Columbia Basin System Planning

SALMON and STEELHEAD PRODUCTION PLAN

WALLA WALLA RIVER SUBBASIN

September 1, 1990

WALLA WALLA RIVER SUBBASIN
Salmon and Steelhead Production Plan

September 1, 1990

Lead Agency: Confederated Tribes of the
Umatilla Indian Reservation
P.O. Box 638
Pendleton, Oregon 97801

Co-writers: Oregon Department of Fish and Wildlife
P.O. Box 59
Portland, Oregon 97207

Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98504

Washington Department of Wildlife
600 Capitol Way North
Olympia, Washington 98501-1091

Columbia Basin System Planning

Funds Provided by
the Northwest Power Planning Council,
and the Agencies and Indian Tribes of the
Columbia Basin Fish and Wildlife Authority

Table of Contents

ACKNOWLEDGMENTS

Members of the System Planning Group would like to acknowledge the wide array of people who participated in the technical advisory groups and public advisory groups throughout the Columbia Basin. Their valuable time and effort have helped shape this and other subbasin plans.

Special recognition also goes to the individual writers from the various fish and wildlife agencies and Indian tribes who have spent countless hours writing and rewriting the plans.

The System Planning Group also wants to acknowledge Duane Anderson of the Northwest Power Planning Council's staff for his assistance and expertise in computer modeling. Eric Lowrance and Leroy Sanchez from the Bonneville Power Administration also deserve recognition for developing the useful salmon and steelhead distribution maps, which appear in many of the subbasin plans.

Last, but not least, the System Planning Group recognizes the members of the System Planning Oversight Committee and the Columbia Basin Fish and Wildlife Authority's Liaison Group for their guidance and assistance over the past several months.

INTRODUCTION

The Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program calls for long-term planning for salmon and steelhead production. In 1987, the council directed the region's fish and wildlife agencies, and Indian tribes to develop a systemwide plan consisting of 31 integrated subbasin plans for major river drainages in the Columbia Basin. The main goal of this planning process was to develop options or strategies for doubling salmon and steelhead production in the Columbia River. The strategies in the subbasin plans were to follow seven policies listed in the council's Columbia River Basin Fish and Wildlife Program (Appendix A), as well as several guidelines or policies developed by the basin's fisheries agencies and tribes.

This plan is one of the 31 subbasin plans that comprise the system planning effort. All 31 subbasin plans have been developed under the auspices of the Columbia Basin Fish and Wildlife Authority, with formal public input, and involvement from technical groups representative of the various management entities in each subbasin. The basin's agencies and tribes have used these subbasin plans to develop the Integrated System Plan, submitted to the Power Planning Council in late 1990. The system plan will guide the adoption of future salmon and steelhead enhancement projects under the Northwest Power Planning Council's Columbia Basin Fish and Wildlife Program.

In addition to providing the basis for salmon and steelhead production strategies in the system plan, the subbasin plans attempt to document current and potential production. The plans also summarize the agencies' and tribes' management goals and objectives; document current management efforts; identify problems and opportunities associated with increasing salmon and steelhead numbers; and present preferred and alternative management strategies.

The subbasin plans are dynamic plans. The agencies and tribes have designed the management strategies to produce information that will allow managers to adapt strategies in the future, ensuring that basic resource and management objectives are best addressed. Furthermore, the Northwest Power Planning Council has called for a long-term monitoring and evaluation program to ensure projects or strategies implemented through the system planning process are methodically reviewed and updated.

It is important to note that nothing in this plan shall be construed as altering, limiting, or affecting the jurisdiction, authority, rights or responsibilities of the United States, individual states, or Indian tribes with respect to fish, wildlife, land and water management.

The Walla Walla River Subbasin Plan was jointly developed by a management committee of state and tribal fishery agencies, a public advisory committee representing a range of fishery interests, and a technical committee that included land management agencies and tribal representatives. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) were assigned the lead authorship role. The technical committee met during the planning process to generate background information, review and critique drafts, and offer ideas and suggestions concerning the management of fishery resources. Material generated by the technical committee was submitted to the public advisory committee for consideration and to obtain its comments and suggestions. The fish management committee then developed final versions of the plan based on input from the technical and public advisory committees. The committees did not function as completely separate entities. Fish management and technical committee members also attended public advisory committee meetings to answer questions and explain proposed management strategies.

The Public Advisory Committee members were:

Kirby Grant (Milton-Freewater Steelhead Enhancement Club)
Edward Nichols (Columbia County)
Don Davis (Walla Walla Union Bulletin)
Larry Zalaznik (Tri-State Steelheaders)
Kent Waliser (State Plan-Citz. Adv. Gr. Chair)
Herb Clark (Pres. Walla Walla Fly Fishers)
Harmon Johnson (Chr. of Board of Walla Walla Co.)
Bill Bean (Oregon Trout/Mill Creek Sports Association)
Tom Darnel (Oregon State University Extension Agent)
Miles Williams (Hudson Bay Irrigation Dist./Dist. Director, Soil and Water Conservation District)

The Technical Committee included the following representatives from the tribal, state, and federal agencies.

Gary James* (CTUIR, Pendleton)
Doug Olson* (CTUIR, Pendleton)
Ed Chaney (CTUIR, Pendleton)
Jim Phelps* (Oregon Dept. of Fish and Wildlife, Pendleton)
Rich Prange (U.S. Bureau of Reclamation, Boise)
Mike Ladd (Oregon Water Resources Dept., Pendleton)
Steve Brutscher (Oregon Water Resources Dept., Salem)
Mark Schuck* (Washington Dept. of Wildlife, Dayton)
Paul Seidel* (Washington Dept. of Fisheries, Olympia)
John Sanchez (U.S. Forest Service, Umatilla National Forest)
John McKern (U.S. Army Corp of Engineers, Walla Walla)

* Fish Management Committee members.

PART I. DESCRIPTION OF SUBBASIN

Location and General Environment

The Walla Walla River originates in the Blue Mountains of northeast Oregon (Fig. 1). The river flows west and north into Washington and enters the Columbia River at RM 315 near Wallula, Washington. The river drains a 1,758-square-mile area of northeastern Oregon and southeastern Washington; approximately 73 percent of the drainage lies within Washington. The subbasin lies within Walla Walla and Columbia counties in Washington and Umatilla, Wallowa and Union counties in Oregon.

