FISH RESEARCH PROJECT
OREGON

JOHN DAY RIVER BASIN STEELHEAD *Oncorhynchus mykiss* DATA AND INFORMATION COMPILATION

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EXECUTIVE SUMMARY

Objectives

1. Compile and report available existing information on habitat, biology and distribution of O. mykiss in the John Day River Basin as a working database to guide future restoration activities and life-history investigations.

2. Analyze the existing data and identify data gaps.

3. Complete reports of progress and communicate results.

Accomplishments and Findings

Existing literature regarding the biology, distribution, and habitat of O. mykiss and other salmonids in the John Day basin were compiled into an annotated bibliography and an access database. An access database of historic summer steelhead spawning ground survey data was also created. We compiled, summarized, and evaluated the quality of index summer steelhead spawning survey data, anadromous hatchery stray coded wire tag data, sport catch, creel, tribal harvest, resident and anadromous O. mykiss hatchery stocking data, non-native fish stocking data, O. mykiss density, and salmonid predation data. Index summer steelhead spawning ground survey trend data collected from 1959 to present shows a declining population of summer steelhead in the John Day basin. Unfortunately, index summer steelhead spawning survey data is inadequate in quality to provide adult escapement estimates, spawning distribution, sex ratio, hatchery/wild ratio, smolt-to-adult survival, or adult-to-smolt survival ratios because survey reaches are not randomly selected. In addition, sample size is small and inconsistent in regards to the number of streams and miles surveyed, and lacks a temporal element to maximize redd count accuracy. Nineteen different hatcheries are sources for steelhead coded wire tags (CWT) collected in the John Day River basin between 1986 and 2003. Of 36 steelhead CWT's collected upstream of Cottownood Bridge, 47% (17) originated at Irrigon Hatchery. We determined that very little data exists to describe the life history (both resident and anadromous) of O. mykiss in the John Day basin. In order to guide future O. mykiss habitat restoration activities, data needs to be collected to describe summer steelhead (O. mykiss) spawning and rearing distribution, density, habitat, adult escapement, sex ratio, wild/hatchery ratio, egg-to-smolt survival, smolt-to-adult survival, and adult-to-smolt survival in the John Day basin.

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INTRODUCTION

The John Day River subbasin supports what may be the largest wild run of summer steelhead Oncorhyncus mykiss in the Columbia River Basin. Because it is largely unaffected by hatchery influences, it is also one of the last remaining intact wild populations within the basin. This population, however, remains depressed relative to historic levels. Despite this apparent importance, relatively little is known about the life-history characteristics of this species within the John Day Basin. Contributing to this lack of information is the complex array of life histories exhibited by O. mykiss in the Columbia River system. These life histories vary from spatially restricted forms of residency in small-order streams to anadromy.

Because of depressed populations, the National Marine Fisheries Service (NMFS), in 1999, listed the mid-Columbia River steelhead ESU as threatened under the endangered species act. This ESU includes the entire John Day River Basin. The NMFS's Federal Columbia River Power System (FCRPS) 2000 Biological Opinion describes the actions that the federal action agencies (Bonneville Power Administration, Bureau of Reclamation, Corps of Engineers) are required to take to recover federally listed species. However, existing life-history information needs to be identified and reported before significant activities are initiated knowledgably, and before they can be effectively monitored and evaluated.

This project provides information to help the Federal action agencies address the habitat assessments called for in reasonable and prudent action 183 in the FCRPS 2000 Biological Opinion. It also will provide information as directed under two measures of the Columbia Basin Fish and Wildlife Program. Measure 4.3C specifies that key indicator naturally spawning populations should be monitored to provide detailed stock status information. In addition, measure 7.1C identifies the need for collection of population status, life history, and other data on wild and naturally spawning populations. This project was developed in direct response to recommendations by the John Day working group comprised of personnel from Bureau of Reclamation, NMFS, Oregon Department of Fish and Wildlife, and the Confederated Tribes of the Warm Springs Reservation. Information generated from this effort will make a significant contribution to data needs of the Interior Columbia River Technical Recovery Team.

STUDY AREA

The John Day River basin is the fourth largest drainage area in Oregon and third largest east of the Cascades draining approximately 20,300 square kilometers in northeastern Oregon (Figure 1, State of Oregon Water Resources Department, 1986). From its source in the Strawberry Mountains at an elevation near 1,800 m, the Mainstem John Day River flows 457 km to an elevation near 90 m to its mouth at river km 351 of the Columbia River. The basin is bounded by the Columbia River to the north, the Blue Mountains to the east, the Strawberry and Aldrich Mountains to the south, and the Ochoco Mountains to the west. Summer steelhead spawn in nearly all tributaries of the basin. Based on differences in geographic proximity, spawning timing, and productivity, six subpopulations of summer steelhead exist within the John Day basin: lower Mainstem (mouth to river kilometer 298 near Kimberly, Oregon), upper Mainstem (everything upstream of river kilometer 298 near Kimberly, Oregon), South Fork, Middle Fork, upper North Fork, and lower North Fork (Chilcote, 2001).

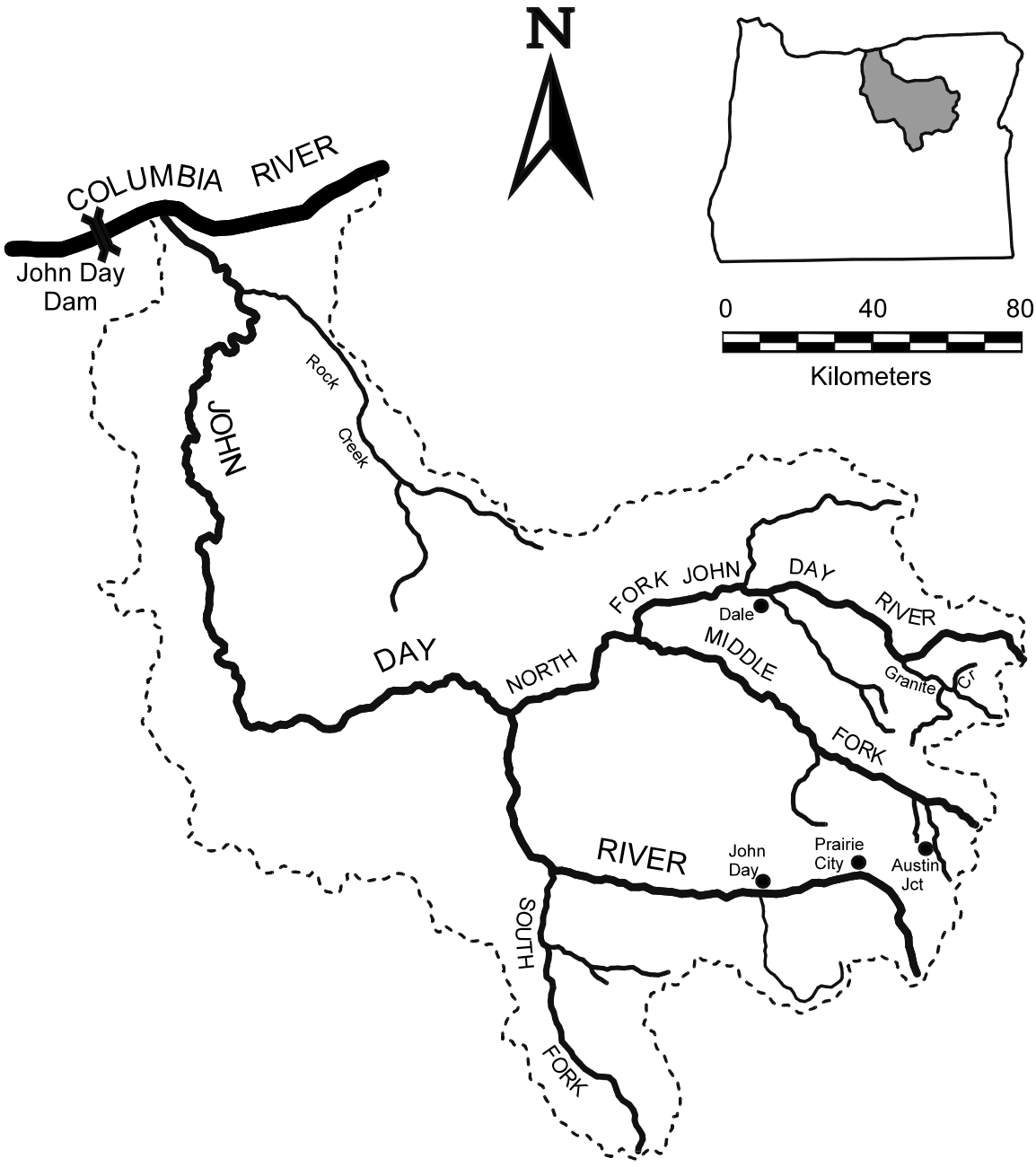

Figure 1. Map of John Day River basin. Dashed lines denote boundaries of the basin.

METHODS

Available existing literature on habitat, biology and distribution of salmonids in the John Day Basin was compiled as an annotated bibliography and as an access database. Literature was subdivided into four types; planning reports, habitat project inventory, fish biology information, and Oregon Department of Fish and Wildlife fish management reports. The following salmonid species were included in the literature review: *Oncorhynchus mykiss* (steelhead, redband trout, and rainbow trout), *Oncorhynchus tshawytscha* (spring and fall chinook salmon), *Oncorhynchus kisutch* (coho salmon), *Oncorhynchus clarki lewisi* (west slope cutthroat trout), *Salvelinus confluentus* (bull trout), *Salvelinus frontinalis* (brook trout), and *Prosopium williamsoni* (mountain whitefish). Literature regarding pacific lamprey (*Lampetra tridentata*) and the introduced species *Micropterus dolomieu* (small mouth bass) and channel catfish (*Ictalurus punctatus*) were also included.

We evaluated the quality and utility of available literature in both the annotated bibliography and access database. Planning reports were categorized by lead agency, type of plan (i.e. habitat, water, or species planning) and geographical scope within the basin. Habitat projects were categorized by their level of restoration (active or passive), type of monitoring (implementation or effectiveness monitoring) and by their geographical scope within the basin. Fish biology literature was categorized by species, data type (qualitative or quantitative), geographic scope, life stage, and report type (genetics, stock identification, stock assessment, stocking records, presence/absence, population assessment, harvest, habitat, and behavior). The term "grey data" was assigned to unpublished fish biology literature and "literature review" was assigned to fish biology literature that covered several topics and/or included discussion of John Day basin salmonids. Oregon Department of Fish and Wildlife fish management reports were categorized by data (creel, spawning survey, stocking, fish species) and information content (discussion of significant events, management topics, and habitat and research projects).

We compiled existing unpublished and published data for John Day River summer steelhead spawning surveys, coded wire tag recoveries, creel, sport catch, historic stocking of rivers and streams, density studies, and predation. We reviewed two methods by which ODFW John Day River fish management conducted index summer steelhead spawning surveys in the John Day basin between 1959 to present. Available index and non-index historic summer steelhead spawning survey data was listed and the quality of index summer steelhead spawning survey data was examined. We also compiled and analyzed hatchery summer steelhead coded wire tag data from the Pacific States Marine Fisheries Commission (PSMFC) Regional Mark Information System (RMIS) Coded Wire Tag Database website for sources of stray steelhead in the John Day basin (http://www.org/cwt/cwt_qbe.html).

The Oregon Department of Fish and wildlife (ODFW) Aquatic Inventories Project maintains a GIS data clearinghouse for salmonid species presence/absence, distribution, and habitat condition for the John Day basin on the ODFW website (http://oregonstate.edu/dept/odfw/freshwater/inventory/index.htm). We did not duplicate their efforts in this literature review. However, we did compile an annotated bibliography of *O. mykiss* density estimates available in published literature and in archives found at the John Day field office of the Oregon Department of Fish and Wildlife located in Canyon City, OR. We also reviewed available literature regarding *O. mykiss* and O. *tshawytscha* predation specific to the John Day basin

RESULTS

Annotated Bibliography of Literature Concerning Salmonids in the John Day Basin

Available existing literature on habitat, biology and distribution of salmonids in the John Day Basin was compiled as an annotated bibliography and as an access database, "Salmonid Database for the John Day Basin." Both the annotated bibliography (Appendix Tables A - D) and access database, "Salmonid Database for the John Day Basin," were subdivided into four parts; planning reports (Appendix Table A), habitat project inventory (Appendix Table B), fish biology information (Appendix Table C), and Oregon Department of Fish and Wildlife fish management reports (Appendix Table D).

Sources of literature included the Oregon Department of Fish and Wildlife District Office archive, StreamNet Library (www.fishlib.org), Columbia River Inter-tribal Fish Commission Library, Bonneville Power Administration Website (www.bpa.gov), the Internet, the Oregon Department of Fish and Wildlife website, and Eastern Oregon University and Oregon State University library resources.

Summer Steelhead Spawning Survey Data Collection Methods, Data, and Data Quality

Oregon Department of Fish and Wildlife (ODFW) and Oregon State Game Commission (OSGC) John Day District fish biologist personnel have conducted summer steelhead spawning ground surveys in the John Day Basin since 1959. Spawning survey data is used to monitor the trend in the density of spawning (redds/mile) in index reaches. Oregon State Game Commission (OSGC) and ODFW district fish biologists opted to conduct index surveys to monitor population trends because of the large extent of summer steelhead spawning habitat in the basin and small staff available to conduct surveys (Tim Unterwegner, personal communication).

Two separate index survey methods have been used to determine an index redd density for summer steelhead in the John Day basin (Tim Unterwegner, personal communication). For the purpose of this report we will designate Index A for the methods used between 1959 and 1993 and index B for the methods used from 1994 to present. Between 1959 and 1993 (Index A) OSGC and ODFW John Day District fish biologists selected summer steelhead survey sites based on personnel time available to conduct surveys, ease of access to survey sites, and the presence of spawning fish. All spawning surveys conducted were pooled to estimate index spawning density.

From 1994 to present (Index B) ODFW John Day District fishery biologists standardized the summer steelhead index counts. Reaches within tributaries from each of five main summer steelhead spawning areas of the John Day basin were selected as index sites; Upper Mainstem, Lower Mainstem, South Fork, Middle Fork, and North Fork subbasins (Table 1). Backup index streams were also selected to be surveyed in place of index streams when weather events prevented adequate surveys of index reaches (Table 1). Survey mileage was standardized by surveying at least 100 miles of the selected index reaches annually (Tim Unterwegner, personal communication). Survey timing was also standardized. Surveys took place after biologists felt that the majority of spawning was complete (Tim Unterwegner, personal communication).

From 1994 to present, surveys were also conducted outside of the pool of selected index sites to verify the occurrence of spawning activity. These sites were labeled non-index B streams (Table 2).

Index A and Index B are similar in their representation of index summer steelhead spawning density (Figure 2). However, Index A spawning density tends to be lower than Index B, especially during years when Index A includes a larger number of streams and/or miles surveyed (Figure 2, Table 3). Both indices show a declining trend in the density of summer steelhead redds observed in index spawning areas of the John Day basin from 1959 to 2003 (Figure 2 and Table 3). Spawning density calculated as index B for the Upper Mainstem, Lower Mainstem, South Fork, Middle Fork, and North Fork vary widely within subpopulations over time but also show a general decline (Table 4).

Tables 5 - 10 summarize the number of streams and miles surveyed, redds counted, and redd density for Index B streams in the Upper Mainstem, Lower Mainstem, South Fork, Middle Fork, North Fork, and the entire basin. Appendix Tables E (Upper Mainstem), F (Lower Mainstem), G (South Fork), H (North Fork), and I (Middle Fork) list all available summer steelhead spawning survey data collected for each tributary surveyed in each of the five subpopulations monitored since 1959.

John Day basin summer steelhead index spawning survey data is limited in its application. Both Index A and Index B survey reaches are not randomly selected and may be bias to represent stream areas with the greatest spawning densities. Sample size in regards to the number of streams and miles surveyed is small in comparison to the scope of available spawning habitat in the entire John Day basin which drains about 20,300 square kilometers, the fourth largest drainage area in Oregon and third largest east of the Cascades (Tables 5 - 10, State of Oregon Water Resources Department, 1986). Sample size for the number of streams sampled and number of miles surveyed is also inconsistent. Between 1959 and 2003, Index B spawning density is calculated from a range of six to 34 streams and 14.5 to 113.1 miles surveyed (Table 10). During the years 1959 - 1965, 1971, 1974, 1975, and 1991 one or more subbasins are not represented in the John Day basin index B spawning density estimate (Table 4). Annual index survey timing from 1959 to 2003 is also inconsistent and ranges as much as 60 days between some years for many of the index streams (Appendix Tables E - I).

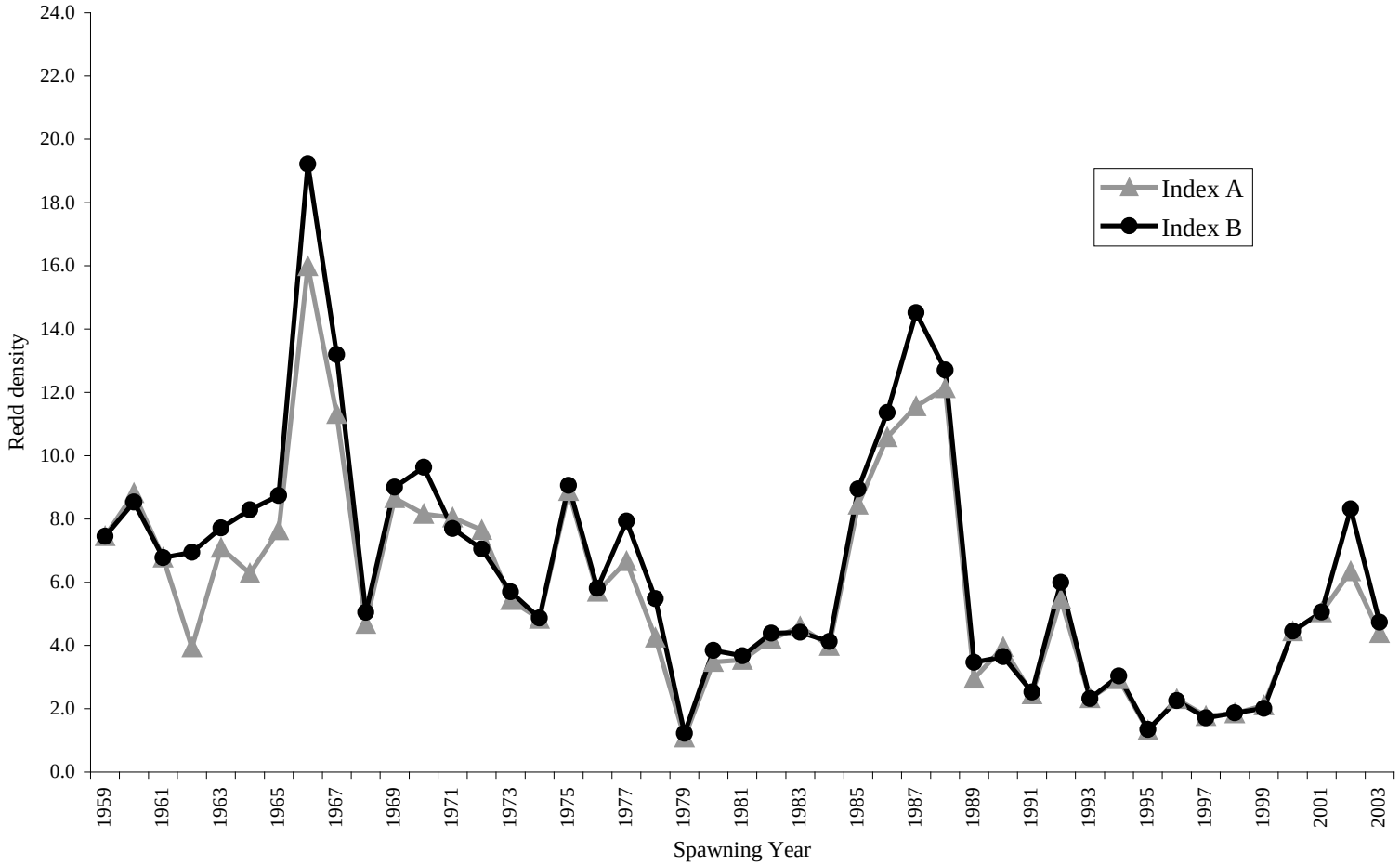

Figure 2. Comparison of Index A and Index B summer steelhead spawning density (redds/mile) for the John Day basin from 1959 to 2003.

Table 1. Index B summer steelhead spawning survey streams selected from five main spawning areas of the John Day basin.

Lower Mainstem	Upper Mainstem	South Fork	Middle Fork	North Fork
Bear Creek (Wheeler)	Bear Creek	Black Canyon Creek	Beaver Creek	Beaver Creek
Kahler Creek	Beech Creek	Deer Creek	Camp Creek	Fox Creek
Parrish Creek	Beech Creek, East Fork	Murderers Creek, Lower	Caribou Creek[a]	Olive Creek
Pine Creek	Belshaw Creek	Murderers Creek, Upper	Deep Creek	Trail Creek, Middle Fork
Rock Creek [a]	Canyon Creek	Tex Creek	Lick Creek	Trail Creek, North Fork
Thirtymile Creek	Canyon Creek, Middle Fork	Wind Creek	Vincent Creek[a]	Trail Creek, South Fork
	Cottonwood Creek			Wall Creek
	Dixie Creek			Wilson Creek
	Fields Creek			
	Indian Creek			
	McClellan Creek			
	Reynolds Creek			
	Riley Creek			
	Tinker Creek			

[a] Backup index streams. Only included in index B when the index streams could not be surveyed due to flow conditions.

Table 2. Non-index B summer steelhead spawning survey streams from five main spawning areas of the John Day Basin.

Lower Mainstem	Upper Mainstem	South Fork	Middle Fork	North Fork
Alder Creek	Canyon Creek, East Fork	Deer Creek (BLM)	Clear Creek	Alder Creek
Alder Creek (lake fork)	Grub Creek	Murderers Creek, Middle	Cougar Creek	Bacon Creek
Bridge Creek	Hall Creek	Murderers Creek, South Fork	Deerhorn Creek	Boundary Creek
Cherry Creek	John Day River	South Fork John Day River	Granite Boulder Creek	Bowman Creek
Gable Creek	Laycock Creek		Indian Creek	Bull Run Creek
Hay Creek	Little Indian Creek		Long Creek	Cable Creek
Henry Creek	Pine Creek		Middle Fork John Day River	Cable Creek, North Fork
Holmes Creek	Standard Creek		Placer Gulch	Camas Creek
Horseshoe Creek	Strawberry Creek		Ruby Creek	Deep Creek
Lone Rock Creek	Vance Creek		Vinegar Creek	Deer Creek
Nelson Creek	Wall Creek			Desolation Creek
Pine Hollow Creek	Bridge Creek			Desolation Creek, South Fork
Service Creek	Mountain Creek			Fivemile Creek
	Rock Creek			Hidaway Creek
				Hog Creek
				Lane Creek
				Little Wall Creek
				Mallory Creek
				Owens Creek
				Porter Creek
				Potamus Creek
				Rancheria Creek
				Rudio Creek
				Skookum Creek
				Swale Creek
				Trail Creek

Table 3. Number of streams and miles surveyed, redds counted, and redd density (redds/mile) for summer steelhead spawning surveys expressed as index A and index B for survey years 1959 - 2003.

	Streams surveyed		Miles surveyed		Redds counted		Redd density (redds/mile)	
Year	Index A	Index B	Index A	Index B	Index A	Index B	Index A	Index B
1959	6	6	14.5	14.5	108	108	7.4	7.4
1960	10	8	22	20.5	194	175	8.8	8.5
1961	8	8	24.5	24.5	166	166	6.8	6.8
1962	11	10	47.5	26.5	187	184	3.9	6.9
1963	11	8	30.5	24.5	216	189	7.1	7.7
1964	14	10	43.5	27.5	273	228	6.3	8.3
1965	18	11	45	31	344	271	7.6	8.7
1966	23	16	69	48.5	1103	932	16.0	19.2
1967	25	18	80	56	905	739	11.3	13.2
1968	23	17	76.5	45	358	227	4.7	5.0
1969	26	22	93.5	82	809	738	8.7	9.0
1970	21	15	65	41	530	395	8.2	9.6
1971	8	7	22.5	19.5	181	150	8.0	7.7
1972	16	15	53.5	52.5	409	396	7.6	7.0
1973	25	21	76.4	62.2	415	354	5.4	5.7
1974	14	13	38	37	184	180	4.8	4.9
1975	14	13	34	33	302	299	8.9	9.1
1976	22	20	63.3	61.8	369	359	5.7	5.8
1977	30	21	82.8	60	552	476	6.7	7.9
1978	34	24	103.2	72.2	438	393	4.2	5.5
1979	30	23	80.7	64.5	88	79	1.1	1.2
1980	36	28	105.1	81.1	365	312	3.5	3.8
1981	32	26	83.8	76.3	297	280	3.5	3.7
1982	29	22	71.8	63.3	301	278	4.2	4.4
1983	32	24	96.8	74.1	445	327	4.6	4.4
1984	29	23	78.8	61.6	314	254	4.0	4.1
1985	39	31	120.3	95.9	1016	858	8.4	8.9
1986	50	34	128.7	102.4	1362	1163	10.6	11.4
1987	61	31	151.8	94.3	1754	1369	11.6	14.5
1988	46	32	125.1	99.1	1518	1259	12.1	12.7
1989	35	28	108	88.8	319	308	3.0	3.5
1990	38	31	114.3	96.7	451	353	3.9	3.7
1991	29	25	91.9	82.4	225	208	2.4	2.5
1992	43	30	137.7	91	751	546	5.5	6.0
1993	36	30	78	71	182	165	2.3	2.3
1994	39	34	120.1	113.1	352	343	2.9	3.0
1995	33	31	104.1	98.1	137	132	1.3	1.3
1996	35	30	103.3	93.6	238	211	2.3	2.3
1997	34	32	102.2	96.5	181	165	1.8	1.7
1998	30	27	77.9	72.2	144	135	1.8	1.9
1999	26	25	82.8	79.6	174	160	2.1	2.0
2000	29	28	89.7	86.5	399	385	4.4	4.5
2001	32	28	98.6	85.7	498	433	5.1	5.1
2002	57	33	153.5	105.2	974	875	6.3	8.3
2003	37	31	113.4	98.7	498	467	4.4	4.7

Table 4. Index B summer steelhead spawning density (redds/mile) for the Upper Mainstem, Lower Mainstem, South Fork, Middle Fork, and North Fork subbasins, and the entire basin.

	Spawning density (redds/mile)					
Year	UMSJD	LMSJD	SFJD	MFJD	NFJD	Entire Basin
1959	6.3	9.6				7.4
1960	4.7	3.6	20.4			8.5
1961	6.8	8	4.9			6.8
1962	4.7	5	21.4			6.9
1963	10	4.2	2.3			7.7
1964	9.2	4.8	10.9		5.6	8.3
1965	5.4	5.7	22.3			8.7
1966	20	12.6	23.8	21.7	18.5	19.2
1967	15.4	10	10.7	12	10.7	13.2
1968	5.4	6.8	0.7	5.8	4.5	5
1969	7.7	5.4	12.5	4	9.6	9
1970	10.6	8.4	11	12	4.3	9.6
1971	4		10.9		5.7	7.7
1972	7.2	2.5	11.4	5	5.4	7
1973	6.9	2.9	7.2	3.1	2.5	5.7
1974	4.2	2.7	7.2	4.7		4.9
1975	6.3	6	13.4	7		9.1
1976	5.5	4.8	6.7	9.7	4.3	5.8
1977	8.4	0	8.9	13.7	3.5	7.9
1978	4.3	5.7	5.1	9.6	5.5	5.5
1979	0.8	0.2	1.9	1.3	1.7	1.2
1980	3.8	4.2	3.9	3.2	4	3.8
1981	3.1	4.4	4.1	5.2	3.6	3.7
1982	3.2	3.1	7.2	4.6	4.5	4.4
1983	5.4	3.3	7.2	3.5	2.1	4.4
1984	5.1	3.5	5.7	2.9	1.1	4.1
1985	8.6	4.5	12.4	9.4	8.9	8.9
1986	13.1	16.3	9.3	14	7.7	11.4
1987	14.1	19	17	11.5	8.6	14.5
1988	17.1	8.1	17.1	13.7	5.3	12.7
1989	3.8	4.3	2.1	5.7	1.7	3.5
1990	5.4	3.8	2.9	3.8	0.8	3.7
1991	3.5	2.3	2.9		0.8	2.5
1992	7.9	3.5	4.2	11.3	4	6
1993	2.4	1.8	3.3	3.2	1.6	2.3
1994	3.3	1.1	4.7	4	1.9	3
1995	1	1.5	1.6	1.9	1.2	1.3
1996	1.7	2	1.3	2	3.8	2.3
1997	1.6	1.7	1.6	1.8	1.8	1.7
1998	2.6	1.2	0.9	1.9	1.8	1.9
1999	1.3	3.5	0.9	3.8	1.8	2
2000	2.6	10.9	2.5	4.6	4.2	4.5
2001	2.7	11	4.9	4.6	4.4	5.1
2002	6.5	11	8.1	11.6	6.9	8.3
2003	3.7	3.8	6.6	4.7	5.6	4.7

Table 5. Number of streams and miles surveyed, redds counted, and density (redds/mi) of summer steelhead redds in Index B streams of the Upper Mainstem John Day River subbasin.

Year	Streams	Miles	Redds	Density
1959	4	9.5	60	6.3
1960	4	9.5	45	4.7
1961	5	16	109	6.8
1962	7	18	84	4.7
1963	5	16	160	10.0
1964	5	16.5	152	9.2
1965	6	17.5	94	5.4
1966	9	29	580	20.0
1967	9	30	461	15.4
1968	8	24.5	133	5.4
1969	10	36.5	281	7.7
1970	6	14.5	153	10.6
1971	3	6.5	26	4.0
1972	5	13	94	7.2
1973	9	26.9	186	6.9
1974	4	10	42	4.2
1975	4	11.5	73	6.3
1976	8	23	126	5.5
1977	10	30.8	259	8.4
1978	10	28.5	123	4.3
1979	9	25.5	20	0.8
1980	11	31	118	3.8
1981	11	33	102	3.1
1982	8	24	76	3.2
1983	11	34.8	187	5.4
1984	8	17.25	88	5.1
1985	12	38.1	328	8.6
1986	12	38.1	501	13.1
1987	13	36.9	530	14.4
1988	12	34.7	592	17.1
1989	11	34.2	130	3.8
1990	13	36.6	198	5.4
1991	10	31.3	108	3.5
1992	11	32.7	259	7.9
1993	10	26.2	64	2.4
1994	12	43.3	145	3.3
1995	9	26.6	26	1.0
1996	11	25.2	42	1.7
1997	12	27.9	46	1.6
1998	11	24.9	65	2.6
1999	7	20.1	27	1.3
2000	8	24.6	65	2.6
2001	7	21.2	58	2.7
2002	11	31.4	203	6.5
2003	10	28.7	105	3.7

Table 6. Number of streams and miles surveyed, redds counted, and density (redds/mi) of summer steelhead redds in Index B streams of the Lower Mainstem John Day River subbasin.

Year	Streams	Miles	Redds	Density
1959	2	5	48	9.6
1960	2	5	18	3.6
1961	2	5	40	8.0
1962	2	5	25	5.0
1963	2	5	21	4.2
1964	2	5	24	4.8
1965	3	7.5	43	5.7
1966	3	8.5	107	12.6
1967	3	8.5	85	10.0
1968	3	8.5	58	6.8
1969	3	8	43	5.4
1970	3	10.5	88	8.4
1971	0	0	-	-
1972	3	16.5	41	2.5
1973	3	9.5	28	2.9
1974	3	11	30	2.7
1975	2	5	30	6.0
1976	4	14.5	69	4.8
1977	2	5	0	0.0
1978	3	11	63	5.7
1979	2	5	1	0.2
1980	2	5	21	4.2
1981	3	11	48	4.4
1982	3	11	34	3.1
1983	3	11	36	3.3
1984	3	11	38	3.5
1985	3	11	50	4.5
1986	5	15	202	16.3
1987	5	16.6	316	19.0
1988	5	17.1	138	8.1
1989	4	14.3	61	4.3
1990	4	14.3	55	3.8
1991	4	13.6	31	2.3
1992	4	13.6	47	3.5
1993	4	9	16	1.8
1994	5	15.9	17	1.1
1995	5	17.9	26	1.5
1996	5	17.9	36	2.0
1997	5	17.9	31	1.7
1998	4	11.9	14	1.2
1999	4	10.9	38	3.5
2000	4	11.9	130	10.9
2001	4	12.1	133	11.0
2002	5	21.6	237	11.0
2003	5	21.6	82	3.8

Table 7. Number of streams and miles surveyed, redds counted, and density (redds/mi) of summer steelhead redds in Index B streams of the South Fork John Day River subbasin.

Year	Streams	Miles	Redds	Density
1959	0	-	-	-
1960	2	5.5	112	20.4
1961	1	3.5	17	4.9
1962	1	3.5	75	21.4
1963	1	3.5	8	2.3
1964	1	3.5	38	10.9
1965	2	6	134	22.3
1966	2	6	143	23.8
1967	2	6	64	10.7
1968	2	6	4	0.7
1969	5	26	326	12.5
1970	4	10.5	115	11.0
1971	3	9.5	104	10.9
1972	5	18.5	211	11.4
1973	5	15.8	113	7.2
1974	4	13	94	7.2
1975	4	12.5	168	13.4
1976	5	17.8	120	6.7
1977	3	7.5	67	8.9
1978	5	18.5	95	5.1
1979	5	15	28	1.9
1980	5	17	67	3.9
1981	4	12.5	51	4.1
1982	5	15	108	7.2
1983	3	6	43	7.2
1984	4	15.5	88	5.7
1985	5	16.5	205	12.4
1986	5	16.5	154	9.3
1987	5	17	289	17.0
1988	4	15.5	265	17.1
1989	3	11	23	2.1
1990	3	14.5	42	2.9
1991	5	19	55	2.9
1992	5	16	67	4.2
1993	4	8	26	3.3
1994	5	19	89	4.7
1995	5	18.5	29	1.6
1996	4	15	19	1.3
1997	5	19.5	31	1.6
1998	3	10.6	10	0.9
1999	4	17.5	16	0.9
2000	4	15.5	39	2.5
2001	5	18.5	90	4.9
2002	5	18.5	149	8.1
2003	5	18.5	123	6.6

Table 8. Number of streams and miles surveyed, redds counted, and density (redds/mi) of summer steelhead redds in Index B streams of the Middle Fork John Day River subbasin.

Year	Streams	Miles	Redds	Density
1959	0	0	-	-
1960	0	0	-	-
1961	0	0	-	-
1962	0	0	-	-
1963	0	0	-	-
1964	0	0	-	-
1965	0	0	-	-
1966	1	3	65	21.7
1967	2	4.5	54	12.0
1968	3	4	23	5.8
1969	1	4	16	4.0
1970	1	2	24	12.0
1971	0	0	-	-
1972	1	1	5	5.0
1973	2	3.5	11	3.1
1974	2	3	14	4.7
1975	3	4	28	7.0
1976	2	3	29	9.7
1977	3	9	123	13.7
1978	3	9	86	9.6
1979	2	7.5	10	1.3
1980	3	9	29	3.2
1981	3	4.8	25	5.2
1982	3	4.8	22	4.6
1983	3	10.3	36	3.5
1984	4	11.3	33	2.9
1985	4	11.3	106	9.4
1986	4	11.3	158	14.0
1987	3	10.3	118	11.5
1988	4	11.3	155	13.7
1989	4	11.3	64	5.7
1990	4	10.8	41	3.8
1991	0	0	-	-
1992	2	7.9	89	11.3
1993	4	9.3	30	3.2
1994	4	11.8	47	4.0
1995	4	11.6	22	1.9
1996	2	12.3	25	2.0
1997	2	8.8	16	1.8
1998	3	5.3	10	1.9
1999	4	11.9	45	3.8
2000	4	11.9	55	4.6
2001	4	11.3	52	4.6
2002	4	11.3	131	11.6
2003	4	11.3	53	4.7

Table 9. Number of streams and miles surveyed, redds counted, and density (redds/mi) of summer steelhead redds in Index B streams of the North Fork John Day River subbasin.

Year	Streams	Miles	Redds	Density
1959	0	0	-	-
1960	0	0	-	-
1961	0	0	-	-
1962	0	0	-	-
1963	0	0	-	-
1964	2	2.5	14	5.6
1965	0	0	-	-
1966	1	2	37	18.5
1967	2	7	75	10.7
1968	1	2	9	4.5
1969	3	7.5	72	9.6
1970	1	3.5	15	4.3
1971	1	3.5	20	5.7
1972	1	3.5	19	5.4
1973	2	6.5	16	2.5
1974	0	0	-	-
1975	0	0	-	-
1976	1	3.5	15	4.3
1977	3	7.7	27	3.5
1978	3	4.7	26	5.5
1979	5	11.5	20	1.7
1980	7	19.1	77	4.0
1981	5	15	54	3.6
1982	3	8.5	38	4.5
1983	4	12	25	2.1
1984	4	6.5	7	1.1
1985	7	19	169	8.9
1986	8	19	147	7.7
1987	5	13.5	116	8.6
1988	7	20.5	109	5.3
1989	6	18	30	1.7
1990	7	20.5	17	0.8
1991	6	18.5	14	0.8
1992	8	20.8	84	4.0
1993	8	18.5	29	1.6
1994	8	23.1	45	1.9
1995	8	23.5	29	1.2
1996	8	23.2	89	3.8
1997	8	22.4	41	1.8
1998	6	19.5	36	1.8
1999	6	19.2	34	1.8
2000	8	22.6	96	4.2
2001	8	22.6	100	4.4
2002	8	22.4	155	6.9
2003	7	18.6	104	5.6

Table 10. Number of streams and miles surveyed, redds counted, and density (redds/mi) of summer steelhead redds in Index B streams for the entire John Day River basin.

Year	Streams	Miles	Redds	Density
1959	6	14.5	108	7.4
1960	8	20.5	175	8.5
1961	8	24.5	166	6.8
1962	10	26.5	184	6.9
1963	8	24.5	189	7.7
1964	10	27.5	228	8.3
1965	11	31	271	8.7
1966	16	48.5	932	19.2
1967	18	56	739	13.2
1968	17	45	227	5.0
1969	22	82	738	9.0
1970	15	41	395	9.6
1971	7	19.5	150	7.7
1972	15	52.5	396	7.0
1973	21	62.2	354	5.7
1974	13	37	180	4.9
1975	13	33	299	9.1
1976	20	61.8	359	5.8
1977	21	60	476	7.9
1978	24	72.2	393	5.5
1979	23	64.5	79	1.2
1980	28	81.1	312	3.8
1981	26	76.3	280	3.7
1982	22	63.3	278	4.4
1983	24	74.1	327	4.4
1984	23	61.6	254	4.1
1985	31	95.9	858	8.9
1986	34	102.4	1163	11.4
1987	31	94.3	1369	14.5
1988	32	99.1	1259	12.7
1989	28	88.8	308	3.5
1990	31	96.7	353	3.7
1991	25	82.4	208	2.5
1992	30	91	546	6.0
1993	30	71	165	2.3
1994	34	113.1	343	3.0
1995	31	98.1	132	1.3
1996	30	93.6	211	2.3
1997	32	96.5	165	1.7
1998	27	72.2	135	1.9
1999	25	79.6	160	2.0
2000	28	86.5	385	4.5
2001	28	85.7	433	5.1
2002	33	105.2	875	8.3
2003	31	98.7	467	4.7

Hatchery Steelhead Coded Wire Tag Data

The majority of known John Day basin hatchery summer steelhead coded wire tag (CWT) recovery data is for the John Day ARM (mouth to Tumwater Falls, Appendix Table J-1), and John Day River ABV ARM (Tumwater falls to Cottonwood Bridge, Appendix Table J-2, J-3). Very little summer steelhead coded wire tag data is available for the John Day basin upstream of Cottonwood Bridge (rkm 64, Appendix Table J-3).

There have been 272 known hatchery steelhead CWT recoveries representing 12 different hatcheries in the John Day River downstream of Tumwater Falls (rkm 16) between 1992 and 2001 (Table 11). The majority (30%, 81 cwt) of these recoveries originated from Dworshak National Hatchery. Other significant CWT sources include Magic Valley Hatchery (14%, 37 CWT), Irrigon hatchery (14%, 37 CTW), and Clearwater Hatchery (13%, 34 CWT, Table 11).

Twenty-nine hatchery steelhead CWT recoveries representing nine hatcheries have been recovered in the John Day River between Tumwater Falls (rkm 16) and Cottonwood Bridge (rkm 64) from 1986 and 2001 (Table 12). Over half (52%) of the CWTs recovered between Tumwater Falls and Cottonwood Bridge originated at Irrigon Hatchery (Table 12).

Seven hatchery steelhead CWT recoveries representing six hatchery sources have been recovered in the John Day basin upstream of Cottonwood Bridge (rkm 64) between 1988 and 2003 (Table 13). Six of the seven CWTs recovered upstream of Cottonwood Bridge (rkm 64) occurred upstream of Service Creek (rkm 254, Table 13).

Table 11. Hatchery source, stock, number recovered, and release agency for hatchery steelhead with coded wire tags recovered in the John Day ARM (mouth to Tumwater Falls) from 1992 - 2001.

Hatchery Source	Stock	Number recovered	Release Agency
Clearwater	Dworshak 'B' run	34	IDFG
Cottonwood Cr Pond	Wallowa R.	11	WDFW
Curl Lake	Snake River at Monumental Dam to Little Goose Dam, Lyons Ferry Hatchery	3	WDFW
Imprint Pond			
Dworshak National	Dworshak 'B' run	81	FWS
Hagerman National	Sawtooth Hatchery 'A' run, Dworshak 'B' run, Pahsimeroi R. 'A' run	24	FWS
Irrigon	Wallowa R., Imnaha R. and tributaries	37	ODFW
Lyons Ferry	Snake R. at Monumental Dam to Little Goose Dam, Lyons Ferry Hatchery	11	WDFW
Magic Valley	Pahsimeroi R. 'A' run, East Fk Salmon R. 'B' run, Dworshak 'B' run, Hells Canyon 'A' run	37	IDFG
Niagra Springs	Hells Canyon 'A' run, Pahsimeroi R. 'A' run	18	IDFG
Oak Springs	Umatilla R.	1	ODFW
Umatilla	Umatilla R.	3	ODFW
Unknown	Snake R. below RM 60 at the Palouse R.	12	NMFS

Table 12. Hatchery source, stock, number recovered, and release agency for hatchery steelhead with coded wire tags recovered in the John Day River ABV ARM (Tumwater Falls to Cottonwood Bridge) from 1986 - 2001.

Hatchery Source	Stock	Number recovered	Release Agency
Clearwater	Dworshak 'B' run	1	IDFG
Dworshak National	Dworshak 'B' run	2	FWS
Magic Valley	Dworshak 'B' run, East Fk Salmon R. 'B' run	3	IDFG
Cottonwood Cr Pond	Wallowa R.	4	WDFW
Irrigon	Wallowa R, Imnaha R. and tributaries	15	ODFW
Hells Canyon		1	
Little Sheep		1	
Niagra Springs	Hells Canyon 'A' run	1	IDFG
Rounde Butte		1	

Table 13. Recovery year, hatchery source, number of recoveries and recovery location for hatchery steelhead with coded wire tags recovered upstream of Cottonwood Bridge 1988 - 2003.

Recovery Year	Hatchery Source	Release Location	Number of recoveries	Recovery Location
1988	Upper Columbia		1	Cottonwood Bridge to Little Ferry Canyon
1992	Wallowa		1	Lower North Fork
1994	Big Canyon		1	Lower North Fork
2003	Irrigon Hatchery	Spring Creek of the Wallowa River, OR	1	Kahler Creek, Lower Mainstem John Day River
2003	Irrigon Hatchery	Big Canyon Creek of the Wallowa River, OR	1	Service Creek, Lower Mainstem John Day River
2003	Cottonwood Creek Pond Hatchery	Grande Ronde River, OR	1	Service Creek, Lower Mainstem John Day River
2003	Unknown Washington Hatchery	Unknown	1	Service Creek, Lower Mainstem John Day River

Sport Catch, Tribal Harvest, and Creel Summary Data

Sport fishing for wild steelhead in the John Day basin was closed in 1994 (ODFW, 1994). Appendix Table K-1 is a summary of angler take tags for summer steelhead caught in the Mainstem, Middle Fork and North Fork John Day Rivers from 1970 - 1984. Currently, the steelhead fishery is catch and release only for wild fish and adipose fin clipped steelhead can be kept (ODFW, 2003).

The Confederated Tribes of the Warm Springs Reservation and Confederated Tribes of the Umatilla Indian Reservation both maintain usual and accustomed fishing sites located in the John Day River basin. No information is available regarding tribal harvest of wild summer steelhead in the John Day basin (Olsen et al. 1994).

Appendix Table K-2 is a summary summer steelhead creel data collected by ODFW John Day District fish biologists (Unterwegner and Neal, 2001). Angler effort to catch a summer steelhead in the John Day basin has decreased since 1994 when sport fishing for wild steelhead was closed. However, recent creel reports rely on small sample sizes and may not reflect actual angler effort (Appendix Table K-2).

Hatchery Fish Stocking and Non-native Transplants in Tributaries of the John Day Basin

Appendix Tables M (Upper Mainstem), N (Lower Mainstem), O (South Fork), P (North Fork) and Q (Middle Fork) list all known hatchery fish species released into tributaries of the John Day basin. Data regarding the stocking of lakes and ponds was not included in this report.

Hatchery releases of summer and winter run steelhead have occurred in the John Day River basin between 1925 and 1969 (Table 14). Rainbow trout make up the majority of all hatchery fish species released into the John Day basin (Tables 15-20). The mean stocking rate of hatchery *O. mykiss* (rainbow and steelhead) in the John Day basin between 1925 and 1997 was 71,402 fish annually and ranged between 5,000 and 612,668 fish. Other hatchery salmonids species released into the John Day River basin include coho salmon, brook trout, and west slope cutthroat trout (Tables 15-20).

Two non-native warm water fish species, small mouth bass (*Micropterus dolomieu*), and channel catfish (*Ictalurus punctatus*) have also been introduced into the lower John Day River basin. Small mouth bass were released in May of 1971 and have since established a strong population throughout the lower Mainstem John Day River basin (Claire, 1971, Daily, 1992, Shrader and Gray, 1998). Channel catfish were released into the lower John Day River in November of 1970 (10,000 fingerlings) and June of 1972 (20,000 fry, Claire, 1971, 1972, and 1973). Channel catfish were also transplanted into the lower John Day River between Kimberly and Service Creek from the Owyhee Reservoir in 1982 (1,515 averaging 1.26 pounds) and 1983 (1,445 averaging 1.18 pounds). Channel catfish have not been as successful as small mouth bass at establishing a population in the lower John Day basin (Claire, 1981 and 1984). Based on angler reports, a small population may persist in the lower John Day basin between Service Creek and Clarno (Claire, 1988 and 1990, Claire and Gray, 1993, Unterwegner and Gray, 1997).

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Table 14. Year, run (W-winter, S-summer, U-unknown), number, tributary, and subbasin of release for all known hatchery steelhead released into the John Day River basin from 1925 - 1969.

Year	Run	Number	Tributary	Subbasin	Source
1925	U	16,080	Canyon Creek	Upper Mainstem	Gunckel, S. 2002
1941	U	8,760	Canyon Creek	Upper Mainstem	Gunckel, S. 2002
1947	U	7,600	Rock Creek	Lower Mainstem	Koski, R.O. 1948
1947	U	7,520	Thirtymile Creek	Lower Mainstem	Koski, R. O. 1948
1962	W	200,000	Camas Creek	North Fork	Olsen et al., 1994
1962	W	375,000	Granite Creek	North Fork	Olsen et al., 1994
1963	U	10,667	Mainstem	Mainstem	Gunckel, S. 2002
1964	W	10,198	Upper Mainstem	Upper Mainstem	Koski, R. O., 1965, Gunckel, S. 2002, and Olsen et al., 1994
1965	W	27,860	South Fork	South Fork	Koski, R. O. 1966b
1966	S	55,518	Middle Fork	Middle Fork	Koski, R. O. 1966a and Olsen et al., 1994
1967	S	98,090	Upper Mainstem	Upper Mainstem	Koski, R. O., 1965, Olsen et al., 1994, and Gunckel, S. 2002
1967	S	71,500	Camas Creek	North Fork	Koski, R. O. 1968, Gunckel, S. 2002, and Olsen, et al, 1994
1969	S	22,375	Bridge Creek	Middle Fork	Koski, R. O. 1970

Table 15. Summary of all known stocking records for hatchery salmonids released into the Upper Mainstem John Day River Basin (upstream of Kimberly, RKM 296) from 1925 - 1997. Species include rainbow trout (Rb T), steelhead of unknown run (Sthd), winter steelhead (StW), summer steelhead (StS), coho salmon (Coho), and brook tout (BkT).

