable size trout annually.

B. Facilities Description

1. Hatcheries

- a. Lyons Ferry Hatchery- located at RM 58 of Snake River. The well water system capable of providing 100 cfs single pass use. Raceways (19) rearing ponds (3) and hatchery building capable of rearing 116,400 pounds of steelhead @ 8/lb (931,000 fish). Also capable of producing 41,000 pounds of catchable size rainbow trout.
- b. Tucannon Hatchery- a reconstructed state facility located at RM 43 on the Tucannon River. The new well water system and spring collection facility allow production of 50,000 pounds of catchable size rainbow trout and rearing of 150,000 spring chinook salmon annually.

2. Conditioning Ponds. These ponds were built to provide improved smoltification and homing in steelhead by final rearing of fish in river water .

- a. Curl Lake Conditioning pond- located at RM 48 on the Tucannon River. Designed for 200,000 smolts/ year.
- b. Dayton Pond- located on the Touchet River in the town of Dayton. Designed for 150,000 smolts/ year.
- c. Cottonwood Pond- located at RM 25 on the Grande Ronde River. Designed for 250,000 smolts/ year.

C. Mitigation Goals in Washington

1. Overall Goals - see above.

- a. Changed fish size goal and rationale
 1. original goal of 8/lb smolts not realistic under new production capabilities. Smolts survival can be greatly increased. Size of smolt was a state option to reach goal.
- b. Poundage- would most likely stay same over years.

2. How and Where Success of Mitigation Will be Measured.
 1. Steelhead success would be measured in relation to return rates (0.5% goal) but ultimately as adults to point of release, or the 4,655 fish.
 2. Resident trout portion would be measured based on angler days of recreation provided annually.
 3. Interim goals of pounds and size of fish would be less important than final goals.

3. Individual basin Goals & Objectives
(eg: harvest, escapement, broodstock collection)
 - a. Snake River - return 500 adults for escapement and harvest.
 - b. Grande Ronde - return 1,500 adults for escapement and harvest.
 - c. Tucannon - return 1,000 adults for escapement and harvest.
 - d. Walla Walla - return 1,500 adults for escapement and harvest.
 - e. Asotin Cr. - return 155 adults for escapement and harvest.

II. PROGRESS TOWARD GOALS

A. SNAKE RIVER

1. Broodstock Development
 - a. Past - used Wells stock from upper Columbia because they were readily available. Wallowa stock from Oregon chosen for use on G. Ronde.
 - b. Present - combination of Wells, Wallowa and Wild fish for development of the New Lyons Ferry Stock.
 - c. Future - problems with returning adults to areas of release force development of new stocks of fish, possibly Touchet and Tucannon Stocks.

2. Production at LFH for each Stock
 - a. Pounds produced compared to goals- consistently above the 116,400 pound goal since 1983.
 - b. Smolt size compared to goals- goal of fish size reduced to 5/lb in 1988. fish released averaged 4.9 and 4.5/lb in 1989 and 1990 respectively.

3. Adult Returns to Project
 - a. Returns from tag groups - early return rates were near or slightly above the 0.5% return rate goal. Second release year results showed between 0.7 and 1.0% return rates through 3 return years. Tagging and freeze branding crucial to our studies.

 - b. Returns to Fisheries- many fisheries throughout the Columbia basin captured our fish. Out of Snake river harvest accounted for almost 50% of all harvest of returning adults.

- c. Escapement to LFH- numbers much less than planned for in first three years. Passage or straying of fish over Lower Granite Dam far exceeded trapping at LFH. This behavior and early indication of a wider problem noted in other rivers in subsequent year. Adults in LFH trap range 1200-4000 fish each year since 1986.

5. Factors Affecting Progress Toward Goals

- a. Wandering/straying - has developed into the largest problem facing the LFH program. While return rates stay well above goal, the adults do not return "in place".
- b. Residualism- varies widely from year to year. appears to be related to fish size at release. Residualism has ranged from less than 10% to 22% in different years in each river.
- c. Fish Cultural Problems
 - 1. IHN - not a serious problem until 1989 when 100% of Lyons Ferry stock fish tested positive. High juvenile mortality required all fish to be destroyed.
 - 2. Avian Predation - constant hazing is required. Gulls and other birds capable of causing >20% loss in individual rearing ponds.

6. Future Direction

- a. Wandering/straying- stock and size at release studies.
- b. Develop new broodstock sources for Tucannon and Walla Walla River systems.
- c. Run timing to improve harvest opportunity. genetics and stock development.

B. GRANDE RONDE RIVER

1. Production

- a. Early cooperation with ODFW in developing the Wallowa stock of fish allowed us to reach goal for the pond at Cottonwood by 1984. Much poundage dedicated to ODFW for their development program.
- b. Reached goal into G. Ronde in 1985 with fish size averaging 5.1/lb for last 5 years.

2. Adult Returns

- a. Early tag groups indicated excellent juvenile survival to Lower Granite Dam. However adults returning to the Snake River could not be accounted for in creel surveys. Concerns about the origin of the Wallowa stock of fish caused us to do several joint studies with ODFW and NMFS.
- b. Results showed that we had underestimated harvest, and that unaccounted for fish were much less than believed. Wallowa fish did however have a

- different migration pattern that wild fish and did not contribute to fisheries as well as expected.
- c. Sport harvest increased from a closed fishery to >800 fish in 1989 for the Washington portion.
 - d. Smolt to adult survival rates for G. Ronde releases have been consistently in the 1-2% range. Consider the program to be a substantial success.

