APPENDIX H

SOCIO-ECONOMIC CONSIDERATIONS

The discussion of fish and wildlife as it relates to local and regional econmics is given in the following reprint from Wyoming Wildlife magazine, May 1972. Although the region and the numerical data in the article do not relate directly to the Snake River area, the concepts discussed are pertinent.

"IS THIS BIG BUSINESS IN WYOMING?" (by Fred Eiserman)

I admit, mention fish in financial circles and you just don't come on as strong as uranium mining, coal processing, timber harvest, or agricultural products. These are the resource commodities people need and use and pay for; they have a place in the gross national product. They contribute to our standard of living. But just a minute, so do fish. That rainbow up the Platte in Alcova Reservoir, that Mackinaw trout in Jackson Lake, the cutthroat in the Snake River; trout, walleye, bass—all over the state—do you know what they do? They make cash registers jingle at sporting good counters. They sell campers, boats, outboards, worms, life jackets, tents, boots, gas. They rent motel rooms, keep bar tenders busy and maybe even keep people happier and out of trouble. A Madison Avenue ad man could go wild over this product. Even broadcasting and film companies make money by the simple fact that Wyoming's clear unpolluted waters have fish.

Sport fishing in Wyoming is a profit making venture; it's a business proposition that requires management of the same sophistication that you'd expect in today's agriculture or forestry. And perhaps this is why those people having responsibilities in the states' fisheries management program think of their jobs with the same regard and have the same dedication as those individuals who work in more conventional natural resources management professions.

So far, about all I've demonstrated is my enthusiasm and maybe a bit of bias is showing through—but why not? We've got a good thing going and it gets better everyday. Fishing is for fun, for recreation, for food, for relaxation and all of the other excuses we use when we rationalize our reasons for participating in this crazy, wonderful sport. And what it all adds up to in Wyoming's economy is more money than most of us can imagine. But before I tell you how much, let me tell you why this is such good, clean money and why it's one of the best business deals for Wyoming people.

First, the product your state Game & Fish Commission is marketing is a high demand item—especially trout, not to mention grayling, walleye, bass and other

gamefish species.

Second, there are no warehouse surpluses and the competition is almost nonexistent.

Third, there is no competition for space with other business ventures and it does not interfere with the production of other renewable resources.

Fourth, the resource can be developed along with Wyoming's industrialization and does not necessarily have to diminish as the state becomes urbanized. Wild trout are presently produced within the city limits of a number of Wyoming towns.

Fifth, in addition to the environment being publicly owned, approximately 8,200 miles of Wyoming's 13,800 miles of trout producing streams and almost all of the major lakes and reservoirs are available through public lands.

Sixth, the product has a rapid renewal rate. Two years for an acceptable product for some species and at the extreme, 10-13 years for trophy size Mackinaw trout.

Seventh, no adverse environmental problems are created either in the growth or harvest of the product.

Eighth, production costs are almost entirely supported by consumer participation fees.

Ninth, profit sharing by the public can be realized without a direct investment in the management of the resource.

Tenth, in the process of developing, marketing and utilizing the resource there are no associated problems of labor relations, womens lib, race or over-taxing public services.

And eleventh, in this up-tight world fishing is good for people. It's a way to unwind without artificially "copping out." And for the most part, what's good for people is good for our society and in the process, good for business in general.

These are a few reasons why we've got a good "thing" going. And although I still believe that a fishing experience is to be measured in terms related to the heart and spirit of man, I also believe that we have a tendency to bury such terms when we talk of what really makes this country go. And that my friends is money. Isn't it a bit difficult for us to imagine that

we can make money and lots of it and still have everything beautiful—no disruption of the environment, no impact evaluation required, no restoration measures needed. Perhaps this is our problem. We've been loath to equate our beautiful thing with dollars and maybe diminish the experience. Let's try it and we may like it.

With apologies to Izaak Walton and his present day followers, here are some of the more important facts and figures associated with the money side of fishing:

There were about 227,000 licensed fishermen active in Wyoming in 1971. Of this number about 125,000 were nonresidents. Fishermen use for the past ten years has been increasing at a fairly stable rate of about 5% annually (52% since 1961). Fishing license fee monies amount to over $933,000 of which about 75% originated from nonresident fees. Approximately $200,000 in additional revenue was received through various matching grants, making over $1,100,000 available for fishery management programs.