Year	RbT	Sthd	StW	StS	Coho	BkT	Total releases
1925	40,000	16,080				25,000	81,080
1926	25,680				42,745	20,000	88,425
1927	6,000						6,000
1928	16,000					27,530	43,530
1929	28,3000						28,3000
1930						50,000	50,000
1931							0
1932							0
1933	50,000					1,000	51,000
1934							0
1935							0
1936							0
1937							0
1938							0
1939							0
1940	61,865						61,865
1941	29,300	8,760					38,060
1942	24,942						24,942
1943	9,038						9,038
1944	31,050						31,050
1945	16,080						16,080
1946	13,680						13,680
1947	37,350						37,350
1948	22,750						22,750
1949	8,850						8,850
1950	48,396						48,396
1951	3,000						3,000
1952	10,046						10,046
1953	10,176						10,176
1954	13,432						13,432
1955	17,759						17,759
1956	17,863						17,863
1957	16,193						16,193
1958	49,963						49,963
1959	8,855						8,855
1960	18,270						18,270
1961	12,717						12,717
1962	19,657						19,657
1963	13,990	10,667					24,657
1964	6,495		10,200				16,695
1965	11,594						11,594
1966	8,984						8,984
1967	91,659			99,000			190,659
1968	12,493						12,493
1969	46,973						46,973
1970	59,837						59,837
1971	10,993						10,993

Table 15. Continued.

Year	RbT	Sthd	StW	StS	Coho	BkT	Total releases
1972	34,434						34,434
1973	16,617						16,617
1974	12,001						12,001
1975	12,008						12,008
1976	11,990						11,990
1977	12,003						12,003
1978	15,021						15,021
1979	60,702						60,702
1980	11,003						11,003
1981	50,981						50,981
1982	10,015						10,015
1983	27,746						27,746
1984	21,820						21,820
1985	6,483						6,483
1986	20,940						20,940
1987	1,498						1,498
1988	16,036						16,036
1989	1,489						1,489
1990	1,501						1,501
1991	1,500						1,500
1992	1,502						1,502
1993	1,500						1,500
1994	1,498						1,498
1995	1,504						1,504
1996	1,499						1,499
1997	1,002						1,002

Table 16. Summary of all known stocking records for hatchery salmonids released into the Lower Mainstem John Day River basin (Mouth to Kimberly, RKM 296) from 1947 - 1976. Species include rainbow trout (Rb T) and summer steelhead (StS).

Year	RbT	Sthd	Total releases
1947	16,300	15120	31,420
1948	8,400		8,400
1949			0
1950			0
1951			0
1952			0
1953			0
1954			0
1955	3,006		3,006
1956	5,985		5,985
1957	7,014		7,014
1958	6,010		6,010
1959	6,496		6,496
1960	7,604		7,604
1961	3,794		3,794
1962	3,000		3,000
1963	2,496		2,496
1964	2,485		2,485
1965	2,093		2,093
1966	2,502		2,502
1967	2,510		2,510
1968	3,000		3,000
1969	3,501		3,501
1970	3,502		3,502
1971	3,001		3,001
1972	3,884		3,884
1973	2,922		2,922
1974	500		500
1975	2,496		2,496
1976	1,141		1,141

Table 17. Summary of all known stocking records for hatchery salmonids released into the South Fork John Day River basin from 1947 - 1994. Species include rainbow trout (Rb T), winter steelhead (StW), and coho salmon (Coho).

Year	RbT	StW	Coho	Total releases
1947	18,450			18,450
1948	19,375			19,375
1949				0
1950				0
1951				0
1952				0
1953				0
1954				0
1955	1,040			1,040
1956	2,998			2,998
1957	2,000			2,000
1958	1,499			1,499
1959	2,279			2,279
1960	4,916			4,916
1961	4,499			4,499
1962	4,510			4,510
1963	4,151			4,151
1964	2,001			2,001
1965	50,008	27,860		77,868
1966	39,742		325,793	365,535
1967	8,003			8,003
1968				0
1969	25,919			25,919
1970	20,400			20,400
1971	3,040			3,040
1972	3,992			3,992
1973	4,492			4,492
1974	5,002			5,002
1975	4,998			4,998
1976	4,999			4,999
1977	4,992			4,992
1978	39,956			39,956
1979	4,939			4,939
1980	23,905			23,905
1981	19,998			19,998
1982	4,996			4,996
1983	9,632			9,632
1984	11,172			11,172
1985	3,002			3,002
1986	13,180			13,180
1987				0
1988	8,035			8,035
1989	4,939			4,939
1990	4,990			4,990
1991	5,534			5,534
1992	5,525			5,525
1993				0
1994	5,498			5,498

Table 18. Summary of all known stocking records for hatchery salmonids released into the North Fork John Day River basin from 1925 - 1997. Species include rainbow trout (Rb T), winter steelhead (StW), summer steelhead (StS), and brook tout (BkT) and west slope cutthroat trout (WcT).

Year	RbT	StW	StS	BkT	WcT	Total releases
1925	37,000					37,000
1926				25,000		25,000
1927						
1928	27,000					27,000
1929	10,000					10,000
1930						
1931	5,000			10,000		15,000
1932						
1933	20,000			7,050		27,050
1934	31,000					31,000
1935						
1936						
1937						
1938						
1939						
1940	30,341			50,268		80,609
1941	37,630					37,630
1942	11,690					11,690
1943	7,725					7,725
1944						
1945						
1946	23,280					23,280
1947	166,210					166,210
1948	14,000					14,000
1949	1,440					1,440
1950	3,947					3,947
1951	11,560					11,560
1952	11,762					11,762
1953	14,200					14,200
1954	23,514					23,514
1955	25,552					25,552
1956	23,867					23,867
1957	17,999					17,999
1958	13,800					13,800
1959	24,097					24,097
1960	10,708					10,708
1961	8,970					8,970
1962	10,501	57,5000				585,501
1963	18,294					18,294
1964	6,527					6,527
1965	8,903				199	9,102
1966	48,282				59,425	107,707
1967	39,038		71,500			110,538
1968	9,000					9,000
1969	198,788					198,788
1970	100,488					100,488
1971	11,996					11,996
1972	13,836					13,836

Table 18. Continued.

Year	RbT	StW	StS	BkT	WcT	Total releases
1973	11,4726					11,4726
1974	13,988					13,988
1975	65,345					65,345
1976	13,033					13,033
1977	65,174					65,174
1978	17,056					17,056
1979	79,662					79,662
1980	17,512					17,512
1981	13,499					13,499
1982	51,501					51,501
1983	47,585					47,585
1984	10,581					10,581
1985	20,031					20,031
1986	30,106					30,106
1987	7,499					7,499
1988	19,501					19,501
1989	12,947					12,947
1990	26,496					26,496
1991	6,490					6,490
1992	6,496					6,496
1993	6,504					6,504
1994	6,533					6,533
1995	6,489					6,489
1996	5,489					5,489
1997	5,477					5,477

Table 19. Summary of all known stocking records for hatchery salmonids released into the Middle Fork John Day River basin from 1947 - 1994. Species include rainbow trout (Rb T) and summer steelhead (StS).

Year	RbT	StS	Total releases
1947	15,715		15,715
1948	1,500		1,500
1949			
1950			
1951			
1952			
1953			
1954			
1955	11,426		11,426
1956	6,584		6,584
1957			
1958			
1959			
1960			
1961			
1962			
1963			
1964			
1965			
1966	74,795	55,518	130,313
1967			
1968			
1969	50,004	22,375	72,379
1970			
1971	2,517		2,517
1972	3,947		3,947
1973	3,001		3,001
1974	53,318		53,318
1975	3,003		3,003
1976	52,958		52,958
1977	3,004		3,004
1978	38,488		38,488
1979	2,991		2,991
1980	43,145		43,145
1981	3,002		3,002
1982	39,541		39,541
1983	27,001		27,001
1984	2,994		2,994
1985	28,199		28,199
1986			
1987			
1988			
1989	9,994		9,994
1990			
1991	7,512		7,512
1992	7,520		7,520
1993			
1994	8,996		8,996

Table 20. Comprehensive summary of all known stocking records for hatchery salmonids released into the entire John Day River basin from 1925 - 1997. Species include rainbow trout (Rb T), steelhead of unknown run (Sthd), winter steelhead (StW), summer steelhead (StS), brook tout (BkT), and west slope cutthroat trout (WcT).

Year	RbT	Sthd	StW	StS	Coho	BkT	WcT	Total releases
1925	77,000	16,080			25,000			118,080
1926	25,680				45,000	42,745		113,425
1927	6,000							6,000
1928	43,000				27,530			70,530
1929	29,3000							293,000
1930					50,000			50,000
1931	5,000				10,000			15,000
1932								0
1933	70,000				8,050			78,050
1934	31,000							31,000
1935								0
1936								0
1937								0
1938								0
1939								0
1940	92,206				50,268			142,474
1941	66,930	8,760						75,690
1942	36,632							36,632
1943	16,763							16,763
1944	31,050							31,050
1945	16,080							16,080
1946	36,960							36,960
1947	254,025	15,120						269,145
1948	66,025							66,025
1949	10,290							10,290
1950	52,343							52,343
1951	14,560							14,560
1952	21,808							21,808
1953	24,376							24,376
1954	36,946							36,946
1955	58,783							58,783
1956	57,297							57,297
1957	43,206							43,206
1958	71,272							71,272
1959	41,727							41,727
1960	41,498							41,498
1961	29,980							29,980
1962	37,668		57,5000					612,668
1963	38,931	10,667						49,598
1964	17,508		10,200					27,708
1965	72,598		27,860				199	100,657
1966	17,4305			55,518		325,793	59,425	615,041
1967	141,210			170,500				311,710
1968	24,493							24,493
1969	325,185			22,375				347,560
1970	184,227							184,227
1971	31,547							31,547
1972	60,093							60,093

Table 20. Continued.

Year	RbT	Sthd	StW	StS	Coho	BkT	WcT	Total releases
1973	141,758							141,758
1974	84,809							84,809
1975	87,850							87,850
1976	84,121							84,121
1977	85,173							85,173
1978	110,521							110,521
1979	148,294							148,294
1980	95,565							95,565
1981	87,480							87,480
1982	106,053							106,053
1983	111,964							111,964
1984	46,567							46,567
1985	57,715							57,715
1986	64,226							64,226
1987	8,997							8,997
1988	43,572							43,572
1989	29,369							29,369
1990	32,987							32,987
1991	21,036							21,036
1992	21,043							21,043
1993	8,004							8,004
1994	22,525							22,525
1995	7,993							7,993
1996	6,988							6,988
1997	6,479							6,479

Oncorhynchus mykiss Density Data

Tables 21 - 24 are annotated bibliographies of *Oncorhynchus mykiss* and other fish species density estimates for tributaries of the Upper Mainstem (Table 21), South Fork (Table 22), Middle Fork (Table 23), and North Fork John Day River subbasins (Table 24). In the John Day basin literature, density estimates were used to examine grazing treatments, spruce budworm spray treatments, man-made structure treatments, and rotenone treatments to reduce competition and predation in the John Day basin. The quality of density estimates vary. Sampling methods used to generate the estimates included electroshocking, snorkeling, and lethal sampling (Tables 21 - 24). Most of the density estimates are from single site surveys and were not generated from random sampling designs.

Table 21. Annotated bibliography of literature including density estimates (fish/meter) for *Oncorhynchus mykiss* and other fish species in the Upper Mainstem John Day River subbasin, 1958 - 1979.

Year	Location	Density	Comment	Source
1958	Deardorff Creek	Before Budworm spray: 1958: 0.27 O. mykiss/meter and 0.03 cottids/meter After Budworm spray: 1958: 0.08 O. mykiss/meter and No cottids/meter 1959: 0.01 O. mykiss/meter 1960: 0.20 O. mykiss/meter	Electroshocker used to sample 200 feet (60.96 meters). Testing for the affect of budworm spray on fish populations.	Hewkin, 1960
1958	Reynolds Creek	Before Budworm spray: 1958: 0.39 O. mykiss/meter and 0.34 cottids/meter After Budworm spray: 1958: 0.34 O. mykiss/meter and 0.15 cottids/meter 1959: 0.01 O. mykiss/meter 1960: 0.52 O. mykiss/meter	Electroshocker used to sample 200 feet (60.96 meters). Testing for the affect of budworm spray on fish populations.	Hewkin, 1960
1959	Upper Mainstem	7/29/1959, Five miles downstream of John Day, OR: O. mykiss: None/meter Sucker species: 1.4/meter 8-18 inches long Northern Pike Minnow: 1.2/meter 9-16 inches long Mountain Whitefish: 0.05/meter 12-13 inches long Chiselmouth: 0.2/meter 6-10 inches long Redside Shiner: Numerous 8/14/1959, 10 miles downstream of Mount Vernon, OR: O. mykiss: None/meter Sucker species: 3.9/meter 5-20 inches long Northern Pike Minnow: 0.2/meter Chiselmouth: 0.1/meter 5.5-10.5 inches long Redside Shiner: Numerous	Species composition of shocker sampling	Hewkin, 1959
1960	Mainstem John Day River	Five miles downstream of John Day, OR: Sucker Species: 3.1/meter 4-14 inches long Chislemouth: 1.1/meter 5-10 inches long Cottid: 0.02/meter cottids Redside Shiner: abundant Eighteen miles downstream of John Day, OR: O. mykiss: 0.05/meter 8 inches long Sucker species: 4.2/meter 4-14 inches long Chiselmouth: 0.4/meter 4-9 inches long Cottid: 0.32/meter Lamprey: 0.16/meter Redside Shiner: abundant Forty miles downstream of John Day, OR: Sucker species: 2.5/meter 10-19 inches long	Electroshocker used to sample on July 22, 1960. 180 feet sampled five miles downstream of John day. Sixty feet sampled 18 miles downstream of John Day. 135 feet sampled 40 miles downstream of John Day.	Hewkin, 1960

Table 21. Continued.

Year	Location	Density	Comment	Source
1961	Rail Creek	Upper Rail Creek: O. mykiss: 0.04/meter Westslope Cutthroat Trout: 0.2/meter Bull Trout: 0.09/meter Lower Rail Creek: O. mykiss: 0.2/meter Westslope Cutthroat Trout: 0.05/meter	Electroshocker sampling Jan, 23-24, 1961. 270 feet sampled in Upper Rail Creek and 200 feet sampled in Lower Rail Creek.	Hewkin, 1961
1961	Upper John Day River	O. mykiss: 0.4/meter Bull Trout: 0.02/meter	Electroshocker sampling Jan, 23-24, 1961. 180 feet sampled	Hewkin, 1961
1961	Eagle Creek tributary to Camp Creek of the Middle Fork	Upper Eagle Creek: O. mykiss: 0.07/meter Lower Eagle Creek: O. mykiss: 1.8/meter	Electroshocker sampling, 65 feet sampled in Lower Eagle Creek and 195 feet sampled in Upper Eagle Creek	Hewkin, 1961
1965	Mainstem John Day River @ Picture Gorge	O. mykiss: None/meter Northern Pike Minnow: 0.6/meter Carp: 0.05/meter Sucker Species: 0.4/meter Mountain Whitefish: None/meter Redside Shiner: 0.5/meter Sculpin species: 0.1/meter Dace species: None/meter	Rotenone used to sample 200 feet of the Mainstem John Day River at Picture Gorge during August of 1965	Hewkin, 1965
1978 and 1979	Deardorff Creek	Log weir section: 1978: 25 O. mykiss/pool 1979: 37 O. mykiss/pool 1980: 23 O. mykiss/pool Control section: 1978: 5 O. mykiss/pool 1979: 3 O. mykiss/pool 1980: 5 O. mykiss/pool	Electrofishing used to count O. mykiss using log weir structures. Author failed to describe the sampling design. Assume that fish numbers are averages by pool or log weir pool within the two section types. Age of log weirs unknown.	Claire, 1978, 1979, and 1980
1979	Upper Mainstem John Day River	O. mykiss: 0.13/meter Spring Chinook: 0.0004/meter Bridgelip Sucker: 0.40/meter Largescale Sucker: 0.39/meter Chiselmouth: 0.17/meter Northern Pike Minnow: 0.22/meter Redside Shiner: 0.26/meter Carp: 0.002/meter Mountain Whitefish: 0.05/meter Small mouth bass: 0.1/meter Brown Bullhead: 0.001/meter	September 10-14, 80 miles of the Mainstem John Day river were treated with rotenone. Dead fish were counted at nine sites totaling 8,000 feet (2438.4 meters) in length.	Claire, 1979

Table 22. Annotated bibliography of literature including *Oncorhynchus mykiss* and other fish species density estimates (fish/meter and fish/square meter) for tributaries in the South Fork John Day River subbasin, 1965 - 2003.

Year	Tributaries	Density	Comment	Source
1965	South Fork	<u>Downstream of Deer Creek:</u> O. mykiss: 0.09/meter Northern Pike Minnow: 0.4/meter Sucker species: 0.14/meter Mountain Whitefish: 0.03/meter Redside Shiner: 0.5/meter Chiselmouth: 0.05/meter Sculpin species: 0.07/meter Dace species: 0.08/meter <u>River mile 12:</u> O. mykiss: 0.005/meter Northern Pike Minnow: 0.03/meter Sucker species: 0.05/meter Mountain Whitefish: 0.1/meter Redside shiner: 0.3/meter Chiselmouth: 0.05/meter Sculpin species: None/meter Dace species: None/meter	Rotenone used to sample the South Fork John Day River during August, 1965. 465 feet sampled near Deer Creek and 600 feet sampled near river mile 12.	Hewkin, 1965
1978	South Fork	O. mykiss: 0.14/meter Bridgelip Sucker: 0.06/meter Chiselmouth: 0.01/meter Coarsescale Sucker: 0.25/meter Redside Shiner: 0.23/meter Northern Pike Minnow: 0.12/meter Whitefish: 0.20/meter	Rotenone used to kill all fish species in 7.5 miles of Murderer's Creek and in 31.0 miles of the South Fork John Day River. Dead fish species were counted in 588.42 meters of the South Fork. Author failed to provide the treatment date. However, author did mention that the treated reaches were restocked with O. mykiss in October of the same year.	Claire, 1978
1980 and 1981	Murderer's Creek	1980: 2.26 O. mykiss/meter 1981: 2.33 O. mykiss/meter 1982: 1.95 O. mykiss/meter	Zippin removal method used to estimate the O. mykiss population in a portion of Murderer's Creek where the channel was put back into its natural channel. In 1982, one site was not sampled.	Claire, 1981, 1982

Table 22. Continued

Year	Tributaries	Density	Comment	Source
1983	Deer Creek	Log weirs: 2.44 age 1+ O. mykiss/meter 1.99-3.03 95% CL Rock weirs: 1.49 age 1+ O. mykiss/meter 0.90-2.08 95% CL Log deflectors: 1.76 age 1+ O. mykiss/meter 1.28-2.24 95% CL Instream: 2.80 age 1+ O. mykiss/meter 1.94-.366 95%CL Control: 1.28 age 1+ O. mykiss/meter 1.11-1.45 95% CL	Densities associated with treatment structures that were 2 years old. Control from six 50m sections upstream of the treatment area. Two or three pass removal w/electroshocking.	Olsen, et al. 1984 and Claire, 1983
2003	Deer Creek and North Fork Deer Creek	<u>Pools:</u> 0.2698 age 1+ O. mykiss/meter^2 0.923 age 1+ O. mykiss/lineal meter <u>Fast water:</u> 0.0697 age 1+ O. mykiss/meter^2 0.191 age 1+ O. mykiss/lineal meter <u>Combined total density:</u> 0.1417 age 1+ O. mykiss/meter^2 0.418 age 1+ O. mykiss/lineal meter	Non-biased systematic sample based on a complete census of the habitat. Two pass depletion-removal method with electrofishing. Density estimate is only good for the section surveyed.	Gunckel et al., 2003

Table 23. Annotated bibliography of literature including *Oncorhynchus mykiss* and other fish species density estimates (fish/meter and fish/square meter) for tributaries of the Middle Fork John Day River subbasin, 1965 - 2001.

Year	Tributaries	Density	Comment	Source
1965	Middle Fork	0.5 miles Upstream of Bates: O. mykiss: 0.03/meter Northern Pike Minnow: 0.2/meter Sucker Species: 0.2/meter Redside Shiner: 0.3/meter Sculpin species: 0.01/meter 0.5 miles Downstream of Bates: O. mykiss: 0.01/meter Northern Pike Minnow: 0.03/meter Sucker species: 0.1/meter Redside Shiner: 0.02/meter Dace species: 0.05/meter Near Little Butte Creek: O. mykiss: 0.1/meter Northern Pike Minnow: 0.05/meter Sucker species: 0.3/meter Redside Shiner: 0.2/meter Dace species: 1.2/meter Sculpin species: 0.1/meter Chiselmouth: 0.02/meter Lamprey: 0.01/meter	Electroshocker used to sample 300 feet of the Middle Fork 0.5 miles upstream of Bates, OR, 300 feet 0.5 miles downstream of Bates OR, and 200 feet near Little Butte Creek during August of 1965.	Hewkin, 1965
1974 - 1985	Camp Creek	Controlled Grazing: 1974: 5.6 O. mykiss/meter and 1.6 dace/meter 1975: 1.5 O. mykiss/meter and 1.0 dace/meter 1976: 2.8 O. mykiss/meter and 0.5 dace/meter 1977: 3.7 O. mykiss/meter and 0.8 dace/meter 1978: 4.3 O. mykiss/meter and 0.5 dace/meter 1979: 2.4 O. mykiss/meter and 0.1 dace/meter 1980: 2.7 O. mykiss/meter and 0.3 dace/meter 1981: 1.3 O. mykiss/meter and 0.4 dace/meter 1982: 2.5 O. mykiss/meter and 0.3 dace/meter 1983: 2.6 O. mykiss/meter and 0.1 dace/meter 1984: 2.5 O. mykiss/meter and 0.1 dace/meter 1985: 2.5 O. mykiss/meter and 0.5 dace/meter Season-long Grazing: 1974: 1.3 O. mykiss/meter and 5.2 dace/meter 1975: 1.5 O. mykiss/meter and 4.3 dace/meter Season-long Grazing, Grazing excluded: 1976: 1.7 O. mykiss/meter and 4.2 dace/meter 1977: 2.4 O. mykiss/meter and 7.9 dace/meter 1978: 5.1 O. mykiss/meter and 6.1 dace/meter 1979: 1.4 O. mykiss/meter and 4.0 dace/meter 1980: 1.5 O. mykiss/meter and 3.9 dace/meter 1981: 1.6 O. mykiss/meter and 2.1 dace/meter 1982: 1.8 O. mykiss/meter and 3.4 dace/meter 1983: 3.1 O. mykiss/meter and 1.6 dace/meter 1984: 2.0 O. mykiss/meter and 1.6 dace/meter 1985: 4.7 O. mykiss/meter and 2.2 dace/meter	Controlled Grazing (good riparian condition) defined as 80% stream shade. Season-long grazing (poor riparian condition) defined as 0% stream shade. After 1975, the season-long grazing section was excluded from grazing. Electroshocker used to count O. mykiss and dace species. Sampling from 100 feet (30.5 meters) of each type of habitat. Site selection was not a random sample. Sites assumed to be the same for each year sampled. Author noted warmer temperatures in the poor habitat in 1976. Author also noted heavy rain and good water flow throughout the summer during 1978. Author noted that 1981 was a poor spawner year for Camp Creek.	Claire, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984 and 1985

Table 23. Continued.

Year	Tributaries	Density	Comment	Source
1978 and 1979	Middle Fork	Rock structure treated section: 1978: 0.92 O. mykiss and 0.12 CHS/meter^2 1979: 0.12 O. mykiss and 0.20 CHS/meter^2 Control section: 1978: 0.71 O. mykiss and 0.05 CHS/meter^2 1979: 0.10 O. mykiss and 0.10 CHS/meter^2	Stream sections treated with rock structures and control section densities of spring chinook parr and O. mykiss. Sampling design unknown. Electroshocking assumed as method to count the fish. Exact location unknown.	Claire, 1979
1983	Camp Creek	Treatment (log weirs): 1.24 age 1+ O. mykiss/meter 1.02-1.46 95% CL Control (no log weirs): 1.29 age 1+ O. mykiss/meter 1.09-1.46 95% CL	Densities associated with treatment structures. Control from 16 sections, 50 meters in length. Two or three pass removal w/electroshocking.	Olsen, et al. 1984
1983	Slide Creek	Control (no log weirs) 0.57 age 1+ fish/meter 0.25-0.89 95% CL	Control from 6 sections 32-73 m in length. Two or three pass removal w/electroshocking.	Olsen, et al. 1984
1987	Lower Middle Fork	0.24 O. mykiss/meter	Raft electroshocher used to count O. mykiss in 0.5 miles (805 meters). Author failed to identify the location of the count other than "lower Middle Fork".	Claire, 1984
1990	Long Creek	Pools: 34 O. mykiss/meter^2 Pools: 9 age 0+ O.mykiss/meter^2 Pools: 19 age 1+ O.mykiss/meter^2 Pools: 7 age 2+ O.mykiss/meter^2 Pools: 3 age 3+ O.mykiss/meter^2 Riffle: 26 O. mykiss/meter^2 Riffle: 11 age 0+ O. mykiss/meter^2 Riffle: 6 age 1+ O. mykiss/meter^2 Riffle: 3 age 2+ O. mykiss/meter^2 Riffle: 1 age 3+ O. mykiss/meter^2 Cascade Pools: 25 O. mykiss/meter^2 Cascade Pools: 9 age 0+ O. mykiss/meter^2 Cascade Pools: 21 age 1+ O. mykiss/meter^2 Cascade Pools: 1 age 2+ O. mykiss/meter^2 Cascade Pools: No age 3+ O. mykiss/meter^2	Average O. mykiss density of all age classes, age 0+, age 1+, age 2+, and age 3+. Ages estimated visually. Fish were counted by snorkeling each section twice. Habitat units were within 100m survey sections. Unknown number of 100m sections surveyed.	Li and Gaither in Li et al., 1990

Table 23. Continued.

Year	Tributaries	Density	Comment	Source
1990	Camp Creek	<u>Upper Camp Creek:</u> Log Weir Pools: 69 O. mykiss/meter^2 Log Weir Pools: 46 age 0+ O. mykiss/meter^2 Log Weir Pools: 29 age 1+ O. mykiss/meter^2 Log Weir Pools: 6 age 2+ O. mykiss/meter^2 Log Weir Pools: 2 age 3+ O. mykiss/meter^2 Pools: 129 O. mykiss/meter^2 Pools: 60 age 0+ O. mykiss/meter ^{2} Pools: 20 age 1+ O. mykiss/meter ^{2} Pools: 21 age 2+ O. mykiss/meter ^{2} Pools: 3 age 3+ O. mykiss/meter ^{2} Runs: 66 O. mykiss/meter^2 Runs: 92 age 0+ O. mykiss/meter^2 Runs: 20 age 1+ O. mykiss/meter^2 Runs: 3 age 2+ O. mykiss/meter^2 Runs: 1 age 3+ O. mykiss/meter^2 Riffles: 87 O. mykiss/meter^2 Riffles: 31 age 0+ O. mykiss/meter^2 Riffles: 13 age 1+ O. mykiss/meter^2 Riffles: 2 age 2+ O. mykiss/meter^2 Riffles: No age 3+ O. mykiss/meter^2 <u>Lower Camp Creek:</u> Log Weir Pools: 59 O. mykiss/meter^2 Log Weir Pools: 18 age 0+ O. mykiss/meter^2 Log Weir Pools: 31 age 1+ O. mykiss/meter^2 Log Weir Pools: 8 age 2+ O. mykiss/meter^2 Log Weir Pools: 1 age 3+ O. mykiss/meter^2 Pools: 53 O. mykiss/meter^2 Pools: 5 age 0+ O. mykiss/meter^2 Pools: 25 age 1+ O. mykiss/meter^2 Pools: 14 age 2+ O. mykiss/meter^2 Pools: 9 age 3+ O. mykiss/meter^2 Runs: 15 O. mykiss/meter^2 Runs: 2 age 0+ O. mykiss/meter^2 Runs: 7 age 1+ O. mykiss/meter^2 Runs: 1 age 2+ O. mykiss/meter^2 Runs: No age 3+ O. mykiss/meter^2 Riffle: 12 O. mykiss/meter^2 Riffle: 10 age 0+ O. mykiss/meter^2 Riffle: 3 age 1+ O. mykiss/meter^2 Riffle: No age 2+ O. mykiss/meter^2 Riffle: No age 3+ O. mykiss/meter^2	Average O. mykiss density of all age classes, age 0+, age 1+, age 2+, and age 3+. Ages estimated visually. Fish were counted by snorkeling each section twice. All habitat units are within three 100m sections of each stream mile assigned randomly to each 0.1 odometer reading for 20% of the stream. Unknown number of 100m sections.	Li and Gaither in Li et al., 1990

Table 23. Continued.

Year	Tributaries	Density	Comment	Source
2000	Vinegar Creek	0.29 O. mykiss/meter^2	Two pass removal electrofishing.	Unterwegner and Seals, 2000
2000	Davis Creek	0.92 O. mykiss/meter^2	Two pass removal electrofishing.	Unterwegner and Seals, 2000
2001	Davis Creek	0.29 O. mykiss/meter^2	Bull trout presence absence protocol used.	Unterwegner and Neal, 2001

Table 24. Annotated bibliography of literature including *Oncorhynchus mykiss* and other fish species density estimates (fish/meter) for tributaries of the North Fork John Day River subbasin, 1979 - 1983.

Year	Tributaries	Density	Comment	Source
1979 - 1983	Bull Run Creek tributary to Granite Creek	1979: .73 age 1+ STS/m and .57 CHS/m 1980: .60 age 1+ STS/m and .19 CHS/m 1981: .68 age 1+ STS/m and .76 CHS/m 1983: .36 age 1+ STS/m and 1.13 CHS/m	STS = all O. mykiss observed. CHS = spring chinook parr. Six control (no log weirs) sections 37-73m in length. Two or three pass removal w/electroshocking.	Olsen, et al. 1984
1979 - 1983	Clear Creek tributary to Granite Creek	<u>Pre-treatment Upper Clear Creek:</u> 1979: 1.05 age 1+ STS/m and 0.03 CHS/m 1980: 0.51 age 1+ STS/m and No CHS/m 1981: 0.50 age 1+ STS/m and No CHS/m <u>Pre-treatment Lower Clear Creek:</u> 1979: 0.42 age 1+ STS/m and 2.99 CHS/m 1980: 0.35 age 1+ STS/m and 0.91 CHS/m 1981: 0.49 age 1+ STS/m and 1.07 CHS/m <u>Post-treatment Upper Clear Creek:</u> 1983: 0.50 age 1+ STS/m and 0.16 CHS/m <u>Post-treatment Lower Clear Creek:</u> 1983: 0.32 age 1+ STS/m and 0.68 CHS/m	STS = all O. mykiss observed. CHS = spring chinook parr. Six upper Clear Creek treatment (log weirs) sections and Six lower Clear Creek treatment sections 37-73m in length. Two or three pass removal w/electroshocking.	Olsen, et al. 1984
1979 - 1983	Granite Creek	1979: 1.80 age 1+ STS/m and 2.18 CHS/m 1980: 0.40 age 1+ STS/m and 0.56 CHS/m 1981: 0.74 age 1+ STS/m and 0.90 CHS/m 1983: 0.24 age 1+ STS/m and 0.83 CHS/m	STS = all O. mykiss observed. CHS = spring chinook parr. Six control (no log weirs) sections. Two or three pass removal w/electroshocking.	Olsen, et al. 1984

O. mykiss and O. tschawytscha Predation Data

Steelhead (*O. mykiss*) and chinook salmon (*O. tschawytscha*) are prey for several fish, bird, mammal, reptile, and insect species that exist in the John Day basin. A few of these species include: northern pike minnow (Ptychocheilus oregonensis), small mouth bass (Micropterus dolomieui), bull trout (Salvelinus confluentus), brook trout (Salvelinus fontinalis), belted kingfisher (Ceryle alcyon), great blue heron (ardea herodias), merganser sp. (mergus sp.) osprey (Pandion haliaetus), bald eagle (Halioeetus leucocephalus), mink (*Mustela vison*), river otter (*Lutra canadensis*), black bear (Ursus americanus) raccoon (*Procyon lotor*) and some snake and insect species.

Of the species listed above, only small mouth bass (Micropterus dolomieui) have been studied to determine their impact on the salmonid population in the John Day basin. Small mouth bass are not native to the John Day basin and were introduced by the Oregon Game Commission in 1971 to provide a recreational fishery in the lower Mainstem John Day River (Claire, 1971, Daily, 1992, Shrader and Gray, 1998). Since their introduction, small mouth bass have successfully colonized the lower John Day basin and have been observed as far upstream as Dayville in the Mainstem John Day River and as far upstream as the Camas Creek in the North Fork John Day River (Claire, 1975, Wayne Wilson personal observation, 2000).

Four studies have been conducted to determine the diet of lower Mainstem John Day River small mouth bass (Claire, 1977 and 1978, Unterwegner and Gray, 1996, and Unterwegner and Seals, 2000). Oregon Game Commission biologists sampled the stomachs of small mouth bass caught in the lower John Day river between July 24 and September 3, 1977. Of 67 small mouth bass stomachs sampled, 24 (36%) were empty, 17 (25%) contained crayfish, 11 (16%) contained fish, 8 (12%) contained aquatic insects, 3 (4%) contained angler bait, 2(3%) contained annelids, and one (1%) contained mollusk remains, and one (1%) contained unidentified debris (Claire, 1977). Researchers were unable to identify salmonid remains in the stomach samples that contained fish remains. (Claire, 1977). However, they did identify lamprey and nongame fish species (Claire, 1977, Shrader and Gray, 1999).

Oregon Game Commission biologists sampled the stomachs of 181 small mouth bass caught in the Mainstem John Day River between Service Creek and Kimberly from April to August, 1978. Of the 181 stomachs sampled, 46 (25%) contained fish, 41 (23%) contained crayfish, 36 (20%) had miscellaneous and unknown debris, 29 (16%) contained insects, 24 (13%) were empty, 3 (2%) contained angler bait, one (1%) contained annelida, and one (1%) contained mollusk remains (Claire, 1978). No salmonids were identified in the fish remains and no account was provided of the fish remains that were examined (Claire, 1978).

Oregon Department of Fish and Wildlife biologists sampled the stomachs of 60 small mouth bass caught in the lower Mainstem John Day River between Twickenham and Clarno from April 16-18, 1996. Only 7 (12%) of 60 small mouth bass stomach samples contained fish remains. The remains that were identified included: two sucker species, two non-salmonids, one lamprey, one cyprinid, and one was an unidentified fish that was possibly a salmonid (Unterwegner and Gray 1996, Shrader and Gray, 1999).

Oregon Department of Fish and Wildlife biologists sampled the stomachs of 71 small mouth bass caught in the lower Mainstem John Day River between Butte Creek and Cottonwood Bridge from June 14-18, 2000 (Unterwegner and Seals, 2000). Approximately 22% (16 samples) of the 71 stomach samples contained identifiable fish species, which included:

cyprinids (12%), cottids (5%), catastomids (3%), and lamprey (2%) (Unterwegner and Seals, 2000). No salmonids were identified in the sample.

Bull trout (Salvelinus confluentus), and northern pike minnow (Ptychocheilus oregonensis), are two other fish species that are important predators of *O. mykiss* and *O. tschawytscha*. Trend data collected at ditch diversion trap boxes located mostly in the upper Mainstem and upper Middle Fork John Day River subbasins is the only data available to access the historic population of bull trout and northern pike minnow in the John Day River basin (Figure 3 and Table 25). The trend of bull trout encounters per trap week at ditch diversion traps suggests a relatively stable population from 1959 - 1998. Bull trout encounters averaged 0.22 encounters per trap week and ranged between 0.02 (1959) and 0.70 (1977) encounters per trap week from 1959 to 1998 (Figure 3, Table 25).

The trend of northern pike minnow encounters per trap week varies widely and suggests a declining population between 1959 and 1993 (Figure 3, Table 25). However, the most recent data suggests that the northern pike minnow population may be recovering (Figure 3, Table 25).

Bull trout and northern pike minnow trend data collected at ditch diversion trap boxes is of limited quality. The number of traps that operated on a weekly basis changed with increases and decreases in water levels and the number of new traps that were installed. In addition, early ditch diversion designs were of poorer quality than more recent designs.

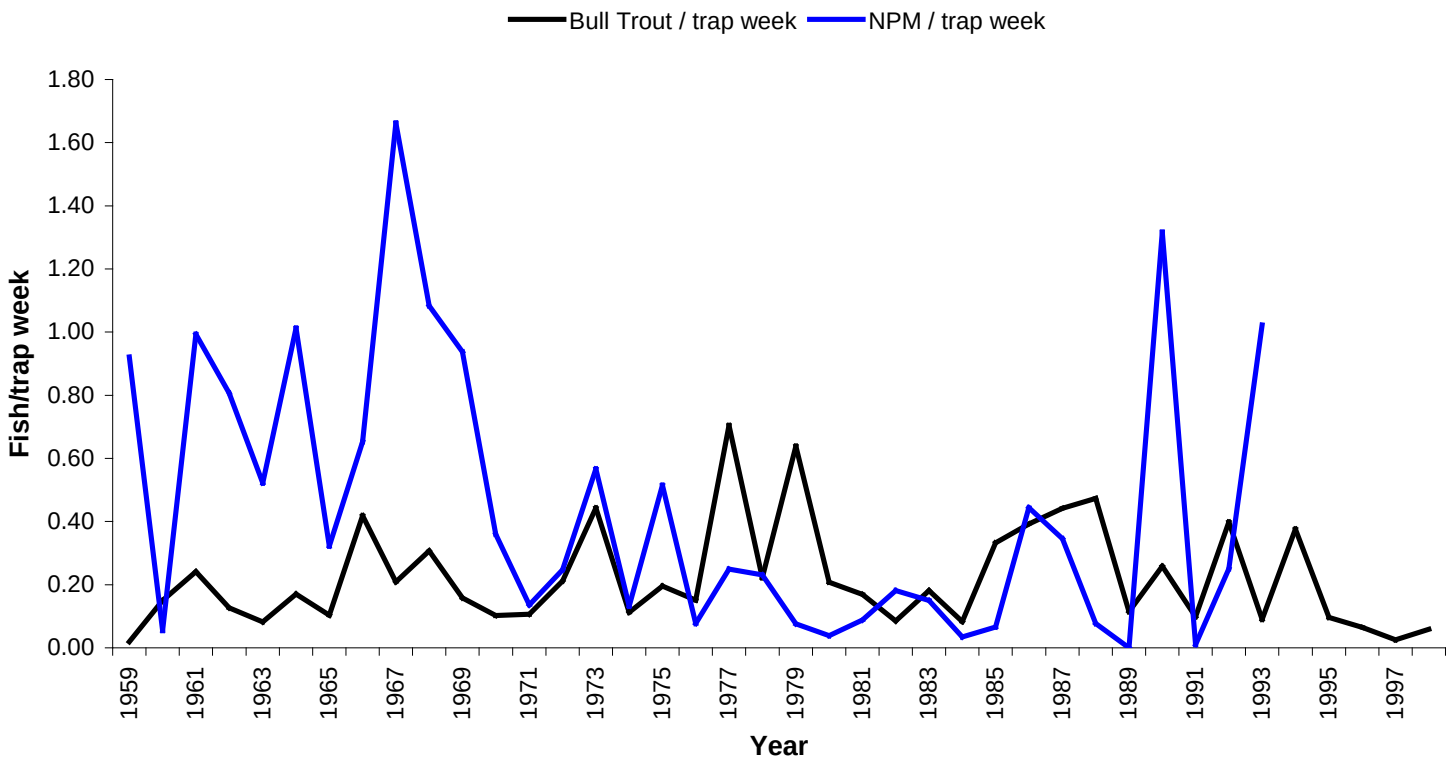

Figure 3. Bull Trout (*Salvelinus confluentus*) and Northern Pike Minnow (*Ptychocheilus oregonensis*) encounters per trap week at ditch diversion trap boxes located in the Middle Fork and Upper Mainstem John Day River subbasins from 1959 - 1998 (John Day District Fish Biologist annual reports 1959 - 1998).

Table 25. Bull Trout (*Salvelinus confluentus*) and Northern Pike Minnow (*Ptychocheilus oregonensis*) encounters per trap week at ditch diversion trap boxes located in the Middle Fork and Upper Mainstem John Day River subbasins from 1959 - 1998.

Year	Number of Traps	Trap Weeks	Encounters / trap week		Comment	Source
			Bull Trout	NPM		
1959	49	836	0.02	0.92	All traps March-November	Hewkin, 1964
1960	48	865	0.15	0.05	All traps March-November	Hewkin, 1960 and 1964
1961	48	872	0.24	0.99	All traps March-November	Hewkin, 1961 and 1964
1962	47	842	0.13	0.81	All traps March-November	Hewkin, 1962 and 1964
1963	47	816	0.08	0.52	All traps April-October	Hewkin, 1963 and 1964
1964	49	848	0.17	1.01	All traps April-October	Hewkin, 1964
1965	46	810	0.10	0.32	All traps April-November	Hewkin, 1965
1966	50	902	0.42	0.65	All traps April-November	Hewkin, 1966
1967	45	861	0.21	1.66	All traps April-November	Hewkin, 1967
1968	49	753	0.31	1.08	All traps April-October	Hewkin, 1968
1969	35	675	0.16	0.94	All traps April-October	Hewkin, 1969
1970	47	751	0.10	0.36	All traps April-October	Hewkin, 1970
1971	44	723	0.11	0.14	All traps April-October	Claire, 1971
1972	45	797	0.21	0.25	All traps April-October	Claire, 1972
1973	44	809	0.44	0.57	All traps April-October	Claire, 1973
1974	28	531	0.11	0.13	All traps April-October	Claire, 1974
1975	29	497	0.20	0.52	All traps April-October	Claire, 1975
1976	64	991	0.15	0.08	All traps April-October	Claire, 1976
1977	35	477	0.70	0.25	All traps April-October	Claire, 1977
1978	31	519	0.22	0.23	All traps April-October	Claire, 1978
1979	19	238	0.64	0.08	All traps April-October	Claire, 1979
1980	25	437	0.21	0.04	All traps April-October	Claire, 1980
1981	23	373	0.17	0.09	All traps April-October	Claire, 1981
1982	19	259	0.08	0.18	All traps May-October	Claire, 1982
1983	19	253	0.18	0.15	All traps May-October	Claire, 1983
1984	28	351	0.08	0.03	All traps April-October	Claire, 1984
1985	22	379	0.33	0.07	All traps April-October	Claire, 1985
1986	27	520	0.39	0.44	All traps April-October	Claire, 1986
1987	29	500	0.44	0.35	All traps April-October	Claire, 1987
1988	29	439	0.47	0.08	All traps April-September	Claire, 1988
1989	30	400	0.12	0.00	All traps April-September	Claire and Smith, 1989
1990	32	465	0.26	1.32	All traps April-October	Claire and Gray, 1990
1991	36	570	0.10	0.01	All traps April-September	Claire and Gray, 1991
1992	31	580	0.40	0.25	All traps April-September	Claire and Gray, 1992
1993	33	541	0.09	1.02	All traps April-September	Claire and Gray, 1993
1994	31	420	0.38	NR	All traps April-September	Claire and Gray, 1994
1995	31	580	0.10	NR	All traps April-October	Unterwegner and Gray, 1995
1996	29	636	0.06	NR	All traps April-October	Unterwegner and Gray, 1996
1997	27	476	0.03	NR	All traps April-Sept.	Unterwegner and Gray, 1997
1998	22	428	0.06	NR	All traps April-Sept.	Unterwegner and Gray, 1998

DISCUSSION

Several types of planning reports coordinated by fifteen lead agencies are available in the literature for the John Day River basin. These reports include environmental assessments, stream and habitat restoration prioritization plans, water resource planning, species plans, ecosystem analyses, watershed analyses, and bioeconomic models (Appendix Table A). These planning reports have shaped the management of John Day basin public and private lands, water, riparian habitat, and fish stocks.

Oregon Department of Fish and Wildlife John Day District fish management reports provide several types of data including spawning surveys, harvest, stocking, and presence absence of fish species (Appendix Table D). Comments written in management reports by ODFW District fish biologists often put available data and management into historic context over the span of active management in the John Day basin.

Literature regarding a variety of habitat projects including fish passage, instream structure, riparian vegetation, alternative irrigation, riparian fencing, grazing practices, streambank stabilization, and floodplain restoration, are summarized in Appendix Tables B-1 through B-5. Most of the habitat projects reviewed include implementation monitoring. However, only five projects include short term effectiveness (measured fish response) monitoring (Appendix Tables B-1 and B-5). A coordinated long term effectiveness monitoring program of habitat projects does not exist in the John Day basin even though habitat projects have been implemented since the mid 1960's (Haas et al., 1961, West et al., 1965a and 1965b).

Available biological literature for *O. mykiss* in the John Day basin is dominated by population assessments, presence/absence surveys, stocking and harvest summaries (Appendix Tables C-1 and C-2). Several information gaps exist in the literature for both resident (rainbow and redband trout) and anadromous (summer steelhead) life histories of John Day basin *O. mykiss.* Information gaps for O. mykiss include a lack of adequate qualitative and quantitative research necessary to describe summer steelhead escapement, sex ratio, wild/hatchery ratio, egg-to-smolt survival, and smolt-to-adult survival.

Several authors have commented on the genetic conservation of summer steelhead in the John Day basin. Chilcote, 2001 identified John Day summer steelhead as one of eleven populations within the Middle Columbia ESU. John Day summer steelhead have also been grouped with wild summer steelhead stocks from tributaries of the lower Snake River, Salmon River and tributaries of the Columbia River between Fifteen mile Creek and the Entiat River based on cluster analysis of meristic and electrophoretic data (Olsen et al., 1994). Kostow, 1995 grouped John Day summer steelhead with mid-Columbia populations between Fifteen mile Creek and the Walla Walla River.

Based on differences in geographic proximity, spawning timing, and productivity, six subpopulations of summer steelhead exist within the John Day basin: Lower North Fork, Upper North Fork John Day, Middle Fork John Day basin, South Fork John Day basin, Lower Mainstem John Day basin, and upper Mainstem John Day (Chilcote, 2001). Allozyme analysis of subpopulations within the John Day Basin conducted by Currens and Stone, 1989, led Kostow, 1995 to group South Fork John Day River summer steelhead in their own gene conservation group.

The John Day basin summer steelhead index trend count is the oldest dataset in the mid-Columbia ESU and is currently the only means of monitoring the summer steelhead population in the John Day River basin. (Kostow, 1997). Other Mid-Columbia basins with shorter datasets (mid 1980's to present) rely on dam and weir counts to monitor population abundance (Kostow, 1997). While index spawning surveys have been adequate to describe the population trend for summer steelhead in the John Day Basin, they have not been adequate to derive a reliable escapement estimate. Without a reliable escapement estimate, basin managers will be unable to effectively monitor and evaluate strategies implemented to recover and delist John Day basin summer steelhead as well as the mid-Columbia endangered species unit.

Researchers who interpret summer steelhead spawning survey data from the John Day basin should be aware of its shortcomings. Sample or survey size for both index A and index B is less than 100 miles for most years reported (Table 3). Survey sites were not selected randomly and therefore are bias towards better quality spawning habitat. Proportions of surveyed area are not equal among subbasins during the history of the survey. Index survey timing is not consistent over time and range as much as 60 days between years for many of the index reaches. Survey timing is a source of bias if surveys are conducted earlier than peak spawning. During the 2003 spawning year, Tattam, 2003 (Appendix R) observed a difference of 10 redds between the summer steelhead index B redd count and cumulative temporal counts in Black Canyon Creek of the South Fork John Day basin (Appendix R). The number of miles surveyed within index tributaries are also inconsistent among years for several reaches during the 46 year history of the index spawning survey (Appendix Tables E - I). Shifts in total area surveyed may bias comparisons between years for redd counts if spawning habitat quality differs in the added reaches.

Essentially, there is a lack of personnel, time and monies to conduct adequate, complete surveys multiple times within the entire spawning time frame (Neal and Unterwegner, personnel communication). The current index surveys are inadequate for assessing steelhead populations in the upper John Day basin, and therefore a new method of data collection would prove valuable. An Environmental Monitoring and Assessment Program (EMAP) design for summer steelhead spawning surveys in the John Day Basin would satisfy the need for an escapement estimate for summer steelhead in the John Day basin.

Hatchery summer steelhead stray rates of 4 - 8 percent are claimed for the upper John Day basin (upstream of Cottonwood Bridge) by authors of the John Day River Subbasin Salmon and Steelhead Production Plan (ODFW, 1990). Recent evidence suggests a higher hatchery summer steelhead stray rate for the upper John Day basin. Claire and Gray, 1992a reported 17 (23%) adipose fin clipped steelhead of 75 caught upstream of Kimberly (RKM 296) during the 1992 steelhead fishery. Within the 1992 Zone 3 summer steelhead fishery (Kimberly to Indian Creek), 16% (6 of 37) of the fish reported by anglers were of hatchery origin (Claire and Gray, 1992a). Within the 1992 lower North Fork summer steelhead fishery, 29% (11 of 37 reported) of steelhead reported by anglers were of hatchery origin (Claire and Gray, 1992a). Claire and Gray, 1992a did not provide an explanation for the high stray rates observed during the 1992 fishery. Wilson et al. (2001) reported observing thirteen adipose fin-clipped adult summer steelhead (46%, both live and as carcasses) of twenty-eight steelhead observed

while seining for smolts in the Mainstem John Day river between Kimberly (rkm 298) and Spray (rkm 274), OR.