3. Factors affecting progress toward Goals.
 - a. Migrating timing- slow to enter river thus lessening available time to anglers.
 - b. Heavy harvest of fish occurring elsewhere in Columbia. This is not keeping us from reaching our goals but is a concern.
 - c. Different broodstock could improve survival rates and increase availability to anglers through altered run timing to coincide with wild fish.

C. TUCANNON RIVER

1. Production

- a. Production has been at or near goal since 1984. Smolt size has averaged 5.3/lb for the last 5 years. Lyons Ferry stock fish have been used in recent years but other stocks have been used in past. The development of a new broodstock from the Tucannon will begin in the next 2 years.
- b. Juvenile emigration and residualism have been a long term problem on the Tucannon. Poor survival rates as measured to McNary Dam have been as low as 50% of other LFH releases. Residualism measured as high as 22% of release.

2. Adult Returns

- a. Residualism and poor survival have caused the adult return rates in Tucannon to lag behind other rivers.
- b. Sport harvest has increased slowly since 1985. Studies done on smolt releases indicated that conditioning pond was functioning properly but fish were still not returning.
- c. Efforts to develop a new brood stock for the Tucannon have begun.

3. Factors affecting progress toward goals.

- a. residualism/ poor smolt survival
- b. improper broodstock for river.
- c. adult straying
- d. poor survival of tagged fish.

D. WALLA WALLA RIVER

1. Production

- a. Production at or near goal since 1984. Fish planted in Walla Walla and Touchet rivers and in Mill Cr. Size of fish consistent with hatchery production.

- b. Little emphasis on the Walla Walla system until 1990. No tagging studies begun until 1988.
2. Adult Returns
- a. Straying problem in other rivers thought not to exist in Walla Walla. Wrong!
 - b. Studies in 1989 showed strong numbers of Touchet R. fish returning to above Lower Granite Dam. Straying fish represented 0.56% smolt to adult survival. The problem of "in place" appeared to be universal in the program.
 - c. Excellent adult returns to the river however. Have had steadily increasing sport harvest on the rivers since the program began.
 - d. Survival rates for Touchet river tags nearly 2% in first return year. Expanded to two year recovery this could mean a 3-4% smolt to adult survival rate.
3. Factors affecting progress toward goals.
- a. Limited data
 - b. Residualism - if Tucannon rates high, why not the Walla Walla system.
 - c. Straying - a universal problem that if solved could dramatically increase sport harvest in rivers.
 - d. Juvenile emigration - low flow in system could be killing smolts.
 - e. Stock of use could be wrong for system.

III. CONCLUSIONS & RECOMMENDATIONS

1. Production from hatcheries has been at or above goal since 1984.
2. Survival rates for the program have been above goal.
3. Adults returning from releases have contributed to wide-spread fisheries.
4. Adults returning to the Snake and Tribs. have met LSREP goals since 1985.
5. Straying/wandering is eliminating many fish from the program that should be contributing.
6. Problems in returning adults "in place" may be the result of environmental, physiological, operational or stock related origin. All areas need to be investigated.
7. LFH problems are unique to its mid-river location and these same problems probably won't show up elsewhere.

LSRCP OBJECTIVES IN WASHINGTON

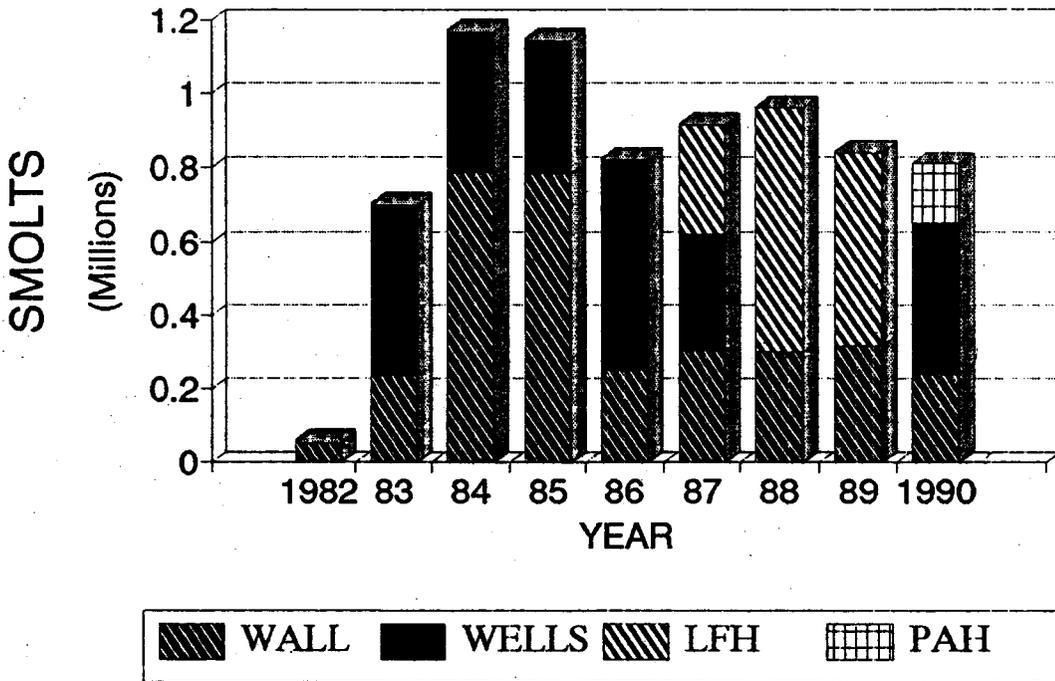
1. ESTABLISH AN ANNUAL SUPPLY OF STEELHEAD BROOD FISH CAPABLE OF MEETING EGG NEEDS.
2. MAINTAIN AND ENHANCE NATURALLY SPAWNING POPULATIONS OF STEELHEAD AND OTHER NATIVE TROUTS WHICH CURRENTLY EXIST IN SOUTHEAST WASHINGTON STREAMS.
3. ESTABLISH A RETURN OF ADULT STEELHEAD INTO THE SNAKE AND TRIBUTARY RIVERS WHICH MEETS COMPENSATION PLAN GOALS.
4. IMPROVE OR REESTABLISH SPORT FISHERIES FOR STEELHEAD AND RESIDENT TROUT IN THE SNAKE RIVER AND IT'S TRIBUTARIES.
5. COORDINATE COMPENSATION PLAN EFFORTS AND MANAGEMENT DIRECTION WITH OTHER AGENCIES AND WITH BASIN-WIDE GOALS.