The basin is comprised of two major physiographic regions. The Walla Walla region is characterized by rolling, treeless upland formed by deep deposits of loess overlying multiple lava flows. The Blue Mountain region consists of the extreme northern extension of the Blue Mountains of Oregon, and the long tilted plateau extending northward into Washington's Columbia, Garfield, and Asotin counties. This area was formed by uplifting, folding, faulting and erosion of the Columbia River basalt and is characterized by flat-topped ridges, steep-walled canyons, and mountain slopes. Elevations in the subbasin range from about 270 feet at the Columbia River to about 3,000 feet along the toe of the Blue Mountains, to 6,000 feet at mountain crests. Though comprising only a small percentage of the basin's area, the Blue Mountains are the major source of water for the subbasin.

Multiple lava flows exceeding 2,500 feet deep known as the Columbia River basalt underlie nearly all of the Walla Walla River Subbasin. Older volcanic, sedimentary and metamorphic rocks are exposed along the crest of the Blue Mountains. Broad U-shaped folds (synclines) form deposition basins between the upland areas. Alluvium deposited by modern rivers and streams is common in valleys and flood plains. A deep deposit of loess, windblown silt and fine sand, covers the surface of much of the subbasin.

Precipitation ranges from about 7 inches in a narrow band along the Columbia River to more than 40 inches at high elevations in the Blue Mountains.

Average temperatures in the basin vary generally with elevation. Annual temperatures at lower elevations average 50 degrees to 55 degrees Fahrenheit (10 to 13 degrees Celsius). Extremes of 115 F (46 C) and minus 21 F (minus 29 C) have been recorded.

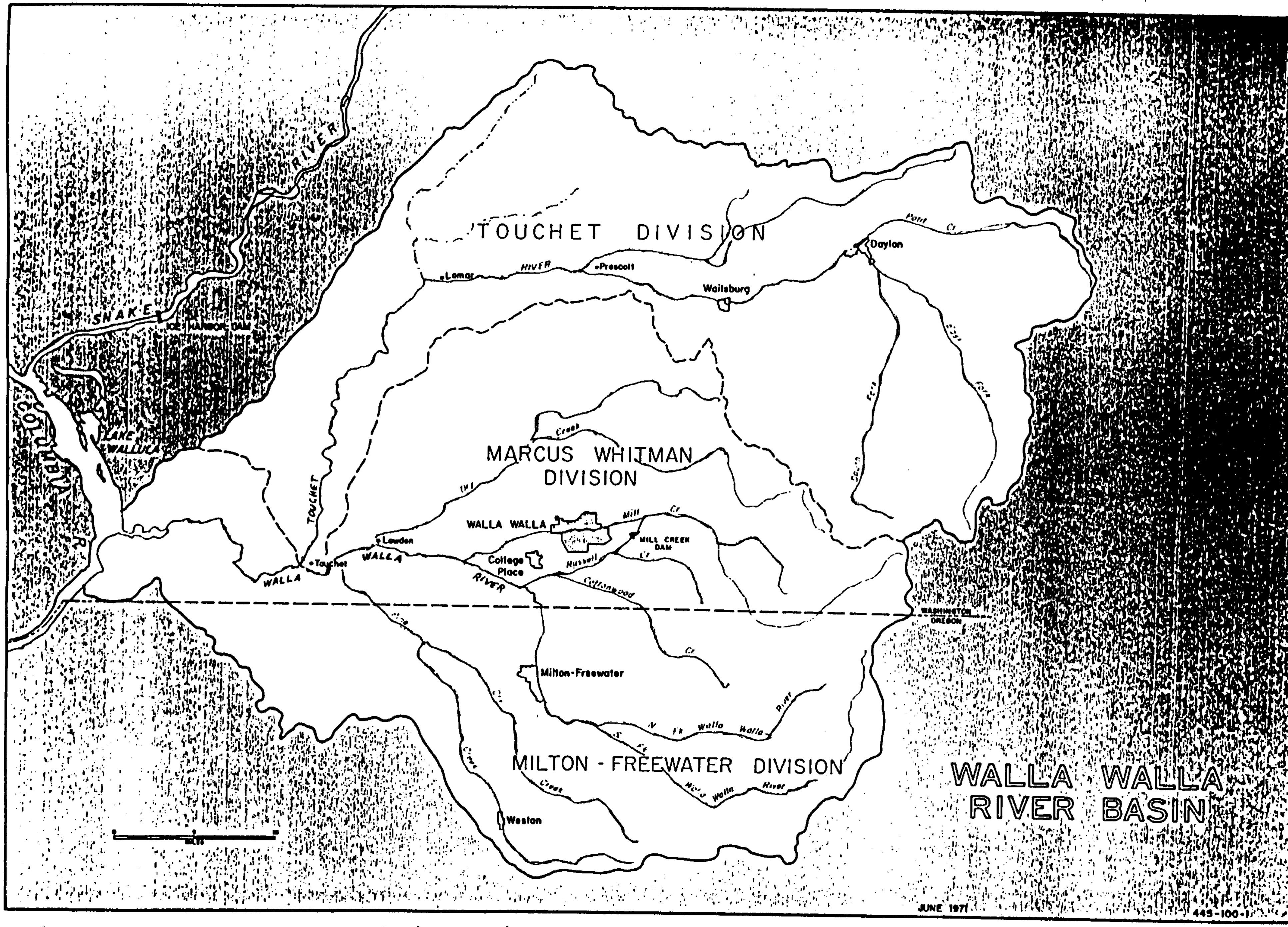


Figure 1. Walla Walla River Basin (BR 1971).

The high elevation Blue Mountains are dominated by trees interspersed with grass. Forest species include lodgepole pine, ponderosa pine, Douglas fir, white fir, grand fir, subalpine fir, Engelmann spruce and larch. Vegetation on the unforested, semiarid uplands is predominately grass. Midelevation uplands are extensively and intensively dry-farmed and during much of the year have little to no vegetative cover. River valley areas suited to agriculture are extensively irrigated.

Streamside vegetation in the upper watershed consists of conifers, deciduous species and grass. Riparian cover is generally good. At lower elevations, brush, grass, and deciduous trees are the major types of bank vegetation. Cultivation, domestic livestock grazing and flood control activities have severely reduced riparian vegetation throughout much of the mid to low elevation areas of the subbasin.

An extensive network of irrigation diversions within the subbasin presents significant barriers to fish passage. Four major diversions -- three permanent structures and one seasonal gravel dam -- exist on the mainstem Walla Walla River. These diversions impede and, at some flows, block upstream migrant fish. The Little Walla Walla Diversion at River Mile (RM) 47 completely dewaters the river during the summer and during the spring in years of low streamflow (ODFW 1987). Numerous small irrigation diversions on Walla Walla River tributaries impede adult and juvenile passage. In Oregon, unscreened diversions on the mainstem Walla Walla River, the North Fork and on the South Fork have posed "serious problems to downstream migrants" (ODFW 1987). Two major diversions on the lower mainstem Touchet, the largest tributary to the Walla Walla River, partially block adult fish passage (USFWS 1982). All irrigation diversions in the Washington portion of the subbasin have functional screens (NPPC 1986).