Summer steelhead spawning ground surveys of the John Day basin provide another source of hatchery fish observations. However, very few steelhead carcasses have been observed and recorded by ODFW John Day fish management personnel during the 45 year history of the steelhead spawning surveys in the John Day basin (Appendix Tables E - I). There are several explanations for the lack of carcass data collected during steelhead spawning surveys. In the John Day basin, spawning surveys take place after peek spawning. Early spawners that died are likely carried off by high water events after rainfall or by scavengers. Unlike chinook salmon, steelhead are iteroparous and are not likely to die within the spawning grounds after spawning. Spawning surveyors may not have recorded carcass data or were not looking for carcasses during the surveys. Finally, carcasses observed may have been too decayed to allow positive identification of hatchery origin by fin clips.

Currently no creel program exists upstream of Cottonwood Bridge. John Day ODFW fishery biologists now rely on reports by Oregon State Police or the occasional volunteer angler information regarding the catch of wild or hatchery steelhead. An intensive statistically designed steelhead creel operation upstream of Cottonwood Bridge is the best option for John Day basin managers to obtain an adequate hatchery to wild ratio for summer steelhead in the John Day basin. Coded wire tag data collected from the upper basin will be valuable in determining the major sources of hatchery strays. Creel data collected downstream of Cottonwood bridge suggests hatchery steelhead from Dworshak National Hatchery, Magic Valley Hatchery, Irrigon Hatchery, and Clearwater Hatchery are the likely significant sources of stray hatchery steelhead in the lower John Day River basin (Tables 11 and 12). Irrigon, Big Canyon and Wallowa hatcheries have been identified as sources of stray steelhead in the upper John Day basin (Table 13). If straying is found to be significant, alternative management may be necessary for stray steelhead source hatcheries and John Day basin managers.

The John Day river has historically been managed for wild summer steelhead (ODFW, 1990). No records exist regarding the intended purpose for releases of hatchery steelhead prior to 1966. Hatchery steelhead released between 1966 and 1969 were for experimental use only and were not meant for production purposes (ODFW, 1990 and Olsen, et al 1994). Unfortunately, no records or documentation are available regarding the outcome of the claimed experiments.

Native O. mykiss competition with hatchery O. mykiss may have contributed the decline of summer steelhead in the John Day basin. Large numbers of *O. mykiss* (both the resident and anadromous life histories) have been released into all portions of the John Day River basin between 1925 and 1997 (Tables 14 - 20). John Day basin managers estimated 900,000 summer steelhead smolts as the full seeding capacity for the John Day River basin (ODFW, 1990). Hatchery O. mykiss (both resident and anadromous) were stocked at a mean rate of eight percent and stocking ranged between 0.7% and 68% of the estimated full seeding of summer steelhead smolt carrying capacity between 1925 and 1997 (Table 20).

The true "wild" genotype of both resident and anadromous life histories of *O. mykiss* in the John Day River basin may have been altered because of the duration (1925 - 1997), level and extent (all subbasins) of hatchery *O. mykiss* stocking. Resident or at

least precocial *O. mykiss* were observed spawning with anadromous *O. mykiss* in Deer Creek of the John Day basin in 2003 (Wayne Wilson and Ian Tattam, personnel communication). Hatchery resident and anadromous stocked *O. mykiss* could also have spawned with John Day River basin wild resident and anadromous *O. mykiss*. Recent studies suggest that resident O. mykiss can produce anadromous progeny (Ruzycki et al. 2001).

Concern over competition for resources with wild stocks and potential hybridization with wild stocks ended all hatchery stocking of O. mykiss in rivers and streams of the John Day River basin after 1997. Stocking of steelhead ended in the John Day River basin after 1969.

At the time that small mouth bass were introduced, Oregon Game Commission biologists believed that small mouth bass would be a minimal threat to migrating steelhead and chinook smolts because these salmonids only used the lower John Day River as a migration corridor during spring runoff when turbid conditions and low water temperatures would make small mouth bass inefficient predators (Shrader and Gray, 1999). Four studies have clearly validated this claim (Claire, 1977 and 1978, and Unterwegner and Gray, 1996, and Unterwegner and Seals, 2000). No salmonids have been positively identified in 379 small mouth bass stomachs sampled from the lower Mainstem John Day River between the months of April through September (Claire, 1977 and 1978, and Unterwegner and Gray, 1996, and Unterwegner and Seals, 2000).

However, no studies have been conducted in the John Day basin to determine if the distribution of small mouth bass overlaps with the distribution of rearing summer steelhead and spring chinook during the summer and fall. Small mouth bass have been sighted as far upstream as Dayville in the Mainstem John Day River and as far upstream as Camas Creek in the North Fork John Day River, well within the rearing range of spring chinook and summer steelhead (Claire, 1975, Wayne Wilson personal observation 2000). In addition, no studies have been conducted to determine if small mouth bass are feeding on juvenile fall chinook salmon in the lower John Day basin downstream of Cottonwood Bridge. The presence of a remnant fall chinook salmon population in the lower John Day basin between Cottonwood Bridge and Tumwater falls was validated in 2000, 2001, and 2002 (Wilson et al., 2001, Wilson et al., 2003 unpublished data).

The relationship between small mouth bass and northern pike minnow may be worth studying in the John Day basin. While small mouth bass in the lower Mainstem John Day River have been shown to have little impact on the salmonid population, they may have impacted lamprey and other native fish species including northern pike minnow (*Ptychocheilus oregonensis*). All four small mouth bass diet studies have documented nongame fish species and lamprey as part of the summer diet (Claire, 1977 and 1978, and Unterwegner and Gray, 1996, and Unterwegner and Seals, 2000). In addition, shocker surveys have shown that small mouth bass have displaced native fish species in some portions of the lower Mainstem John Day River basin (Claire and Smith, 1989). Northern pike minnow (*Ptychocheilus oregonensis*) are an important predator of juvenile salmonids. Small mouth bass may have reduced the population of northern pike minnow in the John Day basin and subsequently reduced the overall salmonid predation rate by northern pike minnow (Figure 3, Table 25). The John Day basin spring chinook population has increased since small mouth bass were introduced (Wilson et al., 2001).

RECOMMENDATIONS FOR FUTURE INVESTIGATIONS

Several information gaps exist in the literature regarding the habitat, biology and distribution of O. mykiss and other salmonids in the John Day River basin. Future life history investigations and restoration activities should consider the following.

Qualitative and quantitative data needs to be collected to describe summer steelhead (O. mykiss) distribution, density, habitat, adult escapement, sex ratio, wild/hatchery ratio, egg-to-smolt survival, smolt-to-adult survival, and adult-to-smolt survival in the John Day basin. This data will be collected by a $338,000 project sponsored by the Oregon Department of Fish and Wildlife and funded by the Bonneville Power Administration titled: Implementation of the Environmental Monitoring and Assessment Program (EMAP) Protocol in the John Day River Subbasin of the Columbia Plateau Province (Appendix S).

Environmental monitoring and assessment program summer steelhead spawning survey protocol may prove to be inadequate to collect enough data to adequately describe the sex ratio and hatchery/wild ratio of summer steelhead in the John Day basin. Very few carcasses have been collected during historic index spawning surveys in the John Day basin (Appendix Tables E -I). The John Day basin does support an active catch and release fishery where hatchery summer steelhead can be taken by anglers (ODFW, 2003). The addition of a summer steelhead creel project would allow angler data to be collected to determine the summer steelhead sex ratio and hatchery/wild ratio in the John Day basin upstream of Cottonwood Bridge (rkm 64). A summer steelhead creel project could also be used to the determine stray steelhead hatchery source from coded wire tags, angler exploitation, and the economic value of the John Day basin summer steelhead catch and release fishery.

The annual estimated cost of a summer steelhead creel project is approximately $60,000. Only the most popular fishing areas of the Mainstem and North Fork John Day Rivers would need to be surveyed. In the Mainstem John Day River, these areas include Cottonwood Bridge upstream to Clarno and Clarno upstream to the John Day Fossil Beds Monument. The North Fork is fished from its mouth at Kimberly upstream to Wall Creek and from Wrightman Canyon upstream to the Highway 395 bridge near Dale, OR.

The summer steelhead creel survey would also need to be structured to follow the upstream migration of summer steelhead. Between the months of October and December, steelhead are present only in the lower 100 miles of the Mainstem John Day River (Unterwegner and Neal, personal communication). From January through April, summer steelhead are present upstream of Clarno in both the Mainstem and North Fork John Day Rivers (Unterwegner and Neal, personal communication).

Kostow, 1995 noted a need for allozyme analysis between summer steelhead populations within the mid-Columbia ESU. Allozyme analysis of the six subpopulations of summer steelhead in the John Day basin (lower Mainstem, upper Mainstem, South Fork, Middle Fork, lower North Fork, and upper North Fork) are needed to verify current groupings based on geographic proximity, spawning timing, and productivity. Samples for allozyme analysis could be collected by employees of the ODFW project John Day Implementation of the Environmental Monitoring and Assessment Program (EMAP) Protocol in the John Day River Subbasin of the Columbia Plateau Province. Samples could then be analyzed by an independent lab or at a university. Since the data could be

collected by current projects in the John Day basin, the only expense is the analysis of the samples by an independent lab or university.

The John Day basin would benefit from a coordinated long term monitoring program of current and historic fish habitat restoration projects. Long term effectiveness monitoring (fish response) of new habitat restoration projects and techniques would also provide valuable data as to which projects actually increase fish production. A variety of fish habitat restoration projects with varying levels of intensity of implementation have been completed in the John Day basin since the mid 1960's (Haas et al., 1961, West et al., 1965a and 1965b, Appendix Tables B1 - B5). An evaluation of historic habitat projects would provide incite into their effectiveness at solving long term fish habitat problems. It would also provide knowledge as to which habitat projects failed to meet long term implementation goals such as fish passage, gravel retention, streambank stabilization, and channel and floodplain restoration. Long term downstream affects could be identified. In addition, such a project could identify those habitat projects that negatively impacted fish production. Some log weirs may need to be removed because they have become summer death traps for rearing salmonids. In addition, some pools created to provide holding habitat for adult spring chinook may be death traps in low water years because they are not thermal refuges. Riparian fencing projects could also be evaluated to determine if older fences need to be replaced.

The goals of a coordinated habitat implementation and effectiveness monitoring project should be to inventory all historic habitat projects in a GIS database. Groupings of habitat projects could then be studied as to their long term implementation success or failure. Maintenance needs could also be identified and performed on historic habitat projects that are not meeting long term implementation goals. The cost of long term habitat project implementation and effectiveness monitoring would depend on the types of projects that were to be evaluated.

Data also needs to be collected to access the extent that the summer and fall distribution of small mouth bass overlaps with the downstream rearing distribution of juvenile summer steelhead and spring chinook salmon. Overlapping summer and fall species distributions could be verified by snorkeling. Small mouth bass stomach samples could be collected by angling or by electrofishing in areas where small mouth bass and salmonid distributions overlap. The stomach samples would then be analyzed to determine the diet of small mouth bass within the overlap zones. Electrofishing could be used to estimate the population of small mouth bass large enough to prey on salmonids and subsequently estimate the predation rate within summer and fall species distribution overlap zones. Small mouth bass fishing regulations could be altered to reduce predation by smallmouth bass if they are found to be a threat to rearing salmonids.

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APPENDIX A

Literature Review, John Day Basin Planning Reports

Appendix Table A-1. List of literature concerning fish species, stream habitat, and water resource planning for the John Day River basin, 1979 - 1993.

Reference	Agency	Plan Type	Geographic Scope/ 4th-level HUC	Summary
Department of the Interior National Park Service, 1979	Department of the Interior National Park Service	Environmental Assessment	Lower Mainstem	Wild and Scenic River Designation report.
U.S. Fish and Wildlife Service and Environmental and Technical Services Division of the National Marine Fisheries Service, 1981	National Marine Fisheries Service	Habitat Restoration	John Day Basin	Joint planning aid report evaluating the fish and wildlife resource problems and needs associated with streamflow and riparian zone habitats of the upper John Day basin.
Andrews J., 1981	USFS Umatilla National Forest	Habitat Restoration	North Fork	Objectives, goals, and benefits to reestablish riparian for cover and bank protection, sediment routing, channel migration, sediment transport, control degradation of water quality from mine tailings and runoff from abandoned mine sites for rehabilitation
James G., 1984	Confederated Tribes of the Umatilla Indian Res.	Habitat Restoration	John Day Basin	Coordinated priorities and site-specific initiatives for rehabilitating anadromous salmon and steelhead for each sub-basin and tributaries, estimated costs, species present, miles of stream needing rehabilitation, and amount of instream structures needed.
Oregon Water Resources Department, 1986	State of Oregon Water Resources Department	Water Resources Planning	John Day Basin	Report on current conditions and problems affecting the water resources of the John Day River Basin. Water problems identified for use in future management.
U. S. Fish and Wildlife Service, 1987	U. S. Fish and Wildlife Service	Species Plan	Columbia River	Identification of potential acclimation sites for release of fall chinook smolts incubated at Spring Creek and Bonneville hatcheries as mitigation to replace upriver bright fall chinook salmon lost by construction of John Day Dam.
Stuart, A. and S. H. Williams, 1988	Oregon Department of Fish and Wildlife	Habitat Restoration	John Day Basin	Plan for implementation of riparian habitat projects on private lands by the Oregon Department of Fish and Wildlife. Priority work areas identified for implementation years April 1, 1988 - March 31, 1992.
Brassard, D. and R. Gritz, 1988	USDA Forest Service, Malheur National Forest	Habitat Restoration	Middle Fork	Description of the Middle Fork John Day River, habitat limiting factors, previous habitat improvement projects and proposed new habitat improvement projects for future implementation.
Oregon Department of Environmental Quality, 1988	Oregon Department of Environmental Quality	Water Quality Assessment	John Day Basin	Water quality assessment of nonpoint sources of water pollution in Oregon.
Oregon Department of Fish and Wildlife, 1990	ODFW, CTUIR, Confederated Tribes Warm Springs	Salmon and Steelhead Production Plan	John Day Basin	Salmon and Steelhead production plan agreement between Oregon Department of Fish and Wildlife, Confederated Tribes of the Umatilla Indian Reservation, and Confederated Tribes of the Warm Springs Reservation of Oregon. Plan funded by the Northwest Power P
U. S. Bureau of Reclamation, 1990	Bureau of Reclamation	Water Plan	Upper Mainstem, Middle Fork and North Fork	Bureau of Reclamation master water plan for improving seasonal distribution of runoff and reducing seasonal water shortages in the upper John Day basin. Measures investigated include: irrigation efficiency improvement, watershed/riparian improvement, an
U. S. Bureau of Reclamation, 1992	Bureau of Reclamation, The John Day Basin Council	Stream Restoration	Upper Mainstem	Overview of planned stream restoration activity in the John Day basin to be implemented by government agencies.

Appendix Table A-1. Continued.

Reference	Agency	Plan Type	Geographic Scope/ 4th-level HUC	Summary
U. S. Bureau of Reclamation, 1992	Bureau of Reclamation, The John Day Basin Council	Stream Restoration	Upper Mainstem	Overview of planned stream restoration activity in the John Day basin to be implemented by government agencies.
U. S. Bureau of Reclamation, 1992.	Bureau of Reclamation, The John Day Basin Council	Stream Restoration	Upper Mainstem	Overview of planned stream restoration pilot program in the South Fork John Day basin to be implemented by government agencies.
Adams et al., 1993	Interdisciplinary	Bioeconomic Model	John Day Basin	Model for estimating costs and benefits of habitat restoration efforts based on hydrology, biology, and economics.
U. S. Bureau of Reclamation, 1993	Bureau of Reclamation, The John Day Basin Council	Stream Restoration	Lower Mainstem	Description of a five year stream restoration pilot project to encourage further participation by landowners in the Rock Creek subbasin and John Day basin. The objectives of the project are to encourage landowner participation in water conservation and s
U. S. Bureau of Reclamation, 1994	Bureau of Reclamation, The John Day Basin Council	Stream Restoration	Upper Mainstem	Overview of planned stream restoration activity in the South Fork John Day basin to be implemented by government agencies.
Umatilla National Forest, 1995	USDA Forest Service, Umatilla National Forest	Ecosystem Analysis	North Fork	Watershed analysis of Wall Creek watershed includes water quality and fish habitat evaluation.
Umatilla National Forest, 1995	USDA Forest Service, Umatilla National Forest	Environmental Assessment	North Fork	Environmental assessment of restoring dredge tailing sites in the North Fork John Day River Basin
Wallowa-Whitman and Umatilla National Forest, 1997	USDA Forest Service, Wallow-Whitman and Umatilla	Watershed Analysis	North Fork	Watershed analysis of the Granite Creek Tributary of the North Fork John Day River using Ecosystem Analysis at the Watershed Scale Version 2.2
USDA Forest Service, Umatilla National Forest, 1999	USDA Forest Service, Umatilla National Forest	Habitat Restoration	North Fork	Summary of mining activity in the Granite Creek drainage. Proposed action as alternative plans for habitat rehabilitation.
Sanchez J, 1999	USFS Umatilla National Forest	Habitat Restoration	North Fork	Proposed action to re-establish riparian vegetation by removal of mine dredge tailings in chinook and steelhead spawning and rearing areas.
Oregon Department of Fish and Wildlife and Oregon Water Resources Department, 2000	Oregon Department of Fish and Wildlife	Habitat Restoration	John Day Basin	Identification and ranking of streams in the John Day Basin for habitat and streamflow restoration.
David Evans and Associates, Inc., 2000	USDA Forest Service, Malheur National Forest	Watershed Analysis	Upper Mainstem	Watershed analysis of the Deer Creek watershed a tributary of the South Fork John Day River using Ecosystem Analysis at the Watershed Scale - Federal Guide for Watershed Analysis.

Appendix Table A-1 Continued.

Reference	Agency	Plan Type	Geographic Scope/ 4th-level HUC	Summary
Evans, D. and Associates, Inc., 2001	Native Fish Society	Case Study and Monitoring Recommendations	Middle Fork	Case study included summer steelhead of the Middle Fork John Day River. Life history, stock status, hatchery fish, harvest, habitat, monitoring recommendations.
Knapp, S., 2001	Oregon Department of Fish and Wildlife	Subbasin Summary	John Day Basin	Subbasin description, fish and wildlife resources, present management, fish and wildlife needs.
U. S. Bureau of Reclamation, 2002	Bureau of Reclamation	Programmatic Environmental Assessment	Upper Mainstem, Middle Fork, and North Fork	Analysis of environmental impacts of implementing a 10-year program of improving streamflows and correcting fish passage and screening problems in within the North Fork, Middle Fork and Upper Mainstem John Day River subbasins.
Oregon Watershed Enhancement Board, 2003	Oregon Watershed Enhancement Board	Watershed Restoration	John Day Basin	Fifteen common watershed basins identified in Oregon for watershed restoration and recovery of fish and wildlife populations. Provides background information for each basin, restoration issues, stressors, investments, accomplishments and challenges.

APPENDIX B

Literature Review, Habitat Projects in the John Day Basin

Appendix B-1. List of literature concerning habitat projects of multiple subbasins in the John Day River basin.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
Haas et al., 1961	Fish Commission of Oregon	Passage	NA	No	No	Aerial survey to identify barriers to fish passage.
U. S. Fish and Wildlife Service and National Marine Fishery Service, 1981	U. S. Fish and Wildlife Service and NMFS	Riparian Zone Vegetation	Fence/Grazing	No	No	Planning report to identify types of watershed restoration projects that would counter the two main causes of reduced fish production: low summer streamflow and degraded riparian vegetation in tributary streams.
Lindsay, 1983	Oregon Department of Fish and Wildlife	Instream Structure		No	Yes	Evaluation of changes in abundance of spring chinook and summer steelhead due to the addition of instream structures added to Deer Creek, Clear Creek, and Camp Creek.
Smith and Claire, 1984	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	No	No	Landowner contacts and ODFW planning to implement habitat enhancement projects in the John Day Basin on private property.
Olsen et al., 1984	Oregon Department of Fish and Wildlife	Instream Structure		No	Yes	Evaluation of changes in abundance of spring chinook and summer steelhead due to instream structure habitat improvement projects in Deer Creek, Camp Creek, and Clear Creek.
Neal et al., 1984	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, maintenance, monitoring, fencing.
Lacy et al., 1985	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, fencing and instream structure. Upper Mainstem, Fox Creek, Deer Creek.
Stuart et al. 1986	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, fencing and instream structure. Also removal of passage barrier on Deer Creek. Upper Mainstem, Fox Creek, Deer Creek.
Lacy and Williams, 1987	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, fencing and instream structure. Also removal of passage barrier on Deer Creek and Five Mile Creek. Upper Mainstem, Fox Creek, Deer Creek, Five Mile Creek
Li et al., 1990	Oregon State University			Yes	Yes	Four approaches to evaluate habitat improvement projects: comparative habitat analysis, tropic analysis, experimental food limitation, and biotic interactions.
Neal, 1990	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, fencing, water gaps, instream structure. Canyon Creek, Cottonwood Creek, Long Creek.
Li et al., 1990	Oregon State University	Instream Structure		Yes	No	Four approaches to habitat project implementation monitoring were presented as examples: Comparative Study, Tropic analysis of log weirs, Drift rates affecting carrying capacity for juvenile steelhead, and interspecific interactions among stream fishes.
Beschta et al., 1991	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	11 John Day basin habitat projects reviewed. Projects include fencing, instream structure, rip rap, weir pools,
Neal et al., 1991	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, lease development, fencing, water gaps, maintenance and monitoring, instream structure. Canyon Creek, Middle Fork.

Appendix Table B-1. Continued.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
Schumacher et al., 1991	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Rotary screen bypass trapping data of several fish species, 1982 - 1991. Screen inventory, operation and maintenance.
Neal et al., 1992	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, lease development, fencing, Mountain Creek, Middle Fork. Cottonwood Creek Thermograph data summarized.
Neal et al., 1993	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, monitoring of completed projects, fencing. Middle Fork.
Moulton and Findley, 1993	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Rotary screen bypass trapping data of salmonids in the John Day Basin, 1983 - 1993. Summary of new screen projects completed in 1993. Presence/ absence data of fish species where traps are operating, includes lamprey.
Moulton, 1994	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Operation and maintenance of 202 fish screens. New screens installed. Bypass trapping of salmonids from 1985 to 1994.
Neal et al., 1995	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, maintenance, monitoring, fencing, water developments. New projects on Camas Creek and Fox Creek.
Moulton et al., 1995	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Fish screen operation in water basins 6,7,8. Rotary fish screens and irrigation pump screens. Screen maintenance, new screens constructed. Inventory of screens constructed. Graph of monthly screen operation. Bypass trapping of fish species reported for 1995 and for the period of 1985-1995.
Neal et al., 1996	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, maintenance, monitoring, fencing. New projects in Middle Fork and Canyon Creek.
Findley et al., 1996	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Inventory of active fish screens. Ten year comparison of juvenile steelhead and chinook trapped at bypass traps, 1987 - 1996. New screen projects completed in 1996.
Neal et al., 1997	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, maintenance, monitoring.
Bronson et al., 1997	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Archive fish screen inventory for water basin 6. John Day District screen operation, bypass trapping data: steelhead, chinook, bull trout, cutthroat trout, whitefish.
Neal et al., 1998	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, maintenance, monitoring. New projects in Mainstem and Indian Creek.
Moulton, 1998	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Basin 6 fish screening operation and maintenance, fabrication. Inventory of active screens. Historic record of number of screens installed per decade since 1950.

Appendix Table B-1. Continued.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
Findley, 1998	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Basin 6 fish screening operation and maintenance, fabrication. Fish species trapped in ditch diversion traps for 10 years, 1989 - 1999.
Moulton, 1999	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Fish screen inventory, replacement projects in Basin 6, operation and maintenance, fabrication. Fish species trapped in screen trap boxes: chinook, steelhead, bull trout, cutthroat trout, whitefish.
Maloney, 1999	Oregon Department of Fish and Wildlife			No	No	Analysis of summer stream temperatures in 12 forested watersheds near John Day, OR managed under three grazing management strategies.
Neal et al., 1999	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, maintenance, monitoring. New projects in Grub Creek, Fox Creek, Indian Creek, Murder's Creek, North Fork.
Moulton, 1999	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Fish screen operation, maintenance, and construction. Replacement screens. Active fish screen inventory for John Day Basin, Region 6
Neal et al., 2000	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, maintenance, monitoring. New projects in Granite Creek, Indian Creek, and Middle Fork.
Smith, 2000	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Maintenance and operation of 372 existing fish screens, replacement of 9 existing outdated fish screens, addition of 13 new screens, 8 pump intake fish screens. Fish screen inventory for John Day Basin as of 2000.
ODFW, 2001b	Oregon Department of Fish and Wildlife	Passage	Irrigation	Yes	No	Before and after pictures of ditch screen projects. Passage barrier modification. Graph of the number of fish screens in operation by month. Operation and maintenance of 364 existing screens. Replacement of 18 outdated screens.

Appendix Table B-2. List of literature concerning habitat projects in the lower Mainstem John Day River.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
Claire et al., 1995	The Grant Soil and Water Conservation District	Passage		Yes	No	Rotary screen bypass trap locations (river mile), water temperature, and fish species observed for the Lower Mainstem John Day basin from 1955 - 1995.
Berry, 2001	Confederated Tribes of the Warm Springs	Passage	Fence/Grazing	Yes	No	Monitoring plan for watershed restoration of Pine Creek on the Pine Creek Ranch.
Clark, 2001	Sherman County Soil and Water Conservation District	Passage	Fence/Grazing	Yes	No	Pine Hollow watershed restoration goal is to restore natural hydrologic function. Fencing, spring development, well development, native range seeding.

Appendix Table B-3. List of literature concerning habitat projects in the upper Mainstem John Day River.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
Wiley, 1982	Bureau of Land Management	Instream Structure		Yes	No	Log weirs installed in Deer Creek to increase summer rearing and spawning habitat for summer steelhead.
Neal and Williams, 1988	Oregon Department of Fish and Wildlife	Passage	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, fencing and passage barrier removal, livestock watering devices, water gap construction. Mainstem, Fox Creek, Canyon Creek, Rock Creek
ODFW, 1989	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	ODFW habitat projects on private lands, fencing, water gaps, spring development, instream structure. Upper Mainstem and Fox Creek.
Young, 1991	Bureau of Land Management	Instream Structure		Yes	No	Monitoring of 1986 project where 1,500 boulder were placed in 14 reaches of the South Fork John Day River between River miles 14 and 25 to increase rearing area for summer steelhead. Physical measures taken.
Wiley, 1993	Bureau of Land Management	Instream Structure		Yes	No	Monitoring of 1986 project where 1,500 boulder were placed in 14 reaches of the South Fork John Day River between River miles 14 and 25 to increase rearing area for summer steelhead. Quantitative measures of physical changes in treated stream reaches.
Claire et al., 1995	The Grant Soil and Water Conservation District	Passage		Yes	No	Rotary screen bypass trap locations (river mile), water temperature, and fish species observed for the Upper Mainstem John Day basin from 1955 - 1995.
Claire et al., 1995	The Grant Soil and Water Conservation District	Passage		Yes	No	Rotary screen bypass trap locations (river mile), water temperature, and fish species observed for the Upper Mainstem John Day basin from 1955 - 1995.
ODFW, 1997	Oregon Department of Fish and Wildlife	NA	NA	No	No	Physical habitat surveys of Bridge Creek, Indian Creek, East Fork Indian Creek, and Onion Creek.
Robertson, 2001	Confederated Tribes of the Warm Springs	Passage	Fence/Grazing and Irrigation	Yes	No	Riparian Fencing, return flow cooling projects, alternative irrigation infiltration gallery replacement of push-up dams.
CTWSR and Grant Soil and Water Conservation District. 1999.	CTWSR and Grant Soil and Water Conservation District	Passage	Irrigation	Yes	No	Upper Mainstem and Middle Fork John Day Rivers. Replacement of push-up dams with permanent structures that allow fish passage. Several projects presented. Irrigation conversion projects to replace ditch irrigation with sprinkler pipes.

Appendix Table B-4. Literature review of habitat projects in the Middle Fork and Upper Mainstem John Day Rivers.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
CTWSR and Grant Soil and Water Conservation District. 1999.	Confederated Tribes of the Warm Springs	Passage	Irrigation	Yes	No	Upper Mainstem and Middle Fork John Day Rivers. Replacement of push-up dams with permanent structures that allow fish passage. Several projects presented. Irrigation conversion projects to replace ditch irrigation with sprinkler pipes.
Green, 1982.	Malheur National Forest	Instream Structure	Fence/Grazing	Yes	No	Log weirs installed in Camp Creek to increase summer rearing habitat for juvenile spring chinook and summer steelhead.
Gritz, 1986	Malheur National Forest	Instream Structure		Yes	No	Summary of habitat projects implemented in the Middle Fork John Day River basin: Beaver Creek, Big Boulder Creek, Davis Creek and Vinegar Creek, Vincent Creek to enhance juvenile summer steelhead and spring chinook rearing habitat.
Stuart et al., 1986	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	Yes	No	Summary of habitat projects implemented in the Mainstem and Middle Fork John Day River basins: Mainstem John Day River, Fox Creek, and Deer Creek
Morris and Gritz, 1992	Malheur National Forest		Fence/Grazing	Yes	No	Fence project to limit grazing and browsing of hardwoods in the upper Middle Fork John Day River.
Philips, 1987	Oregon Department of Fish and Wildlife	Instream Structure	Fence/Grazing	No	No	Middle fork and Upper Mainstem. Site visits to restoration sites, enclosures, and grazed areas. In the John Day River basin, sites in Camp Creek (Middle Fork John Day River) and Beech Creek (Mainstem John Day River) were visited.
ODFW 1991	Oregon Department of Fish and Wildlife	NA	NA	No	No	Middle Fork and Upper Mainstem. Physical habitat surveys of Deardorff Creek, Rail Creek, Reynolds Creek, Big Creek, and Granite Boulder Creek.

Appendix Table B-5. List of literature concerning habitat projects of the South Fork John Day River.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
West et al., 1965b	Oregon State Game Commission	Instream Structure		Yes	No	Underground weir used to raise the water level of sites in Tex Creek a tributary of Murderers Creek that flows into the South Fork John Day River. Underground weirs were meant to make places for summer steelhead parr to reside during summer periods of low streamflow.
Sheeter and Claire, 1981	Bureau of Land Management	Streambank stabilization		Yes	No	Juniper trees used to stabilize streambanks in the South Fork John Day River.

Appendix Table B-6. List of literature concerning habitat projects in the North Fork John Day River.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
West et al., 1965a	Oregon State Game Commission	Instream Structure		Yes	Yes	Gravel introduction to portions of Granite Creek and Clear Creek where spring chinook salmon spawn. Spawning surveys used to monitor success of spring chinook spawning.
Felix, 1981	Umatilla National Forest			No	No	Analysis of water discharge from inactive mines into Clear Creek.
Andrews, 1981.	Umatilla National Forest	Floodplain	NA	Yes	Yes	Project to rehabilitate Clear Creek and Granite Creek anadromous fish habitat previously damaged by mining activity.
Andrews, 1982	Umatilla National Forest	Instream Structure		Yes	No	Spawning gravel was screened and placed in Clear Creek.
Umatilla National Forest, 1983	Umatilla National Forest	Instream Structure		Yes	No	Restoration of side channel habitat in the North Fork John Day River for juvenile salmonid use.
Frazier, 1987	Umatilla National Forest	Instream Structure		Yes	No	Summary of habitat projects implemented in the North Fork John Day River basin: North Fork John Day River, Clear Creek, Desolation Creek, Wilson Creek, Little Wall Creek, Five Mile Creek, North Hidaway Creek.
Frazier, 1987	Umatilla National Forest	Instream Structure		Yes	No	Summary of habitat projects implemented in the North Fork John Day River basin: North Fork John Day River, Desolation Creek, Wilson Creek, Little Wall Creek, Five Mile Creek, North Hidaway Creek.
Dougan et al., 1989	Umatilla National Forest	Instream Structure		Yes	No	Summary of monitoring of habitat projects in the North Fork John Day River basin: North Fork John Day River, Clear Creek, Desolation Creek, Wilson Creek, Little Wall Creek, Five Mile Creek, Camas Creek, North Hidaway Creek, Camas Creek.
Sanchez et al., 1989	Umatilla National Forest	Instream Structure		Yes	No	Summary of habitat projects implemented in the North Fork John Day River basin: Clear Creek, Desolation Creek, Fivemile Creek, North Hidaway Creek, Bear Wallow Creek, Wilson Creek.
Sanchez et al., 1991	Umatilla National Forest	Instream Structure		Yes	No	Summary of habitat projects implemented in the North Fork John Day River basin: Five Mile Creek, Camas Creek, Lane Creek, Rancheria Creek, Wilson Creek, Big Wall Creek.
Sanchez et al., 1992	Umatilla National Forest	Instream Structure	Fence/Grazing	Yes	No	Summary of habitat projects implemented in North Fork John Day River basin: Five Mile Creek, Camas Creek, Bear Wallow Creek, Clear Creek, Big Wall Creek, Wilson Creek, and Wall Creek.
Wallowa Whitman National Forest, 1992	Wallowa-Whitman National Forest			No	No	Water temperatures of streams in the Baker and Unity Districts of the Wallowa Whitman National Forest.

Appendix Table B-6. Continued.

Reference	Agency	Active Habitat Restoration	Passive Habitat restoration	Implementation Monitoring	Effectiveness Monitoring	Summary
Wallowa-Whitman National Forest, 1993	Wallowa-Whitman National Forest			No	No	Water temperatures of streams in the Baker, Unity, and Pine districts of the Wallowa-Whitman National Forest, 1993. Maximum and Minimum daily temperatures. Also includes list of streams exceeding state temperature standards.
ODFW, 1994	Oregon Department of Fish and Wildlife	NA	NA	No	No	Physical habitat surveys and fish surveys (snorkel or single pass electroshocking without a block net) of several tributaries of the North Fork John Day River
McKinney and Calame, 1994	Umatilla National Forest	Floodplain	NA	Yes	No	Rehabilitation project to restore floodplain function to fish habitat previously damaged by mining activity.
High Country Research, 1996	Wallowa-Whitman National Forest	NA	NA	No	No	Seven day maximum average stream temperatures. Several upper North Fork John Day River tributaries included.
Dadoly, J. 1997	Department of Environmental Quality			No	No	Identification of mines in the Granite Creek drainage with effluent heavy metal concentrations exceeding background levels.
Roy F. Weston, Inc., 1997	U. S. Environmental Protection Agency			No	No	Summary of historical mining activity and evaluation of abandoned mines as source of contaminates in the Granite Creek drainage. Seattle, WA
Stubblefield, 1998	North Fork John Day Watershed Council	Push-Up Dam Removal		Yes	No	Removal of gravel push-up dams, monitoring, analysis of irrigation efficiency.
Rhodes and Purser, 1999	Columbia River Inter-tribal Fish Commission			No	No	Monitoring of surface fines and overwinter sedimentation during the incubation period in spawning gravels in the John Day and Grande Ronde River.
Stubblefield, 1999	North Fork John Day Watershed Council	Passage	Irrigation	Yes	No	Push-up dam removal in the lower North Fork John Day River.
Rhodes et al., 1999	Columbia River Inter-tribal Fish Commission			No	No	Monitoring of surface fines and overwinter sedimentation during the incubation period in spawning gravels in the John Day and Grande Ronde River.
Rhodes et al., 2001	Columbia River Inter-tribal Fish Commission			No	No	Monitoring of surface fines and overwinter sedimentation during the incubation period in spawning gravels in the John Day and Grande Ronde River.
ODFW, 2001a	Oregon Department of Fish and Wildlife	NA	NA	No	No	Physical habitat surveys of Ditch Creek, Mallory Creek, North Fork John Day River, and Potamus Creek.

APPENDIX C

Literature Review of biological information for fish species in the John Day Basin

Appendix Table C-1. List of literature concerning biological data for summer steelhead (*Oncorhynchus mykiss*) in the John Day Basin.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Schreck et al., 1985	Oregon State University	Stock Identification	Qualitative and Quantitative	Columbia Basin	All	Physical and genetic characteristics of wild and hatchery stocks using a holistic approach including analysis of life history, biochemical, body shape, and meristic characters, with correlation of habitat characteristics with wild stock characteristics.
Schreck et al., 1986	Oregon State University	Stock Identification	Qualitative and Quantitative	Columbia Basin	All	Physical and genetic characteristics of wild and hatchery stocks using a holistic approach including analysis of life history, biochemical, body shape, and meristic characters, with correlation of habitat characteristics with the wild stock characteristics.
Olsen et al., 1994	Oregon Department of Fish and Wildlife	Stock Assessment, Genetics	Qualitative and Quantitative	John Day Basin	All	John Day Basin spring chinook, fall chinook, and summer steelhead stock summary, genetics, hatchery stray, morphology, survival rates, harvest, life history.
Olsen, 1992	Oregon Department of Fish and Wildlife	Stock Assessment	Qualitative	John Day Basin	All	Stock summary report for the Hood River, Fifteen Mile River, Deschutes River, John Day River, Umatilla River, Grande Ronde River, and Imnaha River subbasins.
ODFW, 1990a	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Single pass electroshocking without block nets surveys to identify the presence of fish species. North Fork Tributaries; Granite Creek, Desolation Creek, Lake Creek, Lost Creek and Crane Creek surveyed.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling and/or single pass electroshocking without block nets surveys for presence of fish species in several streams of the John Day basin.
Wilson et al., 2000	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	Adult	John Day basin spring chiniook spawner escapement estimate from redd counts. Spawner sex ratio, length-at-age, and % hatchery fish. Spring chinook smolt-to-adult survival study. Incidental catch species included.
Wilson et al., 2001	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	Adult	John Day basin spring chinook spawner escapement estimate from redd counts. Spawner sex ratio, length-at-age, and % hatchery fish. Spring chinook smolt-to-adult survival study. Incidental catch reported.
Kostow, 1995	Oregon Department of Fish and Wildlife	Literature Review	Qualitative and Quantitative	Oregon	All	Literature review of the status of wild fish species in Oregon.
Kostow et al., 1997	NA	Literature Review	Qualitative and Quantitative	Pacific Northwest	All	Chapter reviews the status and management of salmon and steelhead in Oregon.
Berry, 1981a	Oregon Department of Fish and Wildlife	Harvest	Quantitative	John Day Basin	Adult	Summary of sport catch statistics.
Berry, 1981b	Oregon Department of Fish and Wildlife	Harvest	Quantitative	John Day Basin	Adult	Summary of sport catch statistics.
Claire, 1984	Oregon Department of Fish and Wildlife	Harvest	Qualitative and Quantitative	North Fork John Day River	All	Creel study to evaluate the hatchery trout fishery in the John Day basin. Estimates of take for wild summer steelhead, resident rainbow, bull trout, and whitefish included. Hatchery trout movement also noted.
Koski, 1947	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.

Appendix Table C-1. Continued.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Koski, 1964	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1965	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1966	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1968	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1970	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Nielson, 1950	United States Fish and Wildlife Service	Habitat	Qualitative	John Day Basin	All	Surveys to provide data for evaluation of each stream or portion of streams for present and potential value for maintenance of salmon and steelhead resources.
Li et al., 1994	Oregon State University	Habitat	Quantitative	Upper Mainstem John Day River tributaries	All	Study to determine the affect of grazing disturbance on O. mykiss.
Lowe, 1981	USFS, Umatilla National Forest	Grey Data	Qualitative	North Fork John Day River	All	Water quality of mine effluent discharge into Clear Creek, fish kills, and newspaper articles regarding fish kills.
Claire, 1986	Oregon Department of Fish and Wildlife	Grey Data	Quantitative	North Fork John Day River	All	Assessment of fish populations below the Red Boy Mine outfall into Clear Creek.
Daily, 1992	Oregon Department of Fish and Wildlife	Behavior/ Predation	Qualitative and Quantitative	Lower Mainstem John Day River and North Fork	All	Smallmouth bass predation on salmonids in the John Day, Umpqua, and Rogue River basins.

Appendix Table C-2. List of literature concerning biological data for *Oncorhynchus mykiss* (rainbow and redband trout) in the John Day basin.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
ODFW, 1998	Oregon Department of Forestry	Presence / absence	Qualitative	John Day Basin	All	Electrofishing used to survey for presence of fish species. Culverts evaluated. Surveys took place throughout the John Day Basin.
ODFW, 1996	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling or single pass electroshocking without blocknets. Surveys to identify the presence of fish species. Several tributaries of the upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
Wallowa Whitman National Forest, 1996	Wallowa-Whitman National Forest	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling and electrofishing used to survey for the presence of fish species. Upper North Fork John Day River and several upper North Fork tributaries included.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling and/or single pass electroshocking without block nets surveys for presence of fish species in several streams of the John Day basin.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Desolation Creek and Big Creek sub-basins surveyed.
ODFW, 1994	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Physical habitat surveys and fish presence surveys (snorkel or single pass electroshocking without block nets). Several tributaries of the North Fork John Day River surveyed.
ODFW, 1993	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River and Middle Fork	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Several tributaries of the Middle Fork and North Fork John Day Rivers surveyed.
ODFW, 1992	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Several tributaries of the upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
ODFW, 1991	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Upper North Fork John Day River tributaries surveyed.
ODFW, 1990b	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	Upper Mainstem John Day River	All	Single pass electroshocking without block nets surveys to identify the presence of fish species. Upper Mainstem John Day River tributaries surveyed.
ODFW, 1990	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Electrofishing used to survey for the presence of fish species. Tributaries in the Upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
Knox et al., 1984	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	All	Spring chinook spawning surveys, juvenile life history, juvenile distribution, length-at-age of spawners, coded wire tag recoveries. Rainbow trout tissue samples tested for viral hemorrhagic necrosis.
Claire, 1984	Oregon Department of Fish and Wildlife	Harvest	Qualitative and Quantitative	North Fork John Day River	All	Creel study to evaluate the hatchery trout fishery in the John Day basin. Estimates of take for wild summer steelhead, resident rainbow, bull trout, and whitefish included. Hatchery trout movement also noted.
Li et al., 1994	Oregon State University	Habitat	Qualitative and Quantitative	Upper Mainstem John Day River	All	Study of the cumulative effects of riparian disturbance by grazing on the tropic structure of high desert trout streams.
Claire, 1986	Oregon Department of Fish and Wildlife	Grey Data	Quantitative	North Fork John Day River	All	Assessment of fish populations below the Red Boy Mine outfall into Clear Creek.

Appendix Table C-2. Continued.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Gunckel et al., 2003	ODFW	Density	Quantitative	South Fork John Day Basin	Parr	*O. mykiss* density estimate for Deer Creek.
Koski, 1947	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1948	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1955	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1957	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1958	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1959	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1960	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1961	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1962	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1963	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1964	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1965	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1966	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koksi, 1968	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1969	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1970	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1971	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1972	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.

Appendix Table C-3. List of literature concerning biological data for Spring Chinook Salmon (*Oncorhynchus tshawytscha*) in the John Day basin.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Schreck et al., 1985	Oregon State University	Stock Identification	Qualitative and Quantitative	Columbia Basin	All	Physical and genetic characteristics of wild and hatchery stocks using a holistic approach including analysis of life history, biochemical, body shape, and meristic characters, with correlation of habitat characteristics with wild stock characteristics.
Schreck et al., 1986	Oregon State University	Stock Identification	Qualitative and Quantitative	Columbia Basin	All	Physical and genetic characteristics of wild and hatchery stocks using a holistic approach including analysis of life history, biochemical, body shape, and meristic characters, with correlation of habitat characteristics with the wild stock characteristics.
Olsen et al., 1994	Oregon Department of Fish and Wildlife	Stock Assessment, Genetics	Qualitative and Quantitative	John Day Basin	All	John Day Basin spring chinook, fall chinook, and summer steelhead stock summary, genetics, hatchery stray, morphology, survival rates, harvest, life history.
Olsen, 1992	Oregon Department of Fish and Wildlife	Stock Assessment	Qualitative	John Day Basin	All	Stock summary report for the Hood River, Fifteen Mile River, Deschutes River, John Day River, Umatilla River, Grande Ronde River, and Imnaha River subbasins.
Fulton, 1968	United States Fish and Wildlife Service	Presence / absence	Qualitative	John Day Basin	Adult	Literature review of known chinook salmon spawning areas and their status.
ODFW, 1990a	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Single pass electroshocking without block nets surveys to identify the presence of fish species. North Fork Tributaries; Granite Creek, Desolation Creek, Lake Creek, Lost Creek and Crane Creek surveyed.
ODFW, 1990b	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	Upper Mainstem John Day River	All	Single pass electroshocking without block nets surveys to identify the presence of fish species. Upper Mainstem John Day River tributaries surveyed.
ODFW, 1991	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Upper North Fork John Day River tributaries surveyed.
ODFW, 1994	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Physical habitat surveys and fish presence surveys (snorkel or single pass electroshocking without block nets). Several tributaries of the North Fork John Day River surveyed.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Desolation Creek and Big Creek sub-basins surveyed.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling and/or single pass electroshocking without block nets surveys for presence of fish species in several streams of the John Day basin.
Hattan and Fortune, 1966	Oregon Fish Commission	Population Assessment	Quantitative	John Day Basin	All	Method to obtain an escapement estimate of John Day Basin spring chinook salmon was investigated.
Burck and Smith, 1978	Oregon Department of Fish and Wildlife	Population Assessment	Qualitative and Quantitative	John Day Basin	All	John Day and Deschutes basin spring chinook salmon juvenile distribution, adult spawning survey data, coded wire tagging.

Appendix Table C-3. Continued.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Burck et al., 1979	Oregon Department of Fish and Wildlife	Population Assessment	Qualitative and Quantitative	John Day Basin	All	John Day Basin spring chinook salmon spawning surveys, coded wire tagging, abundance estimates, and distribution.
Burck et al., 1980	Oregon Department of Fish and Wildlife	Population Assessment	Qualitative and Quantitative	John Day Basin	All	John Day Basin spring chinook salmon spawning surveys, coded wire tagging, abundance estimates, distribution, life history.
Lindsay et al., 1981	Oregon Department of Fish and Wildlife	Population Assessment	Qualitative and Quantitative	John Day Basin	All	John Day River basin spring chinook salmon spawning surveys, coded wire tagging, survival rates, emergence, distribution, and abundance estimates.
ODFW, 1984	Oregon Department of Fish and Wildlife	Population Assessment	Qualitative and Quantitative	John Day Basin	All	John Day River spring chinook stock assessment included. Life history information.
Knox et al., 1984	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	All	Spring chinook spawning surveys, juvenile life history, juvenile distribution, length-at-age of spawners, coded wire tag recoveries. Rainbow trout tissue samples tested for viral hemorrhagic necrosis.
Knox et al., 1984	Oregon Department of Fish and Wildlife	Population Assessment	Qualitative and Quantitative	John Day Basin	Adult	John Day River basin spring chinook salmon spawning surveys, coded wire tagging.
Lindsay et al., 1986	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	All	Coded wire tag recoveries, smolt migration rates, smolt abundance, egg-to-smolt survival, spawning surveys, juvenile distribution, juvenile growth, adult age composition, disease testing of O. mykiss, and management recommendations.
Olson, 1990	Confederated Tribes of the Umatilla Indian Res.	Population Assessment	Quantitative	Middle Fork John Day River	Adult	Holding area surveys, spawning surveys. Spring chinook escapement estimate method for the John Day Basin explored.
Jonasson et al., 1998	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	Adult	John Day basin spring chinook spawner escapement estimate from redd counts. Spawner sex ratio, length-at-age, and % hatchery fish.
Schaller et al., 1999	NA	Population Assessment	Quantitative	NA	Adult	Qualitative approach to test for non-stationary recruitment functions, assessment of using spawner escapement trends for population analysis, hypotheses regarding survival rate, long-term changes in aggregate upriver run, and productivity changes.
Schaller et al., 1999	NA	Population Assessment	Qualitative	Columbia River Basin	All	Evaluation of temporal and spatial patterns of productivity and survival rates of index stocks from the Snake, upper Columbia, and lower Columbia regions to determine the cause of the dramatic declines in upriver stocks. Hydropower development implicated as cause of spring chinook salmon declines.
Wilson et al., 2000	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	Adult	John Day basin spring chiniook spawner escapement estimate from redd counts. Spawner sex ratio, length-at-age, and % hatchery fish. Spring chinook smolt-to-adult survival study. Incidental catch species included.

Appendix Table C-3. Continued.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Wilson et al., 2001	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	Adult	John Day basin spring chinook spawner escapement estimate from redd counts. Spawner sex ratio, length-at-age, and % hatchery fish. Spring chinook smolt-to-adult survival study. Incidental catch reported.
Kostow, 1995	Oregon Department of Fish and Wildlife	Literature Review	Qualitative and Quantitative	Oregon	All	Literature review of the status of wild fish species in Oregon.
Kostow et al., 1997	NA	Literature Review	Qualitative and Quantitative	Pacific Northwest	All	Chapter reviews the status and management of salmon and steelhead in Oregon.
Berry, 1981a	Oregon Department of Fish and Wildlife	Harvest	Quantitative	John Day Basin	Adult	Summary of sport catch statistics.
Berry, 1981b	Oregon Department of Fish and Wildlife	Harvest	Quantitative	John Day Basin	Adult	Summary of sport catch statistics.
Eden and Swartz, 1986	Oregon Department of Fish and Wildlife	Harvest	Quantitative	John Day Basin	Adult	Summary of sport catch statistics.
CTUIR, 1986	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	John Day Basin	Adult	Tribal harvest quota for the John Day River basin, 1986.
CTUIR, 1987	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 1987.
CTUIR, 1990	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 1990.
CTUIR, 1992	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 1992.
CTUIR, 1993	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 1993.
CTUIR, 1994	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 1994.