WASHINGTON'S LSRCP GOALS
STEELHEAD

<u>RIVER</u>	<u>ADULTS</u>
SNAKE RIVER	500
GRANDE RONDE RIVER	1,500
TUCANNON RIVER	1,000
WALLA WALLA	1,500
ASOTIN CREEK	155
TOTAL	<u>4,655</u>

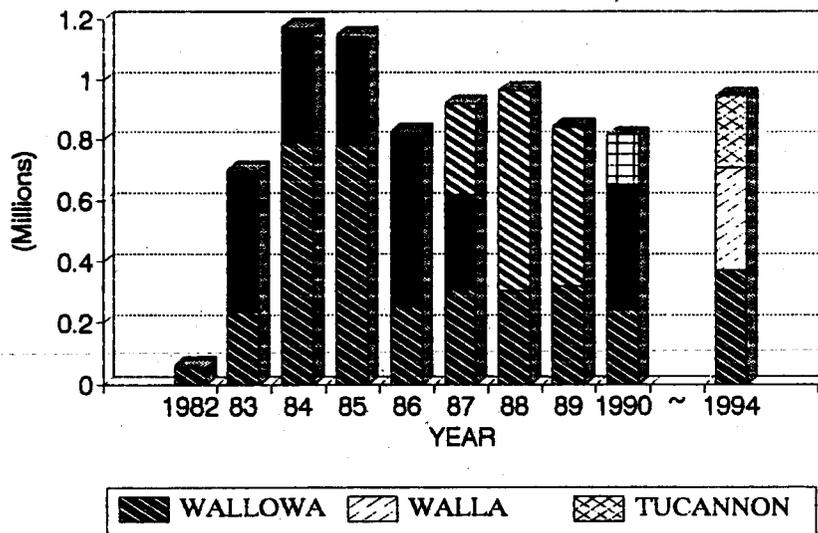
PRODUCTION @ LFH

BROOD SOURCE



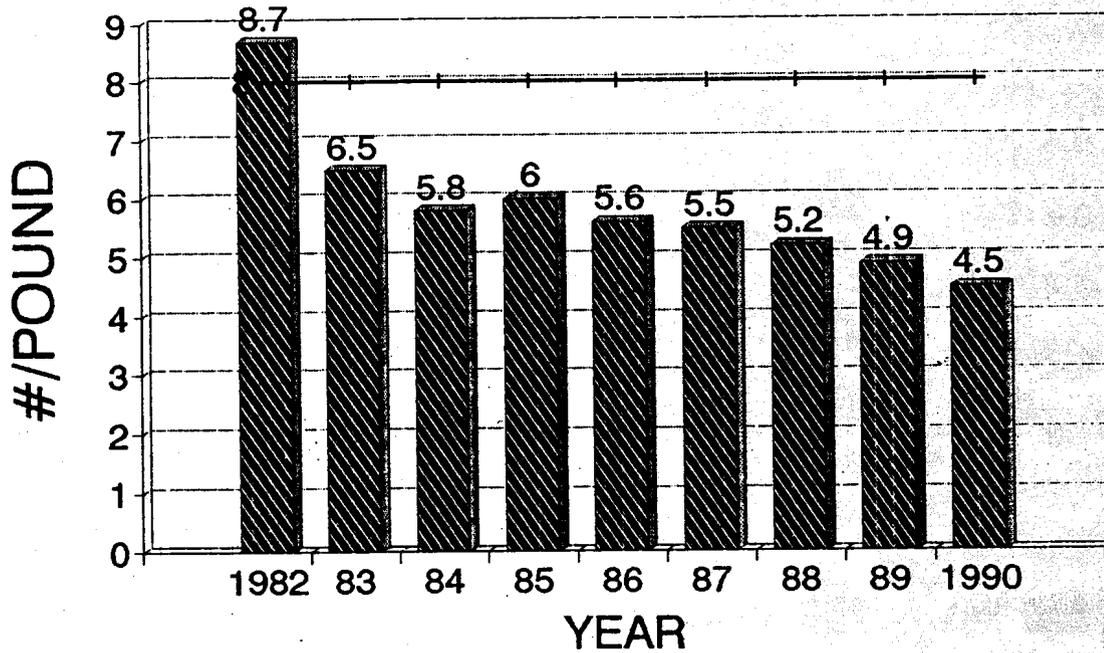
FUTURE BROODSTOCK

LFH BEYOND 1994?