This is the penney ante portion of a blue chip game. From this modest investment on the part of licensed fishermen (there are approximately 25,000 resident pioneer licenses, and children under 14 are not required to have a license) in resource management and in state government, it is conservatively estimated that $30 million dollars worth of business is generated annually by sport fishing only.

This is all within the borders of the state and the most joyful part of this whole thing is that about $12 million dollars of this is new money brought in by out-of-staters. Again remember all of this happens with no environmental deterioration, no additional taxes, no labor problems, no busing problems and just by a little over 200,000 happy fishermen (and a few sore heads) moving about the state enjoying themselves.

From recent economic studies conducted by the University of Wyoming, preliminary and conservative estimates indicate that annually the average Wyoming fisherman spends about $184 and the nonresident spends about $95 in sport fishing pursuits.

From my own one-man private survey which I personally conducted with the cooperation of a Casper fisherman, expenditures for fishing looked a great deal different. A Casper fisherman was selected because we know that many fishermen from this town travel in almost every direction around Wyoming to fish. Hence they probably spend a little more than their fellow fishermen in other towns. Also, this fisherman was selected because he participates in all types of fishing. He boats on Jackson Lake for Mackinaw; he back packs into the high country for cutthroat, brook and

golden trout; he fishes the North Platte River for rainbow and brown trout; Boysen Reservoir for walleye; and Ocean Lake for ling. In spite of all this, though, he is not the most ardent fisherman I have known. Here is what his fishing expenditure budget looks like:

Boat, motor and trailer maintenance—$75
Operational costs for boat; gas, oil, etc.—$150
Replacement fishing gear and license—$53
Life jackets, fire extinguishers and miscellaneous boating equipment—$125
Food and beverages—$125
Auto gas and oil for all trips—$200
Auto maintenance due to fishing trips—$75
Boat insurance and licensing—$35
Total—$838

Now how easy it would be to convert all of this to a price tag affixed to a pound of trout or a creel of walleye. But who can really say how much a fish in its natural environment is worth. The fact that trout occupy Wyoming's waters is testimony enough that we have a quality environment capable of sustaining the human spirit. However, if we really need further motivation to perpetuate this precious heritage, what better financial terms are there than a $30,000,000 annual return from an investment of slightly more than a million? □ □ □

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WASHINGTON
Department of
FISHERIES

APPENDIX I

DANIEL J. EVANS
GOVERNOR

ROOM 115, GENERAL ADMINISTRATION BUILDING • PHONE 753-6600
OLYMPIA, WASHINGTON 98504

THOR C. TOLL
DIRECTOR

November 7, 1974

Colonel Nelson P. Conover, District Engineer
Walla Walla District
U.S. Army Corps of Engineers
Building 602, City-County Airport
Walla Walla, WA 99362

Dear Colonel Conover:

We are pleased to submit for your examination the tabular summary for hatchery requirements and rearing programs for the Lower Snake River Compensation Plan. This report was prepared by the Columbia Basin Fisheries Technical Committee's Lower Snake Hatchery Subcommittee. It has been approved by both the Columbia Basin Fisheries Technical Committee and the respective directors.

Tables 1 and 2, which were prepared several months ago, have a slight discrepancy in the adult chinook requirements (18,512 instead of 18,300). Except for variations due to rounding, we believe the values in the other tables are conservative. Table 3 summarizes the overall program criteria, while Table 4 lists the pounds of smolts to be released for each release site. Table 5 lists a general physical description of available water supplies for each hatchery.

Two tables have also been prepared for each of eight proposed hatcheries: the "A" tables giving the rearing criteria, and the "B" tables giving the specific information relative to hatchery requirements.

We suggest that you and members of your staff examine these closely prior to our meeting with you on November 15. Mr. Robert Hager, Hatchery Subcommittee chairman, will be prepared to answer any questions you may have at the meeting.

Various field tests, i.e., average ground water sources, etc., will be required. We feel this work should be conducted by the Corps and that site investigation should proceed immediately. The fishery agencies will be prepared at the November 15 meeting to supply names of agency representatives that will act liaison with your staff in this endeavor.