Appendix Table C-3. Continued.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
CTUIR, 1995	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 1995.
CTUIR, 1995	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest extension for the North Fork John Day River and its tributaries, 1995.
CTUIR, 1997	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 1997.
CTUIR, 1999	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 1999.
CTUIR, 2000	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 2000.
CTUIR, 2001	Confederated Tribes of the Umatilla Indian Res.	Harvest	Quantitative	North Fork John Day River	Adult	Tribal harvest quota for the North Fork John Day River and its tributaries, 2001.
Nielson, 1950	United States Fish and Wildlife Service	Habitat	Qualitative	John Day Basin	All	Surveys to provide data for evaluation of each stream or portion of streams for present and potential value for maintenance of salmon and steelhead resources.
McIntosh et al., 1995	Oregon State University	Habitat	Qualitative and Quantitative	Middle and North Fork	Adult	See title.
Torgersen et al., 1995	Oregon State University	Habitat	Qualitative and Quantitative	Middle Fork and North Fork	Adult	Quantified distribution and behavior of adult spring chinook salmon related to patterns of stream temperature and physical habitat characteristics.
Torgersen, 1997	Oregon State University	Habitat	Qualitative and Quantitative	Middle Fork and North Fork	Adult	Spatial patterns of adult spring chinook salmon with respect to spatial patterns of stream temperature on the Middle Fork and North Fork John Day Rivers
Torgersen, et al., 1999	Oregon State University	Habitat	Qualitative and Quantitative	Middle Fork and North Fork	Adult	
Lowe, 1981	USFS, Umatilla National Forest	Grey Data	Qualitative	North Fork John Day River	All	Water quality of mine effluent discharge into Clear Creek, fish kills, and newspaper articles regarding fish kills.
Smith, 1984	Oregon Department of Fish and Wildlife	Grey Data	Qualitative	North Fork John Day River	All	Concern involving toxic outfall from inactive Red Boy Mine into Clear Creek. Juvenile chinook died when placed in a live box below the mine outfall. Request for immediate action due to danger to salmon.
Claire, 1986	Oregon Department of Fish and Wildlife	Grey Data	Quantitative	North Fork John Day River	All	Assessment of fish populations below the Red Boy Mine outfall into Clear Creek.
Daily, 1992	Oregon Department of Fish and Wildlife	Behavior/ Predation	Qualitative and Quantitative	Lower Mainstem John Day River and North Fork	All	Smallmouth bass predation on salmonids in the John Day, Umpqua, and Rogue River basins.

Appendix Table C-4. List of literature concerning biological data for fall chinook salmon (Oncorhynchus tshawytscha) in the John Day basin.

Reference	Agency	Report Category	Data Type	Geographic Scope/4th Level HUC	Fish Life Stage	Summary
Tuss, 1982	U. S. Fish and Wildlife Service	Stocking	Qualitative and Quantitative	Columbia River, John Day Dam Reservoir	Adult	Mitigation for loss of fall chinook spawning habitat by construction of John Day Dam. Fall chinook coded wire tag data to evaluate mitigation success.
Schreck et al., 1986	Oregon State University	Stock Identification	Qualitative and Quantitative	Columbia Basin	All	Physical and genetic characteristics of wild and hatchery stocks using a holistic approach including analysis of life history, biochemical, body shape, and meristic characters, with correlation of habitat characteristics with the wild stock characteristics.
Schreck et al., 1985	Oregon State University	Stock Identification	Qualitative and Quantitative	Columbia Basin	All	Physical and genetic characteristics of wild and hatchery stocks using a holistic approach including analysis of life history, biochemical, body shape, and meristic characters, with correlation of habitat characteristics with wild stock characteristics.
Olsen et al., 1994	Oregon Department of Fish and Wildlife	Stock Assessment, Genetics	Qualitative and Quantitative	John Day Basin	All	John Day Basin spring chinook, fall chinook, and summer steelhead stock summary, genetics, hatchery stray, morphology, survival rates, harvest, life history.
Fulton, 1968	United States Fish and Wildlife Service	Presence / absence	Qualitative	John Day Basin	Adult	Literature review of known chinook salmon spawning areas and their status.
Kostow et al., 1997	NA	Literature Review	Qualitative and Quantitative	Pacific Northwest	All	Chapter reviews the status and management of salmon and steelhead in Oregon.
Kostow, 1995	Oregon Department of Fish and Wildlife	Literature Review	Qualitative and Quantitative	Oregon	All	Literature review of the status of wild fish species in Oregon.
Berry, 1981a	Oregon Department of Fish and Wildlife	Harvest	Quantitative	John Day Basin	Adult	Summary of sport catch statistics.
Berry, 1981b	Oregon Department of Fish and Wildlife	Harvest	Quantitative	John Day Basin	Adult	Summary of sport catch statistics.
Nielson, 1950	United States Fish and Wildlife Service	Habitat	Qualitative	John Day Basin	All	Surveys to provide data for evaluation of each stream or portion of streams for present and potential value for maintenance of salmon and steelhead resources.

Appendix Table C-5. List of literature concerning biological data for coho salmon (Oncorhynchus kisutch) in the John Day Basin.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Berry, 1981a	Oregon Department of Fish and Wildlife	Harvest	Quantitative	John Day Basin	Adult	Summary of sport catch statistics.

Appendix Table C-6. List of literature concerning biological data for westslope cutthroat trout (Oncorhynchus clarki lewisi) in the John Day basin.

Ref.	Agency	Report Category	Data Type	Geographic Scope/4th Level HUC	Fish Life Stage	Summary
ODFW, 1998	Oregon Department of Forestry	Presence / absence	Qualitative	John Day Basin	All	Electrofishing used to survey for presence of fish species. Culverts evaluated. Surveys took place throughout the John Day Basin.
ODFW, 1996	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Several tributaries of the upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling and/or single pass electroshocking without block nets surveys for presence of fish species in several streams of the John Day basin.
ODFW, 1993	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River and Middle Fork	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Several tributaries of the Middle Fork and North Fork John Day Rivers surveyed.
ODFW, 1992	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Several tributaries of the upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
ODFW, 1990b	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	Upper Mainstem John Day River	All	Single pass electroshocking without block nets surveys to identify the presence of fish species. Upper Mainstem John Day River tributaries surveyed.
ODFW, 1990	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Electrofishing used to survey for the presence of fish species. Tributaries in the Upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
ODFW, 1990a	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Single pass electroshocking without block nets surveys to identify the presence of fish species. North Fork Tributaries; Granite Creek, Desolation Creek, Lake Creek, Lost Creek and Crane Creek surveyed.
Koski, 1966	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	parr	Hatchery fish stocking reports.

Appendix Table C-7. List of literature concerning biological data for bull trout (Salvelinus confluentus) in the John Day basin.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
ODFW, 1996	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling or single pass electroshocking without blocknets, surveys to identify the presence of fish species. Several tributaries of the upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
Wallowa Whitman National Forest, 1996	Wallowa-Whitman National Forest	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling and electrofishing used to survey for the presence of fish species. Upper North Fork John Day River and several upper North Fork tributaries included.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling and/or single pass electroshocking without block nets surveys for presence of fish species in several streams of the John Day basin.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Desolation Creek and Big Creek sub-basins surveyed.
ODFW, 1994	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Physical habitat surveys and fish presence surveys (snorkel or single pass electroshocking without block nets). Several tributaries of the North Fork John Day River surveyed.
ODFW, 1993	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River and Middle Fork	All	Snorkeling or single pass electroshocking without blocknets, surveys to identify the presence of fish species. Several tributaries of the Middle Fork and North Fork John Day Rivers surveyed.
ODFW, 1992	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling or single pass electroshocking without blocknets, surveys to identify the presence of fish species. Several tributaries of the upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
ODFW, 1991	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Upper North Fork John Day River tributaries surveyed.
ODFW, 1990b	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	Upper Mainstem John Day River	All	Single pass electroshocking without blocknets, surveys to identify the presence of fish species. Upper Mainstem John Day River tributaries surveyed.
ODFW, 1990	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Electrofishing used to survey for the presence of fish species. Tributaries in the Upper Mainstem, North Fork, and Middle Fork fourth level HUC's surveyed.
ODFW, 1990a	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Single pass electroshocking without block nets surveys to identify the presence of fish species. North Fork Tributaries; Granite Creek, Desolation Creek, Lake Creek, Lost Creek and Crane Creek surveyed.
Wilson et al., 2000	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	Adult	John Day basin spring chiniook spawner escapement estimate from redd counts. Spawner sex ratio, length-at-age, and % hatchery fish. Spring chinook smolt-to-adult survival study. Incidental catch species included.
Claire, 1984	Oregon Department of Fish and Wildlife	Harvest	Qualitative and Quantitative	North Fork John Day River	All	Creel study to evaluate the hatchery trout fishery in the John Day basin. Estimates of take for wild summer steelhead, resident rainbow, bull trout, and whitefish included. Hatchery trout movement also noted.
Bellerud et al., 1997	Oregon Department of Fish and Wildlife	Genetics	Qualitative	John Day Basin	All	Analysis of nuclear satellite DNA of bull trout from three regions: coastal (west of mouth of John Day River), Klamath basin, and inland (east of mouth of John Day River).

Appendix Table C-7. Continued.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Hemmingson et al., 1996	Oregon Department of Fish and Wildlife	Genetics	Qualitative	John Day Basin	All	Genetic characteristics of Oregon bull trout determined by analysis of mitochondrial and nuclear DNA.
Hemmingson et al., 2001b	Oregon Department of Fish and Wildlife	Behavior	Qualitative and Quantitative	Upper Mainstem John Day River	All	Passive integrated transponder tags and radio transmitters used to track bull trout movement in upper Mainstem John Day River. Lengths of trapped bull trout provided. Bull trout and brook trout interaction behavior studied in an enclosure; brook trout more aggressive.
Hemmingson et al., 2001a	Oregon Department of Fish and Wildlife	Behavior	Qualitative	Upper Mainstem John Day River	All	Radio telemetry used to track seasonal movement of bull trout in the upper Mainstem John Day River. Temperatures of streams sympatric and allopatric to bull trout. Bull trout and brook trout feeding behavior interaction.
Hemmingson et al., 2001c	Oregon Department of Fish and Wildlife	Behavior	Qualitative	Upper Mainstem John Day River	All	Radio telemetry, passive integrated transponder tags, and screw traps used to monitor bull trout movement in the upper Mainstem John Day River.
Hemmingson et al., 2001d	Oregon Department of Fish and Wildlife	Behavior	Qualitative	Upper Mainstem John Day River and North Fork	All	Radio telemetry, passive integrated transponder tags, and screw traps used to monitor bull trout movement in the upper Mainstem John Day River and upper North Fork. Water temperature monitoring data for the upper Mainstem John Day River Watershed.

Appendix Table C-8. List of literature concerning biological data for brook tout (*Salvelinus fontinalis*) in the John Day Basin.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling and/or single pass electroshocking without block nets surveys for presence of fish species in several streams of the John Day basin.
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Desolation Creek and Big Creek sub-basins surveyed.
Hemmingson et al., 2001b	Oregon Department of Fish and Wildlife	Behavior	Qualitative and Quantitative	Upper Mainstem John Day River	All	Passive integrated transponder tags and radio transmitters used to track bull trout movement in upper Mainstem John Day River. Lengths of trapped bull trout provided. Bull trout and brook trout interaction behavior studied in an enclosure; brook trout more aggressive.
Hemmingson et al., 2001a	Oregon Department of Fish and Wildlife	Behavior	Qualitative	Upper Mainstem John Day River	All	Radio telemetry used to track seasonal movement of bull trout in the upper Mainstem John Day River. Temperatures of streams sympatric and allopatric to bull trout. Bull trout and brook trout feeding behavior interaction.
Koski, 1957	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1958	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1960	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1961	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.
Koski, 1962	Oregon State Game Commission	Stocking	Quantitative	John Day Basin	Parr	Hatchery fish stocking records.

Appendix Table C-9. List of literature concerning biological data for mountain whitefish (Prosopium williamsoni) in the John Day basin.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
ODFW, 1995	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	John Day Basin	All	Snorkeling and/or single pass electroshocking without block nets surveys for presence of fish species in several streams of the John Day basin.
ODFW, 1991	Oregon Department of Fish and Wildlife	Presence / absence	Qualitative	North Fork John Day River	All	Snorkeling or single pass electroshocking without block nets surveys to identify the presence of fish species. Upper North Fork John Day River tributaries surveyed.
Claire, 1984	Oregon Department of Fish and Wildlife	Harvest	Qualitative and Quantitative	North Fork John Day River	All	Creel study to evaluate the hatchery trout fishery in the John Day basin. Estimates of take for wild summer steelhead, resident rainbow, bull trout, and whitefish included. Hatchery trout movement also noted.

Appendix Table C-10. List of literature concerning biological data for pacific lamprey (*Lampetra tridentata*) in the John Day basin.

Reference	Agency	Report Category	Data Type	Geographic Scope / 4th Level HUC	Fish Life Stage	Summary
Wilson et al., 2000	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	Adult	John Day basin spring chiniook spawner escapement estimate from redd counts. Spawner sex ratio, length-at-age, and % hatchery fish. Spring chinook smolt-to-adult survival study. incidental catch species included.
Wilson et al., 2001	Oregon Department of Fish and Wildlife	Population Assessment	Quantitative	John Day Basin	Adult	John Day basin spring chinook spawner escapement estimate from redd counts. Spawner sex ratio, length-at-age, and % hatchery fish. Spring chinook smolt-to-adult survival study. Incidental catch reported.
Jackson et al., 1997	Confederated Tribes of the Umatilla Indian Res.	Population Assessment	Qualitative and Quantitative	North Fork and Middle Fork John Day River	All	Past and present abundance and distribution of pacific lamprey in the John Day basin and other tributaries of the Columbia River. Data is a summary based on oral interviews and review of record in literature. Reasons for lamprey population decline presented. Abundance monitoring at Columbia River Dams and adult passage research.
Jackson et al., 1997	Confederated Tribes of the Umatilla Indian Res.	Population Assessment	Qualitative and Quantitative	John Day Basin	All	Past and present abundance and distribution of pacific lamprey in the John Day basin and other tributaries of the Columbia River. Data is a summary based on oral interviews and review of record in literature. Presence / absence sampling at 16 sites in the John Day Basin. Reasons for lamprey population decline presented. Abundance monitoring at Columbia River Dams and adult passage research.
Close et al., 2000	Confederated Tribes of the Umatilla Indian Res.	Presence / absence	Qualitative and Quantitative	John Day Basin	All	Larval lamprey collection and incidental observations in the John Day basin. Historical and current observations based on oral interview and literature review. Abundance monitoring in Columbia basin. Planning for Columbia basin pacific lamprey projects. Annotated bibliography of lamprey literature.
Close et al., 2001	Confederated Tribes of the Umatilla Indian Res.	Multiple Topics	Qualitative and Quantitative	John Day Basin	All	Historic and current lamprey observation from oral interviews and literature review. Identification of clinical indicators of stress in adult pacific lamprey. Swimming performance and physiological effects of surgical implantation of dummy radio transponders into the peritoneal cavities of pacific lamprey. Genetic stock structure of pacific lamprey in the Columbia River basin. Evaluation of lamprey culture techniques. In-season homing of displaced radio-tagged pacific lampreys in lower Columbia River.
Close et al., 2002	Confederated Tribes of the Umatilla Indian Res.	Habitat	Qualitative	Middle Fork John Day River	Larvae	Reintroduction of lamprey to the Umatilla basin. Middle Fork John Day River analysis of heterogeneity in larval abundance and habitat preference. Description of electro-olfaction apparatus in lamprey.

Appendix Table C-11. List of literature concerning biological data for small mouth bass (*Micropterus dolomieu*) in the John Day basin.

Ref.	Agency	Report Category	Data Type	Geographic Scope/4th Level HUC	Fish Life Stage	Summary
Daily, 1992	Oregon Department of Fish and Wildlife	Behavior/ Predation	Qualitative and Quantitative	Lower Mainstem John Day River and North Fork	All	Smallmouth bass predation on salmonids in the John Day, Umpqua, and Rogue River basins.
Schrader and Gray, 1999	Oregon Department of Fish and Wildlife	Harvest	Qualitative and Quantitative	Lower Mainstem John Day River	All	Summary of CREEL data for smallmouth bass in the John Day Basin. History, population estimates, stomach sampling.

APPENDIX D

Annotated Bibliography of data available in Oregon State Game Commission and Oregon Department of Fish and Wildlife Management Reports

Appendix Table D-1. Annotated Bibliography of data available in Oregon State Game Commission and Oregon Department of Fish and Wildlife Management Reports, 1948 - 2002.

Reference	Anadromous Fish Creel	Resident & Hatchery Fish Creel	Steelhead Spawning Survey	Spring Chinook Spawning Survey	Fall Chinook Spawning Survey	Coho Spawning Surveys	Bull Trout Spawning Surveys	Ditch Screen Diversion Trap	Resident Fish Stocking	Anadromous Fish Stocking	Rainbow & Redband Trout	Fall Chinook	Spring Chinook	Coho	Bull Trout	Westslope Cutthroat Trout	Kokanee	Brook Trout	Mountain Whitefish	Small Mouth Bass	Fish Kill Data / Chemical Treatment	Stream Surveys / Fish Density	Habitat Projects	Other Data Recorded
Oregon Fish Commission, 1948	No	No	No	No	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No	Stocking Records for Watershed O6 - NE Regon
Oregon Fish Commission, 1949	No	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	
Oregon Fish Commission, 1950	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No	Stream surveys for fish composition in Camas Creek, Murders Creek, Canyon Creek. Stocking Records
Oregon Fish Commission, 1951	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	
Oregon Fish Commission, 1952	Yes	No	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	
Oregon Fish Commission, 1953	Yes	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	No	No	Yes	Yes	No	No	No	No	No	No	No	
Oregon Fish Commission, 1953	Yes	No	Yes	No	No	No	No	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No	No	No	No	No	No	Chinook salmon also mentioned. Analysis of fish mortalities in irrigation ditches.
Oregon Fish Commission, 1954	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	
Sayre, 1955	No	No	No	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	Yes	No	No	No	Yes	No	No	No	No	Steelhead and Bull Trout migration timing.
Sayre, 1956	Yes	No	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No	No	No	No	No	Downstream migration timing, pollution and mining effluent
Sayre, 1957	No	Yes	No	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	No	No	No	No	Dad's Creek fish salvage, pollution and mining effluent
Hewkin, 1958a	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	
Hewkin, 1958b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Steelhead sex ratios, fish barriers, water pollution, DDT,
Hewkin, 1959a	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	
Hewkin, 1959b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Fish barriers, water pollution
Hewkin, 1960a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	

Appendix Table D-1. Continued.

Reference	Anadromous Fish Creel	Resident & Hatchery Fish Creel	Steelhead Spawning Survey	Spring Chinook Spawning Survey	Fall Chinook Spawning Survey	Coho Spawning Surveys	Bull Trout Spawning Surveys	Ditch Screen Diversion Trap	Resident Fish Stocking	Anadromous Fish Stocking	Rainbow & Redband Trout	Fall Chinook	Spring Chinook	Coho	Bull Trout	Westslope Cutthroat Trout	Kokanee	Brook Trout	Mountain Whitefish	Small Mouth Bass	Fish Kill Data / Chemical Treatment	Stream Surveys / Fish Density	Habitat Projects	Other Data Recorded
Hewkin, 1960b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Steelhead stream inventory of Kahler Creek impoundment project, stream pollution
Hewkin, 1961a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	
Hewkin, 1961b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Steelhead spawner population estimate, Tex Creek
Hewkin, 1962a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	
Hewkin, 1962b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Canyon Creek Impoundment
Hewkin, 1963a	Yes	Yes	No	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes	
Hewkin, 1963b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Canyon Creek Impoundment, spawning gravel introduced into Middle Fork
Hewkin, 1964a	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	Flood Damage
Hewkin, 1964b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Coho salmon release, fish barrier removal, mine pollution abatement
Hewkin, 1965a	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	
Hewkin, 1965b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	
Hewkin, 1966a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No	
Hewkin, 1966b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	
Hewkin, 1967a	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Flash Floods
Hewkin, 1967b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	
Hewkin, 1968a	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Flash Floods
Hewkin, 1968b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	chinook carcass egg retention study
Hewkin, 1969a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Flash Floods
Hewkin, 1969b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	
Hewkin, 1970a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Flood Damage
Hewkin, 1970b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	
Hewkin, 1971	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	

Appendix Table D-1. Continued.

Reference	Anadromous Fish Creel	Resident & Hatchery Fish Creel	Steelhead Spawning Survey	Spring Chinook Spawning Survey	Fall Chinook Spawning Survey	Coho Spawning Surveys	Bull Trout Spawning Surveys	Ditch Screen Diversion Trap	Resident Fish Stocking	Anadromous Fish Stocking	Rainbow & Redband Trout	Fall Chinook	Spring Chinook	Coho	Bull Trout	Westslope Cutthroat Trout	Kokanee	Brook Trout	Mountain Whitefish	Small Mouth Bass	Fish Kill Data / Chemical Treatment	Stream Surveys / Fish Density	Habitat Projects	Other Data Recorded
Claire, 1971a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	
Claire, 1972a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	
Claire, 1972b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Forest Practices Ace implementation, Fill-Removal Law implementation
Claire, 1973a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	
Claire, 1973b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	
Claire, 1974a	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	
Claire, 1974b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	
Claire, 1975a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	
Claire, 1975b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	
Claire, 1976a	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	
Claire, 1976b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	
Claire, 1977a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Small Mouth Bass Stomach Sampling
Claire, 1977b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Smallmouth Bass stomach content survey data
Claire, 1978a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Small Mouth Bass Stomach Sampling
Claire, 1978b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Smallmouth Bass stomach content survey data
Claire, 1979a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Small Mouth Bass Stomach Sampling
Claire, 1979b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Smallmouth Bass stomach content survey data
Claire, 1980a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	
Claire, 1980b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	
Claire, 1981a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Dam Site Proposals
Claire, 1981b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	U. S. Corps of Engineers dam site proposals for John Day River.
Claire, 1982a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	
Claire, 1982b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	
Claire, 1983a	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	
Claire, 1983b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	
Claire, 1984a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	BPA Stream Habitat Plan
Claire, 1984b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	
Claire, 1985a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	
Claire, 1985b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Minimum stream flow and strategic water planning for the John Day River

Appendix Table D-1. Continued.

Reference	Anadromous Fish Creel	Resident & Hatchery Fish Creel	Steelhead Spawning Survey	Spring Chinook Spawning Survey	Fall Chinook Spawning Survey	Coho Spawning Surveys	Bull Trout Spawning Surveys	Ditch Screen Diversion Trap	Resident Fish Stocking	Anadromous Fish Stocking	Rainbow & Redband Trout	Fall Chinook	Spring Chinook	Coho	Bull Trout	Westslope Cutthroat Trout	Kokanee	Brook Trout	Mountain Whitefish	Small Mouth Bass	Fish Kill Data / Chemical Treatment	Stream Surveys / Fish Density	Habitat Projects	Other Data Recorded
Claire, 1986a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	
Claire, 1986b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	
Claire, 1987a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Genetic Analysis South Fork O. Mykiss , Whirling Disease Sampling
Claire, 1987b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Whirling Disease, Genetic analysis of O. mykiss above and below South Fork Falls, South Fork John Day River.
Claire, 1988a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	
Claire, 1988b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Whirling Disease
Claire and Smith, 1989a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	
Claire and Smith, 1989b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Distribution of sensitive trout species
Claire and Gray, 1990a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	
Claire and Gray, 1990b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Distribution of sensitive trout species
ODFW, 1990	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No	No	No	No	No	No	Chinook and steelhead production plan for the John Day Basin.
Claire and Gray, 1991a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	
Claire and Gray, 1991b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Distribution of sensitive trout species
Claire and Gray, 1992a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Wild/Hatchery Steelhead Ratio, McNary Fallback Tags recovered and reported to John Day Office
Claire and Gray, 1992b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Hatchery steelhead angler catch records, distribution of sensitive trout species
Claire and Gray, 1993a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Aquatic Inventories Project
Claire and Gray, 1993b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Hatchery steelhead angler catch records, distribution of sensitive trout species
Claire and Gray, 1993	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	Bull Trout Population status, screen trap data, distribution, habitat, harvest, genetics.

Appendix Table D-1. Continued.

Reference	Anadromous Fish Creel	Resident & Hatchery Fish Creel	Steelhead Spawning Survey	Spring Chinook Spawning Survey	Fall Chinook Spawning Survey	Coho Spawning Surveys	Bull Trout Spawning Surveys	Ditch Screen Diversion Trap	Resident Fish Stocking	Anadromous Fish Stocking	Rainbow & Redband Trout	Fall Chinook	Spring Chinook	Coho	Bull Trout	Westslope Cutthroat Trout	Kokanee	Brook Trout	Mountain Whitefish	Small Mouth Bass	Fish Kill Data / Chemical Treatment	Stream Surveys / Fish Density	Habitat Projects	Other Data Recorded
Unterwegner and Gray, 1994a	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	
Unterwegner and Gray, 1994b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	
Claire and Gray, 1994	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	No	No	No	No	No	No	No	No	Stock status report for summer steelhead, spring chinook, bull trout and warm water game fish in the John Day Basin
Unterwegner and Gray, 1995a	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Bull Trout genetics from fin clips, West Slope Cutthroat Trout genetics from fin clips, evaluation of O. mykiss stocking impact on resident fish
Unterwegner and Gray, 1995b	Yes	Yes	No	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Evaluation of stocking hatchery O. mykiss and impacts to resident fish, genetic samples taken from Middle Fork bull trout
Unterwegner and Gray, 1995c	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	No	Yes	No	No	No	No	No	No	No	No	Stock status report for summer steelhead, spring chinook, bull trout in the John Day Basin
Unterwegner and Gray, 1996a	Yes	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Small Mouth Bass Stomach sampling, fish passage Bates Pond, Grazing Allotment Management, summer steelhead smolt genetic analysis.
Unterwegner and Gray, 1996b	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Bull Trout distribution sampling. Small Mouth Bass stomach sampling.
Unterwegner and Gray, 1996c	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	Stock status report for summer steelhead, spring chinook and bull trout in the John Day Basin
Unterwegner and Gray, 1997	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	

Appendix Table D-1. Continued.

Reference	Anadromous Fish Creel	Resident & Hatchery Fish Creel	Steelhead Spawning Survey	Spring Chinook Spawning Survey	Fall Chinook Spawning Survey	Coho Spawning Surveys	Bull Trout Spawning Surveys	Ditch Screen Diversion Trap	Resident Fish Stocking	Anadromous Fish Stocking	Rainbow & Redband Trout	Fall Chinook	Spring Chinook	Coho	Bull Trout	Westslope Cutthroat Trout	Kokanee	Brook Trout	Mountain Whitefish	Small Mouth Bass	Fish Kill Data / Chemical Treatment	Stream Surveys / Fish Density	Habitat Projects	Other Data Recorded
Unterwegner and Gray, 1998	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	
Unterwegner and Seals, 2000	No	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Bull Trout presence/absence surveys.
Unterwegner and Neal, 2001	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Bull Trout presence/absence surveys. Irrigation ditch salvage.
Chilcote, 2001	No	No	Yes	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	Conservation status of wild steelhead populations in Oregon

APPENDIX E

Upper Mainstem John Day Basin, Historic Summer Steelhead Spawning Survey Data

Appendix Table E-1. Historic summer steelhead spawning survey data for Bear Creek (Grant Co.) of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Bear Creek (Grant Co.)						Start: N 44º 27' 46.6" W 118º 46' 49.15"	
EPA Code: 1707020108700						Stop: N 44º 30' 41.91" W 118º 45' 57.43"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1969	2.5	May 22	28	0			
1977	2.5	May 3	0	0			
1978	3.0	May 12	16	4			
1979	3.0	May 22	1	0			
1980	3.0	May 6	10	0			1
1981	3.0	May 8	7	1			
1982	3.0	May 12	4	0			0
1983	3.0	May 11	16	1			0
1985	3.0	May 6	22	2			0
1986	3.0	May 1	64	6			0
1987	5.0	May 5	40	0			
1988	4.0	May 11	86	3			
1989	5.0	May 2	11	4			0
1990	3.5	Apr 17	18	1			
1991	4.5	Apr 26	9	1			0
1993	4.7	May 13	14	0			0
1994	5.0	Apr 29	22	1			0
1995	3.5	Apr 28	4	0			0
1996	3.1	May 6	2	0			0
1997	4.6	May 8	10	0	Mod	Good	0
1998	3.1	May 1	4	0	Mod	Fair	0
1999	3.1	May 3	4	2			0
2000	4.1	May 10	0	0	Low		0
2001	3.1	May 14	0	0	Low	Good	0
2002	3.1	May 6	7	1	Low	Good	0

Appendix Table E-2. Historic summer steelhead spawning survey data for Beech Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem					Survey Coordinates		
Stream: Beech Creek					Start: N 44º 29' 46.35" W 119º 1' 47.64"		
EPA Code: 1707020108800					Stop: N 44º 31' 16.04" W 119º 2' 12.0"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1966	5.5	May 25	134	7			
1967	3.5	Jun 1	45	4			
1968	3.5	Apr 17	13	0			
1969	6.5	May 7	29	8			
1972	3.5	May 17	7	0			0
1973	3.5	May 9	14	1			
1974	3.5	Jun 19	8	0			
1975	3.5		16				
1976	3.5	May 19	9	0			0
1977	5.5	Apr 27	32	1			0
1980	3.5	May 7	16	0			0
1981	5.5	May 6	16	1			
1982	5.5	May 25	13	0			0
1983	5.5	May 18	11	0			0
1985	5.5	May 8	33	5			0
1986	5.5	Apr 30	68	8			0
1987	3.5	May 1	49	2			
1988	3.5	May 5	21	3			
1989	3.5	May 17	10	0			
1990	3.5	Apr 13	14	2			
1991	3.5	May 14	8	0	Mod	Fair	0
1992	3.5	Apr 21	17	1			
1993	3.5	May 13	6	6			
1994	5.0	May 6	18	1			0
1995	2.3	May 25	3	0			
1997	2.3	May 19	6	1			
1998	2.3	May 12	9	0			
1999	2.3		0				
2000	2.3	May 10	3	0	Mod	Good	0
2001	2.3	May 7	13	0	Low	Good	0
2002	2.3	May 7	23	2			0

Appendix Table E-3. Historic summer steelhead spawning survey data for East Fork Beech Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Beech Ck., East Fork						Start: N 44º 31' 16.04" W 119º 2' 12.0"	
EPA Code: 1707020113000						Stop: N 44º 30' 52.77" W 118º 58' 30.91"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1962	1.5	Apr 25	5	1			
1966	3.5	Apr 18	109	7			
1967	3.5	Jun 1	48	0			
1968	3.5	Apr 17	18	2			
1969	6.0	May 7	69	0			
1970	3.5	May 28	48	0			
1972	3.5	May 17	47	5			0
1973	3.5	May 9	27	0			
1974	3.5	Jun 19	26	0			
1975	3.5	Jun 11	22	0			
1976	2.0	May 19	15	0			0
1977	3.5	Apr 27	37	1			0
1978	3.5	May 19	21	0			
1979	3.5	May 23	5	0			
1980	3.5	May 7	20	0			0
1981	3.5	May 6	17	0			
1982	3.5	May 25	18	1			0
1983	3.5	May 18	10	0			0
1984	3.5	May 10	13	0			
1985	3.5	May 8	25	6			0
1986	3.5	Apr 30	58	5			0
1987	3.5	May 1	61	0			
1988	3.5	May 5	45	5			
1989	3.5	May 17	0	0			0
1990	3.5	Apr 13	24	4			
1991	3.5	May 3	11	0			0
1992	3.5	Apr 20	35	6			0
1993		May 13	9	0			0
1994	3.5	May 6	11	0			0
1995	3.5	May 25	6	0			0
1996	3.5	May 29	1	0			
1997	3.5	May 19	8	0			
1998	3.5	May 12	24	0			0
1999	3.5	May 5	1	0			0
2000	3.5	May 10	12	0	Mod	Good	0
2001	3.5	May 7	15	0		Good	0
2002	3.5	May 7	17	2	Low	Good	0

Appendix Table E-4. Historic summer steelhead spawning survey data for Belshaw Creek, of the Upper Mainstem John Day River basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Belshaw Creek						Start: N 44º 26' 17.05" W 119º 17' 15.18"	
EPA Code: 1707020111500						Stop: N 44º 27' 31.38" W 119º 16' 37.71"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	0.8	Apr 27	2	0			
1990	3.0	Apr 18	3	0			
1992	2.0	Apr 29	9	0			3 Wild
1993	3.0	Jun 1	8	0		Good	0
1994	2.0	May 31	0	0			0
1996	2.0	May 29	3	0			
1997	2.0	May 29	4	1			0
1998	2.0	May 20	11	0			
2002	2.0	May 10	6	7			

Appendix Table E-5. Historic summer steelhead spawning survey data for Canyon Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Canyon Creek						Start: N 44º 14' 45.84" W 118º 54' 41.01"	
EPA Code: 1707020107000						Stop: N 44º 13' 5.45" W 118º 48' 41.99"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1959	4.0		16	10			
1960	4.5		10				
1961	5.5	Apr 26	35	23			
1962	5.5	May 16	22	4			
1963	5.5	Apr 24	56	18			
1964	5.5	Apr 28	70	9			
1965			29				
1966	5.5	Apr 12	75	33			
1967	8.0	Apr 26	207	20			
1968	5.5	May 10	83	1			
1969	7.0	Jun 11	68	0			
1973	5.0	May 23	23	3			
1974	2.0	May 23	3	0			
1976	5.0	May 24	50	0			0
1977	5.8	May 11	116	15			0
1978	5.0	May 25	38	1			
1979	5.0	Jun 6	9	0			
1980	5.0	May 23	18	0			0
1981	5.0	May 26	25	0			0
1983	5.5	May 11	34	10			0
1985	5.5	May 2	78	8			0
1986	5.5	Apr 30	55	5			0
1987	5.5	May 12	125	9			
1988	6.5	May 10	152	14			
1989	5.5	May 5	30	4			0
1990	5.5	Apr 25	69	3			
1991	5.5	May 14	39	0			0
1992	6.5	Apr 22	74	7			0
1994	5.5	May 11	41	1			0
1995	5.5	May 22	2	0	High	Fair	0
1996	2.0	May 17	8	0			0
1997	2.0	Jun 2	3	0			
1998	2.0	May 20	3	0			
2000	5.5	May 22	38	0	High	Good	0
2001	5.5	May 16	21	0		Good	0
2002	5.5	May 14	56	8	Mod	Fair	0

Appendix Table E-6. Historic summer steelhead spawning survey data for Canyon Creek, upper section, of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Canyon Creek, Upper Section						Start:	
EPA Code:						Stop:	
Stream Survey Status: Non-Index							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1993	2.0	May 24	0	0			0

Appendix Table E-7. Historic summer steelhead spawning survey data for Canyon Creek, East Fork, of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Canyon Creek, East Fork						Start: N 44º 14' 45.84" W 118º 54' 41.01"	
EPA Code: 1707020107200						Stop: N 44º 16' 34.82" W 118º 52' 1.95"	
Stream Survey Status: Non-Index							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1977	3.0	May 16	26	2			0
1978	2.5	May 18	14	3			
1979	2.5	Jun 8	2	0			
1980		May 14	4	1			0
1983	1.5	May 12	7	2			0
1986	1.5	Apr 30	11	0			0
1991	3.0	May 14	0	0		Poor	0

Appendix Table E-8. Historic summer steelhead spawning survey data for Canyon Creek, Middle Fork, of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem							Survey Coordinates
Stream: Canyon Creek, Middle Fork							Start: N 44º 12' 45.08" W 118º 50' 43.24"
EPA Code: 1707020112000							Stop: N 44º 14' 52.5" W 118º 47' 37.98"
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1977	2.0	May 19	27	1			0
1978	2.0	May 17	9	0			
1979	2.0	Jun 6	0	0			
1980	2.0	May 14	7	0			0
1981	2.0	May 19	1	0			
1983	2.0	May 11	18	2			0
1984	2.0	May 9	22	6			
1985	3.0	May 2	38	13			0
1986	3.0	Apr 30	20	5			0
1987	3.0	May 12	29	3			
1988	3.0	May 6	55	0			
1989	3.0	May 5	20	3			0
1990	3.0	Apr 25	18	4			
1991	3.0	May 14	14	0			0
1992	3.0	Apr 22	28	5			0
1994	3.0	May 11	8	1			0
1995	3.0	May 22	1	0	High	Fair	0
1997	1.5	Jun 2	1	0			
1999	3.0		10				
2000	3.0	May 22	2	0	High	Good	0
2001	3.0	May 16	2	1	High	Good	0
2002	3.7	May 14	30	7	Mod	Good	0

Appendix Table E-9. Historic summer steelhead spawning survey data for Cottonwood Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem					Survey Coordinates		
Stream: Cottonwood Creek					Start: N 44º 26' 51.3" W 118º 38' 26.94"		
EPA Code: 1707020101300					Stop: N 44º 25' 7.02" W 119º 38' 15.01"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1959	2.0		6	0			
1960	2.0	Apr 14	12	4			
1961	2.0	Apr 13	13	5			
1962	2.0	Apr 24	8	5			
1963	2.0	Apr 25	17	8			
1964	2.0	May 11	3	0			
1965	2.0	May 11	17	6			
1966	2.0	Apr 15	15	2			
1967	2.0	May 29	28	0			
1968	2.0	Apr 22	0	0			
1969	2.5	May 14	5	0			
1970	2.5	May 14	16	3			
1972	2,5	Apr 25	17	0			0
1973	2.5	Apr 25	9	0			
1975	2.5	May 2	14	2			0
1976	2.5	May 5	8	3			0
1977	3.0	Apr 27	0	0			0
1978	3.0	May 1	8	1			
1979	2.5	May 14	0	0			
1980	2.5	May 5	2	0			0
1981	2.5	May 11	5	1			
1982	2.5	May 19	11	0			0
1983	2.5	May 16	7	0			0
1984	2.5	May 24	12	0			
1985	2.5	May 9	38	7			0
1986	2.5	May 5	33	6			0
1987	2.5	May 7	64	0			
1988	2.5	May 9	61	3			
1989	2.5	May 19	0	0			0
1990	2.5	Apr 20	21	0			
1991	2.5	May 31	6	0			0
1992		Apr 24	4	0			0
1993	2.5		11	0			
1994	8.0	May 13	3	0			0
1995	2.5	May 10	2	0	High	Fair	0
1996	2.5	May 7	4	0			0
2002	2.5	May 13	29	7	Low	Good	2 (wild)

Appendix Table E-10. Historic summer steelhead spawning survey data for Cottonwood Creek (above the Forest Service Boundary) of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem					Survey Coordinates		
Stream: Cottonwood Creek					Start:		
EPA Code: 1707020101300					Stop:		
Stream Survey Status: Non-Index							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1981	1.5	May 11	3	0			
1986		May 5	22	4			0

Appendix Table E-11. Historic summer steelhead spawning survey data for Deardorff Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Deardorff Creek						Start:	
EPA Code: 1707020112700						Stop:	
Stream Survey Status: Non-Index							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1986	0.7	Jun 4	4	0			

Appendix Table E-12. Historic summer steelhead spawning survey data for Dixie Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Dixie Creek						Start: Unknown	
EPA Code: 1707020108600						Stop: Unknown	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1983	3.3	May 20	16	0			
1984	0.75	June 19	4	0			
1985	2.6	May 16	17	1			
1986	2.6	May 5	10	2			0
1987	2.3	May 19	26	0			
1988	0.9	May 4	6	1			
1989	2.7	May 31	3	0			
1990	2.8	April 25	6	0			
1992	3.2	May 20	6	0			

Appendix Table E-13. Historic summer steelhead spawning survey data for Fields Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem					Survey Coordinates		
Stream: Fields Creek					Start: N 44° 25' 25.54" W 119° 18' 6.44"		
EPA Code: 1707020106200					Stop: N 44° 22' 54.41" W 119° 18' 49.57"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1959	2.5		29	0			
1960	2.5	April 12	7	4			
1961	2.5	April 13	6	4			
1962	2.5	April 24	5	2			
1963	2.5	April 18	21	8			
1964		April 30	14	2			
1965		May 8	6	5			
1966		April 25	71	13			
1967		April 27	30	4			
1968		April 22	0	0			
1969		May 13	6	0			
1970		May 13	14	0			
1971		April 27	13	1			
1972	2.5	April 26	13	3			0
1973	2.7	April 27	43	5			
1975	2.0	June 4	21	0			0
1976	2.5	May 20	14				0
1977		April 29	0	0			
1978		May 16	8				
1979		May 30	0				
1980		April 29	6				0
1981		May 7	7				
1982		May 12	5	0			0
1983		April 29	29	3			0
1984		May 2	7	2			
1985		May 1	15	4			0
1986		April 25	34	4			0
1987		May 6	28	0			
1988		May 5	17	3			
1989		May 12	8	4			0
1990		April 16	15	3			
1991		April 29	5	0			0
1992		April 30	9	1			0
1993		May 24	8	0			0
1994		April 29	4	0			0
1995		May 1	5	1			0
1996	2.5	May 7	3	1			0
1997	2.4	May 8	1	1	Moderate	Good	0
1998	2.4	May 7	1	0	Moderate	Good	0
1999	2.4		1		Moderate		
2000	2.4	May 14	4	0			

Appendix Table E-14. Historic summer steelhead spawning survey data for Grub Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem							Survey Coordinates
Stream: Grub Creek							Start: Unknown
EPA Code: 1707020112200							Stop: Unknown
Stream Survey Status: Non-index							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	2.1	May 5	21	0			

Appendix Table E-15. Historic summer steelhead spawning survey data for Hall Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem							Survey Coordinates
Stream: Hall Creek							Start: Unknown
EPA Code: 1707020112900							Stop: Unknown
Stream Survey Status: Non-index							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	2.5		3	0			

Appendix Table E-16. Historic summer steelhead spawning survey data for Holmes Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem downstream of North Fork							Survey Coordinates
Stream: Holmes Creek.							Start: N44º 44' 3.55" W119º 38' 38.8"
EPA Code: 1707020116300							Stop: N44º 43' 55.35" W119º 38' 8.38"
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1993	0.5	Apr 28	8	11			4 Wild

Appendix Table E-17. Historic summer steelhead spawning survey data for Indian Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem					Survey Coordinates		
Stream: Indian Creek					Start: N 44° 23' 5.69" W 118° 44' 45.6"		
EPA Code: 1707020107600					Stop: N 44° 21' 26.63" W 118° 44' 34.04"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1965	1.0	May 25	7	0			
1966	1.0	April 13	15	7			
1967	1.5	May 4	12	2			
1969	1.5	May 22	17	2			
1970	2.0	June 18	51	0			
1971	1.5	May 3	13	2			
1973	2.0	May 11	18	3			
1976	2.0	June 2	14	0			
1977	2.0	May 12	0	0			0
1978	2.0	May 15	7	0			
1980	2.0	May 18	5	0			0
1981		May 12	9	0			
1982		May 12	2	0			0
1983		April 26	27	6			0
1984		April 30	17	5			
1985		May 6	24	3			0
1986		May 7	30	5			0
1987		May 6	8	0			
1988		May 10	21	0			
1989		May 4	19	3			0
1990		April 17	6	2			
1991		April 26	2	0			0
1992	2.0	April 22	29	8			0
1993			0	0	High		
1994		May 13	2	0	High		0
1996	1.1	May 29	2	0			
1997	1.1	June 11	1	0			0
1998	1.1	May 21	0	0			
2002	2.0	May 17	9	2			

Appendix Table E-18. Historic summer steelhead spawning survey data for the John Day River of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day					Survey Coordinates		
Stream: John Day River					Start: Unknown		
EPA Code: 1707020100100					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1968	2.0	Apr 8	4	4			

Appendix Table E-19. Historic summer steelhead spawning survey data for Laycock Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Laycock Creek						Start: Unknown	
EPA Code:						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.5	May 10	14	5			

Appendix Table E-20. Historic summer steelhead spawning survey data for Little Indian Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Little Indian Creek						Start: Unknown	
EPA Code: 1707020107602						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1963	1.0	Apr 12	6	1			

Appendix Table E-21. Historic summer steelhead spawning survey data for McClellan Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day					Survey Coordinates		
Stream: McClellan Creek					Start: N 44º 30' 52.77" W 118º 58' 30.91"		
EPA Code: 1707020113200					Stop: N 44º 32' 10.49" W 118º 56' 42.78"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1962	1.5	Apr 25	9	0			
1966	2.5	Apr 18	99	17			
1967	2.5	Jun 5	35	0			
1968	2.5	Apr 17	2	0			
1969	2.5	May 7	13	0			
1970	2.5	May 27	21	0			
1972	1.0	May 17	10	0			0
1973	1.0	May 2	17	0			
1974	1.0	May 7	5	0			
1976	1.0	May 4	11	0			0
1977	1.0	Apr 26	10	1			0
1978	1.0	May 8	5	0			
1979	1.0	May 17	1	0			
1980	1.0	May 1	11	0			0
1981	1.0	May 6	3	0			
1982	2.0	May 13	11	0			0
1983	2.0	May 10	9	0			
1984	2.0	Apr 27	5	2			
1985	2.0	May 7	23	0			
1986	2.0	Apr 30	24	0			0
1987	1.0	May 1	11	3			
1988	1.5	Apr 28	20	0			
1989	1.0	May 1	15	0			0
1990	2.0	Apr 13	0	0			
1991	2.5	May 1	12	0			0
1992	1.5	Apr 22	8	3			
1993	1.5	May 10	2	0			0
1994	2.0	May 9	9	1			0
1995	2.0	May 3	1	0			0
1996	2.0	May 13	5	0			0
1997	2.0	May 12	4	0			
1998	2.0	May 6	9	0			
1999	2.0	May 4	3	0			0
2000	2.0	May 10	3	0			
2001	2.0	May 7	4	0			0
2002	2.0	May 7	13	0	Low	Good	0

Appendix Table E-22. Historic summer steelhead spawning survey data for Mountain Creek of the Upper Mainstem John Day basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Mountain Creek						Start: Unknown	
EPA Code: 17070201600						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1960	1.0	June 3	9	0			
1970	6.0	April 17	18	2			
1986	2.0	May 7	12	5			0

Appendix Table E-23. Historic summer steelhead spawning survey data for Pine Creek (Holliday) of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Pine Creek (Holliday)						Start: Unknown	
EPA Code:						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.5	May 17	8	1			

Appendix Table E-24. Historic summer steelhead spawning survey data for Reynolds Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Reynolds Creek						Start: N 44º 25' 40.91" W 118º 34' 30.59"	
EPA Code: 1707020108300						Stop: N 44º 25' 1.92" W 118º 32' 35.5"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1961	5.0	Apr 29	48	8			
1962	4.0	Apr 30	27	4			
1963	5.0	May 17	49	7			
1964	5.0	Apr 29	50	12			
1965	5.0	May 14	29	10			
1966	5.0	Apr 14	26	7			
1967	5.0	May 26	39	3			
1968	3.5	May 7	17	0			
1969	4.0	May 8	41	11			
1973	3.0	May 23	32	0			
1977	3.0	May 20	37	0			
1978	3.0	Jun 8	8	0			
1979	3.0	Jun 8	1	0			
1980	3.0	Jun 25	0	0			
1981	3.0	Jun 5	7	0			
1982		Jun 10	4	0			0
1985	3.0	May 28	7	0			0
1986	2.5	May 27	22	0			0
1992	2.0	Apr 22	14	1			0
1993	2.0	Jun 4	0	0		Good	0
1994	2.0	May 13	9	0			0
1996	1.7	May 30	3	0			
1997	1.7	Jun 11	8	0			0
1998	1.7	May 20	0	0			

Appendix Table E-25. Historic summer steelhead spawning survey data for Riley Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Riley Creek						Start: N 44º 24' 11.52" W 119º 9' 19.09"	
EPA Code: 1707020106500						Stop: N 44º 21' 48.9" W 119º 9' 49.04"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1959	1.0		9	3			
1960	1.0	May 2	16	4			
1961	1.0	Apr 14	7	3			
1962	1.0	Apr 26	8	8			
1963	1.0	Apr 23	17	4			
1964	1.5	May 7	15	4			
1965	1.5	May 4	6	3			
1966	1.5	Apr 25	36	5			
1967	1.5	May 25	17	1			
1968	1.5	Apr 25	0	0			
1969	1.5	May 14	5	0			
1970	1.5	May 13	3	0			
1971	2.5	Apr 27	0	0			
1973	3.7	May 2	3	0			
1976	3.0	May 14	5	1			0
1978	3.5	May 9	3	0			
1979	3.0	May 23	3	0			
1980	3.0	May 7	23	1			
1981	3.0	Jun 7	5	0			
1982	3.0	May 19	12	0			5
1983	3.0	May 12	10	0			0
1984	3.0	May 2	8	1			
1985	3.0	May 1	8	1			0
1986	3.0	Apr 29	83	12			0
1987	3.0	May 11	52	6			
1988	3.0	May 23	78	5			
1989	3.0	May 23	14	1			0
1990	1.0	May 3	3	0			
1992	3.0	Apr 29	30	2			1 wild
1993	3.0	May 21	12	0			0
1994	3.0	May 26	15	0			0
1996	3.0	May 29	8	0			
1997	3.0	May 29	0	0			
1998	3.0	May 20	1	0			
2002	3.0	May 10	9	9			

Appendix Table E-26. Historic summer steelhead spawning survey data for Rock Creek (Wheeler County) of the Upper Mainstem John Day basin.