Water Resources

Fractured basalt provides a major groundwater reservoir throughout the subbasin. The basalt aquifer is thought to contain ancient water with limited recharge mainly in the Blue Mountains. Water moves very slowly through the basalt, discharging to the Columbia and Snake rivers and to a lesser extent to gravel aquifers. A major gravel aquifer underlies approximately 120,000 acres in the Walla Walla/Milton Freewater area of the subbasin. Alluvial aquifers are recharged by streams, precipitation, the basalt aquifer and infiltration of irrigation water (WDOE 1977).

Above the Oregon/Washington border, the Walla Walla drains about 160 square miles. Major tributaries in Oregon are the North Fork Walla Walla River, South Fork Walla Walla River and

Couse and Birch creeks. The North and South forks yield the bulk of the water, about 170,000 acre-feet per year. The South Fork yields about three times that of the North (Figs. 2-5).

From the Oregon border to its confluence with the Columbia River near Wallula, Washington, the Walla Walla River drains approximately 770 square miles, not including the Touchet River drainage. Major tributaries entering the Walla Walla River in Washington are the Touchet River and Mill, Pine, Dry, Yellowhawk and Cottonwood creeks (Figs. 6 and 7). The Touchet River drains approximately 740 square miles, emptying into the Walla Walla near Touchet, Washington.

Irrigation is the largest use of surface and groundwater in the Walla Walla Subbasin. Municipal water supply is the second largest use, followed by industrial uses, both of which rely mainly on groundwater. All waters within the subbasin in Washington are closed to further appropriation during the irrigation season; cumulative water rights and irrigation demands exceed available streamflow. Heavy competition exists for groundwater, which appears to have potential for further development despite "alarming declines" in some areas, notably in the vicinity of Walla Walla (WDOE 1977). In 1986 the Oregon Water Resources Commission withdrew from further appropriation the Walla Walla River and tributaries in the area extending from the Little Walla Walla Diversion to the state line (OWRD 1988).

Irrigation-depleted streamflow is the major factor limiting production of anadromous fish in the Walla Walla Subbasin. By May or early June, the mainstem Walla Walla River is dry near the state line due to irrigation withdrawals and naturally low summer streamflow. Depleted streamflows and summer temperatures elevate water temperatures to lethal levels for salmonids in July and August (NPPC 1986). This condition characteristically persists until the end of the irrigation season when fall precipitation increases streamflow. Irrigation-depleted streamflows in the lower reaches of the Touchet River impede fish passage at irrigation diversions and contribute to poor water quality, including elevated water temperatures.

Runoff occurs anytime between January and May as high-elevation snowpack melts. Flows diminish throughout the summer to lows in August or September. Isolated storms may cause locally high flows for short periods during the summer and early fall. Streamflows increase in late fall and winter in response to storms pushing in from the Pacific Ocean. Tables 1 through 3 contain stream discharge data for the mainstem Walla Walla River, North and South Forks and the Touchet River.

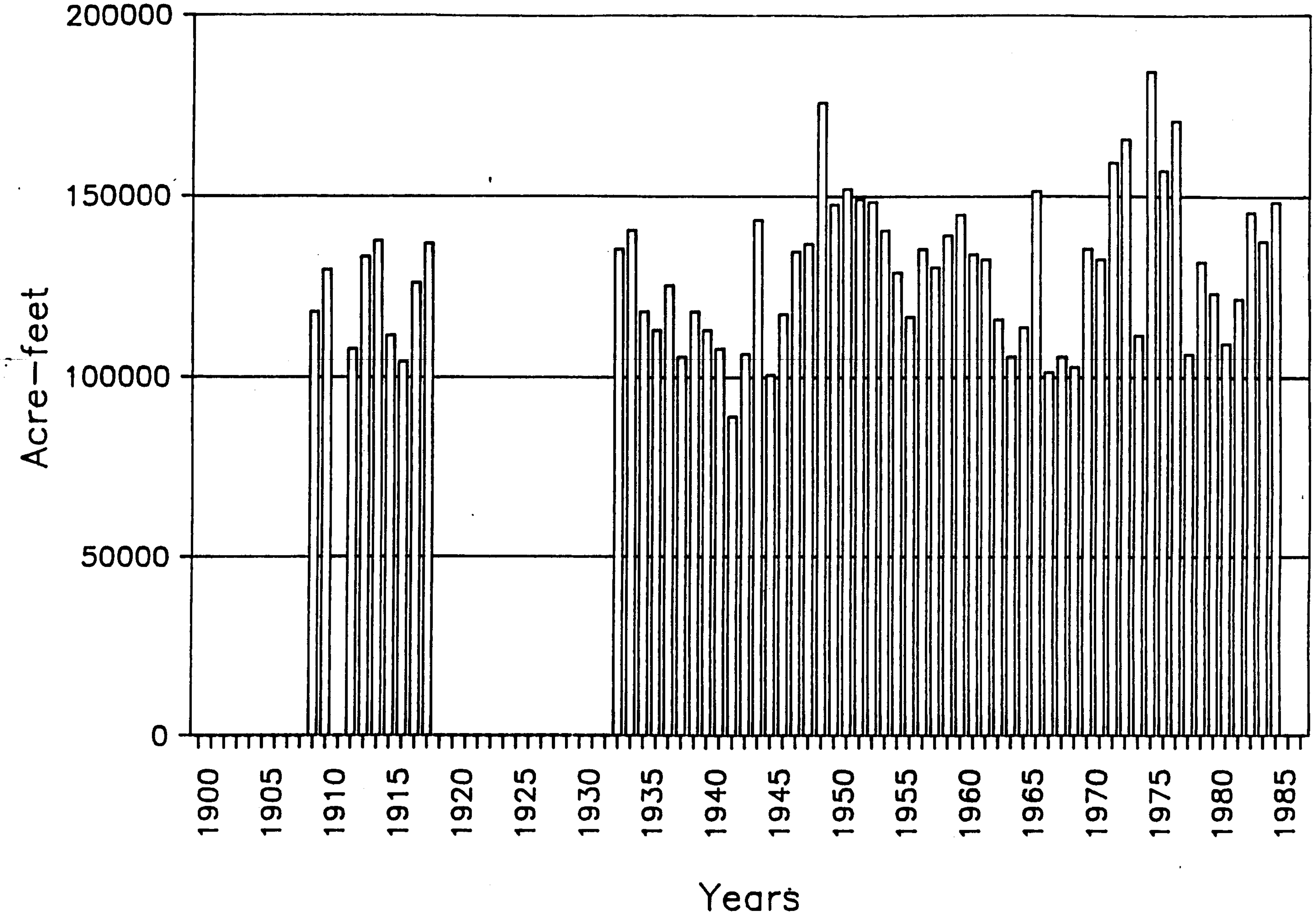


Figure 2. Annual mean discharge of the South Fork Walla Walla River, 1900–85 (OWRD 1988).