Sincerely,

Thor C. Tollefson

Thor C. Tollefson
Director

Enclosures

cc: Gene Kruse - Fish Commission of Oregon
John McKean - Oregon Wildlife Commission
Joseph Greenley - Idaho Fish & Game
Carl Crouse - Wash. Dept. of Game
Kahler Martinson - U.S. Fish & Wildlife Service
Don Johnson - National Marine Fisheries Service
Columbia Basin Fisheries Technical Committee
Robert Hager - Wash. Dept. of Fisheries

Table 1. Distribution of Salmon and Steelhead Requiring Hatchery Compensation. (Obtained by taking 48% of values presented in table on page 10 of Lower Snake River Report)

Area	Fall Chinook1/	Spr. or Summer Chinook	Steel-head
Snake River			
Below Lewiston	5,000		
Lewiston-China G.	3,580		2,208
China G.-High Mtn. Sheep	743		
High Mtn. Sheep-Appaloosa	203		
Appaloosa-Pleasant Valley	743		
Pleasant Valley-Hells Canyon	4,459		
Hells Canyon Dam Fish Facilities	3,648	1,200	2,736
Tucannon River		1,152	1,632
Clearwater River	68	288	20,736
Asotin Creek			816
Grande Ronde River		5,856	7,632
Salmon River		46,656	16,896
Imnaha River	68	3,216	1,920
Small tributaries		288	528
Total	18,512	58,656	55,104

1/ *Total compensation for fall chinook has been adjusted to agree with Corps' report, but distribution agrees with original report. These are to be produced by Washington Department of Fisheries.*

Table 2. Allocation of Compensation (Adults) by State as Suggested by CBFTC, November 2, 1973. Not to be used as an indicator of specific release sites.

Area	Washington			Oregon		Idaho	
	Spring Chinook	Fall Chinook	Steelhead	Spring Chinook	Steelhead	Spr. & Sum. Chinook	Steelhead
Snake River							
Below Lewiston		5,000					
Lewiston-Hells Canyon		9,728	2,208				
Hells Canyon Dam		3,648			1,368 1/	1,200	1,368 1/
Tucannon River	1,152		1,632				
Clearwater River		68				288	20,736
Asotin Creek			816				
Grande Ronde River				5,856	7,632		
Salmon River						46,656	16,896
Imnaha River		68		3,216	1,920		
Small tributaries					264 1/	288	264 1/
Total	1,152	18,512	4,656	9,072	11,184	48,432	39,264

1/ *Young of these fish not to be released in Snake River because of conflict with IPC compensation program. Release sites to be determined by states of Idaho and Oregon.*

Table 3. Hatchery Requirements to Produce Required Numbers of Adult Chinook and Steelhead 1/

	Fall Chinook	Spr. & Sum. Chinook	Summer Steelhead
Number of Females	2,290	2,140	3,392
Eggs per Female	5,000	4,500	5,000
Number of Eggs	11,450,000	9,631,600	16,957,000
Survival (eggs to smolts) Percentage	80	70	65
Number of Smolts	9,160,000	6,741,500	11,021,000
Fish per Pound	90	15	8
Pounds of Smolts 2/	101,800	449,440	1,377,600
Survival (smolt to adult) 3/ Percentage	0.20	0.87	0.50
Number of Returning Adults (mitigation)	18,300	58,700	55,100

1/ *Totals of individual hatcheries cause obvious rounding errors in values.*

2/ *Pounds of smolts reared is the most significant item both with respect to hatchery costs and eventual adult production. Size and numbers may be adjusted to hatchery practice.*

3/ *Survival to Lower Granite Dam.*

Table 4. Hatchery Production and Area of Release

Station	Thousands of Pounds of Reared Fish						General Area of Release
	SH	Catchable Trout	Fall Chin.	Spr. Chin.	Sum. Chin.	Total	
Pasco			101.8			101.8	Hatchery
				8.8		8.8	Tucannon
Total						110.6	
Rocky Ford	116.4					116.4	S.E. WA rivers
		93.0				93.0	Undetermined
Total						209.4	
Lostine	225.0			44.9		269.9	Hatchery
Imnaha	54.6			24.6		79.2	Hatchery
Powell	125.0					125.0	White Sand Cr. (Upper Lochsa)
	100.0					100.0	Potlatch Cr. (Clearwater)
					99.6	99.6	Upper Lochsa
	125.0				61.3	186.3	Crooked River (S.F. Clearwater)
Total	350.0				160.9	510.9	
Briggs Springs	50.0					50.0	Rapid River
	100.0					100.0	Johnson Creek
	100.0					100.0	S.F. Salmon
	381.6					381.6	Lemhi
Total	631.6					631.6	
McCall					30.6	30.6	Johnson Creek
					30.7	30.7	S.F. Salmon
Total					61.3	61.3	
Mackay				148.9		148.9	Upper Salmon (Decker)
Program Totals	1,377.6	93.0	101.8	227.2	222.2	2,021.8	