Subbasin: Upper Mainstem						Survey Coordinates	
Stream: Rock Creek (Wheeler County)						Start: Unknown	
EPA Code: Unknown reach						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	4.0	May 20	14	3			
1988	1.5	June 9	14	0			
1992	3.0	May 2	33	37			

Appendix Table E-27. Historic summer steelhead spawning survey data for Standard Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Standard Creek						Start: Unknown	
EPA Code: 1707020112800						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1983	2.7	Apr 10	22	2			
1984	2.6	May 11	15	0			
1985	2.6	May 16	18	0			
1989	2.6	May 30	2	0			
1990	1.8	Apr 24	2	0			

Appendix Table E-28. Historic summer steelhead spawning survey data for Strawberry Creek of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Strawberry Creek						Start: Unknown	
EPA Code: 1707020108000						Stop: Unknown	
Stream Survey Status: Non index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002		May 17	0				

Appendix Table E-29. Historic summer steelhead spawning survey data for Tinker Creek (tributary of Beech Creek, East Fork) of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day					Survey Coordinates		
Stream: Tinker Creek					Start: N 44º 31' 40.03" W 118º 54' 30.63"		
EPA Code: 1707020113100					Stop: N 44º 32' 56.96" W 118º 53' 44.58"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	2.3	May 1	35	0			
1988	1.8	May 5	30	3			
1990	1.8	Apr 13	1	0			
1991	1.8	May 9	2	0			0
1993		May 10	0	0			0
1994	1.8	May 9	5	0			
1995	1.8	May 3	2	0			0
1996	1.8	May 13	3	0			0
1997	1.8	May 12	0	0			
1998	1.8	May 6	3	0			
1999	1.8	May 4	2	0			0
2000	1.8	May 10	3	0	Low	Good	
2001	1.8	May 7	3	0		Good	0
2002	1.8	May 7	4	0	Low	Good	0

Appendix Table E-30. Historic summer steelhead spawning survey data for Vance Creek (tributary of Canyon Creek) of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Vance Creek						Start: Canyon Creek Lane Culvert	
EPA Code: 1707020111800						Stop: Hwy. 395 Culvert	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1965	1.0	May 11	11	0			
1966	1.0	Apr 13	12	0			
1967	1.0	Apr 26	9	1			
1969	1.0	Apr 23	4	1			
1972	1.0	May 12	13	3			0
1973	1.0	May 9	4	0			
1974	1.0	May 8	4	0			
1975	1.0	May 22	3	2			0
1976	1.0		4	0			0
1977	1.0	May 2	0	0			0
1978	1.0	May 10	7	0			
1979	1.0	May 16	1	0			
1980	1.0	May 14	10	0			0
1981	1.0	May 13	2	0			
1982	1.0	May 14	1	1			0
1983	1.0	May 10	6	0			0
1984	1.0	May 9	4	1			
1985	1.0	May 3	3	0			0
1986	1.0	May 6	5	0			0

Appendix Table E-31. Historic summer steelhead spawning survey data for Wall Creek (tributary of Canyon Creek) of the Upper Mainstem John Day Basin.

Subbasin: Upper Mainstem John Day						Survey Coordinates	
Stream: Wall Creek						Start: Unknown	
EPA Code: 1707020121600						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1977	1.0	May 16	7	0			
1980	1.0	May 14	4	0			0
1983	1.0	May 12	7	3			
1984	1.5	May 21	3	2			

APPENDIX F

Lower Mainstem John Day Basin, Historic Summer Steelhead Spawning Survey Data

Appendix Table F-1. Historic summer steelhead spawning survey data for Alder Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork							Survey Coordinates
Stream: Alder Creek							Start: Unknown
EPA Code: 170702040200							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1965	1.0	May 20	6	0			
1977	8.3		17				
1980	12.0		37				
1987	0.7	Apr 29	2	1			

Appendix Table F-2. Historic summer steelhead spawning survey data for Alder Creek (Lake Fork) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork							Survey Coordinates
Stream: Alder Creek (Lake Fork)							Start: Unknown
EPA Code: 1707020406300							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	0.2	Apr 29	4	0			

Appendix Table F-3. Historic summer steelhead spawning survey data for Bear Creek (Wheeler Co.) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork					Survey Coordinates		
Stream: Bear Creek (Wheeler Co.)					Start: N44º 37' 27.32" W120º 20' 7.35"		
EPA Code: 1707020404100					Stop: N44º 33' 51.81" W120º 24' 29.73"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1959	3.0		27	0			
1960	3.0	Apr 5	10	0			
1961	3.0	Mar 31	9	0			
1962	3.0	Apr 23	12	0			
1963	3.0	Mar 30	7	0			
1964	3.0	Apr 14	9	0			
1965	3.5	Mar 30	17	0			
1966	4.5	Apr 19	53	0			
1967	4.0	Jun 7	72	0			
1968	4.0	Apr 10	58	0			
1969	5.0	May 7	31	6			
1970	6.0	Apr 16	72	8			
1972	6.0	Apr 19	36	4			0
1973	2.0	May 16	0	0			
1974	6.0	May 2	9	1			
1976	6.0	May 5	38	0			0
1978	6.0	Apr 25	41	4			
1981	6.0	Apr 29	31	0			
1982	6.0	Apr 30	26	1			0
1983	6.0	May 4	23	0			0
1984	6.0	May 9	18	3			
1985	6.0	May 1	22	5			0
1986	6.0	Apr 30	29	3			0
1987	6.0	Apr 29	51	5			
1988	6.0	Apr 27	37	7			
1989	6.0	May 17	8	0			0
1990	6.0	Apr 11	31	5			
1991	6.0	Apr 30	10	0		Poor	0
1992	6.0	Apr 19	18	0			0
1993			0	0			
1994	6.0	May 10	8	0			0
1995	6.0	Apr 26	13	0			0
1996	6.0	May 8	7	3			
1997	6.0	May 14	4	2			
2002	6.0	Apr 30	86	27	Mod	Good	0

Appendix Table F-4. Historic summer steelhead spawning survey data for Bologna Creek, East (Heppner RD) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstream downstream of North Fork							Survey Coordinates
Stream: Bologna Creek, East (Heppner RD)							Start: R1 FS Boundary
EPA Code: 17070204058							Stop: Trib. Below 020 R2 above 020
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	3.0	Apr 29	0	0			

Appendix Table F-5. Historic summer steelhead spawning survey data for Bologna Creek, West (Heppner RD) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork							Survey Coordinates
Stream: Bologna Creek, West (Heppner RD)							Start: Downstream from 030
EPA Code: 17070204059							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	0.5	Apr 30	0	0			

Appendix Table F-6. Historic summer steelhead spawning survey data for Bridge Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork							Survey Coordinates
Stream: Bridge Creek							Start: Unknown
EPA Code: 1707020404000							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1965	2.5	Apr 14	24	8			
1966	2.5	Apr 20	21	4			
1968	11.0	Apr 24	55	0			
1992	12.0	May 1	65	43			

Appendix Table F-7. Historic summer steelhead spawning survey data for Cherry Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork							Survey Coordinates
Stream: Cherry Creek							Start: Unknown
EPA Code: 1707020403600							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	3.0	Apr 22	26	0			

Appendix Table F-8. Historic summer steelhead spawning survey data for Hay Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork						Survey Coordinates	
Stream: Hay Creek						Start: N45º 29' 5.57" W120º 19' 18.93"	
EPA Code: 1707020410100						Stop: N45º 26' 49.54" W120º 18' 54.00"	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
*1996	2.5	May 13	13	0			0
1997	2.5	May 9	10	0	Mod	Good	0
1998	2.5	May 6	2	0	Mod	Good	0

* Survey Section: Hay Creek to Six mile

Appendix Table F-9. Historic summer steelhead spawning survey data for Henry Creek (tributary of Kahler Creek) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork						Survey Coordinates	
Stream: Henry Creek (Kahler trib.)						Start: Unknown	
EPA Code: 1707020412400						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1967	1.0	Apr 20	5	0			
1986	0.4	Apr 16	1	3			0

Appendix Table F-10. Historic summer steelhead spawning survey data for Horseshoe Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork						Survey Coordinates	
Stream: Horseshoe Creek						Start: Unknown	
EPA Code: 1707020405100						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1976	2.0	Apr 28	6	2		Poor	0
1977	2.0	Apr 20	0	0	Low		0

Appendix Table F-11. Historic summer steelhead spawning survey data for Indian Creek (Heppner RD) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork						Survey Coordinates	
Stream: Indian Creek (Heppner RD)						Start: Mouth	
EPA Code: 1707020412004						Stop: 900' above 24 culvert	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.6	Apr 9	6	14			
2003	1.5	Apr 9	0	0			

Appendix Table F-12. Historic summer steelhead spawning survey data for Kahler Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork					Survey Coordinates		
Stream: Kahler Creek					Start: N44º 52' 50.65" W119º 47' 3.48"		
EPA Code: 1707020406000					Stop: N44º 53' 58.45" W119º 45' 1.12"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1965	2.0	Apr 30	21	2			
1966	2.0	Apr 5	21	2			
1967	2.5	Apr 20	13	2			
1968	2.5	Mar 27	0	0			
1969	1.0	Apr 14	1	1			
1970	2.0	Apr 13	7	0			
1972	2.0	Apr 19	5	4			0
1973	3.5	Apr 18	2	0			
1974	1.5	Apr 18	5	0			
1975	2.0	Apr 30	18	5			0
1976	2.5	Apr 28	9	1			0
1977	2.0	Apr 20	0	0	Low		0
1978	2.0	Apr 19	8	2			
1979	2.0	Mar 4	0	0			
1980	2.0	Apr 23	9	0			0
1981	2.0	Apr 15	13	3			
1982	2.0	Apr 28	5	0			0
1983	2.0	Apr 15	4	1			0
1984	2.0	Apr 25	2	0			
1985	2.0	Apr 29	15	1			0
1986	2.0	Apr 16	21	8			
1987	2.0	Apr 30	54	2			
1988	2.0	Apr 30	21	1			
1989	2.5	May 4	8	2			0
1990	2.0	Apr 12	14	2			
1991	2.0	Apr 23	13	2			1 W
1992	2.0	Apr 23	8	1			0
1993	3.0	May 11	6	2			0
1994	2.7	Apr 28	2	0			0
1995	2.7	May 8	2	0			0
1996	2.7	May 3	5	0			0
1997	2.7	May 6	3	2	Mod	Good	1 U
1998	2.7	Apr 30	7	2	Mod	Good	0
1999	2.7	Apr 30	11	3			1 Female
2000	2.7	May 3	7	0	Low-Mod		0
2001	2.7	May 4	28	7	Low	Good	0
2002	2.7	Apr 25	15	10	Low	Good	2 W Male, 3W, 1H Male

Appendix Table F-13. Historic summer steelhead spawning survey data for Lone Rock Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork						Survey Coordinates	
Stream: Lone Rock Creek						Start: Unknown	
EPA Code: 1707020411500						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1964	1.5	May 22	4	0			
1965	1.5	Mar 31	1	0			
1966	1.5	May 11	4	0			

Appendix Table F-14. Historic summer steelhead spawning survey data for Nelson Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork						Survey Coordinates	
Stream: Nelson Creek						Start: Unknown	
EPA Code: 1707020100000						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1992	1.25	Apr 30	0	0			

Appendix Table F-15. Historic summer steelhead spawning survey data for Parrish Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork					Survey Coordinates		
Stream: Parrish Creek					Start: N44º 46' 11.02" W119º 48' 57.64"		
EPA Code: 1707020405400					Stop: N44º 43' 17.78" W119º 50' 10.8"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1959	2.0		21	5			
1960	2.0	Apr 4	8	10			
1961	2.0	Mar 29	31	4			
1962	2.0	Apr 12	13	6			
1963	2.0	Mar 29	14	0			
1964	2.0	Apr 13	15	6			
1965	2.0	Mar 23	5	1			
1966	2.0	Apr 4	33	15			
1967	2.0	Apr 14	0	0			
1968	2.0	Mar 27	0	0			
1969	2.0	Apr 14	11	3			
1970	2.5	Apr 13	9	0			
1972	8.5	Apr 18	26	5			0
1973	4.0	Apr 18	0	0			
1974	3.5	Apr 18	16	3			
1975	3.0	Apr 24	12	1	High	Poor	0
1976	3.0	Apr 28	11	1			
1977	3.0	Apr 20	0	0	Low		0
1978	3.0	Apr 19	14	0			
1979	3.0	May 4	1	0			
1980	3.0	Apr 23	12	2			0
1981	3.0	Apr 15	4	0			
1982	3.0	Apr 28	3	0			0
1983	3.0	Apr 15	9	4			0
1984	3.0	Apr 18	18	0			
1985	3.0	Apr 29	13	2			0
1986	3.0	Apr 16	35	8			0
1987	3.0	Apr 30	43	2			
1988	3.0	May 3	17	5			
1989	3.0	May 4	8	1			0
1990	3.0	Apr 12	0	0			
1991	3.0	Apr 23	1	0			0
1992	3.0	Apr 17	2	0	Low	Fair	0
1993	3.0	Apr 29	6	0			0
1994	3.2	Apr 28	0	0			0
1995	3.2	May 8	1	0			0
1996	3.2	May 3	7	0			0
1997	3.2	May 6	5	0	Mod	Fair	0
1998	3.2	Apr 30	1	0	Mod	Fair	0
1999	3.2	Apr 30	2	1			0
2000	3.2	May 3	11	0	Low-Mod		1 Female
2001	3.2	May 4	1	0	Low	Fair	0
2002	3.2	Apr 25	0	0	Low	Good	0

Appendix Table F-16. Historic summer steelhead spawning survey data for Pine Creek (Wheeler County) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork					Survey Coordinates		
Stream: Pine Creek (Wheeler County)					Start: N44º 54' 37.45" W120º 26' 21.23"		
EPA Code: 1707020407000					Stop: N44º 54' 34.55" W120º 22' 48.15"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1976	3.0	Apr 28	11	1	Mod		0
1986	1.4	May 13	14	0			0
1987	3.0	Apr 29	56	1			0
1988	3.5	May 11	46	0			
1989	3.3	May 5	37	8			5
1990	3.3	May 8	10	0			
1994	1.0	May 2	0	0			0
1995	3.0	Apr 25	5	3			0
1996	3.0	Apr 29	16	3			0
1997	3.0	Apr 29	10	2			1 Male
1998	3.0	Apr 29	0	0	Mod	Fair	0
*1999	2.0	Apr 29	6	0		Good	0
2000	3.0	Apr 27	0	0	Mod	Good	0
2001	3.2	Apr 27	1	0		Good	0
2002	3.2	Apr 23	12	5			1

*Survey was done in the lower half section of creek.

Appendix Table F-17. Historic summer steelhead spawning survey data for Pine Hollow 2 Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork					Survey Coordinates		
Stream: Pine Hollow 2 Creek					Start: N45º 3' 25.31" W120º 36' 59.17"		
EPA Code: 1707020401400					Stop: N45º 2' 26.81" W120º 37' 37.36"		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1962	21.0		3				
1996		Apr 25	0	0			0
1997	3.2	Apr 15	6	2	Mod	Good	0
1998	3.2	Apr 24	7	0	Mod	Good	0
1999	3.2		14				
2000		Apr 19	14	4	Low	Good	0
2001	3.2	Apr 27	2	0	Low	Good	0
2002	3.2	Apr 29	0	0	Low	Good	0

Appendix Table F-18. Historic summer steelhead spawning survey data for Rock Creek (Morrow Co., Anson-Wright) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork							Survey Coordinates
Stream: Rock Creek (Morrow Co., Anson-Wright)							Start: Unknown
EPA Code: 1707020412002							Stop: Unknown
Stream Survey Status: Backup Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	4.0		12				
1988	1.5		14				
1992	3.0	May 11	33	0			0
1993	3.5	Jun 2	6	0			0
1994	3.5	May 24	5	0			0
1995	3.5	May 17	2	0			
2001	[b] 1.0	Apr 13	1	0		Good	0
[a]	[c] 2.0		49	22			1 W Male, 2 W Unk
2002	3.5	Apr 25	1	0	Low	Fair	0

[a] EPA code = 1707020410700 These are supplemental, non-index surveys conducted downstream of the irrigation dam that blocked fish passage.
[b] Survey section = one mile above the dam
[c] Survey section = dam downstream to the bridge below Jordan's house

Appendix Table F-19. Historic summer steelhead spawning survey data for Service Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork							Survey Coordinates
Stream: Service Creek							Start: Unknown
EPA Code: 1707020406400							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	1.0	Apr 29	3	1			

Appendix Table F-20. Historic summer steelhead spawning survey data for Tamarack Creek (tributary of Kahler Creek) of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork							Survey Coordinates
Stream: Tamarack Creek (Kahler Trib.)							Start: Unknown
EPA Code: 1707020416500							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1986	0.3	Apr 16	3	0			0

Appendix Table F-21. Historic summer steelhead spawning survey data for Thirtymile Creek of the Lower Mainstem John Day Basin.

Subbasin: Lower Mainstem downstream of North Fork					Survey Coordinates		
Stream: Thirtymile Creek					Start: N45º 1' 50.66" W120º 5' 4.57"		
EPA Code: 1707020408600					Stop: N44º 59' 8.84" W120º 2' 25.29"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1986	2.6	Apr 17	103	4			0
1987	2.6	Apr 29	112	5			
1988	2.6	May 3	17	3			
1991	2.6	May 15	7	0			0
1992	2.6	Apr 23	19	0		Good	0
1993	3.0	May 11	4	0			0
1994	3.0	May 2	7	0			0
1995	3.0	Apr 25	5	0			0
1996	3.0	Apr 29	1	0			0
1997	3.0	Apr 29	9	2	Mod		0
1998	3.0	Apr 29	6	1	Mod	Fair	0
1999	3.0	Apr 29	19	1	Low	Good	0
2000	3.0	Apr 27	112	6	Mod	Good	1 W, 2 Unk
2001	3.0	Apr 26	103	22	Low	Good-fair	1 Female
2002	3.0		123				

APPENDIX G

South Fork John Day Basin, Historic Summer Steelhead Spawning Survey Data

Appendix Table G-1. Historic summer steelhead spawning survey data for Black Canyon Creek of the South Fork John Day Basin.

Subbasin: South Fork					Survey Coordinates		
Stream: Black Canyon Creek					Start: N44º 20' 1.71" W119º 33' 53.84"		
EPA Code: 1707020101600					Stop: N44º 20' 35.35" W119º 37' 20.27"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1969	3.5	May 3	41	27			
1970	3.5	Apr 24	27	10			
1971	3.5	Apr 29	39	10			
1972	3.5	Apr 28	43	7			0
1973	3.5	May 2	26	2			
1976	3.5	May 12	18	0			0
1977	3.5	Apr 27	25	12			0
1978	3.5	May 5	12	0			
1979	3.5	May 18	0	0			
1980	3.5	May 22	6	0			
1981	3.5	May 12	13	0			
1982	3.5	Jun 1	5	0	High		0
1985	3.5	May 10	6	2			0
1986	3.5	May 7	11	0			0
1987	2.5	May 20	8	0			
1991	3.5	May 13	6	1	High	Good	0
1992	3.5	May 6	12	5			0
1993	2.0		5	0			
1994	3.0	May 18	8	1			0
1995	3.0	May 24	2	0	Mod	Good	0
1997	3.0	May 30	5	0			
1998	3.0	May 21	2	0			
1999	3.0	Jun 3	2	0	Mod-high		0
2001	3.0	May 23	12	0		Good	0
2002	3.0	May 16	17	3		Good	1 H

Appendix Table G-2. Historic summer steelhead spawning survey data for Deer Creek of the South Fork John Day Basin.

Subbasin: South Fork					Survey Coordinates		
Stream: Deer Creek					Start: N44º 11' 51.82" W119º 28' 34.36"		
EPA Code: 1707020104800					Stop: N44º 12' 22.34" W119º 22' 48.67"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1969	8.0		128				
1972	8.0		70				
1973	6.0		26				
1974	6.0		32				
1975	6.0		61				
1976	6.0		28				
1978	6.0		23				
1979	5.5		3				
1980	6.0		17				
1981	6.0		27				
1982	5.5		38				
1985	6.0		107				
1986	6.0		68				
1987	6.0		126				
1988	6.0		125				
1989	6.0		0				
1990	6.0		2				
1991	6.0		4				
1992	3.0		7				
1994	6.0		30				
1995	6.0		7				
1996	6.0		7				
1997	6.0		21				
1999	6.0		6				
2000	6.0		19				
2001	6.0		48				
2002	6.0		76				
2003	6.0		53				

Appendix Table G-3. Historic summer steelhead spawning survey data for Deer Creek (BLM) of the South Fork John Day Basin.

Subbasin: South Fork						Survey Coordinates	
Stream: Deer Creek (BLM)						Start: Unknown	
EPA Code: 1707020100000						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	3.0	May 7	26	0			0
1989	3.0	May 26	4	0			0
1998	1.6	May 21	1	0			
2000		May 30	19	0		Good	0

Appendix Table G-4. Historic summer steelhead spawning survey data for Deer Creek, Lower, of the South Fork John Day Basin.

Subbasin: South Fork						Survey Coordinates	
Stream: Deer Creek, Lower						Start: Unknown	
EPA Code: 1707020104800						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	3.0	May 20	26	1			

Appendix Table G-5. Historic summer steelhead spawning survey data for Murderer's Creek, Upper of the South Fork John Day Basin.

Subbasin: South Fork						Survey Coordinates	
Stream: Murderer's Creek, Upper						Start: Unknown	
EPA Code: Unknown						Stop: Unknown	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1960	3.0	May 25	58	1			
1961	3.5	May 15	17	4			
1962	3.5	May 18	75	11			
1963	3.5	Jun 4	8	1			
1964	3.5	May 18	38	8			
1965	3.5	May 26	59	7			
1966	3.5	May 23	87	1			
1967	3.5	May 31	39	3			
1968	3.5	May 22	1	0			
1969	3.5		51				
1970	3.5	May 29	52	8			
1971	3.5	May 26	31	3			
1972	3.5	May 24	38	2			0
1973	2.6	May 16	41	0			
1974	3.5	Jun 5	25	0			
1975	3.0	Jun 4	56	0			0
1976	2.6	May 26	35	0			0
1977	2.0		32	3			
1978	3.5		23				
1979	2.5		8				
1980	2.5		16				
1982	2.5		33				
1983	2.5		15				
1985	3.5	May 20	38	8			0
1986	3.5	May 21	38	7			0
1987	3.0		57				
1988	3.0		55				
1989	3.0	May 31	14	0			0
1990	3.0		12				
1991	3.0		4				
1992	3.0		3				
1993	3.0		11				
1994	3.0		23				
1995	2.5		3				
1996	2.5		1				
1997	3.5		1				
1999	2.5		2				
2000	2.5		0				
2001	2.5		0				
2002	2.5		7				
2003	2.5		8				

Appendix Table G-6. Historic summer steelhead spawning survey data for Murderer's Creek, Lower, of the South Fork John Day Basin.

Subbasin: South Fork					Survey Coordinates		
Stream: Murderer's Creek, Lower					Start: N44º 18' 14.77" W119º 29' 13.71"		
EPA Code: 1707020105200					Stop: N44º 17' 8.12" W119º 26' 9.11"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1969	7.5	Jun 11	39	1			
1976	2.0		10				
1977	2.0	May 4	10	2			
1978	2.0	May 30	5	0			
1980	2.0	May 8	4	0			0
1981	2.0	May 6	5	0			
1982		Jun 2					
1987	2.0	May 20	26	3			
1988	3.5	Jun 10	70	7			
1990	3.5	Apr 23	27	4			
1991	3.5	May 2	35	2			0
1992	3.5	Apr 29	38	8			1 W Male
1993		Jun 11					
1994	3.5	May 16	13	0			0
1995	3.5	May 26	7	0			0
1996	3.0	Jun 6	0	0			
1997	3.5	MAY 20	2	0			
1998	3.5	May 19	5	0			
1999	3.5	May 21	4	0	High	Fair	0
2000	3.5	May 23	11	0	Low-mod	Good	0
2001	3.5	May 17	27	4	Low	Good	0
2002	3.5	May 16	39	3	Mod	Good	0

Appendix Table G-7. Historic summer steelhead spawning survey data for Murderer's Creek, Supplemental, of the South Fork John Day Basin.

Subbasin: South Fork						Survey Coordinates	
Stream: Murderer's Creek, Supplemental (Low cabin to Stewart Cabin)						Start: Unknown	
EPA Code: 1707020105200, 1707020105500						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002		Jun 7	6	0		Good	0

Appendix Table G-8. Historic summer steelhead spawning survey data for Murderer's Creek, South Fork (Supplemental), of the South Fork John Day Basin.

Subbasin: South Fork						Survey Coordinates	
Stream: Murderer's Creek, South Fork (Supplemental)						Start: Unknown	
EPA Code: 1707020105400						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2001			1	0		Good	0

Appendix Table G-9. Historic summer steelhead spawning survey data for South Fork John Day River of the South Fork John Day Basin.

Subbasin: South Fork						Survey Coordinates	
Stream: South Fork John Day River						Start: Unknown	
EPA Code: 1707020101500						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1988	2.0	May 25	17	1			
1990	4.0	May 23	74	5			
1992	4.0	Apr 30	20	0			0

Appendix Table G-10. Historic summer steelhead spawning survey data for Tex Creek of the South Fork John Day Basin.

Subbasin: South Fork					Survey Coordinates		
Stream: Tex Creek					Start: N44º 17' 8.2" W119º 26' 9.11"		
EPA Code: 1707020110900					Stop: N44º 17' 13.48" W119º 15' 11.86"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1960	2.5	May 24	54	10			
1965	2.5	May 26	75	2			
1966	2.5	May 23	56	0			
1967	2.5	May 31	25	2			
1968	2.5	May 22	3	0			
1969	2.5	Jun 8	35	0			
1970	2.5	Jun 2	10	2			
1971	2.5	May 26	34	1			
1972	2.5	May 24	38	2			0
1973	2.7	May 16	18	2			
1974	2.5	May 31	18	0			
1975	2.5	May 29	32	3			0
1976	2.7	May 26	18	0			0
1978	2.5	May 26	27	0			
1979	2.5	May 29	11	2			
1980	2.0	May 21	10	0			0
1982	2.5	May 26	28	2			0
1983	2.5	Jun 8	12	0			
1984	2.5	Jun 6	30	2			
1985	2.5	May 17	46	3			0
1986	2.5	May 21	19	3			0
1987	2.5	May 26	69	0			
1988	2.0	May 25	4	0			
1989	2.0	May 31	9	0			0
1990	2.0	May 16	1	0			
1991	2.0	Jun 7	2	0			0
1992	2.0	Jun 3	1	0			0
1993	2.0	Jun 11	8	0		Fair	0
1994	2.5	May 27	14	0			0
1995	2.5	Jun 7	4	0	High		0
1996	2.5	Jun 3	2	0			0
1997	2.5	May 23	0	0			
1998	2.5	Jun 1	2	0			
1999	2.5	May 26	2	0	Mod	Good	0
2000	2.5	May 29	2	0	Low	Good	0
2001	2.5	May 24	0	0		Good	0
2002	2.5	May 23	6	0	Low	Good	0

Appendix Table G-11. Historic summer steelhead spawning survey data for Wind Creek of the South Fork John Day Basin.

Subbasin: South Fork					Survey Coordinates		
Stream: Wind Creek					Start: N44º 16' 14.33" W119º 32' 57.67"		
EPA Code: 1707020110100					Stop: N44º 16' 16.06" W119º 33' 48.67"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1969	1.0	May 2	36	4			
1970	1.0	Apr 24	26	6			
1972	1.0	May 12	22	0			0
1973	1.0	Apr 25	15	1			
1974	1.0	May 9	2	0			
1975	1.0	May 6	19	3			0
1976	1.0	Apr 28	11	0			0
1977	1.0	May 4	0	0			0
1978	1.0	May 16	5	0			
1979	1.0	May 2	6	0			
1980	1.0	May 6	14	0			0
1981	1.0	May 6	6	0			
1982	1.0	May 12	4	0			0
1983	1.0	May 9	16	0			0
1984	1.0	May 18	6	0			
1985	1.0	May 13	8	1			0
1986	1.0	May 6	18	0			0
1987	1.0	May 20	3	0			
1988	1.0	May 13	11	0			
1991	1.0	May 2	4	1			0
1992	1.0	Apr 29	6	1			0
1993	1.0	May 27	2	0			0
1994	1.0	May 16	1	0			0
1995	1.0	May 10	6	0	High	Good	0
1996	1.0	Jun 6	9	0			
1997	1.0	May 20	2	0			
2000	1.0	May 23	7	0	L-M	Good	0
2001	1.0	May 17	3	0	Low	Good	0
2002	1.0	May 16	4	0	Low	Good	0

APPENDIX H

North Fork John Day Basin, Historic Summer Steelhead Spawning Survey Data

Appendix Table H-1. Historic summer steelhead spawning survey data for Alder Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Alder Creek (Heppner Ranger District)						Start: 21 Rd	
EPA Code: Unknown						Stop: Skookum	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	2.5	May 10	9	1			

Appendix Table H-2. Historic summer steelhead spawning survey data for Alder Creek (Heppner Ranger District 2) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Alder Creek (Heppner Ranger District 2)						Start: 21 Rd	
EPA Code: Unknown						Stop: "y" above camps	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	0.5	May 15	9	0			

Appendix Table H-3. Historic summer steelhead spawning survey data for Bacon Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Bacon Creek (Heppner Ranger District)						Start: Mouth	
EPA Code: 1707020212800						Stop: Moreland Canyon	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.4	May 2	5	0			

Appendix Table H-4. Historic summer steelhead spawning survey data for Beaver Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Beaver Creek						Start: N44º 39' 9.02" W118º 40' 36.45"	
EPA Code: 1707020306000						Stop: N44º 40' 10.54" W118º 39' 49.33"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1964	2.0	May 25	8	1			
1966	2.0	May 2	37	0			
1967	2.0	Jun 6	27	0			
1968	2.0	May 31	9	0			
1969	2.0	Jun 11	15	1			
1977	2.0	Jun 7	7	0			
1978	2.0	Jun 13	2	0			
1979	2.0	Jun 11	2	0			
1980	2.0	Jun 19	3	0			0
1981	2.0	Jun 10	4	0			
1982		Jun 14	1	0			0
1983	1.5	Jun 22	6	0			
1984	1.5	Jun 18	2	0			
1985	2.0	Jun 12	8	0			0
1986	2.0	Jun 11	4	0			0
1987	2.0	Jun 10	8	1			
1988	2.0	Jun 14	19	0			
1989	2.0	Jun 7	8	0			0
1990	1.0	Jun 20	0	0			
1991	2.0	Jun 26	0	0			0
1992	2.5	Jun 10	5	0			
1993	1.5	Jun 16	3	0			0
1994	1.4	Jun 2	0	0			0
1995	2.0	Jun 12	1	0			0
1996	2.0	May 31	6	0			0
1997	1.4	Jun 6	1	0			
2000	1.4	May 31	6	0		Good	0
2001	1.4	May 30	5	1		Good	0
2002	1.4	May 29	7	0	Mod	Good	0

Appendix Table H-5. Historic summer steelhead spawning survey data for Big Wall Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Big Wall Creek						Start: South Fork Wall	
EPA Code: 170720207700						Stop: 2307 Rd	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.3	Apr 11	0	10			

Appendix Table H-6. Historic summer steelhead spawning survey data for Boundary Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Boundary Creek						Start: Unknown	
EPA Code: 1707020210300						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1980	1.0	Jun 19	0	0			0

Appendix Table H-7. Historic summer steelhead spawning survey data for Bowman Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Bowman Creek						Start: Unknown	
EPA Code: 170720213100						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1978	1.0	May 31	0	0			
1983	2.5		2				

Appendix Table H-8. Historic summer steelhead spawning survey data for Bull Run Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Bull Run Creek						Start: Unknown	
EPA Code: 170720203901						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1980	2.0	Jun 19	2	0			0
1987	1.5	Jun 10	10	0			
1993		Jun 16	0	0			0
1994	1.5	Jun 2	1	0			0

Appendix Table H-9. Historic summer steelhead spawning survey data for Cable Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Cable Creek						Start: N45º 9' 18.75" W118º 50' 22.3"	
EPA Code: 1707020205000						Stop: N45º 7' 9.03" W118º 47' 21.62"	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1963	3.0	May 22	7	0			
1964	4.0	May 6	25	2			
1965	4.0	May 10	19	10			
1966	4.0	Apr 26	46	1			
1967	8.0	Jun 7	22	1			
1968	5.0	May 1	33	7			
1970	8.0	Apr 29	61	8			
1973	5.5	May 24	12	0			
1978	7.0	Jun 1	13	0			
1979	7.0	Jun 7	0	0			
1983	7.0		11				
1985	3.0	May 15	11	1			0
1986	3.0	May 14	19	1			0
1987	2.3	May 7	27	1			
1988	2.5	May 18	13	0			
1989	2.3	May 23	0	0			0
1990	2.0	May 11	2	0			
1992	3.0	Apr 27	3	2			
1994			25				
1996	3.0	Jun 1	6	0			

Appendix Table H-10. Historic summer steelhead spawning survey data for Cable Creek, North Fork of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Cable Creek, North Fork						Start: Unknown	
EPA Code: 1707020205001001						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1977	2.0		8				
1978	2.0	Jun 1	0	0			
1980	2.0	May 29	0	0			0

Appendix Table H-11. Historic summer steelhead spawning survey data for Camas Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Camas Creek						Start: N45º 11' 18.82" W118º 45' 51.93"	
EPA Code: 1707020204300						Stop: N45º 10' 2.11" W118º 39' 59.21"	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1963	2.0	May 22	14	0			
1964	1.5	Jun 12	9	0			
1965	1.5	May 13	6	0			
1966	1.5	May 2	18	0			
1967	3.5	May 3	39	4			
1968	7.5	Apr 18	33	1			
1969	4.0	May 14	37	0			
1970	2.0	Apr 27	8	0			
1973	4.2	Jun 6	41	0			
1978	6.0	Jun 1	0	0			
1982	2.5	May 24	8	0			0
1984	3.5	May 25	2	0			
1985	9.5	May 15	49	0			0
1986	2.0	May 29	11	0		Fair	0
1987	2.5	May 7	20	0			
1988	3.0	May 18	17	3			
1989	2.5	May 23	0	0			0
1992	5.0	Apr 27	29	0		Fair	0

Appendix Table H-12. Historic summer steelhead spawning survey data for Clear Creek (tributary of Granite Creek) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Clear Creek (Tributary of Granite Creek)						Start: Unknown	
EPA Code: 17070308800						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1986	2.2	May 20	25	2			
1987	1.0	Jun 10	1	0			

Appendix Table H-13. Historic summer steelhead spawning survey data for Colvin Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Colvin Creek (Heppner Ranger District)						Start: Forest Service Boundary	
EPA Code:						Stop: Exclosure Fence	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	0.75	Apr 12	3	1			

Appendix Table H-14. Historic summer steelhead spawning survey data for Deep Creek (North Fork) of the North Fork John Day Basin.

Subbasin: North Fork							Survey Coordinates
Stream: Deep Creek (North Fork)							Start: Unknown
EPA Code: 1707020210200							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1982	1.0	Jun 15	3	0			0

Appendix Table H-15. Historic summer steelhead spawning survey data for Deer Creek (North Fork) of the North Fork John Day Basin.

Subbasin: North Fork							Survey Coordinates
Stream: Deer Creek (North Fork)							Start: Unknown
EPA Code: 1707020215600							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1985	0.5	May 7	2				
*1986	2.5	May 27	5	0			0
1987	2.0	May 11	14	1			
1989	2.0	May 23	0	0			0
1990	2.0	Apr 9	3	0			

*Survey Section = Deer Creek to house up to meadow

Appendix Table H-16. Historic summer steelhead spawning survey data for Desolation Creek of the North Fork John Day Basin.

Subbasin: North Fork							Survey Coordinates
Stream: Desolation Creek							Start: Unknown
EPA Code: 1707020202100							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	2.5	Jun 12	14	1			
1988	3.0	Jun 14	23	0			

Appendix Table H-17. Historic summer steelhead spawning survey data for Desolation Creek (South Fork) of the North Fork John Day Basin.

Subbasin: North Fork							Survey Coordinates
Stream: Desolation Creek (South Fork)							Start: Unknown
EPA Code: 1707020202400							Stop: Unknown
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1977	2.0	Jun 10	0	0			
1978	2.5	Jun 16	0	0			
1987	1.2	Jun 12	1	0			

Appendix Table H-18. Historic summer steelhead spawning survey data for Fivemile Creek, tributary to Camas Creek, of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Fivemile Creek						Start: Unknown	
EPA Code: Unknown						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1990	2.0	May 14	6	0			
1993	3.0	Jun 16	3	0			
1994	2.0	Jun 3	3	0			
1995	2.5	Jun 1	3	0			
1996	4.2	May 14	8	0			1 H Ad clip

Appendix Table H-19. Historic summer steelhead spawning survey data for Fox Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Fox Creek						Start: N44º 38' 17.33" W119º 9' 8.55"	
EPA Code: 1707020208100						Stop: N44º 37' 46.09" W119º 5' 3.62"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1986	2.5	May 27	1	0			0
1987	2.5	May 4	15	1			
1988	3.0	May 9	21	7			
1990	3.0	May 9	4	0			
1992	1.75	Apr 30	33	0			0
1993	3.0	May 28	12	0			
1994	3.2	Jun 2	16	0			
1995	3.0	May 17	8	0			0
1996	3.0	May 6	37	1			
1997	3.0	May 6	27	4			
1998	3.0	May 13	16	0			
1999	2.7		4				
2000	2.7	May 11	54	0			
2001	2.7	May 11	35	5			
2002	2.5	May 1	39	15	Mod	Good	0

Appendix Table H-20. Historic summer steelhead spawning survey data for Hidaway Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Hidaway Creek						Start: Unknown	
EPA Code: 1707020205200						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1980	5.0	May 30	0	0			0
1993		Jun 3	0	0			0

Appendix Table H-21. Historic summer steelhead spawning survey data for Hog Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Hog Creek (Heppner Ranger District)						Start: Mouth	
EPA Code: 1707020207201						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.5	May 1	5	0			

Appendix Table H-22. Historic summer steelhead spawning survey data for Lane Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Lane Creek						Start: Unknown	
EPA Code: 1707020205500						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1981	1.0	May 18	2	0			

Appendix Table H-23. Historic summer steelhead spawning survey data for Little Wilson Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Little Wilson Creek						Start: Mouth	
EPA Code: Unknown						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	0.25	Apr 11	0	0			

Appendix Table H-24. Historic summer steelhead spawning survey data for Mallory Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Mallory Creek						Start: Unknown	
EPA Code: 1707020206500						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	2.0	May 13	15	1			

Appendix Table H-25. Historic summer steelhead spawning survey data for Mallory Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Mallory Creek (Heppner Ranger District)						Start: Stalder Creek	
EPA Code: Unknown						Stop: 2105 Rd	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	4.2	May 15	2	0			

Appendix Table H-26. Historic summer steelhead spawning survey data for Olive Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Olive Creek						Start: N44º 46' 29.23" W118º 26' 58.85"	
EPA Code: 1707020213200						Stop: N44º 45' 3.84" W118º 28' 6.39"	
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1964	0.5	May 25	6	0			
1969	2.0	Jun 11	20	0			
1973	2.0	Jun 6	11	0			
1977	2.0	Jun 7	5	0			
1978	2.0	Jun 13	7	0			
1979	2.0	Jun 11	4	0			
1980	2.0	Jun 19	6	0			0
1981	2.0	Jun 10	4	0			
1982		Jun 14	0	0	High	Fair	0
1983	2.0	Jun 22	7	0			
1984	2.0	Jun 18	1	0			
1985	2.0	Jun 12	11	0			0
1986	2.0	Jun 11	23	0			0
1987	2.0	Jun 10	8	1			
1988	2.0	Jun 14	11	0			
1989	2.0	Jun 7	1	0			0
1990	2.0	Jun 20	0	0			
1991	2.0	Jun 26	0	0			0
1992	2.0	Jun 10	11	0			
1993	2.0	Jun 16	4	0			0
1994	2.0	Jun 2	6	0			0
1995	2.0	Jun 12	4	0			0
1996	2.0	May 31	9	0			0
1997	2.0	Jun 6	4	0			
2000	2.0	May 31	6	2			0
2001	2.0	May 30	7	0		Good	0
2002	2.0	May 29	10	1	Mod	Good	0

Appendix Table H-27. Historic summer steelhead spawning survey data for Owens Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Owens Creek						Start: N45º 11' 31.59" W118º 52' 44.93"	
EPA Code: 1707020205600						Stop: N45º 14' 12.39" W118º 49' 50.62"	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1965	2.5		6				
1966	9.0		60				
1967	2.5		59				
1968	2.5		2				
1969	3.5		20				
1970	3.0		32				
1971	3.0		31				
1973	3.5		4				
1978	3.0		3				
1979	3.0		3				
1981	3.0		3				
1982	3.0		9				
1983	3.5		41				
1984	3.5		16	4			
1985			33				
1986	3.0	May 14	13	0			0
1987	3.0	May 7	39	0			
1988	3.0	May 18	17	3			
1989	3.0	May 23	0	0			
1990	3.0	May 11	3	0			
1991	3.0	May 16	16	0			0
1992	3.0	Apr 27	6	0			

Appendix Table H-28. Historic summer steelhead spawning survey data for Porter Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Porter Creek (Heppner Ranger District)						Start: Boundary of lower private	
EPA Code: Unknown						Stop: Upper Forest Service boundary	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.5	May 1	7	1			

Appendix Table H-29. Historic summer steelhead spawning survey data for Potamus Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Potamus Creek						Start: Unknown	
EPA Code: 1707020206100						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	1.0	May 13	7	0			

Appendix Table H-30. Historic summer steelhead spawning survey data for Potamus Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Potamus Creek (Heppner Ranger District)						Start: 2105 Rd	
EPA Code: 170702020620.5/1707020206201						Stop: Pole Creek	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	3.0	May 16	6	4			

Appendix Table H-31. Historic summer steelhead spawning survey data for Rancheria Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Rancheria Creek						Start: Unknown	
EPA Code: 1707020211700						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1966	1.0	Apr 26	10	2			
1967	1.5	May 3	10	2			
1969	1.0	May 14	4	0			
1978	1.0	May 31	2	0			
1979	1.0	Jun 7	0	0			
1982	1.0	May 24	2	0			0
1984	2.0	Apr 17	5	0			
1985	2.0	May 15	10	0			0
1986	1.0	May 14	3	0			0

Appendix Table H-32. Historic summer steelhead spawning survey data for Rudio Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Rudio Creek						Start: Unknown	
EPA Code: 1707020200200						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1968	1.5	Mar 29	4	2			
1970	4.0	Apr 17	10	3			
1983	3.5	May 21	22	1			
1985	2.3	May 10	32	5			0
1986	3.0	May 15	37	2			0
1988	3.2	May 19	34	5			
1989	2.8	Jun 8	5	0			
1990	2.8	May 2	8	0			
1992	4.9	May 21	0	0			

Appendix Table H-33. Historic summer steelhead spawning survey data for Skookum Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Skookum Creek (Heppner Ranger District)						Start: Alder	
EPA Code: 1707020207200						Stop: 21 Rd	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	2.5	May 10	2	2			

Appendix Table H-34. Historic summer steelhead spawning survey data for Swale Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Swale Creek (Heppner Ranger District)						Start: 0.25 miles below Exclosure	
EPA Code:						Stop: End of 212-090	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	6.0	May 17	1	0			

Appendix Table H-35. Historic summer steelhead spawning survey data for Trail Creek (Lower) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Trail Creek (Lower)						Start: Unknown	
EPA Code: 1707020210700						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1978	2.5	Jun 14	6	0			
2002	2.1	Jun 4	3	2			0

Appendix Table H-36. Historic summer steelhead spawning survey data for Trail Creek, Middle Fork of the North Fork John Day Basin.

Subbasin: North Fork					Survey Coordinates		
Stream: Middle Fork Trail Creek					Start: N44º 56' 9.60" W118º 21' 4.73"		
EPA Code: 1707020221500					Stop: N44º 56' 47.06" W118º 21' 21.86"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1979	2.0		7				
1980	0.5	Jun 20	0	0			0
1985	2.0	Jun 12	6	0			0
1986	2.0	Jun 11	5	0			0
1992	1.0	Jun 10	2	0			0
1993		Jun 16	0	0			0
1994	1.0	Jun 1	1	0			0
1995	1.0	Jun 8	0	0			0
1996	1.0	Jun 10	2	0			0
1997	1.0	Jun 12	1	0			
1998	1.0	Jun 15	1	0	Mod	Good	0
1999	1.0	Jun 4	1	0	Mod		0
2000	1.0	Jun 1	0	0			
2001	1.0	Jun 5	0	0	Low	Good	0
2002	1.0	Jun 4	6	0	Mod	Good	0

Appendix Table H-37. Historic summer steelhead spawning survey data for Trail Creek, North Fork, of the North Fork John Day Basin.

Subbasin: North Fork					Survey Coordinates		
Stream: Trail Creek, North Fork					Start: N44º 56' 11.34" W118º 23' 19.14"		
EPA Code: 1707020210700					Stop: N44º 57' 57.75" W118º 21' 16.74"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1979	2.0	Jun 12	7	0			
1980	2.5	Jun 20	8	1			0
1981	2.5	Jun 10	0	0			
1984	1.0	Jun 19	0	0			
1985	2.5	Jun 12	12	0			0
1986	2.5	Jun 11	1	0			0
1988	3.5	Jun 14	29	0			
1989	3.5	Jun 7	12	0			0
1990	2.5	Jun 20	5	0			
1991	2.5	Jun 26	2	0			0
1992	3.0	Jun 10	6	0			0
1993	3.0	Jun 16	6	0			0
1994	3.0	Jun 1	6	0			0
1995	3.0	Jun 8	6	2			0
1996	3.0	Jun 10	10	0			0
1997	3.0	Jun 12	2	0			
1998	3.0	Jun 15	2	0	Mod	Good	0
1999	3.0	Jun 4	2	1	Mod		0
2000	3.0	Jun 1	3	1	Low	Poor	0
2001	3.0	Jun 5	4	0	Low	Good	0
2002	3.0	Jun 4	11	1			0

Appendix Table H-38. Historic summer steelhead spawning survey data for Trail Creek (South Fork), of the North Fork John Day Basin.

Subbasin: North Fork					Survey Coordinates		
Stream: Trail Creek, South Fork					Start: N44º 56' 25.23" W118º 19' 21.86"		
EPA Code: 1707020210800					Stop: N44º 56' 11.34" W118º 23' 19.14"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1980	1.5	Jun 20	0	0			0
1985	2.0	Jun 12	8	0			0
1986	2.0	Jun 11	7	0			0
1988	2.0	Jun 14	7	0			
1989	2.0	Jun 7	0	0			0
1990	3.5	Jun 20	3	0			
1991	3.5	Jun 26	1	0			0
1992	4.0	Jun 10	8	0			0
1993	4.0	Jun 16	2	0			
1994	4.0	Jun 1	2	0			0
1995	4.0	Jun 8	6	2			0
1996	3.5	Jun 10	1	0			0
1997	3.5	Jun 12	0	0			
1998	3.5	Jun 15	4	0	Mod	Good	0
1999	3.5		0	0	Mod		0
2000	3.5	Jun 1	1	0			
2001	3.5	Jun 5	4	0		Good	0
2002	3.5	Jun 4	2	1	Mod	Good	0

Appendix Table H-39. Historic summer steelhead spawning survey data for Wall Creek of the North Fork John Day Basin.