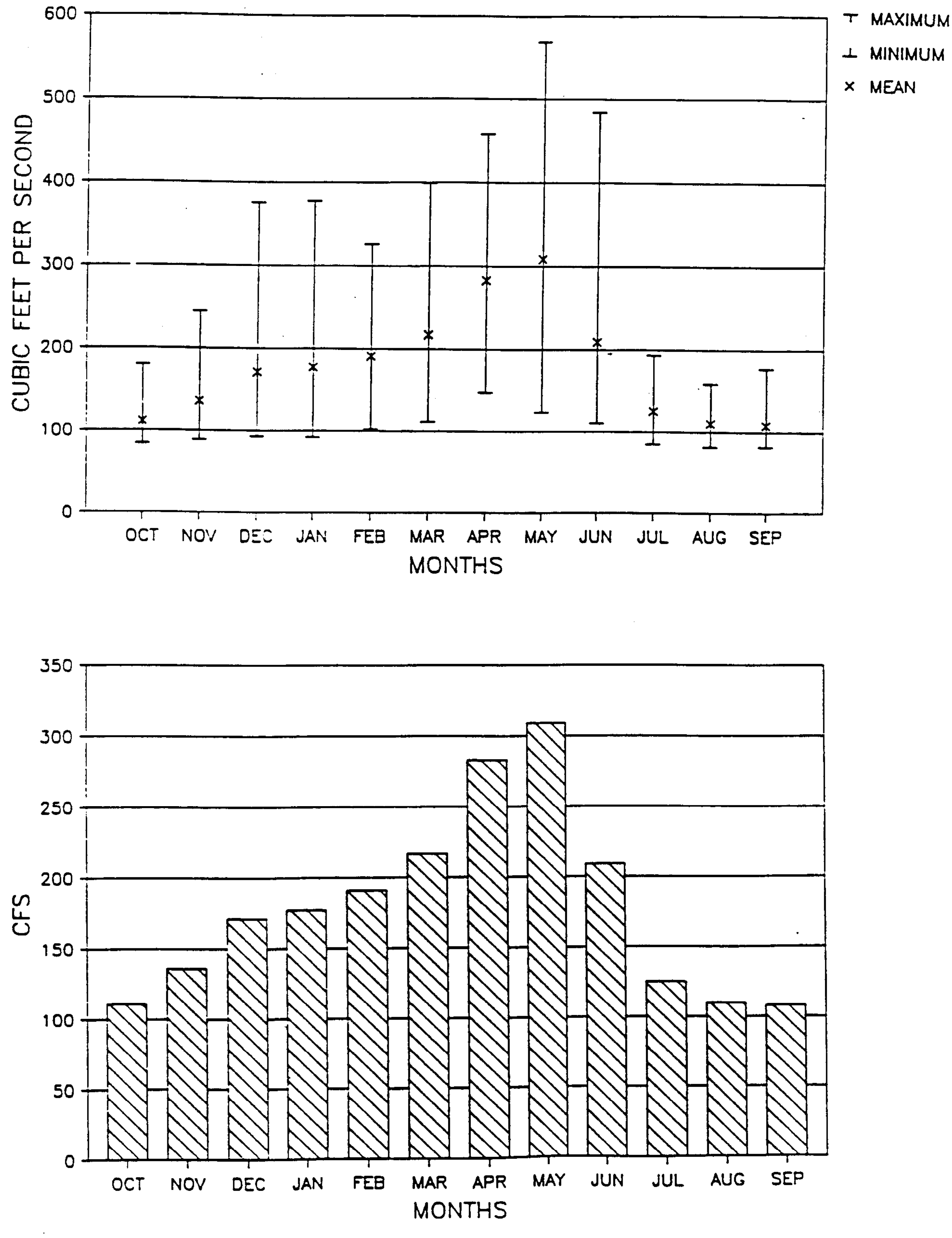


Figure 3. Monthly discharge of the South Fork Walla Walla River, 1903–18 & 1931–86 (OWRD 1988).