Table 5. General Physical Description of Available Water Supplies

Site	Approx. Q (cfs)	Temp. Range (°F)	Source	General Type of Operation
Pasco	40-60	55-60	Existing Ground water	Once-Through
Rocky Ford	30	50	Rocky Ford Creek	Once-Through
Lostine			Develop ground water (12 cfs)	Re-Use (120cfs)
Imnaha			Develop ground water (3.6 cfs)	Re-Use (36 cfs)
Powell			Lochsa River	Once-Through
Briggs Springs	106-115	57-59	Briggs Springs	Once-Through
McCall 1/	Unknown	39-50	Big Payette Lake	Once-Through
Mackay	23	47	Warm Springs Creek	Once-Through

1/ *Expansion of existing hatchery.*

Rearing Program for Lower Snake River Compensation Plan
Agency: Washington Department of Fisheries
Location: Pasco

	Fall Chinook	Spring Chinook
Number adults required	6,026	131
Survival to spawn	95%	80%
Number spawning	5,725	105
Percentage females 1/	40%	40%
Number females	2,290	42
Number of eggs per female	5,000	4,500
Number eggs required	11,450,000	189,100
Survival egg-smolt	80%	70%
Number smolts to liberate	9,160,000	132,400
Number per pound	90	15
Total pounds liberated	101,800	8,800
Survival smolt-adult	0.2%	0.87%
Number returning adults (mitigation)	18,300	1,152
Approximate release date	May-June	April-May
Approximate rearing period (months)		

1/ *Sex composition frequently varies from 40 to 60% females hence lower figure is required to assure adequate number of females.*

Requirements of Hatcheries Proposed Under Lower Snake River Compensation Plan

Agency: Washington Department of Fisheries

Location: Main facility--Pasco, Washington
Satellite Facility--Russell Springs, Tucannon River: Township 10N, Range 41 East W.M. in Columbia County, Washington

Land Requirement: 40 acres

Hatchery type: Single pass [✓] ; Re-use [ ]

Egg Incubation

Species	Number of eggs	Incubation Period From	Incubation Period To
Fall Chinook	11,450,000	October	March
Spring Chinook	189,100	August	December

Maximum number of eggs held at any one time 11,639,100

Smolt Production

Species	Smolts at Time of Release Numbers	No./Lb	Lbs	Rearing Period From	To	Total Mos.
Fall Chinook	9,160,000	90	101,800	February	June	5 to 17
Spring Chinook	132,400	15	8,800	December	April	17

Maximum pounds in ponds at any one time 130,000

Adult Holding Facilities (for each area if more than one)

Species	Location	Number of Adults	Holding Period From	To
Fall Chinook	Hatchery	6,026	August	December
Spring Chinook	Tucannon Site	131	May	September

Description of Available Water Supply

Pasco

Ground water is available from collection ditches in downtown Pasco. This water appears to be a result of U. S. Bureau of Reclamation projects and may be increasing in quantity. The U. S. Army Corps of Engineers has the responsibility for pumping this water from the collection ditches into the Columbia, any future work by the Corps in intercepting this water may well be dovetailed easily into a hatchery program in the immediate Pasco area.

An estimated 40-60 cfs of 55-60 F water is presently available.

Tucannon

An estimated 2.5-3.0 cfs is available from Russell Springs. WDF owns the 14.3 acres at this site and has an existing water right of 5 cfs from the springs.

Note: A supportive supply of pumped Columbia River water will be required for smolt conditioning.

Mode of Operation:

Present plans call for the release of the entire fall chinook production to be released at the hatchery and all spring chinook from the Tucannon satellite facility. Adults will be collected, retained, and spawned at the points of release. Incubation facilities may be required at the Tucannon site.

Incubation and production tables reflect the program design criteria; however, in actual practice it is likely that both species will be reared to a larger size and, as a result, a lesser egg take will be required to maintain the mitigative poundage-production goal. A more precise estimate of actual incubation needs will be developed when actual engineering and design work is initiated.