Subbasin: North Fork							Survey Coordinates
Stream: Wall Creek							Start: N44º 55' 26.22" W119º 31' 39.08"
EPA Code: 1707020206800							Stop: N44º 55' 41.44" W119º 35' 32.55"
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1967	5.0	Apr 28	48	0			
1969	3.5	May 12	37	2			
1970	3.5	Apr 15	15	5			
1971	3.5	May 4	20	1			
1972	3.5	Apr 26	19	0			0
1973	4.5	Apr 24	5	3			
1976	3.5	May 7	15	0			0
1977	3.7	Apr 20	15	4			0
1978	3.7		17	1			
1979	3.5	May 15	0	0			
1980	3.5	Apr 30	19	0			0
1981	3.5	Apr 22	5	2			
1982	3.5	May 5	6	0			0
1983	3.5	May 12	5	3			0
1985	3.5	May 1	35	0			0
1986	3.5	May 29	33	3			0
1987	3.5	Apr 24	48				
1988	3.0	May 4	10	0			
1989	3.5	May 3	5	0			0
1990	3.5	Apr 12	5	0			
1991	3.5	Apr 25	6	0			0
1992	3.5	Apr 15	9	0			
1993	3.0	May 6	0	0	Mod	Good	0
1994	3.5	May 17	10	0			0
1995	3.5	May 11	3	0	High	Good	0
1996	3.5	May 16	15	0			0
1997	3.5	May 13	4	0	Low	Good	0
1998	4.0	May 8	7	0	Mod	Good	0
1999	4.0	May 13	11	0	Low	Good	0
2000	4.0	May 15	7	0	Low	Good	1
2001	4.0	May 15	21	2	Low	Good	0
2002	4.0	May 9	31	2	Low	Good	1

Appendix Table H-40. Historic summer steelhead spawning survey data for Wall Creek, South Fork (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork							Survey Coordinates
Stream: Wall Creek, South Fork (Heppner Ranger District)							Start: Mouth
EPA Code: 1707020212900							Stop: Second Culvert
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.3	Apr 10	2	2			

Appendix Table H-41. Historic summer steelhead spawning survey data for Little Wall Creek of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Little Wall Creek						Start: Unknown	
EPA Code: Unknown						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1988	2.0	May 4	3	1			

Appendix Table H-42. Historic summer steelhead spawning survey data for Little Wall Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork						Survey Coordinates	
Stream: Little Wall Creek (Heppner Ranger District)						Start: Three Trough Creek	
EPA Code: 1707020207303/1707020207304						Stop: Squaw Creek	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	2.0	May 2	7	0			

Appendix Table H-43. Historic summer steelhead spawning survey data for Wilson Creek of the North Fork John Day Basin.

Subbasin: North Fork							Survey Coordinates
Stream: Wilson Creek							Start: N44º 55' 27.88" W119º 34' 6.95"
EPA Code: 1707020207600							Stop: N44º 59' 28.88" W119º 35' 12.49"
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1980	7.1	Apr 30	41	4			0
1981	5.0	Apr 22	41	2			
1982	5.0	May 5	32	1			0
1983	5.0	May 3	7	0			0
1984	2.0	May 16	4	0			
1985	5.0	May 1	89	0			0
1986	5.0	May 29	74	1			0
1987	3.5	Apr 24	37	6			
1988	5.0	May 4	12	0			
1989	5.0	May 3	4	2			0
1990	5.0	Apr 12	0	0			
1991	5.0	Apr 25	5	0			0
1992	5.0	Apr 22	10	1			0
1993	5.0	May 12	2	0			0
1994	5.0	May 17	4	0			0
1995	5.0	May 11	1	0	High	Fair	0
1996	5.2	May 16	9	0			0
1997	5.0	May 13	2	0	Low	Good	0
1998	5.0	May 8	6	0			0
1999	5.0	May 13	16	0	Mod	Good	0
2000	5.0	May 15	19	0	Low	Good	0
2001	5.0	May 15	24	1	Low	Good	0
2002	5.0	May 9	49	3	Low	Good	0

Appendix Table H-44. Historic summer steelhead spawning survey data for Wilson Creek (Heppner Ranger District) of the North Fork John Day Basin.

Subbasin: North Fork							Survey Coordinates
Stream: Wilson Creek (Heppner Ranger District)							Start: Forest Service Boundary
EPA Code: 1707020223200							Stop: Bull Prairie
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2002	1.3	Apr 12	3	2			

APPENDIX I

Middle Fork John Day Basin, Historic Summer Steelhead Spawning Survey Data

Appendix Table I-1. Historic summer steelhead spawning survey data for Beaver Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Beaver Creek					Start: N44° 46' 29.23" W118° 26' 58.85"		
EPA Code: 17070200213300					Stop: N44° 45' 53.74" W118° 25' 29.05"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1975	1.0		3				
1976	1.0		9				
1977	1.0	May 3	9	1			0
1978	1.0	May 19	3	0			
1979	1.0	May 31	0	0			
1980	1.0	May 13	1	0			
1981	1.0	May 4	4	1			
1982	1.0	May 12	4	2			0
1984	1.0	May 7	5	0			
1985	1.0	May 10	0	0			
1986	1.0	May 1	12	0			
1988	1.0	May 11	4	0			
1989	1.0	May 15	0	0			0
1990	1.0	May 4	0	0			
1991		May 30	0	0			0
1993		May 25	0	0			0
1994	1.5	May 25	1	0			
1995	1.5	May 15	1	0			0
1998	1.5	May 18	3	0	Moderate	Good	0
1999	1.5		1				
2000	1.5	May 11	1	0	Moderate	Good	0
2001	1.5	May 10	0	0	Low	Good	0
2002	1.5	May 10	8	1	Moderate	Good	0

Appendix Table I-2. Historic summer steelhead spawning survey data for Boulder Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Boulder Creek					Start: Unknown		
EPA Code: 170702030613					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1982	0.5	June 15	0	0			0

Appendix Table I-3. Historic summer steelhead spawning survey data for Bridge Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Bridge Creek (Bates)					Start: Unkown		
EPA Code: 1707020308700					Stop: Unkown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
2001	2.5	May 21	6	0	Low	Good	0
2002	2.5	May 14	7	2	Moderate	Good	0

Appendix Table I-4. Historic summer steelhead spawning survey data for Camp Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Camp Creek					Start: N44° 37' 35.54" W118° 51' 26.54"		
EPA Code: 1707020302200					Stop: N44° 33' 35.54" W118° 49' 29.84"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1966	3.0	May 10	65	0			
1967	3.0	June 2	34	1			
1968	2.0	April 26	12	1			
1969	4.0	May 9	16	0			
1970	2.0	May 1	24	3			
1973	2.0	May 10	11	0			
1974	2.0	May 24	11	0			
1975	2.0	June 11	18	0			0
1976	2.0	May 19	20	0			0
1977	7.0	April 28	114	22			0
1978	6.5	May 17	78	3			
1979	6.5	May 23	10	1			
1980	6.5	May 13	25	3			
1983	6.5	May 18	27	2			0
1984	6.5	May 18	15	1			
1985	6.5	May 8	84	10			0
1986	6.5	May 7	97	13			0
1987	6.5	May 6	67	5			
1988	6.5	May 11	114	8			
1989	6.5	May 9	38	2			0
1990	6.5		39	0			
1992	5.6	April 21	59	12			0
1993	5.6	May 26	15	0			0
1994	6.5	May 19	25	0			0
1995	6.3	May 16	19	0			0
1996	6.5	May 15	16	0			0
1997	6.5	May 16	9	0			
1999	6.5	May 17	29	2	High	Fair	0
2000	6.5	May 18	34	6	Low	Good	0
2001	5.9	May 16	30	4	Low	Fair	0
2002	5.9	May 14	68	21	Low	Fair	0

Appendix Table I-5. Historic summer steelhead spawning survey data for Caribou Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork						Survey Coordinates	
Stream: Caribou Creek						Start: N44° 37' 12.49" W118° 34' 12.96"	
EPA Code: 1707020305700						Stop: N44 ° 37' 51.33" W118 ° 33' 48.2"	
Stream Survey Status: Backup-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	1.0	May 14	3	0			
1988	0.3	April 26	5	0			
1996	0.8	May 24	2	0			0

Appendix Table I-6. Historic summer steelhead spawning survey data for Clear Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork						Survey Coordinates	
Stream: Clear Creek						Start: Unknown	
EPA Code: 1707020302900						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1986	2.2	May 20	25	2			
1987	2.0	May 14	24	3			
1988	2.0	May 10	41	1			

Appendix Table I-7. Historic summer steelhead spawning survey data for Cougar Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork						Survey Coordinates	
Stream: Cougar Creek						Start: Unknown	
EPA Code: 1707020304700						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1970	1.0	May 11	6	0			

Appendix Table I-8. Historic summer steelhead spawning survey data for Davis Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork						Survey Coordinates	
Stream: Davis Creek						Start: Unknown	
EPA Code: 1707020305500						Stop: Unknown	
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1982	1.5	June 15	0				0

Appendix Table I-9. Historic summer steelhead spawning survey data for Deep Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Deep Creek					Start: N44° 43' 0.52" W118° 49' 15.34"		
EPA Code: 1707020303200					Stop: N44° 43' 57.58" W118° 48' 3.97"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1967	1.5	June 6	20	2			
1968	1.0	May 31	2	0			
1972	1.0	May 2	5	1			0
1973	1.5	May 2	0	0			
1974	1.0	May 30	3	0			
1975	1.0	June 11	7	0			0
1977	1.0	April 28	0	0			0
1978	1.5	May 19	5	0			
1980	1.5	May 13	3	0			
1981	1.5	May 4	3	0			
1982	1.5	May 12	4	0			0
1983	1.5	April 27	4	2			0
1984	1.5	May 8	4	2			
1985	1.5	May 10	1	0			
1986	1.5	May 1	4	2			0
1987	1.5	May 14	14	0			
1988	1.5	May 11	0	0			
1989	1.5	May 15	0	0			0
1990	1.0	May 4	0	0			
1992		May 7	0	0	Low		0
1993	1.4	May 25	4	0			0
1994	1.5	May 25	2	0			
1995	1.5	May 15	0	0			0
1998	1.5	May 18	2	0	Moderate	Fair	0
1999	1.5		1				
2000	1.5	May 11	5	0	Low	Good	
2001	1.5	May 10	0	1	Low	Good	0
2002	1.5	May 10	12	1	Low	Good	0

Appendix Table I-10. Historic summer steelhead spawning survey data for Deerhorn Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Deerhorn Creek					Start: Unknown		
EPA Code: 1707020305400					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	1.5	May 14	17	0			

Appendix Table I-11. Historic summer steelhead spawning survey data for Granite Boulder Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Granite Boulder Creek					Start: Unknown		
EPA Code: 1707020305900					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	0.8	June 12	0	0			

Appendix Table I-12. Historic summer steelhead spawning survey data for Indian Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Indian Creek					Start: Unknown		
EPA Code: 1707020303400					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	2.0	May 19	8	0			

Appendix Table I-13. Historic summer steelhead spawning survey data for Lick Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Lick Creek					Start: N44° 39' 49.94" W118° 48' 30.74"		
EPA Code: 1707020302400					Stop: N44° 38' 10.89" W118° 47' 1.17"		
Stream Survey Status: Index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1968	1.0	April 26	9	0			
1981	2.3	May 14	18	0			
1982	2.3	May 12	14	3			0
1983	2.3	May 11	5	0			0
1984	2.3	May 8	9	2			
1985	2.3	May 8	21	0			0
1986	2.3	May 7	45	1			0
1987	2.3	May 6	37	3			
1988	2.3	May 6	37	3			
1989	2.3	May 9	26	4			0
1990	2.3	April 26	2	0			
1992	2.3	April 21	30	1			0
1993	2.3	May 26	11	0			0
1994	2.3	May 19	19	0			0
1995	2.3	May 16	2	0			0
1996	2.3	May 15	5	0			0
1997	2.3	May 16	7	0			
1998	2.3	June 2	5	0			
1999	2.3	May 17	14	3	Moderate	Good	0
2000	2.4	May 18	15	0	Low	Good	0
2001	2.4	May 10	22	1	Low	Good	0
2002	2.4	May 13	43	7	Low	Good	0

Appendix Table I-14. Historic summer steelhead spawning survey data for East Fork Lick Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Lick Creek, East Fork					Start: Unknown		
EPA Code: 1707020302600					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1981	1.0	May 14	4	0			

Appendix Table I-15. Historic summer steelhead spawning survey data for West Fork Lick Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Lick Creek, West Fork					Start: Unknown		
EPA Code: 1707020302500					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1981	1.0	May 14	3	0			

Appendix Table I-16. Historic summer steelhead spawning survey data for Long Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Long Creek					Start: Unknown		
EPA Code: 1707020300600					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1964	7.0		7				
1967	4.5	May 1	22	6			
1986	2.0	May 12	25	0			0
1987	2.0	May 21	11	1			
1988	2.5	May 13	44	4			

Appendix Table I-17. Historic summer steelhead spawning survey data for the Middle Fork John Day River.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Middle Fork John Day River					Start: Unknown		
EPA Code: 1707020300100					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1977	2.5	May 6	9	3			0
1987	3.4	May 14	32	0			
1992	2.5	May 7	10	1			1

Appendix Table I-18. Historic summer steelhead spawning survey data for Placer Gulch of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Placer Gulch					Start: Unknown		
EPA Code: 1707020307300					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1987	3.5		16	0			
1988	1.0	May 5	10	0			

Appendix Table I-19. Historic summer steelhead spawning survey data for Ruby Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Ruby Creek					Start: Unknown		
EPA Code: 1707020305100					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1979	0.7	June 12	1	0			
1987	1.0	June 10	8	0			

Appendix Table I-20. Historic summer steelhead spawning survey data for Vincent Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Vincent Creek					Start: N44° 36’ 28.35” W118° 32’ 44.15”		
EPA Code: 1707020305600					Stop: N44 ° 38’ 13.67” W118 ° 32’ 11.52”		
Stream Survey Status: Backup Index							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1979	1.0	May 24	2	0			
1987	3.3		19	0			
1988	3.0	April 28	31	0			
1996	2.7	May 24	2	0			0

Appendix Table I-21. Historic summer steelhead spawning survey data for Vinegar Creek of the Middle Fork John Day basin.

Subbasin: Middle Fork					Survey Coordinates		
Stream: Vinegar Creek					Start: Unknown		
EPA Code: 1707020303100					Stop: Unknown		
Stream Survey Status: Non-index B							
Year	Miles	Survey Date	# Redds	# Live Fish	Flow	Visibility	Carcasses # H / # W
1977	1.0	May 6	9	0			0
1987	1.5	May 14	2	0			

APPENDIX J

John Day Basin Steelhead Coded Wire Tag Recovery Data

Appendix Table J-1. John Day ARM (mouth to Tumwater Falls) steelhead coded wire tag recovery data from the Pacific States Marine Fishery Commission Regional Mark Information System (1992 - 2001).

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY ARM	11/4/92	Z6947	3	2	52047	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/4/92	Z6946	3	2	104318	IDFG	Magic Valley Hatchery	Hazard Creek: LT SAL R	PAH A
JOHN DAY ARM	11/10/92	Z6948	3	2	104058	IDFG	Magic Valley Hatchery	East Fork Salmon River	East FK B
JOHN DAY ARM	11/15/92	Z6949	3	2	52047	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/15/92	Z6950	3	2	52047	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/15/92	Z6955	3	2	52048	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/15/92	Z6951	3	2	104334	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	11/15/92	Z6954	3	2	104337	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	11/15/92	Z6952	3	2	75359	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	11/15/92	Z6953	3	2	104328	IDFG	Niagra Springs Hatchery	Pahsimeroi Hatchery	PAH A
JOHN DAY ARM	11/21/92	Z6958	3	2	52047	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/21/92	Z6957	3	2	75351	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/29/92	Z6959	3	2	52047	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	12/5/92	Z6961	3	2	75359	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	12/12/92	Z6962	3	2	52049	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	12/13/92	Z6963	3	2	75118	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	12/13/92	Z6964	3	2	75121	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	11/4/93	Z6967	3	2	75354	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/5/93	Z6972	3	2	52425	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/5/93	Z6968	3	2	52426	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/5/93	Z6973	3	2	52427	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/5/93	Z6970	3	2	52428	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/5/93	Z6969	3	2	104413	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY ARM	11/6/93	Z6974	3	2	52427	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/6/93	Z6975	3	2	104234	IDFG	Magic Valley Hatchery	East Fork Salmon River	DWOR B
JOHN DAY ARM	11/6/93	Z6976	3	2	104315	IDFG	Magic Valley Hatchery	East Fork Salmon River	DWOR B
JOHN DAY ARM	11/7/93	Z6977	3	2	52425	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/11/93	Z6980	3	2	52044	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/11/93	Z6979	3	2	52429	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/11/93	Z6978	3	2	104340	FWS	Hagerman National FH	Hazard Creek: LT SAL R	DWOR B
JOHN DAY ARM	11/11/93	Z6982	3	2	75351	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/11/93	Z6981	3	2	75359	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	11/13/93	Z6983	3	2	52428	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/13/93	Z6985	3	2	104332	FWS	Hagerman National FH	Hazard Creek: LT SAL R	DWOR B
JOHN DAY ARM	11/13/93	Z6984	3	2	104318	IDFG	Magic Valley Hatchery	Hazard Creek: LT SAL R	PAH A

Appendix Table J-1. Continued.

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY ARM	11/14/93	Z6986	3	2	52047	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/14/93	Z6987	3	2	52424	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/18/93	Z6988	3	2	104333	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	11/28/93	Z6992	3	2	635947	WDFW	Lyons Ferry Hatchery	Dayton Acclimation Pond	Snake L. Mon-LTL Goos
JOHN DAY ARM	11/28/93	Z6993	3	2	75342	ODFW	Oak Springs Hatchery	Meacham Creek (UMATILLA)	UMATILLA R
JOHN DAY ARM	12/2/93	Z6994	3	2	52427	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	12/5/93	Z6997	3	2	52429	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	12/8/93	Z6998	3	2	75351	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	12/11/93	Z7000	3	2	104405	IDFG	Niagra Springs Hatchery	Pahsimeroi Hatchery	PAH A
JOHN DAY ARM	10/31/94	C0505	3	2	232419	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	11/1/94	C0506	3	2	76103	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/2/94	C0507	3	2	104408	FWS	Hagerman National FH	LT SAL@Warm Spring Bridge	DWOR B
JOHN DAY ARM	11/5/94	C0509	3	2	52646	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/5/94	C0508	3	2	104408	FWS	Hagerman National FH	LT SAL@Warm Spring Bridge	DWOR B
JOHN DAY ARM	11/5/94	C0512	3	2	105021	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	11/5/94	C0513	3	2	232419	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	11/5/94	C0510	3	2	232446	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	11/6/94	C0516	3	2	104946	FWS	Hagerman National FH	Salmon R @ Hammer CK	PAH A
JOHN DAY ARM	11/6/94	C0515	3	2	76105	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/6/94	C0514	3	2	232417	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	11/7/94	C0517	3	2	104419	IDFG	Magic Valley Hatchery	East Fork Salmon River	DWOR B
JOHN DAY ARM	11/11/94	C0518	3	2	634815	WDFW	CURL LK Imprint Pond	Tucannon R 35.0009	Snake L. Mon-LTL Goos
JOHN DAY ARM	11/11/94	C0519	3	2	104402	IDFG	Niagra Springs Hatchery	Pahsimeroi Ponds	PAH A
JOHN DAY ARM	11/12/94	C0522	3	2	105018	FWS	Hagerman National FH	Lt Sal @ Warm Springs Bridge	PAH A
JOHN DAY ARM	11/12/94	C0523	3	2	75855	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/12/94	C0521	3	2	104414	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY ARM	11/13/94	C0526	3	7	75857	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/13/94	C0525	3	2	76105	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/13/94	C0524	3	2	104416	IDFG	Magic Valley Hatchery	Hazard Creek: LT SAL R	Hells Canyon A
JOHN DAY ARM	11/13/94	C0527	3	2	232448	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	11/14/94	C0528	3	2	52646	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/14/94	C0530	3	2	52421	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	11/14/94	C0529	3	2	104924	IDFG	Magic Valley Hatchery	N FK Salmon Release	PAH A
JOHN DAY ARM	11/18/94	C0531	3	2	104408	FWS	Hagerman National FH	LT SAL@Warm Spring Bridge	DWOR B

Appendix Table J-1. Continued.

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY ARM	11/18/94	C0532	3	2	104325	IDFG	Niagra Springs Hatchery	N FK Salmon Release	PAH A
JOHN DAY ARM	11/19/94	C0535	3	2	52646	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	11/19/94	C0533	3	2	104924	IDFG	Magic Valley Hatchery	N FK Salmon Release	PAH A
JOHN DAY ARM	11/21/94	C0537	3	2	104409	FWS	Hagerman National FH	LT SAL@Warm Spring Bridge	DWOR B
JOHN DAY ARM	11/22/94	C0539	3	2	104937	IDFG	Clearwater Hatchery	Clearwater River Mainstem	DWOR B
JOHN DAY ARM	11/22/94	C0540	3	2	104938	IDFG	Clearwater Hatchery	Clearwater River Mainstem	DWOR B
JOHN DAY ARM	11/22/94	C0541	3	2	52421	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	11/27/94	C0543	3	2	104407	FWS	Hagerman National FH	LT SAL@Warm Spring Bridge	DWOR B
JOHN DAY ARM	11/27/94	C0542	3	2	105015	IDFG	Magic Valley Hatchery	LEMHI R:Salmon R	PAH A
JOHN DAY ARM	11/28/94	C0545	3	2	52422	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	11/28/94	C0544	3	2	76101	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY ARM	12/3/94	C0546	3	2	634816	WDFW	Lyons Ferry Hatchery	Curl Lake Release Site	Snake L. Mon-LTL Goos
JOHN DAY ARM	12/3/94	C0547	3	2	104418	IDFG	Magic Valley Hatchery	East Fork Salmon River	DWOR B
JOHN DAY ARM	12/3/94	C0548	3	2	104429	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY ARM	12/4/94	C0553	3	2	52419	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	12/7/94	C0555	3	2	232449	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	12/10/94	C0556	3	2	105021	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	12/10/94	C0558	3	2	104417	IDFG	Magic Valley Hatchery	Hazard Creek: LT SAL R	Hells Canyon A
JOHN DAY ARM	12/11/94	C0559	3	2	104946	FWS	Hagerman National FH	Salmon R @ Hammer CK	PAH A
JOHN DAY ARM	12/12/94	C0561	3	2	52422	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	12/12/94	C0563	3	2	104413	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY ARM	12/13/94	C0564	3	2	52421	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	12/13/94	C0565	3	2	76060	ODFW	Umatilla Hatchery	Umatilla River	UMATILLA R
JOHN DAY ARM	12/13/94	C0566	3	2	232419	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	12/17/94	C0569	3	2	52423	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	12/17/94	C0572	3	2	52646	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	12/17/94	C0571	3	2	232963	NMFS		Col R. @ RM 18.2	Snake R-LOWR 33.0002
JOHN DAY ARM	12/18/94	C0573	3	2	104949	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	12/19/94	C0576	3	2	232416	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	12/19/94	C0575	3	2	232445	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	12/20/94	C0579	3	2	52937	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	12/20/94	C0578	3	2	76105	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLOWA R

Appendix Table J-1. Continued.

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY ARM	12/20/94	C0577	3	2	104427	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY ARM	12/21/94	C0580	3	2	104403	IDFG	Niagra Springs Hatchery	Pahsimeroi Ponds	PAH A
JOHN DAY ARM	12/21/94	C0581	3	2	232419	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	12/27/94	C0582	3	2	634816	WDFW	Lyons Ferry Hatchery	Curl Lake Release Site	Snake L. Mon-LTL Goos
JOHN DAY ARM	12/27/94	C0583	3	2	104418	IDFG	Magic Valley Hatchery	East Fork Salmon River	DWOR B
JOHN DAY ARM	12/28/94	C0584	3	2	52419	FWS	Dworshak National Hatchery	Dworshak National Hatchery	DWOR B
JOHN DAY ARM	1/21/95	G2343	3	2	105012	IDFG	Magic Valley Hatchery	LEMHI R:Salmon R	PAH A
JOHN DAY ARM	1/28/95	G2345	3	2	104418	IDFG	Magic Valley Hatchery	East Fork Salmon River	DWOR B
JOHN DAY ARM	10/13/95	C1520	3	2	70328	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	10/13/95	C1521	3	2	635314	WDFW	Lyons Ferry Hatchery	Walla Walla R32.0008	Snake L. Mon-LTL Goos
JOHN DAY ARM	10/23/95	C1524	3	2	52421	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	10/23/95	C1526	3	2	104924	IDFG	Magic Valley Hatchery	N FK Salmon Release	PAH A
JOHN DAY ARM	10/23/95	C1525	3	2	104703	IDFG	Niagra Springs Hatchery	Salmon R @ CHALLIS	PAH A
JOHN DAY ARM	10/30/95	C1531	3	2	101532	IDFG	Niagra Springs Hatchery	SR: Red Fish CK-GLD CK	Hells Canyon A
JOHN DAY ARM	11/2/95	C1533	3	2	104937	IDFG	Clearwater Hatchery	Clearwater River Mainstem	DWOR B
JOHN DAY ARM	11/2/95	C1532	3	2	104938	IDFG	Clearwater Hatchery	Clearwater River Mainstem	DWOR B
JOHN DAY ARM	11/2/95	C1534	3	2	104703	IDFG	Niagra Springs Hatchery	Salmon R @ CHALLIS	PAH A
JOHN DAY ARM	11/5/95	C1535	3	2	70144	ODFW	Umatilla Hatchery	Umatilla River	UMATILLA R
JOHN DAY ARM	11/7/95	C1536	3	2	104623	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY ARM	11/8/95	C1537	3	2	52937	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	11/11/95	C1538	3	2	105019	FWS	Hagerman National FH	Lt Sal @ Warm Springs Bridge	PAH A
JOHN DAY ARM	11/13/95	C1539	3	2	634816	WDFW	Lyons Ferry Hatchery	Curl Lake Release Site	Snake L. Mon-LTL Goos
JOHN DAY ARM	11/15/95	C1542	3	2	634815	WDFW	CURL LK Imprint Pond	Tucannon R 35.0009	Snake L. Mon-LTL Goos
JOHN DAY ARM	11/18/95	C1544	3	2	104428	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY ARM	11/21/95	C1546	3	2	104926	FWS	Hagerman National FH	SAL R @ Bruno Bridge	Sawtooth A
JOHN DAY ARM	11/22/95	C1547	3	2	233005	NMFS		Col R. @ RM 141	Snake R-LOWR 33.0002
JOHN DAY ARM	11/25/95	C1550	3	2	52937	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	11/25/95	C1549	3	2	634816	WDFW	Lyons Ferry Hatchery	Curl Lake Release Site	Snake L. Mon-LTL Goos
JOHN DAY ARM	12/30/95	C1551	3	2	104623	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY ARM	10/18/96	C0414	3	2	104926	FWS	Hagerman National FH	SAL R @ Bruno Bridge	Sawtooth A
JOHN DAY ARM	10/24/96	C0415	3	2	635717	WDFW	CURL LK Imprint Pond	Tucannon R 35.0009	Lyons Ferry Hatchery
JOHN DAY ARM	10/27/96	C0416	3	2	75823	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	10/28/96	C0418	3	2	75822	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	10/30/96	C0421	3	2	104701	IDFG	Niagra Springs Hatchery	Pahsimeroi Salmon R	PAH A

Appendix Table J-1. Continued.

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY ARM	11/3/96	C0425	3	2	53407	FWS	Dworshak National Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/3/96	C0426	3	2	75822	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	11/3/96	C0427	3	2	104714	IDFG	Magic Valley Hatchery	Hazard Creek: LT SAL R	DWOR B
JOHN DAY ARM	11/16/96	C0433	3	2	52425	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/16/96	C0435	3	2	635728	WDFW	Lyons Ferry Hatchery	Snake R-LOWR 33.0002	Lyons Ferry Hatchery
JOHN DAY ARM	11/23/96	C0437	3	2	104723	IDFG	Magic Valley Hatchery	Lt Sal@ Warm Spring Bridge	PAH A
JOHN DAY ARM	11/26/96	C0439	3	2	70920	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/26/96	C0438	3	2	102001	IDFG	Magic Valley Hatchery	Slate CK:U Salmon R	DWOR B
JOHN DAY ARM	10/12/97	G9451	3	2	52456	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	10/12/97	G9452	3	2	53212	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	10/18/97	G9457	3	2	104728	IDFG	Clearwater Hatchery	SFK Clearwater R @ MP18	DWOR B
JOHN DAY ARM	10/18/97	G9456	3	2	75820	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY ARM	10/21/97	G9461	3	2	52458	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	10/21/97	G9460	3	2	52461	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	10/22/97	G9463	3	2	104621	IDFG	Clearwater Hatchery	SFK CLWTR@ Mill Creek	DWOR B
JOHN DAY ARM	10/22/97	G9462	3	2	52456	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	10/23/97	G9465	3	2	102025	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	10/23/97	G9466	3	2	53363	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	10/25/97	G9467	3	2	102026	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	10/25/97	G9471	3	2	104621	IDFG	Clearwater Hatchery	SFK CLWTR@ Mill Creek	DWOR B
JOHN DAY ARM	10/25/97	G9472	3	2	636033	WDFW	Lyons Ferry Hatchery	Tucannon R 35.0009	Lyons Ferry Hatchery
JOHN DAY ARM	10/25/97	G9468	3	2	102012	IDFG	Magic Valley Hatchery	East Fork Salmon River	DWOR B
JOHN DAY ARM	10/25/97	G9470	3	2	102001	IDFG	Magic Valley Hatchery	Slate CK:U Salmon R	DWOR B
JOHN DAY ARM	10/29/97	G9473	3	2	102027	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/2/97	G9475	3	2	104727	IDFG	Clearwater Hatchery	Cotton WD CK: SFK CLWTR	DWOR B
JOHN DAY ARM	11/3/97	G9476	3	2	102026	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/4/97	G9479	3	2	52455	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/4/97	G9477	3	2	52458	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/9/97	G9482	3	2	52461	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/13/97	G9484	3	2	102026	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/13/97	G9483	3	2	52457	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/15/97	G9486	3	2	52456	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/15/97	G9485	3	2	52458	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/21/97	G9487	3	2	52461	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/21/97	G9488	3	2	53148	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B

Appendix Table J-1. Continued.

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY ARM	11/22/97	G9490	3	2	102025	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/22/97	G9491	3	2	104621	IDFG	Clearwater Hatchery	SFK CLWTR@ Mill Creek	DWOR B
JOHN DAY ARM	11/22/97	G9489	3	2	52461	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/28/97	G9494	3	2	102027	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/28/97	G9492	3	2	104621	IDFG	Clearwater Hatchery	SFK CLWTR@ Mill Creek	DWOR B
JOHN DAY ARM	11/28/97	G9493	3	2	52455	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/30/97	G9497	3	2	102025	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	12/4/97	G9499	3	2	102026	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	12/4/97	G9500	3	2	104621	IDFG	Clearwater Hatchery	SFK CLWTR@ Mill Creek	DWOR B
JOHN DAY ARM	12/4/97	G9498	3	2	104925	IDFG	Magic Valley Hatchery	Slate CK: Salmon R	DWOR B
JOHN DAY ARM	12/7/97	G9301	3	2	71160	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	12/9/97	G9302	3	2	52456	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	12/12/97	G9303	3	2	52455	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	12/16/97	G9304	3	2	52454	FWS	Dworshak National Hatchery	Clearwater @ Button Beach	DWOR B
JOHN DAY ARM	12/17/97	G9305	3	2	636035	WDFW	Lyons Ferry Hatchery	Snake R-LOWR 33.0002	Lyons Ferry Hatchery
JOHN DAY ARM	12/18/97	G9306	3	2	102026	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	12/19/97	G9307	3	2	52454	FWS	Dworshak National Hatchery	Clearwater @ Button Beach	DWOR B
JOHN DAY ARM	12/19/97	G9308	3	2	53212	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	12/19/97	G9309	3	2	53363	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	12/20/97	G9310	3	2	102026	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	12/22/97	G9312	3	2	104621	IDFG	Clearwater Hatchery	SFK CLWTR@ Mill Creek	DWOR B
JOHN DAY ARM	10/15/98	C2425	3	2	54149	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	10/18/98	C2427	3	2	103515	IDFG	Clearwater Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	10/18/98	C2428	3	2	54006	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	10/18/98	C2429	3	2	75330	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	10/21/98	C2430	3	2	53212	FWS	Dworshak National Hatchery	South Fork Clearwater Facilities	DWOR B
JOHN DAY ARM	10/24/98	C2432	3	2	103515	IDFG	Clearwater Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	10/24/98	C2431	3	2	103509	IDFG	Magic Valley Hatchery	Hazard Creek: LT SAL R	DWOR B
JOHN DAY ARM	10/27/98	C2433	3	2	71159	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/1/98	C2434	3	2	103514	IDFG	Clearwater Hatchery	Cotton WD CK: SFK CLWTR	DWOR B
JOHN DAY ARM	11/6/98	C2435	3	2	103515	IDFG	Clearwater Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	11/12/98	C2440	3	2	53145	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/12/98	C2439	3	2	103509	IDFG	Magic Valley Hatchery	Hazard Creek: LT SAL R	DWOR B
JOHN DAY ARM	11/19/98	C2442	3	2	103514	IDFG	Clearwater Hatchery	Cotton WD CK: SFK CLWTR	DWOR B
JOHN DAY ARM	11/21/98	C2452	3	2	71218	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA River)	IMNAHA R AND TRBS

Appendix Table J-1. Continued.

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY ARM	11/22/98	C2453	3	2	103053	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/29/98	C2454	3	2	103507	IDFG	Magic Valley Hatchery	Slate Creek: Upper Salmon River	DWOR B
JOHN DAY ARM	12/16/98	C2456	3	2	103509	IDFG	Magic Valley Hatchery	Hazard Creek: LT SAL R	DWOR B
JOHN DAY ARM	10/23/99	C0803	3	1	105222	IDFG	Magic Valley Hatchery	East Fork Salmon River @ Dumpster	DWOR B
JOHN DAY ARM	10/31/99	C0805	3	2	53959	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/3/99	C0806	3	1	102132	IDFG	Magic Valley Hatchery	LT SAL@Stinky SPRGS	DWOR B
JOHN DAY ARM	11/14/99	C0808	3	1	102148	IDFG	Magic Valley Hatchery	Slate Creek:Upper Salmon River	East FK B
JOHN DAY ARM	11/18/99	C0810	3	2	54147	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/21/99	C0812	3	2	92329	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	11/28/99	C0813	3	2	104607	FWS	Dworshak National Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	12/3/99	C0814	3	1	105224	IDFG	Magic Valley Hatchery	East Fork Salmon River @ Dumpster	DWOR B
JOHN DAY ARM	12/4/99	C0815	3	2	636339	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	12/10/99	C0817	3	2	53957	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	10/10/00	C0553	3	2	53959	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	10/12/00	C0554	3	2	636128	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	10/14/00	C0555	3	2	105226	FWS	Dworshak National Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	10/17/00	C0558	3	1	104738	IDFG	Clearwater Hatchery	SFK Clearwater R @ Red House	DWOR B
JOHN DAY ARM	10/17/00	C0556	3	2	105232	FWS	Dworshak National Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	10/18/00	C0559	3	2	54001	FWS	Dworshak National Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	10/22/00	C0560	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	10/22/00	C0562	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	10/24/00	C0563	3	1	105225	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/3/00	C0564	3	2	92563	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/4/00	C0565	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	11/7/00	C0566	3	1	105237	IDFG	Clearwater Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	11/9/00	C0569	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	11/15/00	C0571	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	11/15/00	C0570	3	2	105226	FWS	Dworshak National Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	11/18/00	C0573	3	2	53959	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/19/00	C0574	3	1	104739	IDFG	Clearwater Hatchery	SFK Clearwater R @ Red House	DWOR B
JOHN DAY ARM	12/26/00	C0577	3	2	105227	FWS	Dworshak National Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	12/28/00	C0578	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	10/13/01	C1329	3	2	105522	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	10/14/01	C1330	3	2	105526	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	10/17/01	C1331	3	2	92928	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY ARM	10/27/01	C1332	3	1	105235	IDFG	Clearwater Hatchery	SFK CLWTR Facilities	DWOR B

Appendix Table J-1. Continued.

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY ARM	11/2/01	C1337	3	1	105235	IDFG	Clearwater Hatchery	SFK CLWTR Facilities	DWOR B
JOHN DAY ARM	11/2/01	C1338	3	2	55107	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/2/01	C1339	3	2	631305	WDFW	Lyons Ferry Hatchery	Tucannon R 35.0009	Lyons Ferry Hatchery
JOHN DAY ARM	11/2/01	C1340	3	2	631305	WDFW	Lyons Ferry Hatchery	Tucannon R 35.0009	Lyons Ferry Hatchery
JOHN DAY ARM	11/4/01	C1341	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	11/4/01	C1342	3	2	55107	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/11/01	C1347	3	2	54223	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	11/11/01	C1345	3	2	105525	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	11/11/01	C1349	3	2	92935	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	11/11/01	C1348	3	2	92928	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY ARM	11/11/01	C1346	3	7	70535	ODFW	Umatilla Hatchery	Umatilla River	UMATILLA R
JOHN DAY ARM	11/18/01	C1351	3	2	105525	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	11/20/01	C1356	3	1	105419	IDFG	Clearwater Hatchery	Clear Creek: Clearwater River	DWOR B
JOHN DAY ARM	11/20/01	C1354	3	2	92928	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY ARM	11/20/01	C1355	3	1	105403	IDFG	Magic Valley Hatchery	East Fork Salmon River @ Dumpster	DWOR B
JOHN DAY ARM	11/20/01	C1353	3	1	103606	IDFG	Magic Valley Hatchery	LEMHI R:Salmon R	PAH A
JOHN DAY ARM	11/21/01	C1358	3	2	631309	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	11/21/01	C1359	3	1	105414	IDFG	Magic Valley Hatchery	Salmon R @ SHOUP Bridge	PAH A
JOHN DAY ARM	11/28/01	C1361	3	2	92934	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	12/1/01	C1366	3	2	55114	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	12/1/01	C1365	3	2	92935	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	12/1/01	C1364	3	2	92605	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	12/2/01	C1368	3	2	92937	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY ARM	12/2/01	C1367	3	2	92526	ODFW	Umatilla Hatchery	Umatilla River	UMATILLA R
JOHN DAY ARM	12/7/01	C1370	3	2	55112	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	12/9/01	C1372	3	2	631309	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY ARM	12/9/01	C1371	3	1	105255	IDFG	Magic Valley Hatchery	Squaw Creek Pond Outlet	DWOR B
JOHN DAY ARM	12/10/01	C1374	3	2	105527	FWS	Hagerman National FH	Sawtooth Hatchery	Sawtooth A
JOHN DAY ARM	12/10/01	C1375	3	1	105401	IDFG	Magic Valley Hatchery	SAL R @ Tunnel Rock	DWOR B
JOHN DAY ARM	12/10/01	C1373	3	1	105414	IDFG	Magic Valley Hatchery	Salmon R @ SHOUP Bridge	PAH A
JOHN DAY ARM	12/12/01	C1376	3	1	104649	IDFG	Niagra Springs Hatchery	Pahsimeroi Hatchery	PAH A
JOHN DAY ARM	12/19/01	C1380	3	2	55104	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY ARM	12/27/01	C1381	3	2	92930	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY ARM	12/31/01	C1384	3	2	92929	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY ARM	12/31/01	C1383	3	1	105403	IDFG	Magic Valley Hatchery	East Fork Salmon River @ Dumpster	DWOR B

Appendix Table J-2. John Day River ABV ARM (Tumwater Falls to Cottonwood Bridge) steelhead coded wire tag recovery data from the Pacific States Marine Fishery Commission Regional Mark Information System (1996 - 2001).

Recovery location	Recovery date	Recovery identification	Species	Run	Tag code	Release Agency	Hatchery	Release location Name	Stock
JOHN DAY R (ABV ARM)	3/26/96	G0049	3	2	70321	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA River)	IMNAHA R AND TRBS
JOHN DAY R (ABV ARM)	10/20/96	Z2706	3	2	104622	IDFG	Niagra Springs Hatchery	Snake@HLLS Canyon Dam	Hells Canyon A
JOHN DAY R (ABV ARM)	10/29/96	Z2707	3	2	70324	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA River)	IMNAHA R AND TRBS
JOHN DAY R (ABV ARM)	10/11/98	G3605	3	2	636339	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY R (ABV ARM)	10/29/98	G3607	3	2	91829	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY R (ABV ARM)	10/10/99	G3004	3	2	92329	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY R (ABV ARM)	10/16/99	C0802	3	2	92330	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY R (ABV ARM)	10/24/99	G3020	3	1	102133	IDFG	Magic Valley Hatchery	LT SAL@Stinky SPRGS	DWOR B
JOHN DAY R (ABV ARM)	10/29/99	C0804	3	2	91832	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY R (ABV ARM)	11/1/99	G3019	3	2	636127	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY R (ABV ARM)	12/8/99	G3018	3	1	102131	IDFG	Magic Valley Hatchery	LT SAL@Stinky SPRGS	DWOR B
JOHN DAY R (ABV ARM)	1/5/00	G3016	3	2	92328	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY R (ABV ARM)	1/6/00	G3015	3	2	91831	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY R (ABV ARM)	1/28/00	G3002	3	2	92322	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY R (ABV ARM)	10/17/00	C0557	3	2	53961	FWS	Dworshak National Hatchery	Mainstem Clearwater River	DWOR B
JOHN DAY R (ABV ARM)	11/2/00	G8205	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY R (ABV ARM)	11/8/00	C0567	3	2	630460	WDFW	Cottonwood Cr. Pond	Grand Ronde R35.2192	Wallowa R.
JOHN DAY R (ABV ARM)	12/24/00	G8209	3	2	92326	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY R (ABV ARM)	1/4/01	G8210	3	2	92328	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY R (ABV ARM)	1/7/01	G8211	3	2	92560	ODFW	Irrigon Hatchery	Little Sheep Creek (IMNAHA)	IMNAHA R AND TRBS
JOHN DAY R (ABV ARM)	1/9/01	G8213	3	1	104740	IDFG	Clearwater Hatchery	SFK Clearwater R @ Red House	DWOR B
JOHN DAY R (ABV ARM)	1/9/01	G8212	3	2	92604	ODFW	Irrigon Hatchery	Big Canyon Creek (Wallo)	WALLAWA R
JOHN DAY R (ABV ARM)	1/23/01	G8219	3	1	104706	IDFG	Magic Valley Hatchery	East Fork Salmon River Trap	East FK B
JOHN DAY R (ABV ARM)	2/1/01	G8223	3	2	92602	ODFW	Irrigon Hatchery	Spring Creek (WALLAWA R)	WALLAWA R
JOHN DAY R (ABV ARM)	2/9/01	G8220	3	2	105226	FWS	Dworshak National Hatchery	SFK CLWTR Facilities	DWOR B

Appendix Table J-3. List of known summer steelhead coded wire tag recoveries recorded in the ODFW John Day District Office arcive 1986 - 1996 (Tim Unterwegner, unpublished data).

Recovery Year	Hatchery Source	Number of Recoveries	Recovery Location
1986	Rounde Butte	1	Tumwater Falls to Cottonwood Bridge
1996	Irrigon Hatchery	1	Tumwater Falls to Cottonwood Bridge
1996	Hells Canyon	1	Tumwater Falls to Cottonwood Bridge
1996	Little Sheep	1	Tumwater Falls to Cottonwood Bridge
1988	Upper Columbia	1	Cottonwood Bridge to Little Ferry Canyon
1992	Wallowa	1	Lower North Fork
1994	Big Canyon	1	Lower North Fork

APPENDIX K

John Day River Basin Steelhead Creel and Sport Catch Data

Appendix Table K-1. Sport Catch of Summer Steelhead in the John Day River basin by run year 1971-1981 (Berry 1981a, 1981b, Eden and Swartz, 1986).

Year	John Day River	Middle Fork John Day River	North Fork John Day River
1970-1971	1,789		
1971-1972	2,666	--	--
1972-1973	5,359	--	--
1973-1974	906	--	--
1974-1975	2,784	--	--
1975-1976	1,511	--	--
1976-1977	2,589	40	295
1977-1978	948	112	415
1978-1979	292	0	13
1979-1980	380	59	230
1980-1981	1,391	35	295
1981-1982	2,512	120	350
1982-1983	836	54	100
1983-1984	1,734	20	220

Appendix Table K-2. John Day River basin summer steelhead creel summary, 1958 - 2001.

Year	Anglers Checked	Hours angled	Number of fish	Hours per fish landed	Fish landed per angler	Source
1958	197	457	72	6.3	0.4	Hewkin, J. A., 1958
1959	373	1,499	78	19.2	0.2	Hewkin, J. A., 1959
1960	270	993	99	10.0	0.4	Hewkin, J. A., 1960
1961	200	654	29	22.6	0.1	Hewkin, J. A., 1961
1962	193	639	35	18.3	0.2	Hewkin, J. A., 1962
1963	263	991	42	23.6	0.2	Hewkin, J. A., 1963
1964	430	1,386	53	26.2	0.1	Hewkin, J. A., 1964
1965	278	946	79	12.0	0.3	Hewkin, J. A., 1965
1966	495	1,505	153	9.8	0.3	Hewkin, J. A., 1966
1967	437	1,523	104	14.6	0.2	Hewkin, J. A., 1967
1968	298	1,171	62	18.9	0.2	Hewkin, J. A., 1968
1969	500	1,351	122	11.1	0.2	Hewkin, J. A., 1969
1970	229	597	50	11.9	0.2	Hewkin, J. A., 1970
1971	111	401	34	11.8	0.3	Claire, E. W., 1971
1972	341	928	38	24.4	0.1	Claire, E. W., 1972
1973	581	1,966	69	28.5	0.1	Claire, E. W., 1973
1973	353	1,094	44	24.9	0.1	Claire, E. W., 1974
1975	517	1,628	128	12.7	0.2	Claire, E. W., 1975
1976	242	1,002	46	21.8	0.2	Claire, E. W., 1976
1977	613	2,200	139	15.8	0.2	Claire, E. W., 1977
1978	454	1,330	63	21.1	0.1	Claire, E. W., 1978
1979	166	436	4	109.0	0.0	Claire, E. W., 1979
1980	296	1,094	32	34.2	0.1	Claire, E. W., 1980
1981	365	1,054	41	25.7	0.1	Claire, E. W., 1981
1982	489	2,096	136	15.4	0.3	Claire, E. W., 1982
1983	373	1,604	54	29.7	0.1	Claire, E. W., 1983
1984	468	1,801	131	13.7	0.3	Claire, E. W., 1984
1985	540	1,765	127	13.9	0.2	Claire, E. W., 1985
1986	624	2,242	183	12.3	0.3	Claire, E. W., 1986
1987	1,053	3,175	514	6.2	0.5	Claire, E. W., 1987
1988	1,481	5,801	546	10.6	0.4	Claire, E. W., 1988
1989	207	571	39	14.6	0.2	Claire, E. W. and B. J. Smith, 1989
1990	428	1,194	62	19.3	0.1	Claire, E. W. and M. E. Gray, 1990
1991	412	1,144	111	10.3	0.3	Claire, E. W. and M. E. Gray, 1991
1992	1,085	3,662	335	10.9	0.3	Claire, E. W. and M. E. Gray, 1992
1993	92	389	29	13.4	0.3	Claire, E. W. and M. E. Gray, 1993
1994	346	1,226	99	12.4	0.3	Unterwegner T. J. and M. E. Gray. 1994
1995	181	575	84	6.8	0.5	Unterwegner T. J. and M. E. Gray. 1995
1996	130	589	189	3.1	1.5	Unterwegner T. J. and M. E. Gray. 1996
1997	83	272	110	2.5	1.3	Unterwegner T. J. and M. E. Gray. 1997
1998	228	859	217	4.0	1.0	Unterwegner T. J. and M. E. Gray. 1998
1999	56	243	116	2.1	2.1	Unterwegner, T. J. and J. Neal. 2001
2000	52	117	10	11.7	0.2	Unterwegner, T. J. and J. Seals. 2000
2001	7	87	14	6.2	2.0	Unterwegner, T. J. and J. Neal. 2001

APPENDIX L

Species, Hatchery And Stock Codes Identified In Appendix M - Q For Hatchery Fish Released Into Tributaries Of The John Day River Basin.

Table L-1. Species code, common name, and scientific name for hatchery fish species recorded in Appendices M-Q.

Species code	Species common name	Scientific name
Rainbow	Rainbow	Oncorhynchus mykiss
RBF	Assumed to be rainbow trout, unknown acronym	Oncorhynchus mykiss
RBS	Assumed to be rainbow trout, unknown acronym	Oncorhynchus mykiss
Brook	Brook Trout	Salvelinus frontinalis
Cutthroat	Cutthroat Trout	Oncorhynchus clarki
Steelhead	Steelhead, unknown run	Oncorhynchus mykiss
Steelhead, Summer	Summer Steelhead	Oncorhynchus mykiss
Steelhead, Winter	Winter Steelhead	Oncorhynchus mykiss
Coho, Silver	Coho, Silver	Oncorhynchus kisutch
Smallmouth Bass	Smallmouth Bass	Micropterus dolomieu

Table L-2. Hatchery code, hatchery, stock code, and stock source for hatchery fish recorded in Appendices M - Q.

Hatchery Code	Hatchery	Stock Code	Stock Source
EC	Eagle Creek	Alsea	Alsea
FR	Fall River	CC	Cape Cod Rainbow
GC	Gnat Creek	CR	Cole Rivers
HR	Hood River	CRH	Cole Rivers Hatchery
IR	Irrigon	DL	Diamond Lake
KL	Klamath	EPL	East and Paulina Lakes
OS	Oak Springs	FR	Fall River
Oxbow	Oxbow	Idaho	Idaho
Sandy	Sandy	OS	Oak Springs
WA	Wallowa	RR	Roaring River
WF	Wizard Falls	WR	Willamette River
WI	Willamette Trout	WT	Willamette Trout
YL	Yellowstone Lake		

Appendix M

Historic stocking records for Tributaries of the Upper Mainstem John Day River

Appendix Table M-1. Record of hatchery fish released into Beech Creek of the Upper Mainstem John Day River basin in 1953.