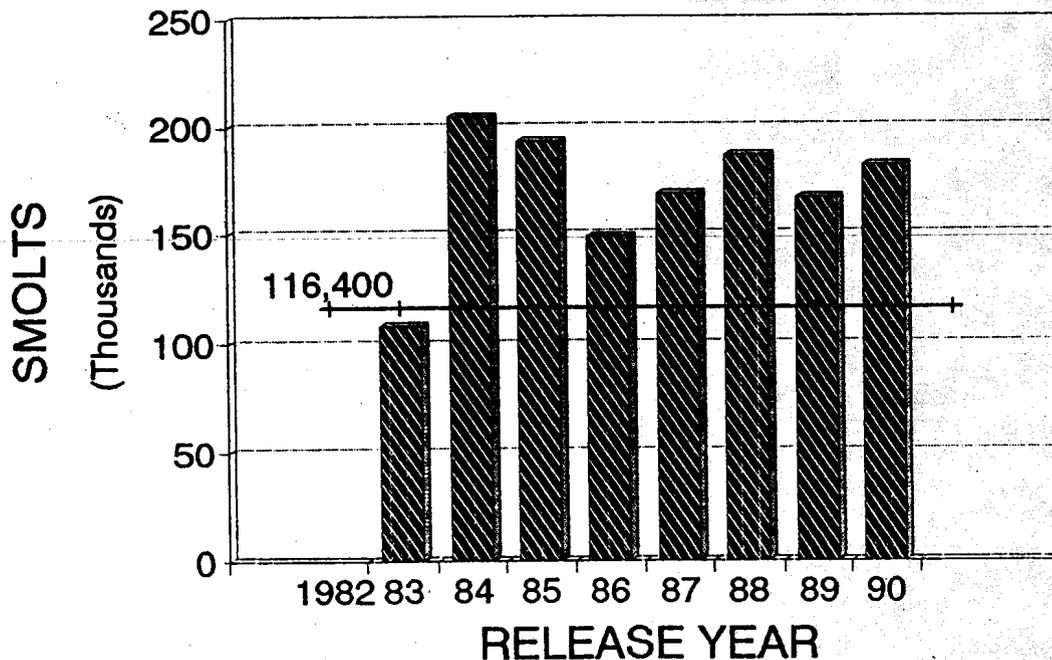
PRODUCTION @ LFH

FISH SIZE

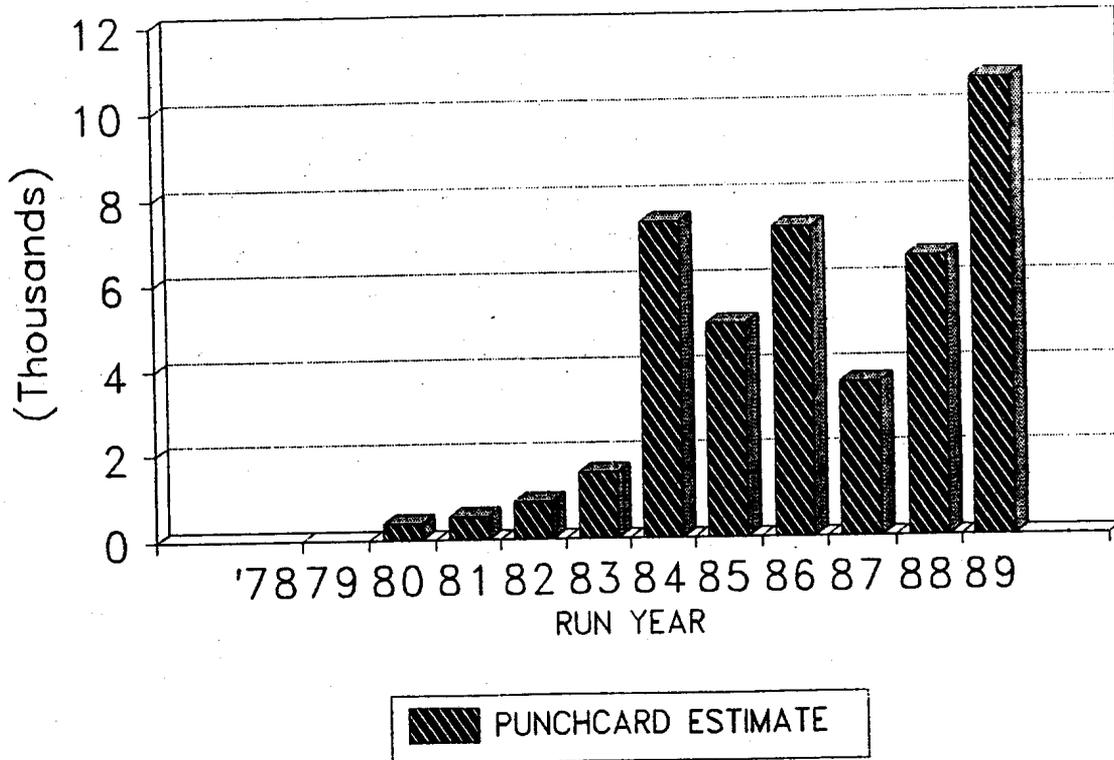


PRODUCTION @ LFH

POUNDS OF SMOLTS



SNAKE RIVER HARVEST

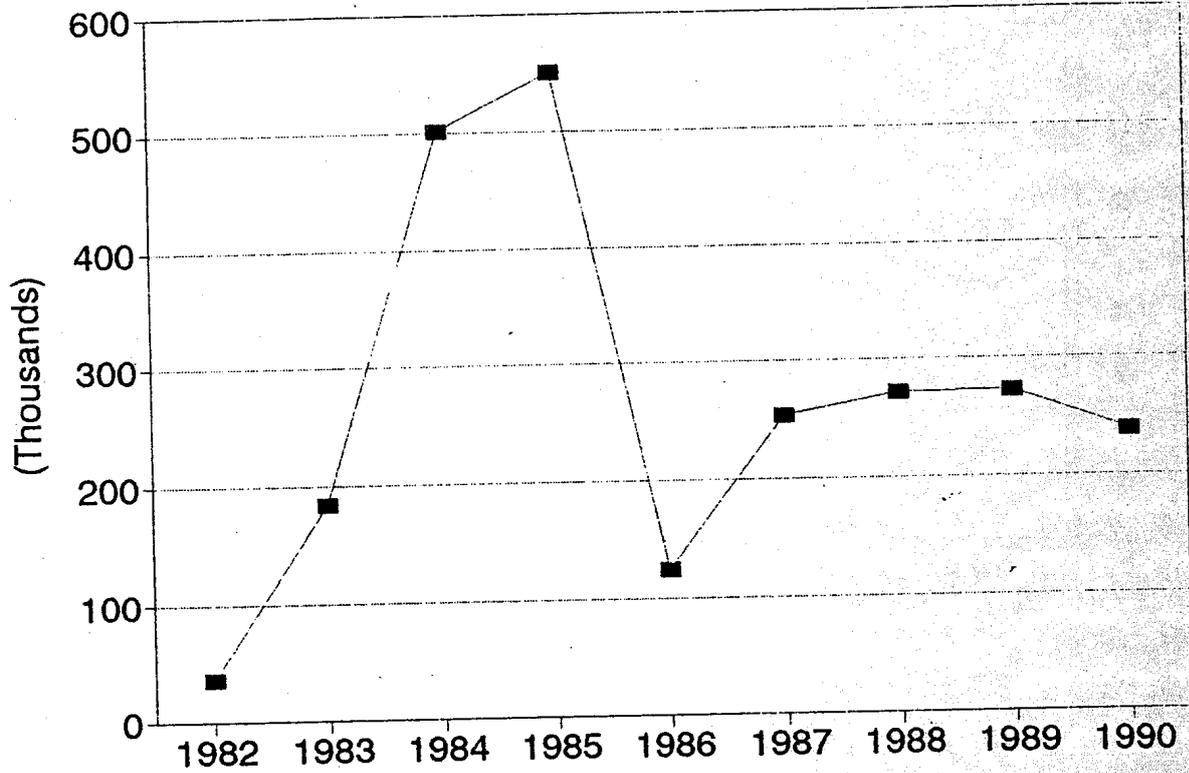