Rearing Program for Lower Snake River Compensation Plan
Agency: Washington Department of Game
Location: Rocky Ford Creek

	Steelhead	Catchable 2/ Trout
Number adults required	755	
Survival to spawn	95%	
Number spawning	717	
Percentage females 1/	40%	
Number females	287-	
Number of eggs per female	5,000	
Number eggs required	1,433,000	
Survival egg-smolt	65%	
Number smolts to liberate	931,200	233,000
Number per pound	8	2.5
Total pounds liberated	116,400	93,000
Survival smolt-adult	0.50%	
Number returning adults (mitigation)	4,656	
Approximate release date	April-May	
Approximate rearing period (months)		

1/ *Sex composition frequently varies from 40 to 60% females hence lower figure is required to assure adequate number of females.*

2/ *Most criteria not applicable to catchable program.*

Requirements of Hatcheries Proposed under Lower Snake River Compensation Plan

Agency: Washington Department of Game

Location: Rocky Ford Creek--near Soap Lake, Washington
Satellite Facilities: Adult holding pond at Goldendale Hatchery, WDG, adult collection facilities at Lower Granite Dam

Land Requirement: 40 acres

Hatchery Type: Single pass ☑ ; Re-use ☐

Egg Incubation

Species	Number of Eggs	Incubation Period From	To
Steelhead	1,433,000	February	May
Catchable Trout	600,000	January	March

Maximum number of eggs held at any one time 2,033,000

Smolt Production

Species	Smolts at Time of Release Numbers	No./Lb	Lbs	Rearing Period From	To	Total Mos.
Steelhead	931,200	8	116,400	June	May	12
Catchable Trout	465,000	5	93,000	Feb.	August	18

Maximum pounds in ponds at any one time 200,000

Adult Holding Facilities (for each area if more than one)

Species	Location	Number of Adults	Holding Period From	To
Steelhead	Satellite Fac.	755	September	November

Description of Available Water Supply

Rocky Ford Creek rises from springs and is a proven hatchery stream. Approximately 30 cfs of 50 F water is available.

Descriptions of any satellite pond water supplies is unavailable at present.

Mode of Operation:

All fish will be planted off-station. Catchable trout distribution has not as yet been determined. Steelhead smolts will be planted in the Grande Ronde at Rattlesnake Creek, Tenmile, or Couse Creek, Alpowa Creek, at Little Goose tailwater and other Washington streams.

Note: It may be necessary to construct acclimation or short-term rearing facilities at release sites.

Rearing Program for Lower Snake River Compensation Plan
Agency: State of Oregon
Location: Lostine

	Spring Chinook	Steelhead
Number adults required	670	1,460
Survival to spawn	80%	95%
Number spawning	535	1,385
Percentage females	40%	40% 3/
Number females	214	554
Number eggs per female	4,500	5,000
Number eggs required	963,000	2,770,000
Survival egg-smolt	70%	65%
Number smolts to liberate	673,000	1,800,000
Number per pound	15	8
Total pounds liberated	44,900	225,000
Survival smolt-adult	0.87%	0.50%
Number returning adults (mitigation)	5,856	9,000
Approximate release date	April 15	April 15
Approximate rearing period	16.5 mo. 1/	9.5 mo. 2/

1/ *Based on 44° average annual temperature.*

2/ *Based on 51° constant temperature.*

3/ *Sex composition frequently varies from 40 to 60% females, hence lower figure is required to assure adequate number of females.*

Requirements of Hatcheries Proposed under Lower Snake River Compensation Plan

Agency: State of Oregon

Location: Lostine River at its Juncture with the Wallowa River (river mile 27.0). NW 1/4, SE 1/4 S 19, T1N, R43E (EL--3,002)

Specific site locations:	Owner
NW 1/4 SE 1/4 S 19, T1N, R43E (with springs)	Frank Renthrow
NW 1/4 SE 1/4 S 19, T1N, R43E	Tom Willit
SE 1/4 NW 1/4 S 19, T1N, R43E	Stone Hereford Ranch (Pendleton, OR)

Land Requirement: 40 acres

Hatchery Type: Single pass [ ] ; Re-Use [✓]

Egg Incubation

Species	Number of Eggs	Incubation Period From	Incubation Period To
Steelhead	2,770,000	5/1	8/15
Spring Chinook	963,000	8/13	12/29

Maximum number of eggs held at any one time 3,733,000

Smolt Production

Species	Smolts at Time of Release: Numbers	No./Lb	Lbs	Rearing Period: From	To	Total Mos
Steelhead	1,800,000	8	225,000	7/1	4/15	9.5(@51 F)
Spring Chinook	673,000	15	44,900	11/26	4/15	16.5(@44 F)

Maximum pounds in ponds at any one time 272,900(4/15)

Adult Holding Facilities (for each area if more than one)

Species	Location	Number of adults	Holding Period From	Holding Period To
Steelhead	Hatchery	1,460	4/15	6/15
Spring Chinook	Hatchery	670	5/15	9/15

Description of Available Water Supply

Wallowa River (river mile 29.0) Based on spot observation minimum flow was estimated to be 100 cfs on 9/9/58. For the period 1957-58, max-min temp (°F) ranged from 69 in August to 31 in December and January. Temperatures of 32 or less occurred in November, December, January, and March. FWS.