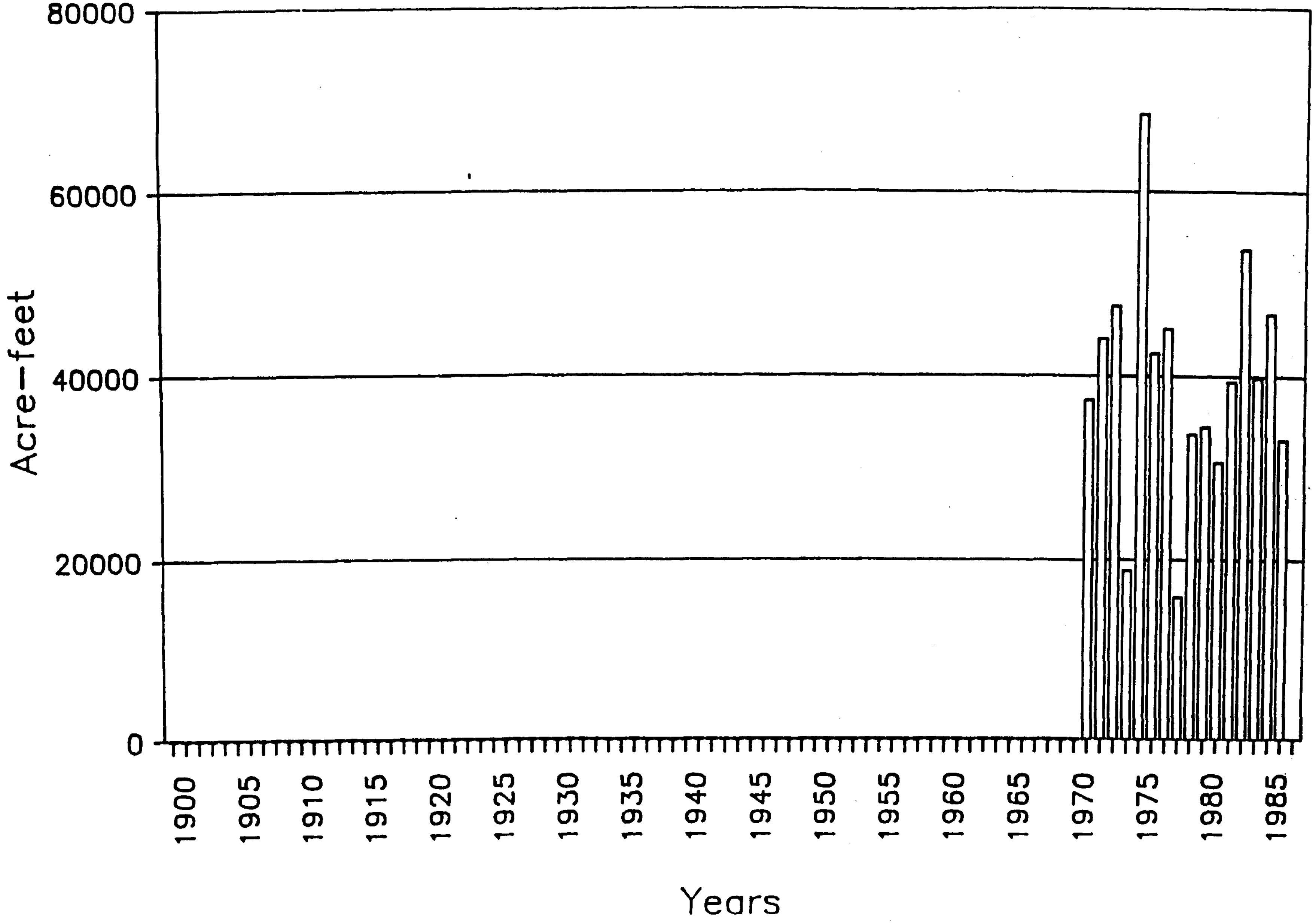


Figure 4. Annual mean discharge, North Fork Walla Walla River (OWRD 1988).

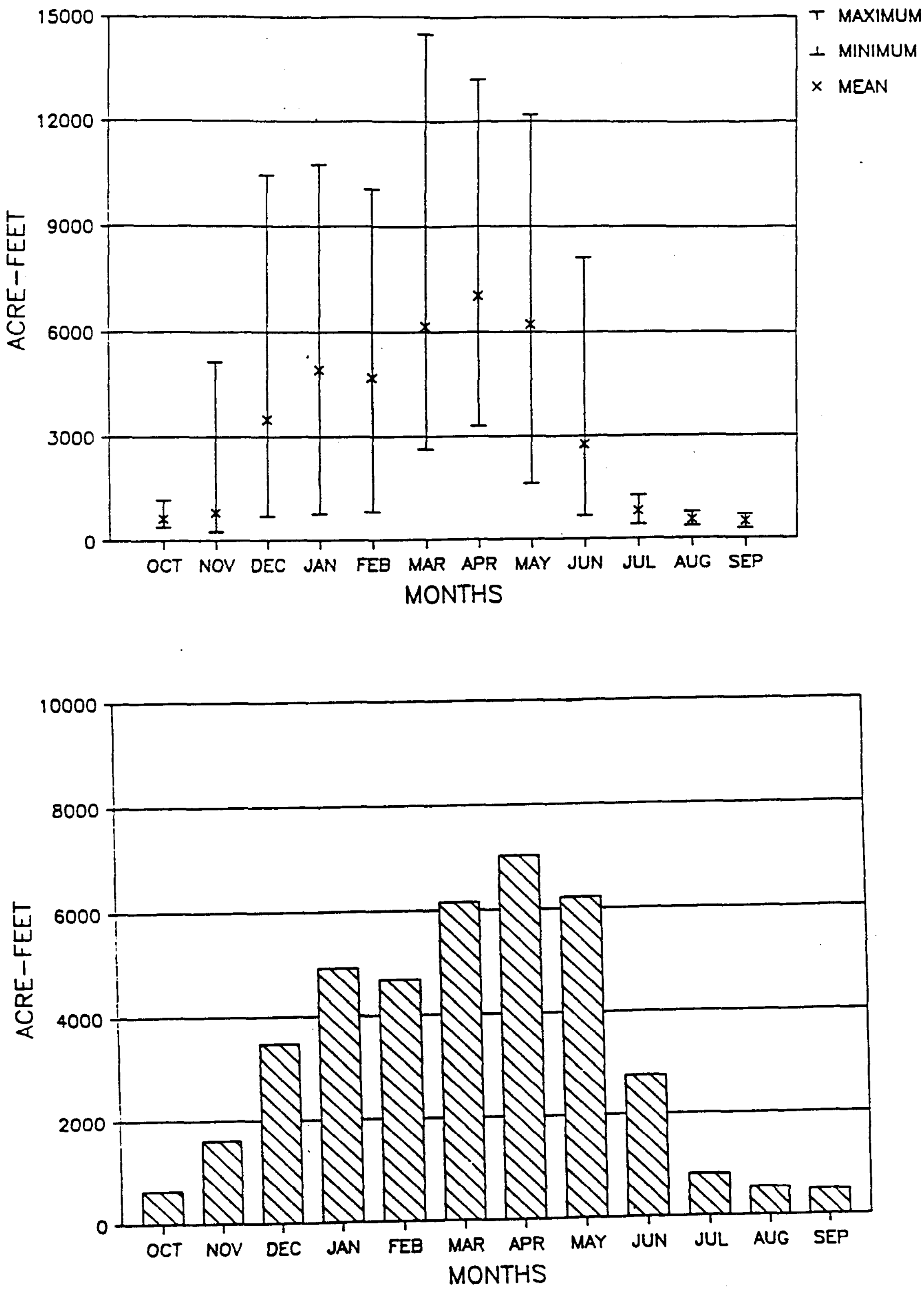


Figure 5. Monthly discharge of the North Fork Walla Walla River, 1970-86 (OWRD 1988).