FUTURE WORK DIRECTION SNAKE RIVER / LFH

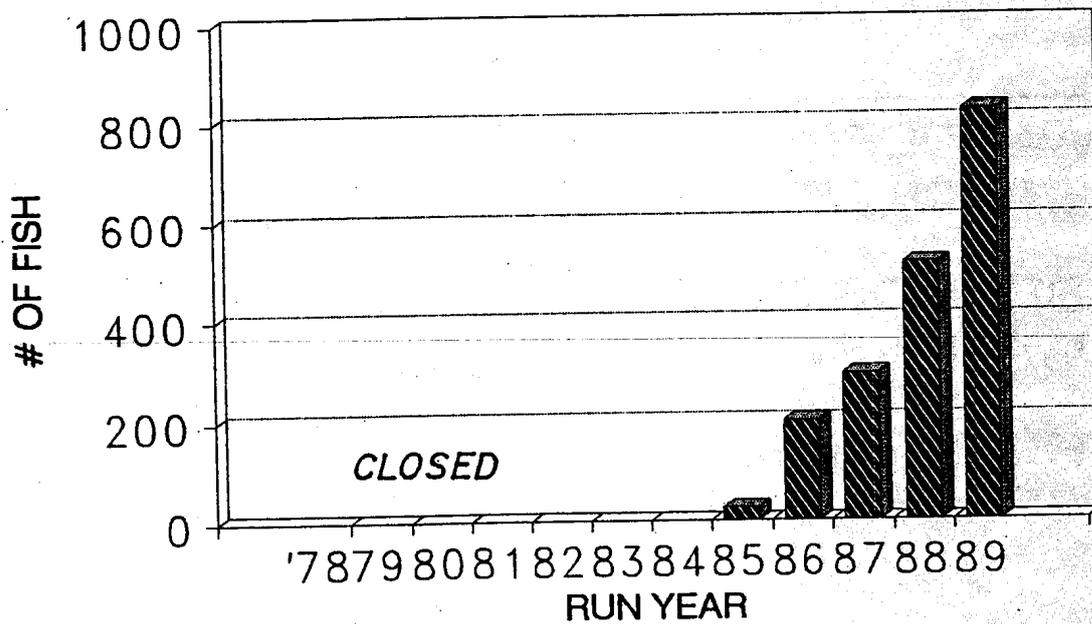
1. WANDERING / STRAYING
STOCK, SIZE/TIME OF RELEASE
2. BROODSTOCK SOURCES
WALLA, TUCANNON, WALLOWA?
3. RUN TIMING
GENETICS, STOCK