Lostine River (river mile 10) For the period 1969-73, max-min flows ranged from 1,880 cfs in June to 19 cfs in December (ice) min flows in August and September 31 and 25 cfs, respectively. For the entire period of record (49 years) max-min flows ranged from 2,540 cfs, 5/27/13 to 7.5 cfs, 3/2/66 (result of ice), U.S.G.S.

For the period 1957-58, max-min temp (°F) ranged from 64 in July and August to 33 in December and March. Average annual temp was 44 F. USGS

Spring water (S 19, T1N, R43E) Several springs ranging in flow from 0.25-2 cfs with temps of 54-58 are located in section 19 and the surrounding area.

Wells Three wells have been drilled in the surrounding area for domestic use. All are with 6-inch casings and range in depth from 41-97 feet, outputs range from 4-42 gpm with temps at 48-50 F.

Due to extreme water quality and quantity conditions associated with the Wallowa and Lostine rivers, it is necessary that sufficient ground water be developed to provide 10% or 12 cfs make-up water for a 120 cfs re-use hatchery. The Lostine River will provide standby, adult holding and attraction water.

Mode of Operation:

Self-contained hatchery with adult holding, egg take, incubation, and rearing facilities.

All production will be released at hatchery site. Smolt distribution to other areas need not be considered until excess hatchery adult escapement occurs. When excess adult escapement does occur trucks will be necessary for distribution of surplus hatchery production.

Rearing Program for Lower Snake River Compensation Plan
Agency: State of Oregon
Location: Imnaha River

	Spring Chinook	Steelhead
Number adults required	365	350
Survival to spawn	80%	95%
Number spawning	292	335
Percentage females 1/	40%	40%
Number females	117	134
Number eggs per female	4,500	5,000
Number eggs required	528,000	672,000
Survival egg-smolt	70%	65%
Number smolts liberated	369,600	436,800
Number per pound	15	8
Total pounds liberated	24,600	54,600
Survival smolt-adult	0.87%	0.50%
Number returning adults (mitigation)	3,216	2,184
Approximate release date	April 15	April 15
Approximate rearing period	16.5 mo. 2/	9.5 mo. 3/

1/ *Sex composition frequently varies from 40 to 60% females hence lower figure is required to assure adequate number of females.*

2/ *Based on 44° average annual temperature.*

3/ *Based on 51° constant temperatures.*

Requirements of Hatcheries Proposed under Lower Snake River Compensation Plan

Agency: State of Oregon

Location: Imnaha River

Eventual hatchery site location dependent on development of sufficient ground water. Numerous flat parcels of land are situated from College Creek Ranger Station, downstream 12 miles to a point 2 miles north of Imnaha, Oregon. One other possible site is situated on Big Sheep Creek near its juncture with the Imnaha River.

Specific Site Locations:	Owner
Imnaha R. SE 1/4 S 26, T1S, R48E	Don Norton
Imnaha R. SW 1/4 S 23, T1S, R48E	Grant Warnock
Imnaha R. SE 1/4 S 10, T1S, R48E	Wayne Marks
Imnaha R. NW 1/4 S 21, T1N, R48E	Pay Harp- Jim Stiltson
Imnaha R. SW 1/4 S 9, T1N, R48E	K. G. Bensen
Big Sheep Creek NE 1/4 S20, T1N, R48E	Ducket

Land Requirement: 25 acres

Hatchery Type: Single pass [ ] ; Re-use [✓]

Egg Incubation

Species	Number of Eggs	Incubation Period From	Incubation Period To
Steelhead	672,000	5/1	8/15
Spring Chinook	528,000	8/3	12/29

Maximum number of eggs held at any one time 1,200,000

Smolt Production

Species	Smolts at Time of Pelease Numbers	No./Lb.	Lbs	Rearing Period From	To	Total Mos
Steelhead	436,800	8	54,600	7/1	4/15	9.5 (@51F)
Spring Chinook	369,600	15	24,600	11/26	4/15	16.5 (@44F)

Maximum pounds in ponds at any one time 80,880 (4/15)

Adult Holding Facilities (for each area if more than one)

Species	Location	Number of Adults	Holding Period From	To
Steelhead	Hatchery	350	4/15	6/15
Spring Chinook	Hatchery	365	5/15	9/15

Description of Available Water Supply

Lostine River For the period 1969-73, max-min flows ranged from 4,500 cfs in May to 65 cfs in January (result of ice). For the 45 year period of record, max-min flows were 6,650 cfs on 5/19/57 to 16 cfs on 11/22/31 (result of ice) U.S.G.S.