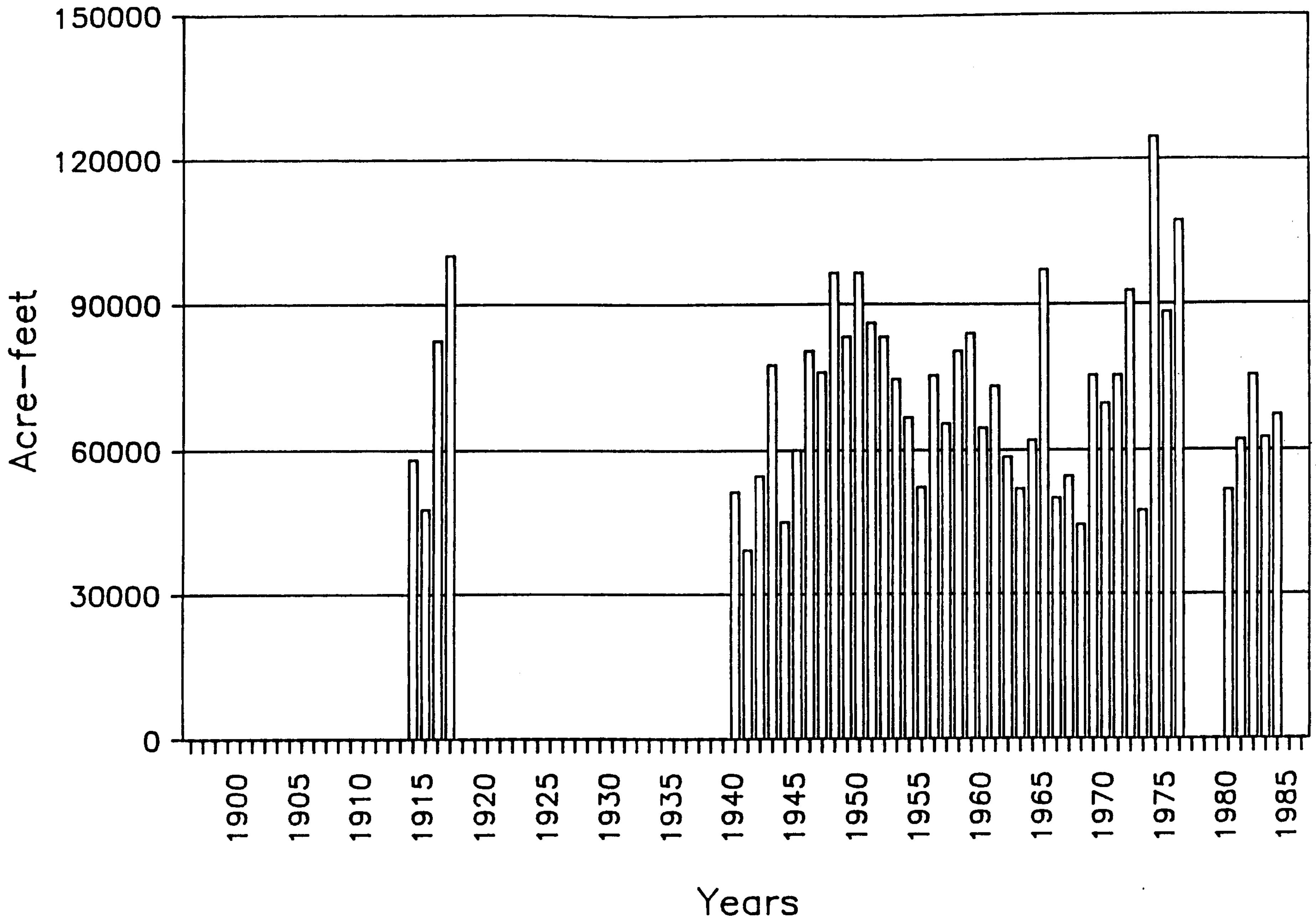


Figure 6. Annual mean discharge of Mill Creek, 1900–85 (OWRD 1988).

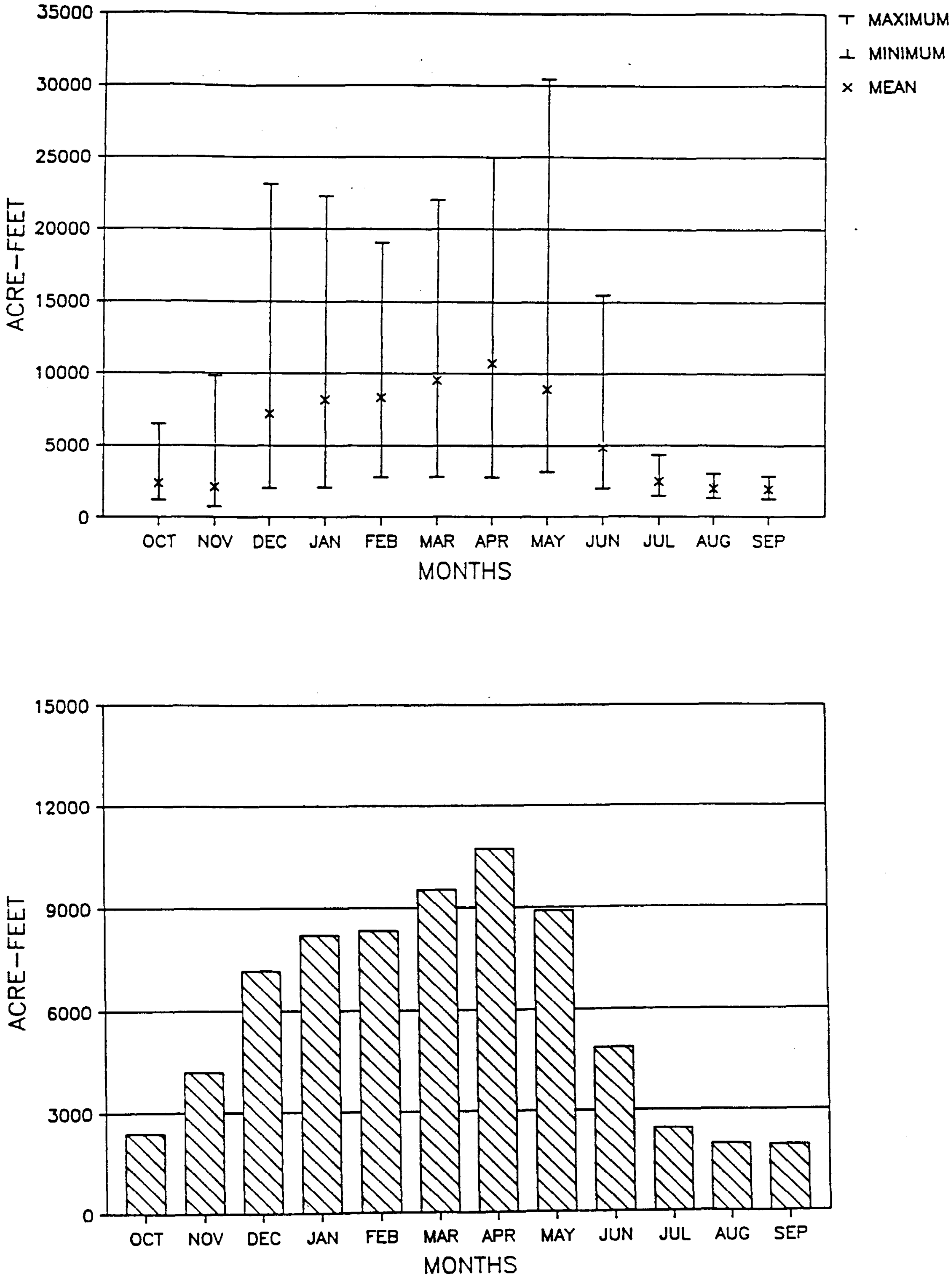


Figure 7. Monthly discharge of Mill Creek, 1914-17 & 1938-85 (OWRD 1988).