Species	Year	Date	Number	Lbs.	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1953	7/27	1,001	167		OS		2	Gunckel, S. 2002

Appendix Table M-2. Record of hatchery fish released into Canyon Creek of the Upper Mainstem John Day River basin from 1925 to 1997.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Brook	1925		25,000						Gunckel, S. 2002
Rainbow			40,000						
Steelhead			16,080						
Brook	1926		20,000						Gunckel, S. 2002
Rainbow			25,680						
Silver			42,745						
Rainbow	1927		6,000						Gunckel, S. 2002
Brook	1928		27,530						Gunckel, S. 2002
Rainbow			16,000						
Rainbow	1929		253,000						Gunckel, S. 2002
Brook	1930		50,000						Gunckel, S. 2002
Brook	1933		1,000						Gunckel, S. 2002
Rainbow			50,000						
RBS	1940		61,865	170					Gunckel, S. 2002
RBS	1941	5/16-5/20	25,325	1,500		OS			Gunckel, S. 2002
Steelhead		9/22	8,760	40		OS			
RBF	1942	5/27	24,942	120					Gunckel, S. 2002
RBF	1943	8/16	9,038	125					Gunckel, S. 2002
RBF	1944	5/25	31,050	100					Gunckel, S. 2002
RBF	1945	9/1	16,080	100					Gunckel, S. 2002
RBF	1946	4/27	2,160	240					Gunckel, S. 2002
RBS		7/13	11,520	38					
Rainbow	1947		9,450	150	2 - 4				Koski, R. O. 1948
Rainbow	1947		4,500	250	4 - 6				Koski, R. O. 1948
Rainbow	1948		6,000	480	Legal				Koski, R. O. 1949
Rainbow	1949		2,850	660					Gunckel, S. 2002
			6,000						
Rainbow	1950		3,000						Gunckel, S. 2002
Rainbow	1951		3,000	484					Gunckel, S. 2002
Rainbow	1952	6/23-6/24	3,197	899		WF		5	Gunckel, S. 2002
		8/1	819	400		OS		9	
Rainbow	1953	6/9	904	135		WF		7	Gunckel, S. 2002
		6/23	4,512	475		OS		2	
Rainbow	1954	3/29-5/8	2,000	797		OS		1	Gunckel, S. 2002
		7/14	996	249		OS		5	
		7/22	2,002	167		WF		18	
Rainbow	1955	4/1-8/9	4,757	1,960	6 +	OS	OS	5304 and 5303	Koski, R. O. 1955, Gunckel, S. 2002
Rainbow	1956	4/26	3,007	640	6 +	OS	OS	5302	Koski, R. O. 1957, Gunckel, S. 2002
		7/26	2,016	480	6 +	OS	FR	4902	
		8/14	2,038	400	6 +	OS	OS	5302	
		8/15	2,003	477	6 +	WF	FR	4901	
Rainbow	1957	5/23-6/11	3,002	586	6 +	OS	CRH	5207	Koski, R. O. 1958, Gunckel, S. 2002
		6/12	1,999	455	6 +	OS	FR	4903	
		7/23	1,002	167	6 +	WF	WT	5706	
Rainbow	1958		12,795[a]	2,537.5	6 +				Koski, R. O. 1959[a], Gunckel, S. 2002
		6/2-7/9	18,307	3,645		OS	FR	4904	
		6/27	3,497	725.5		WF	WT	5702	
		6/30	500	125		OS	WT	5702	
Rainbow	1959	4/20-5/19	4,346	771.2	6 +	OS	FR	4905	Koski, R. O. 1960, Gunckel, S. 2002
Rainbow	1960	6/9	3,076	699.1	8 +	OS	FR	4908	Koski, R. O. 1961, Gunckel, S. 2002
		7/11	1,517	433.6	8 +	WF	WT	5704	
Rainbow	1961	6/13-7/12	5,799	2,048	8 +	OS	EPL	6701	Koski, R. O. 1962, Gunckel, S. 2002
Rainbow	1962	6/6-7/2	6,059	1,724.7	8 +	OS	EPL	6703	Koski, R. O. 1963, Gunckel, S. 2002
Rainbow	1963	6/10	2,992	1,196.8	9 - 10	OS	EPL	6707	Hewkin, J. A. 1963, Gunckel, S.
		7/1	3,000	926	9 - 10	WF	WT	5708	2002
Rainbow	1964	6/25	3,002	1,035	8 +	WF	WT	5703	Koski, R. O. 1965, Gunckel, S. 2002

Appendix Table M-2. Continued.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1965	6/15	2,595	998	8 +	OS	EPL	6705	Koski, R. O. 1966b, Gunckel, S.
		7/8	3,399	1,478	8 +	OS	Private	7603	2002
Rainbow	1966	5/9-6/10	5,982	2,369	8 +	OS		4801	Koski, R. O. 1966a, Gunckel, S. 2002
Rainbow	1967	6/26-7/5	6,003	2,080	8 +	WF	WT	5702	Koski, R. O. 1968, Gunckel, S. 2002
Rainbow	1968	4/16-5/9	5,990	1,717	8 +	OS		4868	Koski, R. O. 1969
Rainbow	1969	5/27	3,001	1,035	8 +	WF	RR	5408	Koski, R. O. 1970, Gunckel, S. 2002
		6/3-6/26	4,504	1,338	8 +	OS		4801	
Rainbow	1970	6/5-6/11	7,502	2,587	8 +	OS		4804	Koski, R. O. 1971, Gunckel, S. 2002
Rainbow	1971	5/28-6/10	6,993	2,152	8 +	OS		4802	Koski, R. O. 1972, Gunckel, S. 2002
Rainbow	1972	5/31-6/13	6,957	2,785	10	FR	RR	5405	Hewkin, J. A. 1972, Gunckel, S. 2002
Rainbow	1973	5/30	3,499	1,094	9 - 11	WF	RR	5406	Claire, E. W. 1973, Gunckel, S.
		6/28	1,650	1,100	9 - 11	KL	RR	5406	2002
Rainbow	1974	6/17-7/1	6,002	2,112	10	WF	RR	5408	Claire, E. W. 1974, Gunckel, S. 2002
Rainbow	1975	6/17-6/30	6,003	1,910	9	FR	RR	5404	Claire, E. W. 1975, Gunckel, S. 2002
Rainbow	1976		6,004		9				Claire, E. W. 1976
Rainbow	1977		5,999		9				Claire, E. W. 1977
Rainbow	1978	5/23-6/6	5,998	1,845	10	FR	RR	05476	Claire, E. W. 1978, Gunckel, S. 2002
Rainbow	1979	6/13-7/17	6,002	1,758	9	FR	RR	05477	Claire, E. W. 1979, Gunckel, S. 2002
Rainbow	1980	5/29-6/17	5,997	1,748	9	FR	RR	05478	Claire, E. W. 1980, Gunckel, S. 2002
Rainbow	1981	6/3-7/15	5,999	2,241	9	FR	CC	07279	Claire, E. W. 1981, Gunckel, S. 2002
Rainbow	1982	6/22-7/27	5,998	1,915.9	9	FR	CC	07280	Claire, E. W. 1982, Gunckel, S. 2002
Rainbow	1983	7/12	3,497	1,248.9	9	FR	CC	07281	Claire, E. W. 1983, Gunckel, S. 2002
Rainbow	1983	7/10	3,492	1,027	9	FR	CC	07282	Claire, E. W. 1984, Gunckel, S. 2002
Rainbow	1985	6/14	3,501	1,165	9	FR	CC	07283	Claire, E. W. 1985, Gunckel, S. 2002
Rainbow	1986	5/20	3,493	1,126.7	9	FR	CC	07284	Claire, E. W. 1986, Gunckel, S. 2002
Rainbow	1987	5/26	1,498	483.4	9	FR	CC	07285	Claire, E. W. 1987, Gunckel, S. 2002
Rainbow	1988	6/7	3,497	1,059.7	9	FR	CC	07286	Claire, E. W. 1988, Gunckel, S. 2002
Rainbow	1989	6/14	1,489	495	9	FR	CC	07287	Claire, E. W. and B. J. Smith. 1989, Gunckel, S. 2002
Rainbow	1990	6/13	1.501	469	9	FR	CC	07288	Claire, E. W. and M. E. Gray 1990, Gunckel, S. 2002
Rainbow	1991	6/14	1,500	500	9	FR	CC	07289	Claire, E. W. and M. E. Gray 1991, Gunckel, S. 2002
Rainbow	1992	6/10	1,502	441.7	9	FR	CC	07290	Claire, E. W. and M. E. Gray 1992
Rainbow	1993	6/24	1,500	484	9	FR	CC	07291	Claire, E. W. and M. E. Gray 1993, Gunckel, S. 2002
Rainbow	1994	6/8	1,498	427.8	9	WF	CC	07292	Unterwegner, T. J. and M. E. Gray 1994, Gunckel, S. 2002
Rainbow	1995	6/7	1,504	470	9	FR	CC	07293	Unterwegner, T. J. and M. E. Gray 1995, Gunckel, S. 2002
Rainbow	1996	6/7	1,499	463.4	9	FR	CC	07294	Unterwegner, T. J. and M. E. Gray 1996, Gunckel, S. 2002
Rainbow	1997	6/4	1,002	313	9	WF	CC	07295	Unterwegner, T. J. and M. E. Gray 1997

[a] The Koski and Gunckel records for stocking did not match up, and could not be reconciled, thus they are both presented.

Appendix Table M-3. Record of hatchery fish released into Canyon Creek, East Fork of the Upper Mainstem John Day River basin in 1929.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1929		30,000						Gunckel, S. 2002

Appendix Table M-4. Record of hatchery fish released into Deardorff Creek, of the Upper Mainstem John Day River basin in 1912.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Cutthroat	1912					YL	YL		Gunckel, S. 2002

Appendix Table M-5. Record of hatchery fish released into Fields Creek, of the Upper Mainstem John Day River basin in 1941.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBS	1941	5/23	2,126	400		OS			Gunckel, S. 2002

Appendix Table M-6. Record of hatchery fish released into Indian Creek, of the Upper Mainstem John Day River basin in 1948.[a]

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1948		5,625	75	2 - 4				Koski, R. O. 1949[a]

[a] Koski does not explicitly cite which subbasin Indian Creek was located in, thus we assumed it was the Indian Creek on the Upper Mainstem near Prairie City.

Appendix Table M-7. Record of hatchery fish released into the mainstem John Day River from 1947 to 1980. Actual release sites are unknown.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		18,900	300	2 - 4				Koski, R. O. 1948
Rainbow	1947		4,500	250	4 - 6				Koski, R. O. 1948
Rainbow	1948		5,625	75	2 - 4				Koski, R. O. 1949
Rainbow	1948		3,000	240	4 - 6				Koski, R. O. 1949
Rainbow	1948		2,500	250	Legal				Koski, R. O. 1949
Rainbow	1950		45,396	1,767					Gunckel, S. 2002
Rainbow	1952		6,030	650					Gunckel, S. 2002
Rainbow	1953		2,759						Gunckel, S. 2002
		7/28	1,000	100		OS		2	
Rainbow	1954		8,434	1,887					Gunckel, S. 2002
Rainbow	1963		5,500		10 - 11				Hewkin, J. A. 1963
Rainbow	1963	6/17	2,498	999.2		OS	EPL	6707	Gunckel, S. 2002
Steelhead		5/27	10,667	401		EC	FWS	6000	
Steelhead, Winter	1964		10,200			Sandy			Olsen et al. 1994
Steelhead, Summer	1967		99,000		2.5	Oxbow	Idaho		Olsen et al. 1994
Rainbow	1970		10,000		2		CC		Hewkin, J. A. 1970
Rainbow	1971		9		12 - 30		CC		Hewkin, J. A. 1971
Smallmouth Bass	1971		79		8 - 17				Hewkin, J. A. 1971, Daily, K. 1992
Rainbow	1975	6/18	3,003	910	9	FR	RR	5405	Claire, E. W. 1975, Gunckel, S. 2002
		7/1	3,002	790	9	FR	WT	5708	
Rainbow	1980	6/17	2,486	777	9	FR	RR	05478	Claire, E. W. 1980, Gunckel, S. 2002
		7/8	2,520	840	9	WF	RR	05478	

Appendix Table M-8. Record of hatchery fish released into the John Day River, Section 2, of the Upper Mainstem John Day River basin from 1957 to 1983.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1957		1,014	169	6 +				Koski, R. O. 1958
Rainbow	1967		76,415	3,696	4 - 6				Koski, R. O. 1968
Rainbow	1967		6,241	790	8 +				Koski, R. O. 1968
Rainbow	1970		34,332	730	4 - 6	WF			Koski, R. O. 1971
Rainbow	1972		20,000		Fry		CC		Hewkin, J. A. 1972
Rainbow	1982		1.515		12		CC		Claire, E. W. 1982
Rainbow	1983		1,245		1.18 lb. avg.		CC		Claire, E. W. 1983

Appendix Table M-9. Record of hatchery fish released into the John Day River, Section 3, of the Upper Mainstem John Day River basin from 1955 to 1988.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1955		11,987	3,587	6 +				Koski, R. O. 1955
Rainbow	1956		5,499		6 +				Koski, R.O. 1957, Gunckel, S.
		6/25	3,300	600	6 +	OS	FR	4902	2002
Rainbow	1957	5/23-5/28	4,176	803	6 +	OS	CRH	5207	Koski, R. O. 1958, Gunckel, S.
		6/11	1,999	400		OS	FR	4903	2002
		6/18-7/23	3,001	283		WF	WT	5706	
Rainbow	1958		10,684	2,267	6 +				Koski, R. O. 1959,
		7/8-7/9	4,180	912			FR	4904	Gunckel, S. 2002
Rainbow	1959	4/20-5/12	4,509	801	6 +	OS	FR	4905	Koski, R. O. 1960, Gunckel, S. 2002
Rainbow	1960	6/17	2,626	795.8	8 +	OS	FR	4908	Koski, R. O. 1961
		6/20-7/21	11,051	2,268	8+	WF	WT	5704	Gunckel, S. 2002
Rainbow	1961	6/27	2,748	1099.1	8 +	OS	EPL	6701	Koski, R. O. 1962, Gunckel, S.
		8/7	4,170	1,042.5		OS	OS	5303	2002
Rainbow	1962	10/11	7,581	523	4 - 6	KL	RR	5406	Koski, R. O. 1963, Gunckel, S.
		5/23-6/12	6,017	1,896	8+	OS	EPL	6703	2002
Rainbow	1964	7/6	3,493	998	8+	WF	WT	5703	Koski, R. O. 1965, Gunckel, S. 2002
Steelhead	1964	5/21	10,198[a]	340	yearling	GC		7805	Koski, R. O. 1965, Gunckel, S. 2002
Rainbow	1965	6/15	2,600	1,000	8 +	OS	EPL	6704	Koski, R. O. 1966b, Gunckel, S.
		6/29	3,000	1,250	8 +	WF	WT	5706	2002
Rainbow	1966	6/9	3,002	938	Yearling	WF	WT	5704	Koski, R. O. 1966a, Gunckel, S. 2002
Rainbow	1967	6/28	3,000	909	8 +	WF	WT	5702	Koski, R. O. 1968
Steelhead, Summer[a]	1967	11/7	98,090[a]	900	2 - 4	Oxbow	Idaho	8501	Koski, R. O. 1968, Olsen et al. 1994, Gunckel, S. 2002
Rainbow	1968	5/8	3,501	1,061	8 +	OS		4868	Koski, R. O. 1969, Gunckel, S.
		5/26	3,002	1,072	8+	WF	WT	5703	2002
Rainbow	1969	9/25	33,958	1,590	4 - 6	WI	WT	5705	Koski, R. O. 1970, Gunckel, S.
		6/4-6/30	5,510	1,635	8 +	OS		4801	2002
Rainbow	1970	6/19	2,001	741	8 +	WF	WT	5705	Koski, R. O. 1971, Gunckel, S.
		6/9-7/9	6,002	2,127	8 +	OS		4804	2002
Rainbow	1971	6/22-7/20	3,991	1,841	8 +	WF	RR	5403	Koski, R. O. 1972, Gunckel, S. 2002
Rainbow	1972	6/21	1,000	400		KL	RR	5405	Hewkin, J. A. 1972, Gunckel, S.
		6/15-7/25	6,477	3,189		FR	RR	5405	2002
Rainbow	1973		6,476		10 - 11				Claire, E. W. 1973
		7/6	2,490[b]	1,245		OS		4803	Gunckel, S. 2002[b]
		7/17	2,502[b]	962		WF	RR	5406	Gunckel, S. 2002[b]
Rainbow	1974	6/13-6/25	5,999	2,070	9 - 10	WF	RR	5408	Claire, E. W. 1974, Gunckel, S. 2002
Rainbow	1976		5,986		9				Claire, E. W. 1976
Rainbow	1977		6,004		8				Claire, E. W. 1977
Rainbow	1978		6,013		9				Claire, E. W. 1978
		7/6	3,010[b]	860		WF	WR	05776	Gunckel, S. 2002[b]
Rainbow	1979	6/6-6/26	4,958	1,558	9	FR	RR	05477	Claire, E. W. 1979, Gunckel, S. 2002
			49,742		4 - 5				
Rainbow	1981	6/17-7/24	4,999	1,934	9	FR	CC	07279	Claire, E. W. 1981, Gunckel, S.
		6/24	39,983	1,538	4	OS	OS	05380	2002
Rainbow	1982	6/23	2,502	736	9	FR	CC	07280	Claire, E. W. 1982, Gunckel, S. 2002
Rainbow	1983	7/14	2,994	1,069.1	9	FR	CC	07281	Claire, E. W. 1983, Gunckel, S.
		6/17	20,010	435	4	WA	OS	05382	2002
Rainbow	1984	7/9	15,250	1,016.6	5	OS	OS	05383	Claire, E. W. 1984, Gunckel, S.
		7/3	3,078[c]	1363	10	OS	WR	05783	2002
Rainbow	1985	7/3	2,982	1064.8	10	FR	CC	07283	Claire, E. W. 1985, Gunckel, S. 2002
Rainbow	1986	6/3	2,497	832.3	9	FR	CC	07284	Claire, E. W. 1986, Gunckel, S.
		5/21	14,950	373.75	4	OS	OS	05385	2002
Rainbow	1988	6/15	2,479	652.4		FR	CC	07286	Claire, E. W. 1986, Gunckel, S.
		5/11	10,060	119.8	3	WF	OS	05387	2002

[a] This release is probably the same as the one previously listed for the Mainstem John Day with the Olsen et al. reference.
[b] These releases may be the same as those listed by Claire, although they did not correspond numerically. Gunckel may be missing a release group, which could cause the discrepancy.
[c] Gunckel (2002) lists a 2,999 legal size release, which is assumed to be the same as this 3,078 legal size release listed by Claire (1984).

Appendix Table M-10. Record of hatchery fish released into Rail Creek, of the Upper Mainstem John Day River basin in 1941.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBS	1941	5/19	1,849	360		OS			Gunckel, S. 2002

Appendix Table M-11. Record of hatchery fish releases into Rock Creek (assumed to be the Rock Creek of Wheeler County) of the Upper Mainstem John Day River basin in 1955.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1955		1,015	175	6 +				Koski, R. O. 1955

APPENDIX N

Historic stocking records for Tributaries of the Lower Mainstem John Day River

Appendix Table N-1. Record of hatchery fish released into Butte Creek, of the Lower Mainstem John Day River basin from 1947 to 1976.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		2,940	210	4 - 6				Koski, R. O. 1948
Rainbow	1956		1,991	476	6 +				Koski, R. O. 1957
Rainbow	1957		2,042	395	6 +				Koski, R. O. 1958
Rainbow	1958		3,507	794	6 +				Koski, R. O. 1959
Rainbow	1959		2,999	522	6 +				Koski, R. O. 1960
Rainbow	1960		2,700	736	8 +				Koski, R. O. 1961
Rainbow	1961		299	88	8 +				Koski, R. O. 1962
Rainbow	1962		180	60	8 +				Koski, R. O. 1963
Rainbow	1972		896		9 - 10				Hewkin, J. A. 1972
Rainbow	1973		420		10				Claire, E. W. 1973
Rainbow	1974		500		9				Claire, E. W. 1974
Rainbow	1976		150		9				Claire, E. W. 1976

Appendix Table N-2. Record of hatchery fish released into Kahler Creek, of the Lower Mainstem John Day River basin in 1947.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		2,800	200	Legal				Koski, R. O. 1948

Appendix Table N-3. Record of hatchery fish released into Rock Creek, of the Lower Mainstem John Day River basin from 1947 to 1976.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		7,000	500	4 - 6				Koski, R. O. 1948
Steelhead	1947		7,600	190	4 - 6				Koski, R. O. 1948
Rainbow	1948		5,600	560	Legal				Koski, R. O. 1949
Rainbow	1955		1,503	334	6 +				Koski, R. O. 1955
Rainbow	1956		2,998	597	6 +				Koski, R. O. 1957
Rainbow	1957		968	220	6 +				Koski, R. O. 1958
Rainbow	1958		1,004	223	6 +				Koski, R. O. 1959
Rainbow	1959		2,095	381	6 +				Koski, R. O. 1960
Rainbow	1960		3,789	914.3	8 +				Koski, R. O. 1961
Rainbow	1961		1,998	522.9	8 +				Koski, R. O. 1962
Rainbow	1962		1,395	465	8 +				Koski, R. O. 1963
Rainbow	1963		1,456		9				Hewkin, J. A. 1963
Rainbow	1964		1,495	453	8 +				Koski, R. O. 1965
Rainbow	1965		1,150	500	8 +				Koski, R. O. 1966b
Rainbow	1966		1,502	518	yearling				Koski, R. O. 1966a
Rainbow	1967		1,505	430	8 +				Koski, R. O. 1968
Rainbow	1968		3,000	750	8 +				Koski, R. O. 1969
Rainbow	1969		3,000	1,000	8 +				Koski, R. O. 1970
Rainbow	1970		3,000	938	8 +	WF			Koski, R. O. 1971
Rainbow	1971		2,501	715	8 +				Koski, R. O. 1972
Rainbow	1972		2,492		9				Hewkin, J. A. 1972
Rainbow	1973		2,502		10				Claire, E. W. 1973
Rainbow	1975		2,496	713		OS		4803	Liberation Report, 1975
Rainbow	1976		991		9				Claire, E. W. 1976

Appendix Table N-4. Record of hatchery fish releases into Rock Creek, Middle Fork of the Lower Mainstem John Day River basin in 1957.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1957		1,000	200	6 +				Koski, R. O. 1958

Appendix Table N-5. Record of hatchery fish releases into Service Creek, of the Lower Mainstem John Day River basin in 1947.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		560	40	4 - 6				Koski, R. O. 1948

Appendix Table N-6. Record of hatchery fish releases into Thirtymile Creek, of the Lower Mainstem John Day River basin from 1947 to 1972.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		3,000	250	4 - 6				Koski, R. O. 1948
Steelhead	1947		7,520	188	4 - 6				Koski, R. O. 1948
Rainbow	1948		2,800	280	Legal				Koski, R. O. 1949
Rainbow	1955		1,503	334	6 +				Koski, R. O. 1955
Rainbow	1956		996	232	6 +				Koski, R. O. 1957
Rainbow	1957		3,004	680	6 +				Koski, R. O. 1958
Rainbow	1958		1,499	333	6 +				Koski, R. O. 1959
Rainbow	1959		1,402	255	6 +				Koski, R. O. 1960
Rainbow	1960		1,115	259.3	8 +				Koski, R. O. 1961
Rainbow	1961		1,497	374.4	8 +				Koski, R. O. 1962
Rainbow	1962		1,425	475	8 +				Koski, R. O. 1963
Rainbow	1963		1,040		10				Hewkin, J. A. 1963
Rainbow	1964		990	300	8 +				Koski, R. O. 1965
Rainbow	1965		943	410	8 +				Koski, R. O. 1966b
Rainbow	1966		1,000	345	Yearling				Koski, R. O. 1966a
Rainbow	1967		1,005	314	8 +				Koski, R. O. 1968
Rainbow	1969		501	167	8 +				Koski, R. O. 1970
Rainbow	1970		502	162	8 +	OS			Koski, R. O. 1971
Rainbow	1971		500	139	8 +				Koski, R. O. 1972
Rainbow	1972		496		9				Hewkin, J. A. 1972

APPENDIX O

Historic stocking records for Tributaries of the South Fork John Day River

Appendix Table O-1. Record of hatchery fish released into Deer Creek, of the South Fork John Day River basin in 1948.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1948		5,625	125	4 - 6				Koski, R. O. 1949

Appendix Table O-2. Record of hatchery fish released into the South Fork John Day River, of the South Fork John Day River basin from 1947 to 1994.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		14,175	225	2 - 4				Koski, R. O. 1948
Rainbow	1947		4,275	285	4 - 6				Koski, R. O. 1948
Rainbow	1948		2,500	250	Legal				Koski, R. O. 1949
Rainbow	1955		1,040	400	6 +				Koski, R. O. 1955
Rainbow	1956		2,998	638	6 +				Koski, R. O. 1957
Rainbow	1957		2,000	500	6 +				Koski, R. O. 1958
Rainbow	1958		1,499	375	6 +				Koski, R. O. 1959
Rainbow	1959		2,279	495.5	6 +				Koski, R. O. 1960
Rainbow	1960		4,916	1,068.7	8 +				Koski, R. O. 1961
Rainbow	1961		4,499	1,363.3	8 +				Koski, R. O. 1962
Rainbow	1962		4,510	1,555	8 +				Koski, R. O. 1963
Rainbow	1963		4,151		9				Hewkin, J. A. 1963
Rainbow	1964		2,001	690	8+				Koski, R. O. 1965
Rainbow	1965		50,008	1,330	4 - 6				Koski, R. O. 1966b
Steelhead, Winter	1965		27,860	449	2 - 4		Alsea		Koski, R. O. 1966b
Rainbow	1966		36,744	1,531	4 - 6				Koski, R. O. 1966a
Rainbow	1966		2,998	1,071	yearling				Koski, R. O. 1966a
Coho	1966		325,793		Fry(unfed)				Hewkin, J. A. 1966
Rainbow	1967		8,003	920	8 +				Koski, R. O. 1968
Rainbow	1969		19,920	905.5	4 - 6				Koski, R. O. 1970
Rainbow	1969		5,999	2,458	8 +				Koski, R. O. 1970
Rainbow	1970		20,400	280	2 - 4	FR			Koski, R. O. 1971
Rainbow	1971		3,040	800	8 +				Koski, R. O. 1972
Rainbow	1972		3,992		10				Hewkin, J. A. 1972
Rainbow	1973		4,492		9 - 10				Claire, E. W. 1973
Rainbow	1974		5,002		10				Claire, E. W. 1974
Rainbow	1975		4,998		9				Claire, E. W. 1975
Rainbow	1976		4,999		9				Claire, E. W. 1976
Rainbow	1977		4,992		9				Claire, E. W. 1977
Rainbow	1978		4,991		9				Claire, E. W. 1978
Rainbow	1978		34,965		4				Claire, E. W. 1978
Rainbow	1979		4,939		9				Claire, E. W. 1979
Rainbow	1980		5,005		9				Claire, E. W. 1980
Rainbow	1980		18,900		6				Claire, E. W. 1980
Rainbow	1981		4,996		9				Claire, E. W. 1981
Rainbow	1981		15,002		4				Claire, E. W. 1981
Rainbow	1982		4,996		9				Claire, E. W. 1982
Rainbow	1983		2,594		9				Claire, E. W. 1983
Rainbow	1983		7,038		4				Claire, E. W. 1983
Rainbow	1984		2,997		9				Claire, E. W. 1984
Rainbow	1984		8,175		5				Claire, E. W. 1984
Rainbow	1985		3,002		9				Claire, E. W. 1985
Rainbow	1986		3,000		9				Claire, E. W. 1986
Rainbow	1986		10,180		4				Claire, E. W. 1986
Rainbow	1988		3,000		9				Claire, E. W. 1988
Rainbow	1988		5,035		3				Claire, E. W. 1988
Rainbow	1989		4,939		3				Claire, E. W. and B. J. Smith. 1989
Rainbow	1990		4,990		3				Claire, E. W. and M. E. Gray 1990
Rainbow	1991		5,534		4				Claire, E. W. and M. E. Gray 1991
Rainbow	1992		5,525		4	WF			Claire, E. W. and M. E. Gray 1992
Rainbow	1994		5,498		5	OS			Unterwegner, T. J. and M. E. Gray 1994

Appendix Table O-3. Record of hatchery fish released into Murderers Creek of the South Fork John Day River basin in 1948.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1948		11,250	250	4 - 6				Koski, R. O. 1949

APPENDIX P

Historic stocking records for Tributaries of the North Fork John Day River

Appendix Table P-1. Record of hatchery fish released into Bear Wallow Creek, tributary to Camas Creek, of the North Fork John Day River basin in 1947.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		20,000	4.2	0 - 2				Koski, R. O. 1948

Appendix Table P-2. Record of hatchery fish released into Big Meadow Creek, of the North Fork John Day River basin in 1941.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBF	1941	10/9	2,102	40					Gunckel, S. 2002

Appendix Table P-3. Record of hatchery fish released into Cable Creek, a tributary of Camas Creek of the North Fork John Day River basin from 1941 to 1947.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBF	1941	10/9	1,840	35		OS			Gunckel, S. 2002
Rainbow	1947		30,000	6.3	0 - 2				Koski, R. O. 1948

Appendix Table P-4. Record of hatchery fish released into Camas Creek, of the North Fork John Day River basin form 1925 to 1997.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1925		12,000						Gunckel, S. 2002
Brook	1926		25,000						Gunckel, S. 2002
Rainbow	1928		27,000						Gunckel, S. 2002
Rainbow	1931		5,000						Gunckel, S. 2002
Rainbow	1933		20,000						Gunckel, S. 2002
Rainbow	1934		11,000						Gunckel, S. 2002
RBF	1940		30,341	467					Gunckel, S. 2002
RBF	1941	10/3	6,855	115		OS			Gunckel, S. 2002
RBF	1942	7/31	11,690	70					Gunckel, S. 2002
RBF	1943	8/16	7,725	75					Gunckel, S. 2002
Rainbow	1947		20,000	4.2	0 - 2				Koski, R. O. 1948
Rainbow	1948		13,000	200	2 - 4				Koski, R. O. 1949
Rainbow	1949		1,440	360					Gunckel, S. 2002
Rainbow	1950		1,960	280					Gunckel, S. 2002
Rainbow	1951		3,510	325					Gunckel, S. 2002
Rainbow	1952	4/10	3,000	313		OS			Gunckel, S. 2002
Rainbow	1953	6/8	1,039	800		OS			Gunckel, S. 2002
Rainbow	1954	7/23	3,993	470		WF		18	Gunckel, S. 2002
Rainbow	1955	7/18	1,978	445	6 +	OS	OS	53 03	Koski, R. O. 1955, Gunckel, S. 2002
Rainbow	1956	6/20	1,032	240	6 +	OS	OS	53 02	Koski, R. O. 1957, Gunckel, S. 2002
Steelhead, Winter	1962		200,000		Fingerling, 45 fish/lb				Olsen et al. 1994, this release group split among Cable, Bowman, and Camas creeks, all in the Camas drainage.
Rainbow	1967	9/19	10,043	844	4 - 6	WA	WT	57 03	Koski, R. O. 1968, Gunckel, S. 2002
Steelhead, Summer	1967		71,500			Oxbow	Idaho		Olsen et al. 1994
Rainbow	1971	6/8	2,502	715	8 +	OS		48 02	Koski, R. O. 1972, Gunckel, S. 2002
Rainbow	1972	6/9	2, 462	1071	10	FR	RR	54 05	Hewkin, J. A. 1972, Gunckel, S. 2002
Rainbow	1973	5/21	2,496	805	9	WF	RR	54 06	Claire, E. W. 1973, Gunckel, S. 2002
Rainbow	1974	5/23	2,501	695	9	OS		48 01	Claire, E. W. 1974, Gunckel, S. 2002
Rainbow	1975	6/12	2,498	833	9	OS		48 05	Claire, E. W. 1975, Gunckel, S. 2002
Rainbow	1976		2,501		9				Claire, E. W. 1976
Rainbow	1977		2,580		9				Claire, E. W. 1977
Rainbow	1978	5/24	2,604	930	10	OS	WR	05777	Claire, E. W. 1978, Gunckel, S. 2002
Rainbow	1979	6/6	2,513	739	9	OS	DL	04878	Claire, E. W. 1979, Gunckel, S. 2002
Rainbow	1980	5/23	2,506	895	9	OS	WR	05779	Claire, E. W. 1980, Gunckel, S. 2002
Rainbow	1981	6/18	2,500	834	9	WF	CC	07279	Claire, E. W. 1981, Gunckel, S. 2002
Rainbow	1982	6/18	2,501	1,042	10	OS	WR	05781	Claire, E. W. 1982, Gunckel, S. 2002
Rainbow	1983	6/15	2,500	1,136	9	OS	WR	05782	Claire, E. W. 1983, Gunckel, S. 2002
Rainbow	1984	6/28	2,985	995	9	FR	CC	07282	Claire, E. W. 1984, Gunckel, S. 2002
Rainbow	1985	5/24	2,501	758	9	WF	CC	07283	Claire, E. W. 1985, Gunckel, S. 2002
Rainbow	1986	5/29	2,498	713.6	9	WF	CC	07284	Claire, E. W. 1986, Gunckel, S. 2002
Rainbow	1987	5/21	2,501	806.7	9	WF	CC	07285	Claire, E. W. 1987, Gunckel, S. 2002
Rainbow	1988	5/25	2,507	659.7	9	WF	CC	07286	Claire, E. W. 1988, Gunckel, S. 2002
Rainbow	1989	5/31	2,462	849.2	10	IR	CC	07287	Claire, E. W. and B. J. Smith 1989 Gunckel, S. 2002
Rainbow	1989	5/31	2,503	863					Gunckel, S. 2002
Rainbow	1990	5/23	2,498	780.8	9	IR	CC	07288	Claire, E. W. and M. E. Gray 1990, Gunckel, S. 2002
Rainbow	1991	6/4	2,097	599.1	9 - 10	WF	CC	07289	Claire, E. W. and M. E. Gray 1991,
		7/1	398	137.3		IR		07289	Gunckel, S. 2002
Rainbow	1992	6/4	2,500	781.4	9	WF	CC	07290	Claire, E. W. and M. E. Gray 1992, Gunckel, S. 2002
Rainbow	1993	6/10	2,501	735.7	9	IR	CC	07291	Claire, E. W. and M. E. Gray 1993, Gunckel, S. 2002
Rainbow	1994	6/7	2,545	831.7	9	IR	CC	07292	Unterwegner, T. J. and M. E. Gray 1994, Gunckel, S. 2002
Rainbow	1995	6/8	2,490	701.3	9	FR	CC	07293	Unterwegner, T. J. and M. E. Gray 1995, Gunckel, S. 2002
Rainbow	1996	6/5	2,491	803.5	9	IR	CC	07294	Unterwegner, T. J. and M. E. Gray 1996, Gunckel, S. 2002
Rainbow	1997	6/4	2,497	734.4	9	IR	CC	07295	Unterwegner, T. J. and M. E. Gray 1997, Gunckel, S. 2002

Appendix Table P-5. Record of fish stocking in Clear Creek, of the North Fork John Day River basin in 1965.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Cutthroat	1965		100			Transplant from Deardorff Creek			Gunckel, S. 2002

Appendix Table P-6. Record of hatchery fish released into Crane Creek, of the North Fork John Day River basin from 1929 to 1954.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1929		10,000						Gunckel, S. 2002
Brook	1931		10,000						Gunckel, S. 2002
Brook	1933		7,050						Gunckel, S. 2002
Brook	1940		25,134	71					Gunckel, S. 2002
Rainbow	1954	8/18	10,000	25		WA		3	Gunckel, S. 2002

Appendix Table P-7. Record of hatchery fish released into Desolation Creek, of the North Fork John Day River basin from 1941 to 1995.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBF	1941	10/2	7,505	115		OS			Gunckel, S. 2002
Rainbow	1950		1,987	265					Gunckel, S. 2002
Rainbow	1951		2,100	280					Gunckel, S. 2002
Rainbow	1952	4/24	1,508	130		OS		12	Gunckel, S. 2002
Rainbow	1953	7/15	3,564	445		OS		2	Gunckel, S. 2002
Rainbow	1954	7/12	3,501	674		OS		5	Gunckel, S. 2002
Rainbow	1955	8/10	1,140	285	6 +	OS	OS	5303	Koski, R. O. 1955, Gunckel, S. 2002
Rainbow	1956	7/26	1,000	250	6 +	OS	FR	4902	Koski, R. O. 1957, Gunckel, S. 2002
		8/13	3,000	682		WF		4901	
Rainbow	1957	6/24	1,999	400		OS	CR	5207	Gunckel, S. 2002
Rainbow	1958	7/9	3,704	699	6 +	OS	FR	4904	Koski, R. O. 1959, Gunckel, S. 2002
Rainbow	1959	7/1	2,697	539	6 +	OS	FR	4905	Koski, R. O. 1960, Gunckel, S. 2002
		7/6	1,399	200		OS	FR	4905	
		7/9	3,704	699		OS	FR	4904	
Rainbow	1960	6/21	2,499	295	8 +	OS	FR	4908	Koski, R. O. 1961, Gunckel, S. 2002
Rainbow	1961	6/27	1,619	647.5	8 +	OS	EPL	6701	Koski, R. O. 1962, Gunckel, S. 2002
		7/5	1,885	698.2					
Rainbow	1962	6/14	3,501	1,167.0	8 +	WF	WT	5706	Koski, R. O. 1963, Gunckel, S. 2002
Rainbow	1963	6/25	3,000	857	9	WF	WT	5708	Hewkin, J. A. 1963, Gunckel, S. 2002
Rainbow	1965	7/9	2,500	1,087		OS	Private	7603	Gunckel, S. 2002
Rainbow	1967	7/10	1,502	518	8 +	WF	WT	5702	Koski, R. O. 1968, Gunckel, S. 2002
Rainbow	1968	7/1	2,998	1,034	8 +	WF	WT	5703	Koski, R. O. 1969, Gunckel, S. 2002
Rainbow	1969	6/25	3,000	1,250	8 +	WF	RR	5408	Koski, R. O. 1970, Gunckel, S. 2002
Rainbow	1970	6/24	2,994	1,198	8 +	WF	WT	5705	Koski, R. O. 1971, Gunckel, S. 2002
Rainbow	1971	7/1	2,499	735	8 +	OS		4802	Koski, R. O. 1972, Gunckel, S. 2002
Rainbow	1972	7/6	2,501	1,191	10	OS		4801	Hewkin, J. A. 1972, Gunckel, S. 2002
Rainbow	1973	7/6	2,500	926	10	WF	RR	5406	Claire, E. W. 1973, Gunckel, S. 2002
Rainbow	1974	7/2	2,496	925	10	WF	RR	5408	Claire, E. W. 1974, Gunckel, S. 2002
Rainbow	1975	7/1	2,502	833	9	FR	RR	5404	Claire, E. W. 1975, Gunckel, S. 2002
Rainbow	1976		2,500		9				Claire, E. W. 1976
Rainbow	1977		2,503		9				Claire, E. W. 1977
Rainbow	1978	7/7	2,496	861	10	FR	RR	05476	Claire, E. W. 1978, Gunckel, S. 2002
Rainbow	1979	7/11	2,480	744	9	FR	RR	05477	Claire, E. W. 1979, Gunckel, S. 2002
Rainbow	1980	7/15	2,496	624	9	FR	RR	05478	Claire, E. W. 1980, Gunckel, S. 2002
Rainbow	1981	6/23	2,500	926		FR	CC	07279	Claire, E. W. 1981, Gunckel, S. 2002
Rainbow	1982		2,500		10				Claire, E. W. 1982
Rainbow	1983	7/19	2,498	892.3	9	FR	CC	07281	Claire, E. W. 1983, Gunckel, S. 2002
Rainbow	1984	7/11	2,492	736	9	FR	CC	07282	Claire, E. W. 1984, Gunckel, S. 2002
Rainbow	1985	6/28	2,499	806	9	WF	CC	07283	Claire, E. W. 1985, Gunckel, S. 2002
Rainbow	1986	6/10	2,563	801	9	WF	CC	07284	Claire, E. W. 1986, Gunckel, S. 2002
Rainbow	1987	6/1	2,499	833	9	WF	CC	07285	Claire, E. W. 1987, Gunckel, S. 2002
Rainbow	1988	6/21	2,498	832.7	9	WF	CC	07286	Claire, E. W. 1988, Gunckel, S. 2002
Rainbow	1989	6/28	2,001	870	10	IR	CC	07287	Claire, E. W. and B. J. Smith 1989, Gunckel, S. 2002
Rainbow	1990	6/19	1,000	400	9	IR	CC	07288	Claire, E. W. and M. E. Gray 1990, Gunckel, S. 2002
Rainbow	1991	7/1	1,000	344.7	9 - 10	IR	CC	07289	Claire, E. W. and M. E. Gray 1991
Rainbow	1992	6/4	1,001	312.7	4	WF	CC	07290	Claire, E. W. and M. E. Gray 1992, Gunckel, S. 2002
Rainbow	1993	7/6	1,002	358	9	IR	CC	07291	Claire, E. W. and M. E. Gray 1993, Gunckel, S. 2002
Rainbow	1994	6/23	1,000	303	9	IR	CC	07292	Unterwegner, T. J. and M. E. Gray 1994, Gunckel, S. 2002
Rainbow	1995	6/29	1,000	303	9	IR	CC	07293	Unterwegner, T. J. and M. E. Gray 1995, Gunckel, S. 2002

Appendix Table P-8. Record of hatchery fish released into Desolation Creek North Fork, of the North Fork John Day River basin from 1957 to 1965.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1957		1,999	400	6 +				Koski, R. O. 1958
Rainbow	1965		2,500	1,087	8 +				Koski, R. O. 1966

Appendix Table P-9. Record of hatchery fish released into Desolation Creek South Fork, of the North Fork John Day River basin from 1941 to 1965.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBF	1941	10/3	3,324	50		OS			Gunckel, S. 2002
Rainbow	1957	6/5	2,000	400	6 +	OS	CRH	5207	Koski, R. O. 1958, Gunckel, S. 2002
Cutthroat	1965		99			Transplant from Deardorff Creek			Gunckel, S. 2002

Appendix Table P-10. Record of hatchery fish released into Fox Creek, tributary to Cottonwood Creek of the North Fork John Day River basin from 1941 to 1948.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBF	1941	6/11	5,550	1500		OS			Gunckel, S. 2002
Rainbow	1947		1,210	110	Legal				Koski, R. O. 1948
Rainbow	1948		1,000	100	Legal				Koski, R. O. 1949

Appendix Table P-11. Record of hatchery fish released into Frazier Creek, of the North Fork John Day River basin from 1941 to 1947.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBF	1941	10/8	2,831	51.6		OS			Gunckel, S. 2002
Rainbow	1947		20,000	4.2	0 - 2				Koski, R. O. 1948

Appendix Table P-12. Record of hatchery fish released into Granite Creek, of the North Fork John Day River basin in 1962.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Steelhead, Winter	1962		375,000		Fry		EC		Olsen et al. 1994, note: most died at release

Appendix Table P-13. Record of hatchery fish released into Hidaway Creek, of the North Fork John Day River basin from 1941 to 1947.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBS	1941	10/6	2,001	36.5		OS			Gunckel, S. 2002
Rainbow	1947		20,000	4.2	0 - 2				Koski, R. O. 1948

Appendix Table P-14. Record of hatchery fish released into the North Fork John Day River, of the North Fork John Day River basin from 1925 to 1997.

Species	Year	Date	Number	Lbs.	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1925		25,000						Gunckel, S. 2002
Rainbow	1934		20,00						Gunckel, S. 2002
RBS	1941	5/19	4,571	890		OS			Gunckel, S. 2002
Rainbow	1951		5,950	1,250					Gunckel, S. 2002
Rainbow	1952	4/24	3,004	259		OS		12	Gunckel, S. 2002
		4/25	1,150	500		OS		3	
		4/28	1,100	500		OS		3	
		4/29	1,150	500		OS		3	
		4/30	850	425		OS		3	
Rainbow	1953	3/25	1,500	750		OS		4	Gunckel, S. 2002
		5/27	2,016	360		WF		7	
		6/17	2,502	278		OS		2	
		6/19	2,583	287		OS		2	
		7/30	996	100		OS		2	
Rainbow	1954	4/5	1,008	360		OS		1	Gunckel, S. 2002
		5/17	984	448		OS		1	
		7/14	2,000	500		OS		5	
		7/15	1,040	200		OS		5	
		7/23	988	117		WF		18	
Rainbow	1955[a]	4/4	1,040	400		OS	OS	5304	Gunckel, S. 2002[a]
		7/20	2,514	370		OS	OS	5303	
		8/10	2,797	700		OS	OS	5303	
		8/18	4,366	760		OS	OS	5303	
Rainbow	1956[a]	6/20	1,978	460		OS	OS	5302	Gunckel, S. 2002[a]
		7/24	2,010	450		OS	FR	4902	
		8/14	3,503	687		OS	OS	5302	
		8/20	3,678	628		WF	FR	4901	
Rainbow	1957[a]	6/3	2,999	653		OS	CRH	5207	Gunckel, S. 2002[a]
		6/24	3,002	536		WF	WT	5706	
		6/24	999	200		OS	CRH	5207	
Rainbow	1958	7/7	7,099	1,479		OS	WT	5702	Gunckel, S. 2002
Rainbow	1963		6,150		9 - 12				Hewkin, J. A. 1963
Rainbow	1963[b]	6/17	2,999	1,199.6		OS	EPL	6707	Gunckel, S. 2002[b]
		7/1	2,995	1,498		OS	EPL	6707	
		7/2	2,000	1,000		OS	EPL	6707	
		7/5	1,150	311		WF	WT	5708	
Rainbow	1972	6/30-7/27	8,873	4,372	10	FR	RR	5405	Hewkin, J. A. 1972, Gunckel, S. 2002
Rainbow	1973	6/12	2,495	780	9 - 10	WF	RR	5406	Claire, E. W. 1973,
		6/29	2,499	926		WF	RR	5406	Gunckel, S. 2002
		7/5	2,500	1,042		OS	-	4803	
		7/10	3,000	1,200		OS	-	4803	
		8/28-9/18	97,751	6,001		WF	RR	5408	
		5/8	1,485	594		WF	RR	5406	
Rainbow	1974	7/9-7/23	8,991	3,459	10	WF	RR	5408	Claire, E. W. 1974, Gunckel, S. 2002
Rainbow	1975	7/8	3,001	811	9	WF	WT	5708	Claire, E. W. 1975,
		7/14	2,996	881	9	WF	WT	5708	Gunckel, S. 2002
		7/16	51,345	1,467		OS	WT	5710	
		7/22	3,003	858	9	FR	WT	5708	
Rainbow	1976		8,032		9				Claire, E. W. 1976
Rainbow	1977		8,955		8				Claire, E. W. 1977
Rainbow	1977		51,136		4				Claire, E. W. 1977
Rainbow	1978	6/20	8,956	2,662	9	FR	RR	05476	Claire, E. W. 1978,
		7/11	3,000	937		WF	WR	05776	Gunckel, S. 2002
Rainbow	1979	6/13-7/10	7,521	2,289	9	FR	RR	05477	Claire, E. W. 1979,
		7/6	40,176	648	3	OS	RR	05478	Gunckel, S. 2002
		10/9	26,972	1,226		FR	RR	05478	
Rainbow	1980		7,497		9				Claire, E. W. 1980,
		6/18	2,520	700		WF	RR	05478	Gunckel, S. 2002
		7/1	2,493	712		FR	RR	05478	
Rainbow	1981	6/19-7/23	7,491	3,454	9	FR	CC	07279	Claire, E. W. 1981,
		7/22	1,008	70		OS	OS	05380	Gunckel, S. 2002

Appendix Table P-14. Continued.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1982		3,795		10				Claire, E. W. 1982, Gunckel, S. 2002
		10/27	38,000	1,000	4	WF	CC	07281	
		7/20	2,495	891.2		WF	RR	05480	
		8/3	2,210	1300		OS	WR	05781	
Rainbow	1983	7/19	2,997	1,110.1	11	WF	CC	07281	Claire, E. W. 1983, Gunckel, S. 2002
		8/5	4,490	3,206.8		OS	WR	05782	
		6/29	35,100	900	4	WF	OS	05382	
Rainbow	1984	7/16	2,614	1,307	10	OS	WR	05783	Claire, E. W. 1984, Gunckel, S. 2002
		7/31	2,490	803.1	10	FR	CC	07282	
Rainbow	1985	6/28-7/8	4,989	1,695.8	9 - 10	WF	CC	07283	Claire, E. W. 1985, Gunckel, S. 2002
		6/28	10,042	196.9	4	WF	OS	05384	
Rainbow	1986	6/16-7/1	5,038	1,618	10	WF	CC	07284	Claire, E. W. 1986, Gunckel, S. 2002
		6/17	20,007	769.5	4	OS	OS	05385	
Rainbow	1987	5/28	2,499	735.1	9	WF	CC	07285	Claire, E. W. 1987
Rainbow	1988	6/22-7/6	4,502	1500.7	9	WF	CC	07286	Claire, E. W. 1988, Gunckel, S. 2002
		6/8	9,994	163.8	3	WF	OS	05387	
Rainbow	1989	6/21-7/5	3,980	1,602.2	10	IR	CC	07287	Claire, E. W. and B. J. Smith. 1989,
		7/5	2,001	741					Gunckel, S. 2002
Rainbow	1990	6/19	3,000	1200	10	IR	CC	07288	Claire, E. W. and M. E. Gray 1990,
		6/14	14,992	555.3	4	OS	OS	05389	Gunckel, S. 2002
		6/14	5,006	143.9	4	OS	CC	07289	
Rainbow	1991	6/18	2,995	966.1	9	IR	CC	07289	Claire, E. W. and M. E. Gray 1991, Gunckel, S. 2002
Rainbow	1992	6/10	2,995	998.3	9	WF	CC	07290	Claire, E. W. and M. E. Gray 1992, Gunckel, S. 2002
Rainbow	1993	7/6	3,001	1,071.6	9	IR	CC	07291	Claire, E. W. and M. E. Gray 1993, Gunckel, S. 2002
Rainbow	1994	6/23	2,988	905.4	9	IR	CC	07292	Unterwegner, T. J. and M. E. Gray 1994, Gunckel, S. 2002
Rainbow	1995	629	2,999	908.7	9	IR	CC	07293	Unterwegner, T. J. and M. E. Gray 1995, Gunckel, S. 2002
Rainbow	1996	6/12	2,998	967	9	IR	CC	07294	Unterwegner, T. J. and M. E. Gray 1996, Gunckel, S. 2002
Rainbow	1997	6/27	2,980	993.3	9	IR	CC	07295	Unterwegner, T. J. and M. E. Gray 1997

[a] These releases are probably the same as those listed in other sections of the North Fork for the same year by Koski, however, they could not be accurately matched and were thus reported individually.