For the period 1965-68 max-min temps (°F) ranged from 74 in August to 32 in November, December, January, February, and March. USGS

Wells: Five wells have been drilled in the surrounding area for domestic use. Diameter of wells range from 6-8 inches, with depths from 75-34 feet, outputs range from 8-30 gpm with temps from 52-53 F.

Due to extreme water quality and quantity conditions associated with the Imnaha River and its tributaries it is necessary that sufficient ground water be developed to provide 10% or 3.6 cfs make-up water for a 36 cfs re-use hatchery. The Imnaha River will provide standby, adult holding and attraction water.

Mode of Operation:

Self-contained hatchery, with adult holding, egg take, incubation, and rearing facilities.

All production will be released at hatchery site. Smolt distribution to other areas need not be considered until excess hatchery adult escapement occurs. When excess adult escapement does occur trucks will be necessary for distribution of surplus hatchery production.

Rearing Program for Lower Snake River Compensation Plan
Agency: Idaho Fish and Game Department
Location: Powell

	Steelhead	Spring Chinook
Number Adults required	227	2,394
Survival to spawn	95%	80%
Number spawning	216-	1,915
Percentage females 1/	40%	40%
Number females	862-	766
Number eggs per female	5,000	4,500
Number eggs required	4,308,000	3,447,000
Survival egg-smolt	65%	70%
Number smolts to liberate	2,800,000	2,413,000
Number per pound	8	15
Total pounds liberated	350,000	160,900
Survival smolt-adult	0.50%	0.87%
Number returning adults (mitigation)	14,000	21,000
Approximate release date	April-May	April-May
Approximate rearing period (months)		

1/ *Sex composition frequently varies from 40 to 60% females, hence lower figure is required to assure adequate number of females.*

Requirements of Hatcheries Proposed under Lower Snake River Compensation Plan

Agency: Idaho Fish and Game Department

Location: Powell

Land Requirement: _____ acres

Hatchery Type: Single pass [✓]; Re-use [ ]

Egg Incubation

Species	Number of eggs	Incubation Period From	Incubation Period To
Steelhead	4,308,000		
Spring Chinook	3,447,000		

Maximum number of eggs held at any one time _____

Smolt Production

Species	Smolts at Time of Release Numbers	No./Lb	Lbs	Rearing Period From	To	Total Mos.
Steelhead	2,800,000	8	350,000			
Spring Chinook	2,413,000	15	160,900			

Maximum pounds in ponds at any one time _____

Adult Holding Facilities (for each area if more than one)

Species	Location	Number of Adults	Holding Period From	To
* Steelhead	Total	227		
* Spring Chinook	Total	2,394		

Description of Available Water Supply

Lochsa River

Mode of Operation:

Smolts to be distributed from satellite facilities on White Sand Creek, (upper Lochsa), Potlatch Creek (Clearwater), upper Lochsa, Crooked River (S. F. Clearwater).

Breakdown to be filled in by IF&GD.

Rearing Program for Lower Snake River Compensation Plan
Agency: Idaho Fish and Game Department
Location: Briggs Springs

	Steelhead
Number adults required	4,093
Survival to spawn	95%
Number spawning	3,888
Percentage females 1/	40%
Number females	1,555
Number eggs per female	5,000
Number eggs required	7,774,000
Survival egg-smolt	65%
Number smolts to liberate	5,053,000
Number per pound	8
Total pounds liberated	631,600
Survival smolt-adult	0.50%
Number returning adults (mitigation)	25,260
Approximate release date	April-May
Approximate rearing period (months)	

1/ *Sex composition frequently varies from 40 to 60% females hence lower figure is required to assure adequate number of females.*

Requirements of Hatcheries Proposed under Lower Snake River Compensation Plan

Agency: Idaho Fish and Game Department

Location: Briggs Springs--Near Hagerman, Idaho (Sheldon Estates)

Land Requirement: _____ acres

Hatchery Type: Single pass [✓] ; Reuse [ ]

Egg Incubation

Species	Number of Eggs	Incubation Period From	To
Steelhead	7,774,000		

Maximum number of eggs held at any one time _____

Smolt Production

Species	Smolts at Time of Release Numbers	No./Lb	Lbs	Rearing Period From	To	Total Mos.
Steelhead	5,053,000	8	631,600			

Maximum pounds in ponds at any one time _____

Adult Holding Facilities (for each area if more than one)

Species	Location	Number of Adults	Holding Period From	To
* Steelhead	Total	4,093		

Description of Available Water Supply

Briggs Springs appears to be an excellent source of water. Spring flow ranges from 106 to 115 cfs. Temperature ranges from 57 to 59 F.