Table 1. Monthly and annual mean discharges (in cfs), Walla Walla River near Touchet, Wash. Station 14016500 (OWRD 1988).

Year	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL
1952	392	447	873	1048	1836	993	1525	800	137	94.3	22.9	58.6	681
1953	62.8	124	295	1555	1509	1173	1076	766	385	35.2	17.9	22.3	580
1954	77.6	173	924	964	1303	770	974	298	471	41.0	34.4	70.7	503
1955	103	171	287	484	593	518	1134	1048	296	45.6	11.7	32.7	392
1956	139	528	1807	1576	861	1686	1539	1052	189	35.5	22.6	48.8	792
1957	103	215	805	334	1177	1730	1559	1217	142	15.7	12.6	20.4	608
1958	164	184	711	963	1872	737	2165	1147	166	26.3	6.58	28.8	672
1959	64.9	436	1317	1888	1389	1287	1154	687	207	27.6	16.3	181	718
1960	336	531	490	470	1069	1157	1076	761	162	9.72	11.3	35.1	507
1961	87.8	384	427	642	2096	1843	932	699	148	6.78	4.05	13.7	597
1962	63.4	150	658	782	590	1224	1217	845	190	20.1	10.2	30.3	482
1963	226	416	820	435	1411	662	912	309	26.0	18.3	9.23	13.4	431
1964	20.0	156	442	794	722	633	1015	736	359	41.5	21.2	25.4	412
1965	49.6	262	2890	2698	1956	765	996	440	228	49.8	47.3	80.1	868
1966	65.0	117	257	628	545	1266	944	265	59.9	47.8	12.3	13.9	351
1967	32.2	150	547	1152	752	719	688	966	113	21.7	5.98	14.3	430
1968	30.0	75.6	415	586	1287	408	268	60.6	21.2	5.85	4.05	33.1	262
1969	76.3	460	730	2264	1131	1438	2061	936	135	26.9	7.53	17.5	772
1970	56.7	60.7	272	2264	1763	1442	927	824	237	33.9	11.6	55.3	655
1971	87.7	426	639	1907	1146	1096	917	724	693	62.3	14.2	86.8	647
1972	95.5	353	1254	1362	1933	3105	1187	1013	311	53.9	30.0	70.2	896
1973	81.2	123	731	963	618	689	243	86.6	24.4	6.42	3.07	18.1	298
1974	28.6	971	2364	2567	1856	1652	2437	1372	1130	139	32.9	43.3	1212
1975	65.5	160	463	2058	1357	1506	937	1264	373	76.4	39.6	56.0	694
1976	106	324	2231	2085	1285	1268	1745	947	275	60.0	82.7	53.6	873
1977	71.5	152	283	348	286	339	308	83.8	34.8	9.47	16.6	69.2	166
1978	71.1	257	1353	1151	1224	997	945	513	48.0	58.2	38.6	100	560
1979	38.5	156	568	306	1891	1385	1282	893	66.7	16.7	7.52	8.78	543

Table 2. Average streamflows in the Walla Walla River by month (OWRD 1988a).

USGS GAGE STATIONS	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANN
#1000 South Fork Walla Walla River	111	136	171	177	191	217	283	309	209	125	110	108	179
#10800 North Fork Walla Walla River (1970-86)	10.3	26.9	56.6	90	84.3	100	118	101	46.3	13.2	8.89	8.26	54.5
#11000 North Fork Walla Walla River (1931-70)	10.8	26.9	51.5	55.8	65.7	81.5	119	95.7	40.9	7.75	3.5	5.22	47.3

Table 3. Monthly and annual mean discharges (in cfs), Touchet River, NR Touchet, Wash., Station 14017500 (OWRD 1988).

Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	ANNUAL
1941									180	69.3	27.4	38.5	
1942	57.4	154	326	154	358	299	257	323	193	84.9	17.6	18.8	186
1943	29.7	170	334	257	485	296	654	319	171	49.6	20.8	22.4	232
1944	51.9	75.7	108	72.4	162	312	293	140	64.7	20.6	11.3	16.1	110
1945	29.8	44.9	50.5	167	282	354	376	293	121	29.6	16.2	29.0	148
1946	38.7	136	403	580	355	565	434	301	150	49.0	18.2	32.7	255
1947	62.6	226	438	450	425	391	434	204	83.3	27.3	19.5	38.7	232
1948	102	286	316	519	711	437	638	960	281	76.1	43.5	40.7	366
1949	58.6	163	402	237	1718	811	655	491	128	43.5	27.2	42.8	389
1950	64.6	81.4	128	192	860	939	623	452	362	87.8	36.9	37.9	318
1951	89.5	345	493	493	798	578	423	248	206	50.8	26.0	33.2	312
1952	109	136	295	347	666	320	536	306	107	54.3	30.1	37.2	243
1953	42.1	52.2	68.1	559	621	414	384	292	181	57.0	29.4	28.1	225
1954	47.3	89.5	365	436	480	251	402	201	199	47.5	36.5	45.8	215
1955	54.1	69.3	84.6	146	155	208	539	419	161	55.2	22.6	32.7	162

Water quality in high elevation, timbered headwaters of the Walla Walla Subbasin generally are cool, clear, low in pollutants and high in dissolved oxygen. The mid and lower reaches of the watershed have been heavily developed for dryland and irrigated agriculture. Dryland farms produce prodigious amounts of sediments; the area is notorious for having some of the worst soil erosion in the nation. Irrigation depletes streamflows, increasing water temperatures and concentrating pollutants.

Land Use

A major portion of the Walla Walla River's headwaters rise in the high elevation, timbered Blue Mountains, which comprise a small fraction of the drainage. The upper North and South Fork Walla Walla, Mill Creek, and upper Touchet River tributaries drain from Umatilla National Forest lands. These areas are managed for multiple uses including timber harvest, domestic livestock grazing and motorized recreation. The 26,700-acre Mill Creek watershed 15 miles east of Walla Walla is open to the public by U.S. Forest Service permit only during hunting seasons. Timber harvest and road construction are prohibited in this area. There are also 34,500 acres of roadless area in the upper North and South Fork Walla Walla drainages.