GRANDE RONDE RIVER

SMOLTS PLANTED



G. RONDE HARVEST



 PUNCHCARD ESTIMATE

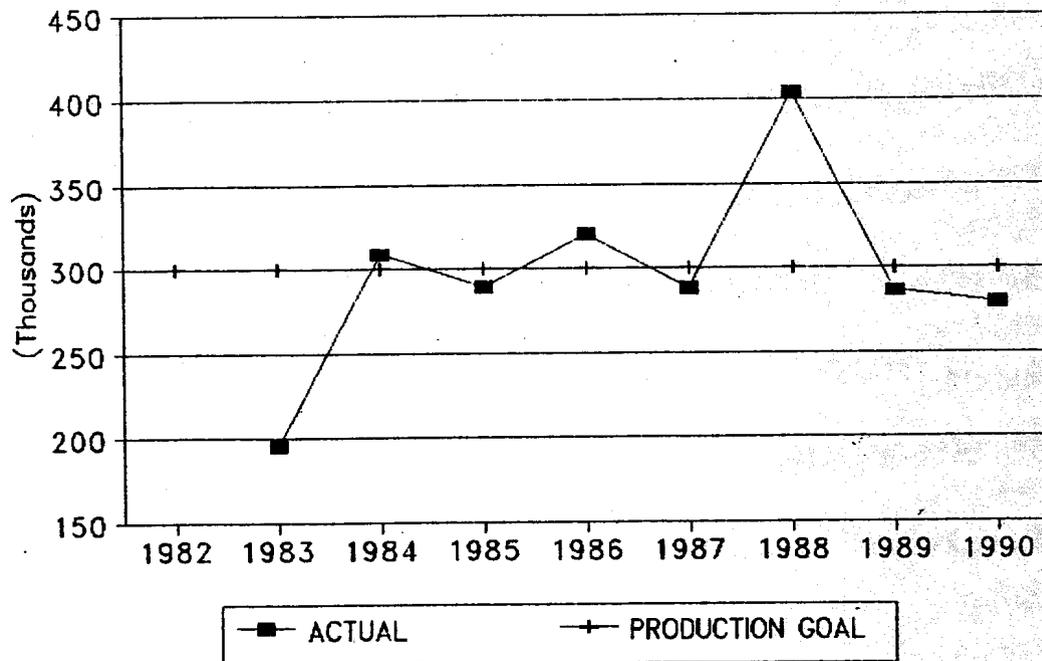
Low Tucannon Survival Reasons

1. Poor survival of tagged fish.
2. Residualism (22% in 1990)
3. Poor smolt survival throughout system.
4. Improper stock for Tucannon.
5. Straying
6. Other - unknown

FUTURE WORK DIRECTION TUCANNON RIVER

1. WANDERING / STRAYING
STOCK, SIZE/TIME OF RELEASE
ENVIRONMENTAL
2. NEW BROODSTOCK
3. RESIDUALISM
ENVIRONMENTAL, STOCK
C.P. vs DIRECT RELEASE
4. RESIDENT / ANADROMOUS
INTERACTIONS ?