Mode of Operation:

Smolts to be released from satellite on Rapid River, Johnson Creek, S. F. Salmon River, Lemhi River.

Adults to be collected at release sites.

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* Breakdown to be filled in by IF&GD.

Rearing Program for Lower Snake River Compensation Plan
Agency: Idaho Fish and Game Department
Location: McCall

	Summer Chinook
Number adults required	912
Survival to spawn	80%
Number spawning	730
Percentage females 1/	40%
Number females	292-
Number eggs per female	4,500
Number eggs required	1,313,500
Survival egg-smolt	70%
Number smolts to liberate	919,500
Number per pound	15
Total pounds liberated	61,300
Survival smolt-adult	0.87%
Number returning adults (mitigation)	8,000
Approximate release date	April-May
Approximate rearing period (months)	

1/ *Sex composition frequently varies from 40 to 60% females, hence lower figure is required to assure adequate number of females.*

Requirements of Hatcheries Proposed under Lower Snake River Compensation Plan

Agency: Idaho Fish and Game Department

Location: McCall Hatchery. This is programmed to be an expansion of an existing IF&GD hatchery.

Land Requirement: _____ acres

Hatchery Type: Single pass [✓]; Re-use [ ]

Egg Incubation

Species	Number of Eggs	Incubation Period From	To
Summer Chinook	1,313,500		

Maximum number of eggs held at any one time _____

Smolt Production

Species	Numbers	No./Lb	Lbs	Rearing Period From	To	Total Mos
Summer Chinook	919,500	15	61,300			

Maximum pounds in ponds at any one time _____

Adult Holding Facilities (for each area if more than one)

Species	Location	Numbers of Adults	Holding Period From	To
Summer Chinook	Johnson Cr.	456		
" "	S. F. Salmon	456		

Description of Available Water Supply

The projected source is Big Payette Lake.

Mode of Operation:

Smolts will be distributed to satellite facilities for release into Johnson Creek (S.F. Salmon) and S.F. Salmon.

Adult collection will occur at release sites.

Rearing Program for Lower Snake River Compensation Plan
Agency: Idaho Fish and Game Department
Location: Mackay

	Spring Chinook
Number adults required	2,215
Survival to spawn	80%
Number spawning	1,772
Percentage females 1/	40%
Number females	709
Number eggs per female	4,500
Number eggs required	3,191,000
Survival egg-smolt	70%
Number smolts to liberate	2,234,000
Number per pound	15
Total pounds liberated	148,900
Survival smolt-adult	0.87%
Number returning adults (mitigation)	19,432
Approximate release date	April-May
Approximate rearing period (months)	

1/ *Sex composition frequently varies from 40 to 60% females hence lower figure is required to assure adequate number of females.*

Requirements of Hatcheries Proposed under Lower Snake River Compensation Plan

Agency: Idaho Fish and Game Department

Location: Mackay
Site location is S 28 22E T8N, owner is Mr. Dick Smith
Mackay, Idaho

Land Requirement: _____ acres

Hatchery Type: Single pass [✓] ; Re-use [ ]

Egg Incubation

Species	Number of Eggs	Incubation Period From	Incubation Period To
Spring Chinook	3,191,000		

Maximum number of eggs held at any one time _____

Smolt Production

Species	Smolts at Time of Release Numbers	No./Lb.	Lbs.	Rearing Period From	To	Total Mos.
Spring Chinook	2,234,000	15	148,900			

Maximum pounds in ponds at any one time _____

Adult Holding Facilities (for each area if more than one)

Species	Location	Number of Adults	Holding Period From	Holding Period To
Spring Chinook	Upper Salmon R.	2,215		

Description of Available Water Supply

North Fork of Warm Springs Creek is the scheduled water supply. The source provides 23 cfs flow with a 47-49 F temperature range.

Mode of Operation:

Fish will be distributed from a satellite facility located on the Upper Salmon River.