[b] These releases likely overlap and/or include the release listed by Hewkin for the same year, however they could not be individually identified and were thus reported individually.

Appendix Table P-15. Record of hatchery fish released into the North Fork John Day River Section 1, of the North Fork John Day River basin from 1957 to 1970.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1957		2,999	653	6 +				Koski, R. O. 1958
Rainbow	1967	10/3	19,991	1,886	4 - 6	WI	WT	5703	Koski, R. O. 1968, Gunckel, S. 2002
Rainbow	1970	9/17	51,575	999	4 - 6	FR	RR	5402	Koski, R. O. 1971, Gunckel, S. 2002

Appendix Table P-16. Record of hatchery fish released into the North Fork John Day River Section 2, of the North Fork John Day River basin from 1955 to 1970.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1955		5,406	1,160	6 +				Koski, R. O. 1955
Rainbow	1956		5,688	1,078	6 +				Koski, R. O. 1957
Rainbow	1958	7/7	2,997	624	6 +	OS	WT	5702	Koski, R. O. 1959, Gunckel, S. 2002
Rainbow	1959	6/29-7/6	9,198	1,520	6 +	OS	FR	4905	Koski, R. O. 1960, Gunckel, S. 2002
Rainbow	1960	6/22	3,985	1,245.3	8 +	OS	FR	4908	Koski, R. O. 1961, Gunckel, S.
		7/4	4,224	880		OS	OS	5314	2002
Rainbow	1961	7/5-7/10	5,466	2,098.4	8 +	OS	EPL	6701	Koski, R. O. 1962, Gunckel, S. 2002
Rainbow	1962	6/28-7/5	7,000	1,750	8 +	OS	EPL	6703	Koski, R. O. 1963, Gunckel, S. 2002
Rainbow	1965	7/7	3,001	968	8 +	WF	WT	5706	Koski, R. O. 1966b, Gunckel, S.
		7/9	402	175		OS	Private	7603	2002
		7/19	3,000	1,000		WF	WT	5706	
Cutthroat	1966		59,425	253	2 - 4	HR	Idaho	8500	Koski, R. O. 1966a, Gunckel, S. 2002
Rainbow	1966	9/14	17,577	837	4 - 6	OS	RR	5406	Koski, R. O. 1966a, Gunckel, S.
		9/14	14,700	700		OS	RR	5406	2002
		10/11	10,004	870		WA	RR	5406	
Rainbow	1966	6/15-6/22	6,001	2,035	yearling	WF	WT	5704	Koski, R. O. 1966a, Gunckel, S. 2002
Rainbow	1967	7/6-7/10	7,502	2,487	8 +	WF	WT	5702	Koski, R. O. 1968, Gunckel, S. 2002
Rainbow	1968	6/24-7/1	6,002	2,070	8 +	WF	WT	5703	Koski, R. O. 1969, Gunckel, S. 2002
Rainbow	1969	9/11	49,967	1,050	4 - 6	HR	WT	5705	Koski, R. O. 1970, Gunckel, S.
		9/29	19,910	1,100		WI	WT	5705	2002
		9/29	28,950	1,600		WI	WT	5705	
		10/1	14,980	903		WI	WT	5705	
		10/1	31,973	1,454		WI	WT	5705	
Rainbow	1970	9/22	39,920	798	4 - 6	KF	WT	5702	Koski, R. O. 1971, Gunckel, S. 2002
Rainbow	1970	6/24	3,002	1,112	8 +	OS		4804	Koski, R. O. 1971, Gunckel, S. 2002

Appendix Table P-17. Record of hatchery fish released into the North Fork John Day River Section 3, of the North Fork John Day River basin from 1955 to 1971.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1955		6,311	1,070	6 +				Koski, R.O. 1955
Rainbow	1956		1,978	460	6 +				Koski, R.O. 1956
Rainbow	1957		4,001	736	6 +				Koski, R. O. 1958
Rainbow	1959		7,099[a]	1,479	6 +				Koski, R. O. 1959[a]
Rainbow	1964	7/16-8/4	6,527	1,338	8+	WF	OS	5302	Koski, R. O. 1965, Gunckel, S. 2002
Steelhead, Summer[b]	1967[b]	11/9	71,500[b]	650	2 - 4	OS	Idaho	8501	Koski, R. O. 1968, Gunckel, S. 2002
Rainbow	1969	9/9	50,008	1,051	4 - 6	HR	WT	5705	Koski, R. O. 1970, Gunckel, S. 2002
Rainbow	1970	7/8	2,997	999	8 +	OS		4804	Koski, R. O. 1971, Gunckel, S. 2002
Rainbow	1971	6/29-7/9	6,995	2,342	8 +	OS		4802	Koski, R. O. 1972, Gunckel, S. 2002

[a] The date of release may be erroneous, as Gunckel (2002) attributes the same number and weight of fish released as this release group to a 1958 release in the North Fork subbasin.

[b] This release is likely a duplicate of the 1967 release listed for Camas Creek, as the release group size and stock are identical to that listed in Appendix Table Q-4.

Appendix Table P-18. Record of hatchery fish released into Lake Creek, of the North Fork John Day River basin, 1946.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBS	1946	7/13	21,120	69					Gunckel, S. 2002

Appendix Table P-19. Record of hatchery fish released into Lane Creek, tributary of Camas Creek of the North Fork John Day River basin, in 1947.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		15,000	3.1	0 - 2				Koski, R. O. 1948

Appendix Table P-20. Record of hatchery fish released into Meadow Creek, of the North Fork John Day River basin, in 1947.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		40,000	8.3	0 - 2				Koski, R. O. 1948

Appendix Table P-21. Record of hatchery fish released into Taylor Creek, of the North Fork John Day River basin in 1946.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBF	1946	4/27	2,160	240					Gunckel, S. 2002

Appendix Table P-22. Record of hatchery fish released into Trout Creek, of the North Fork John Day River basin in 1940.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Brook	1940		25,134	71					Gunckel, S. 2002

Appendix Table P-23. Record of hatchery fish released into Winom Creek, of the North Fork John Day River basin in 1941.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
RBF	1941	10/8	1,051	20					Gunckel, S. 2002

APPENDIX Q

Historic Stocking Records For Tributaries Of The Middle Fork John Day River

Appendix Table Q-1. Record of hatchery fish released into Bridge Creek, of the Middle Fork John Day River basin, from 1955 to 1969.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1955		2,008	359	6 +				Koski, R. O. 1955
Steelhead, Summer	1969		22,375	350	2 - 4				Koski, R. O. 1970

Appendix Table Q-2. Record of hatchery fish released into the Middle Fork John Day River, of the Middle Fork John Day River basin, from 1955 to 1994.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1955		6,931	1,063	6 +				Koski, R. O. 1955
Rainbow	1956		6,584	1,437	6 +				Koski, R. O. 1956
Rainbow	1966		74,795	3,299.5	4 - 6				Koski, R. O. 1966a
Steelhead, Summer	1966		55,518	302	2 - 4		Skamania		Koski, R. O. 1966a, Olsen et al. 1994
Rainbow	1969		40,014	2,210.5	4 - 6				Koski, R. O. 1970
Rainbow	1971		2,517	899	8 +				Koski, R. O. 1972
Rainbow	1972		3,947		10				Hewkin, J. A. 1972
Rainbow	1973		3,001		10				Claire, E. W. 1973
Rainbow	1974		3,000		9				Claire, E. W. 1974
Rainbow	1974		50,138		5				Claire, E. W. 1974
Rainbow	1975		3,003		9				Claire, E. W. 1975
Rainbow	1976		3,003		9				Claire, E. W. 1976
Rainbow	1976		49,955		4				Claire, E. W. 1976
Rainbow	1977		3,004		8				Claire, E. W. 1977
Rainbow	1978		2,980		9				Claire, E. W. 1978
Rainbow	1978		35,508		5				Claire, E. W. 1978
Rainbow	1979		2,991		9				Claire, E. W. 1979
Rainbow	1980		2,985		9				Claire, E. W. 1980
Rainbow	1980		40,160		6				Claire, E. W. 1980
Rainbow	1981		3,002		9				Claire, E. W. 1981
Rainbow	1982		3,001		10				Claire, E. W. 1982
Rainbow	1982		36,540		4				Claire, E. W. 1982
Rainbow	1983		3,001		11				Claire, E. W. 1983
Rainbow	1983		24,000		4				Claire, E. W. 1983
Rainbow	1984		2,994		9				Claire, E. W. 1984
Rainbow	1985		2,999		10				Claire, E. W. 1985
Rainbow	1985		25,200		3				Claire, E. W. 1985
Rainbow	1989		9,994		3				Claire, E. W. and B. J. Smith. 1989
Rainbow	1991		7,512		4				Claire, E. W. and M. E. Gray 1991
Rainbow	1992		7,520		4	WF			Claire, E. W. and M. E. Gray 1992
Rainbow	1994		8,996		5	OS			Unterwegner T. J. and M. E. Gray 1994

Appendix Table Q-3. Record of hatchery fish released into Long Creek, of the Middle Fork John Day River basin, from 1947 to 1969.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		1,540	140	Legal				Koski, R. O. 1948
Rainbow	1948		1,250	125	Legal				Koski, R. O. 1949
Rainbow	1955		2,487	429	6 +				Koski, R. O. 1955
Rainbow	1969		9,990	602	4 - 6				Koski, R. O. 1970

Appendix Table Q-4. Record of hatchery fish released into Long Creek, North and South Forks, of the Middle Fork John Day River basin, from 1947 to 1948.

Species	Year	Date	Number	Lbs	Size (inches)	Hatchery	Stock	Lot #	Source
Rainbow	1947		14,175	225	2 - 4				Koski, R. O. 1948
Rainbow	1948		250	25	Legal				Koski, R. O. 1949

APPENDIX R

Tattam, I. 2003 unpublished data. Accuracy of John Day basin Index Spawning Survey Timing For Summer Steelhead Redd Counts in Black Canyon Creek of the South Fork John Day Basin

Accuracy of John Day basin index spawning survey timing
for summer steelhead redd counts in Black Canyon Creek of the South Fork John Day basin

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Oregon Department of Fish and Wildlife
John Day District Office
Unpublished Data

15 June 2003

Abstract

Single visit redd counts are widely used as a means of measuring steelhead escapement, however, error associated with these counts has seldom been evaluated. A single, post-spawning period survey in Black Canyon Creek (a tributary of the South Fork John Day River) counted 61.5% of the number of redds as were counted by surveys conducted multiple times throughout the spawning period. Multiple visit surveys allowed for identification of redds before environmental factors decreased their visibility. Given that the single-visit survey substantially underestimated escapement in Black Canyon Creek, multiple visit surveys may be needed to accurately estimate summer steelhead spawner escapement.

Introduction

Redd counts are the most commonly used metric for assessment of adult steelhead escapement in unimpeded streams. Two key assumptions must hold true if redd counts are to be an accurate estimate of abundance. These assumptions are that the number of redds is indicative of population status, and that the "true" number of redds is accurately measured (Dunham et al. 2001). However, as Dunham et al. (2001) note, there is a paucity of evidence to support the latter assumption. Measuring the true number of redds may be especially problematic for steelhead surveys, which are commonly conducted only once at the latter end of the spawning period. Redds may be flattened by high springtime streamflows, and the rapid periphytic growth common in springtime may obscure areas of substrate which were cleaned during redd construction. One-visit, late season surveys may be prone to underestimating redd numbers because failure to count true redds increases with redd age, and with shallower water depths at redd tailspills (Dunham et al. 2001). Shallower water depths may occur on late surveys, as these surveys can coincide with declining streamflows.

I conducted an initial assessment of the accuracy of one-visit redd counts in Black Canyon Creek, a tributary of the South Fork of the John Day River. I employed an intensive survey approach, consisting of multiple surveys spaced over the temporal breadth of steelhead spawning activity. The redd count from this approach, which is believed to be the "true" or best possible estimate, was then compared to the standard one-visit, post-spawning period survey.

Methods

The study reach was the standard index survey area for Black Canyon Creek, which is from the confluence of Black Canyon and the South Fork John Day River upstream approximately 3 miles to the Big Ford trail crossing. Intensive surveys were conducted on three occasions, spaced throughout the temporal extent of the assumed spawning period for steelhead. Redds were flagged and individually identified during the intensive surveys to avoid duplicate counting, and to track the visibility of individual redds. The flagging was removed prior to the one-visit survey. The one-visit survey was conducted by an experienced redd surveyor on the standard index survey date, which was after the end of the assumed steelhead spawning period.

Results and Discussion

The intensive surveys estimated that a total of 26 redds were constructed in Black Canyon Creek (Table 1), while the one-visit survey counted 16 redds (Table 2), or 61.5% of the "true" estimate. Some of the discrepancy in redd counts may be due to inter-observer variability in redd identification, which Dunham et al. (2001) demonstrated can be high. However, on the final intensive survey (5/18/03), I judged that 5 of the 17 previously located redds would be difficult to detect had they not been flagged on prior surveys. Thus, it seems reasonable to conclude that some portion of the difference in redd counts was, in fact, due to decreased redd visibility when the one-visit survey occurred. Additionally, at least one redd (which was constructed in fine gravel in a side-channel) that was counted on the intensive surveys may have been omitted on the one-visit survey. Conducting surveys prior to most spawning activity (as occurred with the intensive surveys) developed familiarity with the natural hydrologic features of the reach (Dunham et al. 2001). This allowed detection of redds, such as those in fine gravel, which may be confused with hydrologic features on a one-visit survey, even though they are relatively visible (i.e., clean).

Table 1. Redd and fish counts from intensive spawning surveys of Black Canyon Creek.

	Fish observed			
Date	Wild	Hatchery	Unknown	New redds
4/7/03	2 [a]	2 [a]	0	3
4/27/03	0	0	2	14
5/18/03	1	0	0	9
Totals	3	2	2	26

[a] One of the 2 wild fish was a female prespawn mortality. The other observed wild fish was also a female and was paired with a hatchery male.

Table 2. Redd and fish counts from the one-visit spawning survey of Black Canyon Creek.

	Fish observed			
Date	Wild	Hatchery	Unknown	Total redds
5/20/03	1	0	0	16

The visibility of redds on the final intensive survey seemed to be less related to redd age than what was observed by Dunham et al. (2001). The three redds observed on the first survey remained visible on the final survey. All five redds which I judged as difficult to detect on the final survey (5/18/03), were first observed on the second survey (4/27/03). These redds, however, could have been constructed on 4/8/03 or shortly thereafter. Although the temporal precision of the intensive surveys was likely insufficient to draw firm conclusions regarding the effect of redd age on visibility, it seems likely that other factors may influence or even override the effect of redd age. These factors seemed to include current velocity over the redd, substrate size and embeddedness in the area of redd construction, and receptiveness of the redd to isolation and thus periphytic growth.

Additionally, it is worth noting that the hatchery-wild composition estimates were much different for the intensive and one-visit surveys. The one-visit survey estimated 100% wild fish escapement, whereas the intensive survey estimated only 60% wild escapement. The intensive survey also documented interbreeding between wild and hatchery steelhead. An intensive survey approach may yield a better estimate of hatchery-wild spawner composition.

Ian A. Tattam
June 15, 2003

REFERENCES

Dunham, J., B. Rieman, and K. Davis. 2001. Sources and magnitude of sampling error in redd counts for bull trout. North American Journal of Fisheries Management 21:343-352.

APPENDIX S

Statement of Work for Project: Implementation of the Environmental Monitoring and Assessment Program (EMAP) Protocol in the John Day River Subbasin of the Columbia Plateau Province

Statement of Work
FY 2003

Project Title: Implementation of the Environmental Monitoring and Assessment Program (EMAP) Protocol in the John Day River Subbasin of the Columbia Plateau Province.

Previously Entitled:

John Day Basin Spring Chinook Salmon Escapement and Productivity Monitoring.

PROJECT NUMBER: 1998-016-00

FISH & WILDLIFE PROGRAM MEASURE:

Population monitoring (4.3C) and collection of population status, life history, and other data on wild and natural spawning populations (7.1C).

PROJECT SPONSOR: Oregon Department of Fish & Wildlife
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Contract Administrator:

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PO Box 59
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Contract Period: September 1, 2003 – August 31, 2004

Introduction

A coordinated approach to the monitoring and evaluation of status and trends in anadromous and resident salmonid populations and their habitats is needed to support restoration efforts in the Columbia Plateau. Currently, independent research projects and some monitoring activities are conducted by various state and federal agencies, tribes, and to some extent by watershed councils or landowners, but there is no overall framework for coordination of efforts or for interpretation and synthesis of results. We propose that the structure and methods employed by the Oregon Plan for Salmon and Watersheds Monitoring Program (Nicholas, 1997a; 1997b; 1999) be extended to the John Day subbasin of the Columbia Plateau. This approach, successfully implemented in Oregon's coastal watersheds, applies a rigorous, Tier-2 sampling design to answer key monitoring questions, provides integration of sampling efforts, and has greatly improved coordination among state, federal, and tribal governments, along with local watershed groups. Because Columbia Basin managers have identified the John Day subbasin spring chinook population as an index population for assessing the effects of alternative future management actions on salmon stocks in the Columbia Basin (Schaller et al. 1999) we propose to enhance our ongoing studies and include additional studies in this subbasin. This project is high priority based on the high level of emphasis the NWPPC Fish and Wildlife Program, Subbasin Summaries, NMFS, and the Oregon Plan for Salmon and Watersheds have placed on monitoring and evaluation to provide the real-time data to guide restoration and adaptive management in the region.

The John Day River subbasin supports one of the last remaining intact wild populations of spring chinook salmon and summer steelhead in the Columbia River Basin. These populations, however, remain depressed relative to historic levels. Between the completion of the life history and natural escapement study in 1984 and the start of this project in 1998, spring chinook spawning surveys have not provided adequate information to assess age structure, progeny-to-parent production values, smolt-to-adult survival (SAR), or natural spawning escapement. Further, only very limited information is available for steelhead life history, escapement, and productivity measures in the John Day subbasin. Numerous habitat protection and rehabilitation projects to improve salmonid freshwater production and survival have also been implemented in the basin and are in need of effectiveness monitoring. While our monitoring efforts outlined here will not specifically measure the effectiveness of any particular project, they will provide much needed background information for developing context for project-specific effectiveness monitoring efforts. To meet the data needs as index stocks, to assess the long-term effectiveness of habitat projects, and to differentiate freshwater and ocean survival, sufficient annual estimates of spawner escapement, age structure, SAR, egg-to-smolt survival, and freshwater habitat use are essential. We have begun to meet this need through spawning ground surveys initiated for spring chinook salmon in 1998 and smolt PIT-tagging efforts initiated in 1999. Additional sampling and analyses to meet these goals include an estimate of smolt abundance and SAR rates, and an updated measure of the freshwater distribution of critical life stages.

The sampling program described in this document will fulfill critical monitoring needs for Council's Fish and Wildlife Program and help fulfill population and environmental monitoring

requirements under the NMFS 2000 FCRPS Biological Opinion (Action 180). The work proposed under this statement of work will meet most of the BiOp requirements for Tier 1 and 2 monitoring throughout the John Day River subbasin. Current population and environmental monitoring in the Province is based on a highly variable application of a combination of index surveys and periodic monitoring of some status and trend indicators. For example, most adult steelhead monitoring is based on a small number of index sites relative to the number of streams steelhead use for spawning. The index approach only allows us to draw inference about trends in adult abundance for the surveyed streams and provides little information on abundance (status) or distribution at the subbasin or plateau spatial scales. This is due to the fact that index reaches are not randomly selected and represent an unknown proportion of the total population. In addition, there are no systematic programs in place to collect information on the status, trends, and distribution of fish habitat/riparian conditions or juvenile salmonids.

The ISRP, in their guidance on monitoring, strongly recommended that the region move away from index surveys and embrace probabilistic sampling for most population and habitat monitoring. The ISRP stated "the Council's Fish and Wildlife Program calls for monitoring and evaluation of biological and environmental conditions at the scale of provinces and subbasins. Tier 2-level monitoring will be required to provide inductive inferences to entire provinces, subbasins, and many watersheds, because it is impossible to survey every square meter of every stream bottom, riparian zone, and uplands area in these large regions every month of every year for decades. Many of the Columbia Basins' projects for "*monitorin*g" fish and wildlife species (redds, spawners, juveniles, etc.) currently limit surveys to "*index site*s" selected by professional judgment in past years. The objectives of these projects can only be met with Tier 2-level monitoring using probabilistic selection of survey sites with limited replication". The sampling approach outlined in this study will fulfill these requirements.

By implementing the proposed program we will be able to address many of the goals for Tier 1 monitoring, such as defining areas currently used by adult steelhead and spring chinook for holding and spawning habitats and summer rearing habitats for juvenile *O. mykiss* and spring chinook (adult/juvenile salmonid monitoring), determining range expansion or contraction of summer rearing and spawning populations of *O. mykiss* and spring chinook (adult/juvenile salmonid monitoring), and identifying associations between salmonid presence (adult/juvenile monitoring) and habitat attributes (habitat monitoring). The BiOp describes Tier 2 goals as defining population growth rates (adult monitoring), detecting changes in those growth rates or relative abundance in a reasonable time (adult/juvenile monitoring), estimating juvenile abundance and survival rates (juvenile/smolt monitoring), and identifying stage-specific survival (adult-to-smolt, smolt-to-adult) and environmental attributes (habitat monitoring).

Integration with on-going monitoring will be accomplished in the following manner. In annual reporting, we will use data from on-going projects to develop a more complete picture of status and trends in resources and life stage-specific survival. This project will be the vehicle to pull all related fish population and habitat monitoring data together into a synthetic analysis of resources at the provincial and subbasin scales. For example, we will use data from ongoing smolt and adult monitoring to calibrate surveys and to track trends in survival and productivity at life-

stages not targeted under the EMAP program. More detailed studies at finer scales will inform the EMAP program and vice-versa. To accomplish these tasks, we will work with co-managers and other interested publics to establish a monitoring oversight committee for the region that is tasked with coordinating and integrating on-going efforts into a comprehensive reporting system of regional resources.

This project provides information as directed under two measures of the Columbia Basin Fish and Wildlife Program. Measure 4.3C specifies that key indicator naturally spawning populations should be monitored to provide detailed stock status information. In addition, measure 7.1C identifies the need for collection of population status, life history, and other data on wild and naturally spawning populations. This project was developed in direct response to the recommendations and needs of regional modeling efforts, the Independent Scientific Review Panel (ISRP), the Fish and Wildlife Program, and the Columbia Basin Fish and Wildlife Authority Multi-Year Implementation Plan.

Project Goals

1. Provide accurate and precise information on trends in juvenile salmonid populations and status and trends in adult steelhead and aquatic habitats in the John Day River subbasin.

Project Objectives

1. Monitor trends in abundance of juvenile trout and salmon and status and trends in stream and riparian habitats in the John Day River subbasin.

2. Monitor status and trends in steelhead redd abundance in the John Day River subbasin.

3. Complete reports of progress and communicate results.

Endangered Species Act Permit Requirements

John Day River Spring Chinook Salmon are not listed under the Endangered Species Act (ESA). Therefore, no directed take permits or consultations are required to conduct the chinook salmon activities proposed in this statement of work. Steelhead juveniles, which are listed as threatened under the ESA will be captured, handled, and released during their directed take and during the collection of chinook smolts. The National Marine Fisheries Service (NMFS) authorizes take of steelhead under the provisions of the 4(d) ruling. The 4(d) rule includes an exemption from take prohibitions for research activities called "Limit on the take prohibitions for research activities". We submitted a 4(d) research application to NMFS for take of listed steelhead in the John Day River subbasin. We received 4(d) take authorization from NMFS in early March 2001 and are expected to be renewed in 2002. Take will be reported annually in a comprehensive report provided to NMFS.

ODFW has an ESA Section 6 agreement with the U.S. Fish and Wildlife Service (USFWS) for bull trout. This agreement authorizes all direct take associated with bull trout management and research activities conducted by ODFW. Because we are providing biological data for bull trout management, catch of bull trout during chinook and steelhead sampling is covered under this Section 6 agreement.

Study Plan

OBJECTIVE 1: Monitor trends in abundance of juvenile trout and salmon and status and trends in stream and riparian habitats in the John Day River subbasin.

APPROACH: We will implement the EMAP sampling framework, a statistically based and spatially explicit sampling design, to quantify trends in juvenile trout and spring chinook and status and trends in stream and riparian habitats. Juvenile and habitat data collected in coastal watersheds and the Great Basin were critical to NOAA Fisheries and US Fish and Wildlife Services decisions to not list Klamath Mountain Province steelhead and Great Basin Redband Trout. In addition, NOAA Fisheries Technical Review Teams and Oregon's Salmon Recovery Task Force have used these data sets extensively in their status reviews and recovery planning efforts. [Table 1, Condition 4, juvenile all other subbasins]. Fifty spatially balanced, randomly selected reaches will be sampled for juvenile salmonids and stream and riparian condition in the Deschutes and John Day subbasins from late June through September annually.

Sampling domains and site selection: In each subbasin, ODFW, in cooperation with co-managers and other interested parties, will refine the sampling universe for habitat and juvenile surveys based on current ODFW distribution maps. The sampling domain will be defined at the upper ends of watersheds by perennial streams and at the lower end by the capability of field crews to snorkel the sample reach. Juvenile salmonids will be inventoried at all sites within the summer rearing distribution of juvenile *O. mykiss* and spring chinook in **snorkelable** streams below known barriers to upstream migration. Sample sites will be derived from the 1:100k EPA River Reach file. To balance the needs of status (more random sites) and trend (more repeat sites) monitoring, we will implement a rotating panel design in the Columbia Plateau based on recommendations from the EPA EMAP Design Group. The 50 sites drawn on an annual basis for each subbasin will be assigned to the rotating panel design as follows:

- 3 panels with different repeat intervals
- 17 of the sites will be sampled every year
- 16 sites will be allocated to a 4 year rotating panel (sites visited once every 4 years on a staggered basis)
- 17 sites will be new sites each year

With this sampling strategy, 50 sites will be drawn the first year and 33 new sites will be drawn in subsequent years because 17 of the originally drawn sites will be repeated each year. There is nothing "magical" about 50 as precision increases gradually with increase in sample size. For the most part, we want a good estimate of the variance of our target population. Small sample sizes give poor estimates of the variance, and with small samples, random draws can be quite a bit off from the actual population's characteristics (mean, variance, median...). Fifty is a rule of thumb to get a reasonably good picture. Another reasonably good rule of thumb is that doubling precision requires a four-fold increase in sample size. So if you get a particular precision at 50 samples, you'd need 200 samples to double precision. Over the first 3 years of the study, ODFW will evaluate the influence of sample size on meeting/not-meeting/exceeding our target precision levels and make recommendations for adjusting the sample size accordingly. Without the data this survey will provide it is extremely difficult to conduct the appropriate power analysis. Our experience on coastal watersheds has demonstrated that a target sample size of 50 sites will meet out precision targets for habitat and juvenile sampling.

Once annual sample sites are drawn, the site is assigned to the river reach file based on site coordinates. From these point coverage's ODFW will develop landowner contacts based on county plat maps. Based on ownership maps, project personnel will work with ODFW District Biologists and Co-Managers to obtain permission from landowners and set up sites. Overlap between spawner and juvenile sampling sites are checked to minimize multiple landowner contacts. A Geographic Information System (GIS) incorporating a 1:100,000 digital stream network is used to insure an unbiased and spatially balanced selection of sample sites across each subbasin. The GIS site selection process provides the geographic coordinates (i.e. latitude and longitude) of each of the candidate sites. We then produce topographic maps showing the location of each sample point. Field crews use a handheld Geographic Positioning System to find the approximate location of the EMAP selected sample point, and then establish 1 km long survey reaches that encompass the sample point.

Juvenile Salmonid Survey Methodology: Snorkel surveys involve a single upstream pass through each pool during daylight along a 1-km survey reach. The number of snorkelers employed will be based on what is needed to effectively cover the pool being snorkeled on a single upstream pass. To reduce problems associated with snorkeling in shallow or fast water habitat, only pools $\geq$ 6 m^2 in surface area and $\geq$ 40 cm deep are snorkeled. Counts of the number of juvenile and adult trout (*O. mykiss and O. clarki*) and salmon (*O. tshawytscha*) are recorded for each pool. Trout and salmon will be categorized as juvenile (1+ years or greater), or adult based on size classes developed from local data and/or standards used by ODFW and co-managers. Other species will be noted as present and recorded. Crewmembers either alternate the pools that they snorkel or one crewmember snorkels the entire reach. After snorkeling, the underwater visibility of each pool during the snorkel count is ranked on a scale of 0 to 3 where: 0 = not snorkelable due to an extreme amount of hiding cover or zero water visibility; 1 = high amount of hiding cover or poor water clarity; 2 = moderate amount of hiding cover or

moderate water clarity neither of which were thought to impede accurate fish counts; and 3 = little hiding cover and good water clarity. Only pools with a visibility rank of two or three are used in data analysis. If all pools in a reach have visibilities < 2, then as many pools in the reach as possible will be electrofished using Smith-Root model 12-B backpack electrofishers following NMFS electrofishing guidelines for juvenile salmonid presence/absence. Electrofishing will be conducted by making a single pass upstream in each pool that meets the size and depth criteria for conducting snorkel surveys. No block nets will be used for this sampling. Electrofishing data will be combined with snorkeling data to determine the presence/absence of juvenile *O. mykiss* and spring chinook. The presence/absence data will be analyzed to quantify the percent of sites where juvenile *O. mykiss* and spring chinook are present as an estimate of juvenile distribution in the sample frame annually (e.g., 40% site occupancy).

To quantify the measurement error in the snorkel data, and to provide information on temporal changes in abundance during the course of the sampling season, supervisory staff will resurvey a random sample of 10 to 20 percent of the sites surveyed in each subbasin. Our goal is to limit between diver error to ± 20% or less with intensive presurvey training of field crews and regular random resurveys. Our approach in coastal watersheds has been to check crews early and often to ensure that the surveys are meeting the target precision levels. Once this is done, we have found no need to adjust the data. Since the crews know that any site may be re-surveyed at any time the focus on quality data has remained high. Five years of data and over 1000 sites surveyed have required no post-survey adjustment of the data. Re-surveyed sites that do not meet our precision goals are evaluated with the crew and re-done to meet the QC criteria.

Data analysis will involve calculating the percentage of survey sites that contain at least one juvenile fish for *O. mykiss* and spring chinook and the percentage of pools per site that contain juvenile *O. mykiss* and spring chinook to quantify changes in the relative distribution interannually. Analysis from coastal watersheds indicate that snorkeling data from pools has the strongest explanatory power regarding the overall trend is juvenile steelhead and coho populations (Pers. Comm, Jeff Rodgers, ODFW Research Lab, Corvallis). We will quantify the number of juvenile *O. mykiss* and spring chinook observed per square meter for use in population trend analysis within and among individual subbasins. Confidence limits for summary estimates will be developed based on quantifying the measurement error in the snorkel data (see paragraph above) and site-to-site variability based on a variance estimator developed by the EPA EMAP Program for this application. Because juvenile salmonids have more diverse habitat requirements (rearing habitats are often different and dispersed relative to spawning habitat), evaluating their trends through time are necessary as an independent indicator of salmonids status. ODFW will use the data developed in this project to evaluate the types of questions put forth in BPA's 9/27/2003 memo. These are important questions to answer in the evaluation but should not be conditions for implementation. Plausible outcomes and interpretations should not be required a priori.

Habitat and Riparian Survey Methodology: Channel habitat and riparian surveys will be conducted as described by Moore et al. (1997) with some modifications. Modifications include: survey lengths of 500-1000 m and measurement of all habitat unit lengths and widths (as opposed to estimation). Survey teams will collect field data based on stream, reach, and channel unit characteristics. Each field crew is comprised of two people with each member responsible for specific tasks. The "Estimator" will focus on the identification of channel unit characteristics. The "Numerator" will focus on the counts and relative distribution of several unit attributes and will verify the length and width estimates for a subset of units. The "Estimator" and "Numerator" share the responsibility for describing reach characteristics, riparian conditions, identifying habitat unit types, and for quantifying the amount of large woody debris. Crewmembers may switch responsibility for estimator or numerator when they start a new stream. They will not, however, switch estimator and numerator jobs on the same stream. The methods and indicator variables collected with this protocol are far too detailed to include in a work statement, but can be viewed at http://osu.orst.edu/Dept/ODFW/freshwater/inventory/pdffiles/habmethod.pdf. These variables are consistent with the core indicators for US Forest Service and BLM surveys in the region. In fact, the BLM contracts with ODFW to conduct BLM habitat surveys using the ODFW protocol in Oregon. The core variables are consistently used and accepted throughout the Pacific Northwest, not just in coastal watersheds. ODFW's program has been implemented and refined for the past 12 years and has formed the basis for several recent EDT analyses in Oregon. The most recent example being the work of Chip McConnaha in Johnson Creek where he noted that our habitat data was particularly useful for EDT modeling. ODFW will work with BPA and other partners to refine the list of habitat indicators as needed.

To quantify within-season habitat variation and differences in estimates between survey crews, ten percent of the sites will be resampled with a separate two-person crew. Repeat surveys will be a randomly selected sub-sample from each subbasin and each survey crew. Variation in survey location was assumed minimal because survey starting and ending points were marked in the field. The precision of individual metrics will be calculated using the mean variance of the resurveyed streams "Noise" and the overall variance encountered in the habitat surveys "Signal". Three measures of precision are calculated, the standard deviation of the repeat surveys SDrep, the coefficient of variation of the repeat surveys (CVrep), and the signal to noise ratio (S:N). S:N ratios of < 2 can lead to distorted estimates of distributions and limit regression and correlation analysis. S:N ratios > 10 have insignificant error caused by field measurements and short term habitat fluctuations (Kauffman et al. 1999).

Habitat conditions in each subbasin will be described using a series of cumulative distributions of frequency (CDF). The variables described are indicators of habitat structure, sediment supply and quality, riparian forest connectivity and health, and in-stream habitat complexity. The specific attributes include but are not constrained to:

Density of woody debris pieces (> 3 m length, >0.15 m diameter)
Density of woody debris volume (> 3 m length, >0.15 m diameter)
Density of key woody debris pieces (>10 m length, >0.6 m diameter)
Density of wood jams (groupings of more than 4 wood pieces)
Density of deep pools (pools >1 m in depth)
Percent pool area
Density of riparian conifers (>0.5 m DBH) within 30 m of the stream channel
Percent of channel shading (percent of 180 degrees)
Percent of substrate area with fine sediments (<2 mm) in riffle units
Percent of substrate area with gravel (2-64 mm) in riffle units

While these attributes do not describe all of the conditions necessary for high quality salmonid habitat, they do describe important attributes of habitat structure within and adjacent to the stream channel. The attributes are also indicative of streamside and upland processes. Water quality and quantity, as well as food production, are not addressed in the discussion of physical habitat, but are critical elements for the Oregon Department of Environmental Qualities EMAP program. The median and first and third quartiles will be used to describe the range and central tendencies of the frequency distributions of the key habitat attributes used in the analysis of current habitat conditions (Zar 1984). Frequency distributions will be tested to determine if significant differences ($p<0.05$) exist between subbasins for each habitat attribute (Thom et al. 2000).

After year one of the survey, ODFW and ODEQ with assistance from the EPA EMAP program will directly compare each other's habitat data for comparability and redundancy in the habitat indicators. Overlapping variables will be directly compared (precision, variability, repeatability) and additional indicators will be evaluated for their value at quantifying key habitat variables. Surveys need to be conducted annually for the first 5 years to establish a baseline of habitat conditions in the respective subbasins. After the baseline is established, habitat surveys can be conducted at a less frequent interval, corresponding to likely responses to management actions. For example, in eastside streams 5 years is a reasonable time to expect to detect responses in some riparian and stream habitat conditions in relationship to restoration activities. The frequency of surveys is an issue that should be determined after input from the RME workgroup and the ISRP. The problem with establishing infrequent intervals is the capacity to assess habitat changes due to large disturbances such as fire and floods.

Task 1.1: Define sampling domains for habitat and juvenile sampling in each of the four subbasins (September 1 – December 31, 2003, review annually prior to site selection).

Task 1.2: Conduct habitat and juvenile surveys to determine trends in juvenile abundance and status and trends in stream and riparian habitats (June 15 – September 30, 2004; occurs annually).

Task 1.3: Enter data into Access database developed for ODFW's Coastal EMAP program (October 1, 2004 – January 31, 2005; occurs annually) (note: This objective will not be addressed during the Sept. 1, 2003 – August 31, 2004 contract period).

Task 1.4: Use the juvenile database to determine the distribution of salmonids based on site occupancy (e.g., % of sites with at least one juvenile *O. mykiss*) (January 31, 2005 - May 31, 2005; occurs annually) (note: This objective will not be addressed during the Sept. 1, 2003 – August 31, 2004 contract period).

Task 1.5: Compare subbasin estimates of habitat condition to reference conditions to assess the relative condition of habitat. Reference conditions will be developed by the ODEQ EMAP project based on their criteria. (January 31, 2005 – May 31, 2005; occurs annually) (note: This objective will not be addressed during the Sept. 1, 2003 – August 31, 2004 contract period).

Task 1.6: Compare habitat monitoring approaches implemented by ODEQ and ODFW for redundancy and sensitivity in the John Day subbasin (January 31, 2005 – May 31, 2005) (note: This objective will not be addressed during the Sept. 1, 2003 – August 31, 2004 contract period).

Subbasin-Specific Methods and Responsibilities

John Day Subbasin

1. ODFW will be responsible for project oversight and implementation in the John Day subbasin. We will work closely with co-managers to insure consistent implementation of the program in the subbasin. The program will be applied subbasin-wide and will focus on juvenile trout and salmon with incidental observations of the presence of other species such as char being noted.
2. ODFW and ODEQ will implement and overlap their respective habitat monitoring programs in the John Day subbasin to evaluate and compare methods. ODEQ is currently implementing Western REMAP with funding from EPA in the lower Deschutes and John Day basins to assess the status of biological, physical, and chemical indicators of stream condition.

OBJECTIVE 2: Monitor status and trends in steelhead redd abundance in the John Day River subbasin.

APPROACH: We will implement the EMAP sampling framework, a statistically based and spatially explicit sampling design, to quantify the status and trends in the abundance of steelhead redds. Based on the strong relationship between cumulative redd counts and adult steelhead abundance, cumulative redd counts will be used to index the abundance and distribution of adult steelhead at the provincial and subbasin scales (Susac and Jacobs, 1999; Jacobs et al., 2000; Jacobs et al., 2001). Fifty spatially balanced, randomly

selected reaches will be sampled and steelhead redds will be quantified in the John Day subbasin from about March 1 through June 1 annually. This new work meets the requirements of the FWP and BiOp and is strongly supported by the ISRP. If the existing data were sufficient, the above programs wouldn't call for this work. Dam counts and index surveys tell only part of the story and include unknown biases. Adding a statistically-based sample program will give unbiased estimates of abundance in addition to data on distribution and habitat use and life history patterns (timing of spawning, spatial distributions). This information cannot be derived from dam counts or index surveys.

Sampling domains and site selection: ODFW in cooperation with co-managers and other interested parties will refine the sampling universe for steelhead redd surveys based on current ODFW distribution maps. The sampling domain will be defined for the upper and lower ends of distributions based on available data and best professional judgment on the potential distribution of spawners. The delineation of the sampling domain will be liberal in its' extent at the outset to encompass all potential habitat. To balance the needs of status (more random sites) and trend (more repeat sites), we will implement a rotating panel design based on recommendations from the EPA EMAP Design Group. The 50 sites drawn on an annual basis will be assigned to the rotating panel design as follows:

- 3 panels with different repeat intervals
- 17 of the sites will be sampled every year
- 16 sites will be allocated to a 4 year rotating panel (sites visited once every 4 years on a staggered basis)
- 17 sites will be new sites each year

With this sampling strategy, 50 sites will be drawn the first year and 33 new sites will be drawn in subsequent years because 17 of the originally drawn sites will be repeated each year. Once annual sample sites are drawn, the site is assigned to the river reach file based on site coordinates. From these point coverage's ODFW will develop landowner contacts based on county plat maps. Based on ownership maps, project personnel will work with ODFW District Biologists and Co-Managers to obtain permission from landowners and set up sites. A Geographic Information System (GIS) incorporating a 1:100,000 digital stream network is used to insure an unbiased and spatially balanced selection of sample sites across each subbasin. The GIS site selection process provides the geographic coordinates (i.e. latitude and longitude) of each of the candidate sites. We then produce topographic maps showing the location of each sample point. Field crews use a handheld Geographic Positioning System to find the approximate location of the EMAP selected sample point, and then establish 1.6 km long survey reaches that encompass the sample point. Site reconnaissance is conducted in the fall in preparation for spawning surveys the following spring. Site reconnaissance involves obtaining landowner permission, verifying the presence of suitable habitat (e.g., presence of spawning gravel, barriers to upstream migration, gradient, etc.), marking the upper and

lower boundaries of the survey with spawner survey signs, take Universal Transverse Mercator (UTM) coordinates of the upper and lower boundaries, and attempting to define upper and lower boundaries by distinctive landmarks.

Adult Steelhead Redd Surveys: Adult steelhead redd surveys will be conducted from March 1 – June 1 annually based on standard ODFW methods for conducting steelhead redd surveys (Susac and Jacobs, 1999; Jacobs et al., 2000; Jacobs et al., 2001). Fifty sites will be selected and are visited on a bi-weekly basis throughout the season to quantify the cumulative redd count at each site. At each sample site, the sample reach is split in two with each surveyor responsible for one half of the survey. Each surveyor samples upstream from the downstream end of each survey reach. Each surveyor counts live fish and determines the fin-mark status of all live fish through observations. All redds are counted, flagged and rocked with a painted rock. Data are recorded on the spawning survey form, redd longevity form, and spawning location description form. Survey crews review survey forms daily and deliver hard copies bi-weekly to the crew chief. Crew chiefs conduct weekly site visits with each crew. Data entry is conducted as time allows throughout the survey season and is completed within one month of the end of fieldwork. The population status will be indexed through cumulative redd counts. Expected precision will be ±40% at the subbasin scale. Hatchery: wild ratios will be estimated by observing the occurrence of adipose fin-clipped and unmarked live fish on spawning grounds.

To quantify observer error we will implement the following procedures. Each site is visited bi-weekly with the surveyors swapping sample reaches every survey. The surveyor records the number of flagged/rocked redds, new redds, and redds missed during the previous survey. Missed redds are distinguished from new redds by the amount of periphytic growth in the redd pocket. New redds will be devoid of periphyton whereas older redds become obscured by periphytic growth. The independent estimate of marked versus unmarked redds from survey to survey will provide an estimate of the error associated with identifying steelhead redds. To validate whether cumulative redd counts are a reliable indicator of populations status, we will begin exploring where we can develop the data to allow the conversion of redd counts to population estimates. The necessary data would include the sex ratio of returning adults and redd:female ratios.

Where we have on-going index surveys, these surveys will continue through a transition period from index surveys to probabilistic sampling. We will need to develop a dataset that covers the range of abundance seen under the historic index surveys to examine the relationship between the two. From this analysis we should be able to develop a strong relationship that will allow us to index the historic surveys to the probabilistic surveys. This will take an unknown length of time but will probably be on the order of 5-10 years.

> *Task 2.1:* Define sampling domain for steelhead spawning distribution in each of the four subbasins (September 1, 2003 – December 31, 2003; review annually).

Task 2.2: Conduct steelhead redd surveys to index status and trends in steelhead abundance (March 15 – June 1, 2003; occurs annually).

Task 2.3: Enter data into Access database developed for ODFW's Coastal EMAP program (May 1 – July 31, 2004; occurs annually).

Task 2.4: Estimate hatchery: wild ratios on spawning grounds by observing the occurrence of adipose fin-clipped and unmarked live fish (March 15 – June 1, 2004; occurs annually).

Task 2.5: Evaluate relationships between adult steelhead abundance and distribution and landscape characteristics, habitat conditions and land use (September 30, 2004 – May 31, 2005; begins in second year) (note: This objective will not be addressed during the September 1, 2003 – September 30, 2004 contract period).

Subbasin-Specific Methods and Responsibilities

John Day Subbasin

1. The program will be applied subbasin-wide.
2. We will use 2-2 person crews to sample throughout the range of adult steelhead spawning; no restrictions due to large river sampling. An additional crew has been added due to the large size of the basin (travel time) and the logistics of doing surveys in wilderness areas (time). Remote areas will be visited on a monthly basis instead of the bi-weekly basis at more accessible sites.

Objective 3: Complete reports of progress and communicate results.

Approach: Quarterly and annual reports will be prepared and submitted as required in the contract agreement. Results will be communicated through reports and presentations at ODFW, BPA, and professional society meetings. Products produced from this objective are specified in the tasks below. Regional coordination and oversight committees have been proposed to guide and coordinate monitoring and evaluation efforts in the Columbia Plateau and John Day subbasin. Program managers, project and assistant project leaders will participate in these committees. Permits and reports will be prepared to ensure consistency with ESA requirements.

TASK 3.1: Write and submit quarterly reports.

TASK 3.2: Write and submit an annual report draft 30 days after the end of the contract period and a final report within 90 days after the end of the contract period.

TASK 3.3: Provide data to Project biologists developing regional models and to StreamNet. Provide information as requested by subbasin planners, Technical Recovery Team (TRT), and basin-wide research activities.

Task 3.4: Comply with ESA permitting requirements including data summarization related to the 4D rule.

Schedule

Contract Year Tasks	Dates of Completion
TASK 1.1 (DEFINE JUV/HAB SAMPLING DOMAINS)	SEPTEMBER 1 – DECEMBER 31, REVIEW ANNUALLY
TASK 1.2 (CONDUCT JUV/HAB SURVEYS)	JUNE 15 – SEPTEMBER 30, OCCURS ANNUALLY
TASK 2.1 (DEFINE ADULT SAMPLING DOMAINS)	SEPTEMBER 1 – DECEMBER 31, REVIEW ANNUALLY
TASK 2.2 (CONDUCT REDD SURVEYS)	MARCH 15 – JUNE 1, OCCURS ANNUALLY
TASK 2.3 (DATA ENTRY)	MAY 1 – JULY 31, OCCURS ANNUALLY
Task 2.4 (Estimate hatchery:wild ratios)	**August 1 – October 1, occurs annually**
TASK 3.1 (SUBMIT QUARTERLY REPORTS)	WITHIN 30 DAYS OF THE END OF EACH QUARTER
TASK 3.3 (PROVIDE DATA)	COMPLETE BY APRIL 30, 2005
TASK 3.4 (COORDINATION AND OVERSIGHT)	AS NEEDED

Out-year Tasks	Dates of Completion (begins in 2004)
Task 1.3 (Data entry)	OCTOBER 1 – JANUARY 31, OCCURS ANNUALLY
Task 1.4 (Determine juvenile distribution)	January 31 - May 31, occurs annually
TASK 1.5 (ASSESS HABITAT CONDITION)	JANUARY 31 - MAY 31, OCCURS ANNUALLY
TASK 1.6 (COMPARE ODFW/ODEQ HABITAT)	JANUARY 31 - MAY 31, OCCURS IN SECOND YEAR
TASK 2.5 (EVALUATE ABUNDANCE/HABITAT RELATIONSHIPS)	SEPTEMBER 30 – MAY 31, BEGINS IN SECOND YEAR
TASK 3.2 (SUBMIT ANNUAL REPORTS)	DRAFT-OCT. 1, 2004; FINAL-DEC. 1, 2004

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