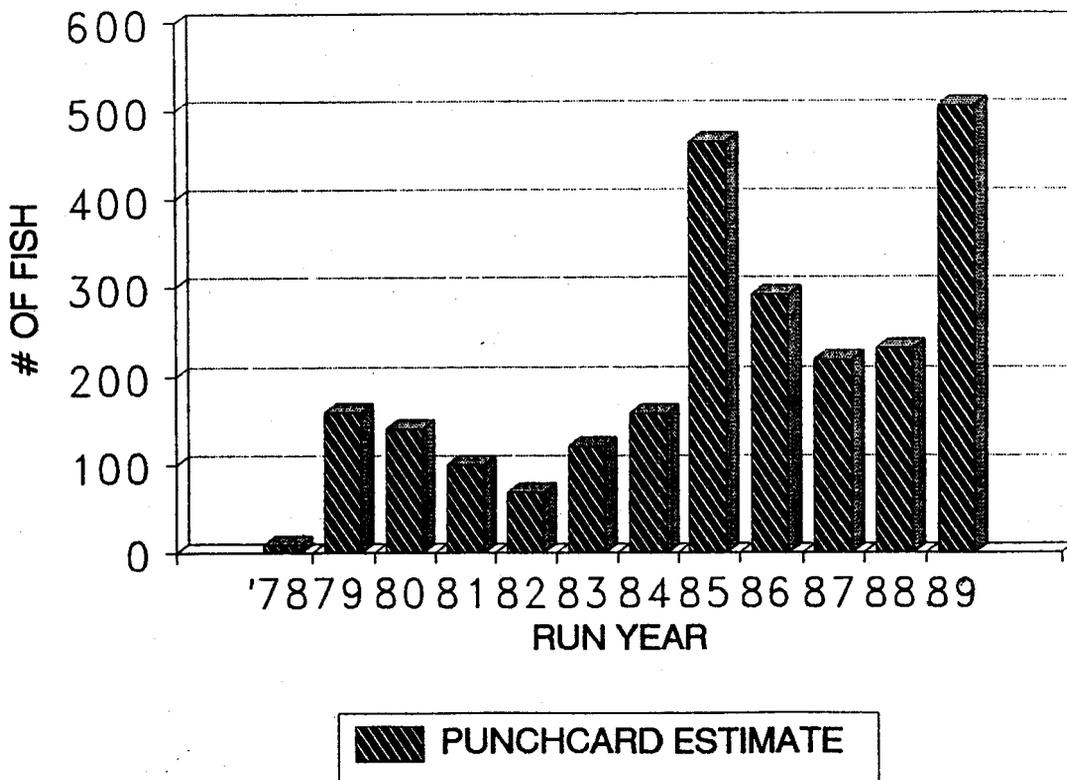
WALLA WALLA RIVER SMOLTS PLANTED



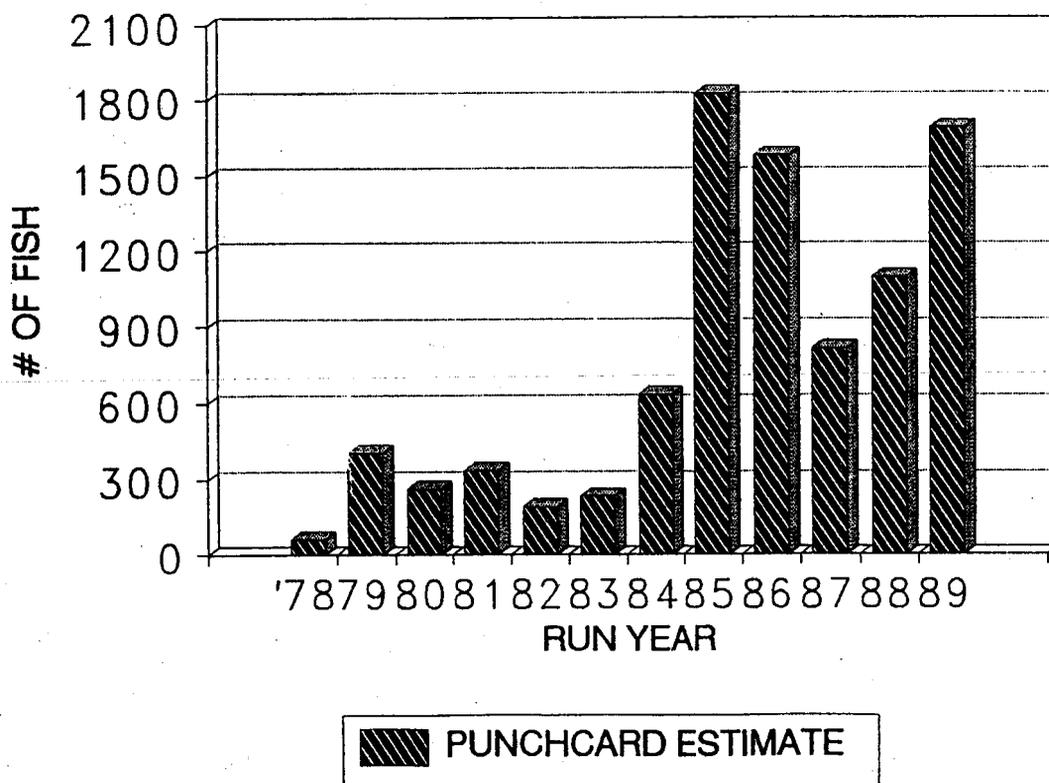
FUTURE WORK DIRECTION WALLA WALLA RIVER

1. WANDERING / STRAYING STOCK, ENVIRONMENTAL
2. NEW BROODSTOCK N.E.O.H.
3. DIFFERENT SURVIVAL RATES
REFINE CREEL ESTIMATES
MEASURE ESCAPEMENT ?

TOUCHET HARVEST



WALLA WALLA HARVEST

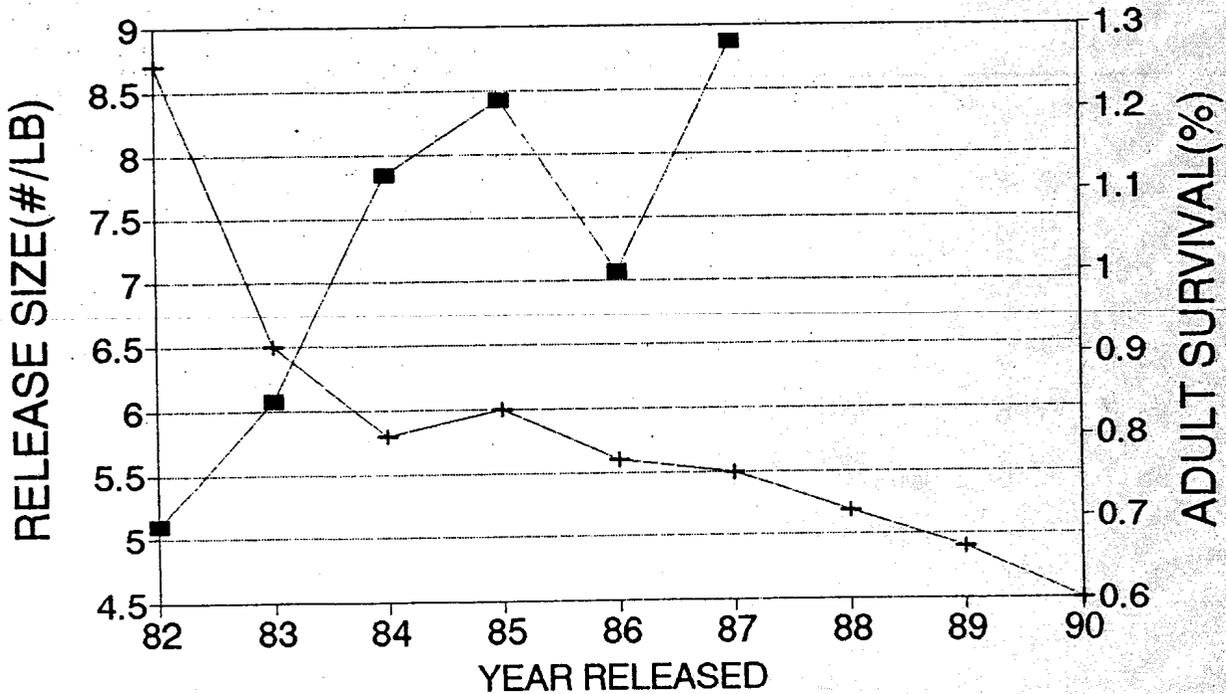


LYONS FERRY ORIGIN 1989
 STEELHEAD PASSAGE AT GRANITE DAM

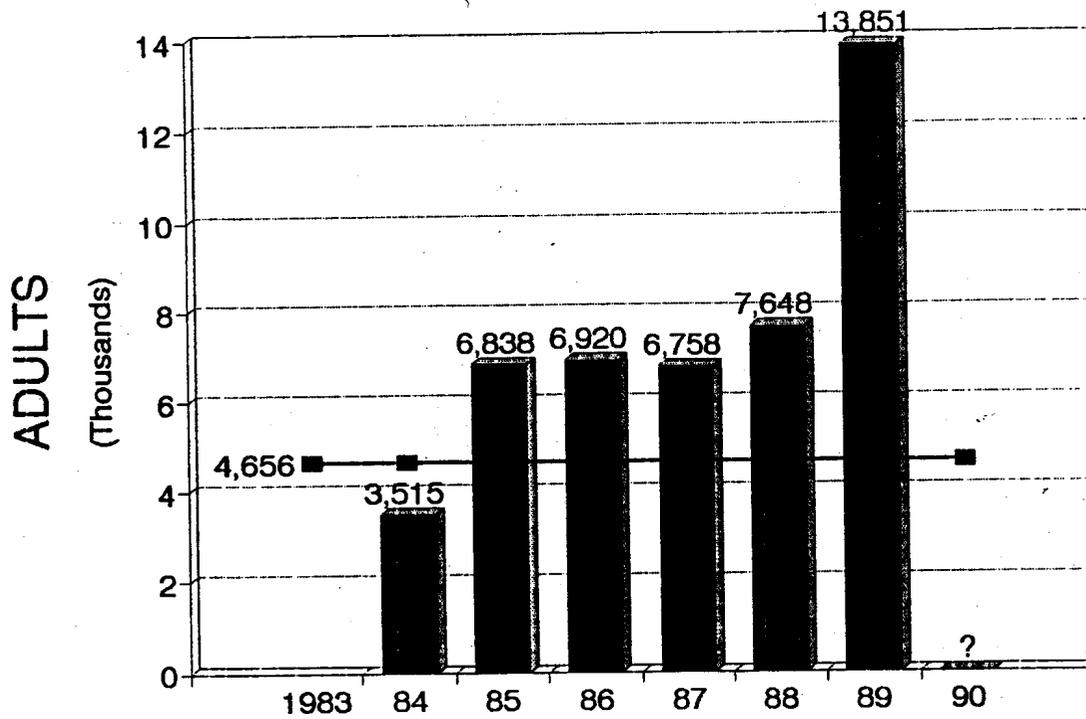
	1 SALT	2 SALT
COTTONWOOD	2,100	1,818
ASOTIN CR.	217	178
LYONS FERRY	973	540
TUCANNON	720	405
TOUCHET	888	726
WALLA WALLA	1,212	990
TOTALS	6,110	4,657

TOTAL ESCAPED OVER LGD - 10,767

ADULT SURVIVAL BASED ON SMOLT RELEASE SIZE



LFH RETURNS vs LSRCP GOAL



DIRECTION OF JUVENILE RESEARCH 1990-1995

ENVIRONMENTAL-

POLLUTION (PALOUSE RIVER)
THERMAL BLOCKS
LOW FLOWS
WELL WATER REARING

IMPRINTING-

CONDITIONING POND RESPONSE
DIRECT vs C.P. RELEASE
LFH RESIDUAL EFFECT
SIZE AT RELEASE
TIME OF RELEASE

STOCK-

GENERAL BEHAVIOR
UPRIVER vs DOWNRIVER
GENETIC ADAPTABILITY
INTERACTION WITH IMPRINTING