Midelevation lands principally are devoted to dryland farming and livestock grazing. The Walla Walla River Valley in the vicinity of the cities of Walla Walla, Washington and Milton-Freewater, Oregon to just downstream of Touchet, Washington is extensively and intensively irrigated. The vast majority of land within the subbasin is privately owned, including approximately 96 percent of subbasin lands in Washington.

PART II. HABITAT PROTECTION NEEDS

History and Status of Habitat

The geology, topography, soils, climate and precipitation of the subbasin are broadly described in Part I. All these factors significantly affect fish production in the subbasin. The high elevation Blue Mountains intercept moisture-laden air masses moving inland from the Pacific and ultimately yield the majority of subbasin streamflows. Annual precipitation in the mid and lower reaches of the subbasin is low; streamflows and, therefore, fish production are very much dependent upon the annual high-elevation snowpack.

Alluvium in the mainstem Walla Walla River and its tributaries provides extensive spawning gravels. A major alluvial deposit in the Milton-Freewater area acts as a giant sink, which in combination with irrigation depleted streamflows, seasonally dewaters the mainstem Walla Walla River. Steep headwater topography contributes to rapid runoff and bedload movement that limit fish production in some areas. Soils over much of the subbasin are deep windblown silt and fine sand and are highly erodible, yielding sediments that limit fish production, particularly in the middle to lower reaches of the mainstem Walla Walla River and its principal tributary, the Touchet River.

High elevation lands are dominated by forest with an understory of grass; watershed conditions generally are good except where heavily impacted by logging. Midelevation lands are characterized by stringers and patches of timber shading into brush and grass as elevation declines; large areas have been converted to dryland farming, which yields prodigious amounts of sediment runoff.

Riparian conditions are generally good in the high elevation headwaters. Cultivation, domestic livestock grazing and flood control activities have severely reduced riparian vegetation throughout much of the mid to low elevation reaches of the subbasin.

Irrigation is the principal water use limiting fish production in the subbasin (see Parts III and IV). A network of tributary and mainstem Walla Walla River irrigation diversions seasonally block and/or impede juvenile and adult migrants. The mainstem Walla Walla River is dry by May or early June near the Oregon/Washington border due to irrigation diversions and naturally low summer streamflows.

Part I contains discharge data for the Walla Walla River and its principal tributaries. Peak flows in the lower Walla Walla and Touchet rivers typically occur December through May. Lowest flows generally occur July through October. Irrigation diversions and naturally low streamflows seasonally impede adult fish passage in the lower Touchet River, particularly during years of low runoff, and annually block fish passage in the Milton-Freewater reach of the mainstem Walla Walla River.

High elevation, timbered headwaters of the subbasin generally are cool, clear, low in pollutants and high in dissolved oxygen. Steep gradient and rapid runoff limit fish production in some areas. At midelevations within the subbasin, streamflows generally are low and have elevated temperatures due to natural summer conditions exacerbated by extensive removal of riparian vegetation and irrigation diversions.

Constraints and Opportunities for Protection

Institutional Considerations

A large number and wide variety of governmental entities and corporate and private land and water managers directly and indirectly affect fish habitat in the Walla Walla Subbasin (see Part III). Federal agencies with key roles in habitat protection include the U.S. Forest Service, which manages much of the upper watershed, the U.S. Fish and Wildlife Service and National Marine Fisheries Service, which provide technical and financial support to habitat protection initiatives, and the U.S. Soil Conservation Service and Agricultural Stabilization and Conservation Service, which provide technical support for watershed improvement initiatives.

The Confederated Tribes of the Umatilla Indian Reservation have treaty-reserved rights to fish in the subbasin and, thereby, have a key role in protecting fish habitats.

The Washington departments of Wildlife and Ecology, and the Oregon departments of Fish and Wildlife, Environmental Quality, and Water Resources are the principal state entities involved in habitat protection in the subbasin.

The Walla Walla County Regional Planning Commission plays a key role by administering controls on streambank and stream channel alterations. The Walla Walla and Columbia County conservation districts are addressing serious agriculture-related soil erosion problems within the subbasin.

Legal Considerations

Since the adoption of the 1917 Water Code, the state of Washington has allocated water based on the Prior Appropriations Doctrine. In many cases, the amount of water allocated has resulted in many overappropriations and the reduction in corresponding anadromous fish runs. Instream flow protection started with Chapter 75.20 RCW (1949), with Department of Fisheries and Department of Wildlife recommendations for low flow conditions and stream closures to further appropriations of water. Since 1969, beginning with passage of the Minimum Water Flows and Levels Law (RCW 90.22), the state law has acknowledged a greater need to protect instream flows for fisheries and other instream values through developing basinwide flow protection programs. In addition, the 1917 Water Code provided that water permits would not be granted that could prove "detrimental to the public welfare" (RCW 90.03.290).

Both the Minimum Water Flows and Levels Law and the Water Resources Act of 1971 (RCW 90.54) direct the Department of Ecology to set minimum or base flows that protect and preserve fish and other instream resources. Because minimum or base flow regulations do not affect existing water rights, reductions in anadromous fish runs in overappropriated streams will continue to be a problem. The Water Resources Act specifically lists fish and wildlife maintenance and enhancement as a beneficial use. It further directs the Department of Ecology (DOE) to enhance the quality of the natural environment where possible.

The state statutes, however, do not define the extent of instream resource protection, leaving to the DOE the task of determining adequate protection levels for instream flows. This has caused increasing controversy in recent years and resulted in an attempt by the DOE to define the level of flow that was to be provided for fish in the state's streams. The Department of Ecology's 1987 effort to set a standard of "optimum" flows for fish was challenged by out-of-stream water users via the Washington Legislature in 1988. The 1988 Legislature put a moratorium (which has now been lifted) on the DOE's recommended standard and established a Joint Legislative Committee on Water Resources Policy to address Washington's water future. To date, the committee has yet to define the level of protection that will be afforded fish resources.

Lacking any legislative direction on instream flow protection levels, water continues to be allocated from state streams under past practices. All water right applications are reviewed by the Department of Fisheries (WDF) and the Department of Wildlife (WDW), under RCW 75.20 prior to issuance by the Department of Ecology. The DOE considers WDW and WDF comments before to making a decision regarding the issuance of a permit for withdrawal. WDF and WDW comments are recommendations only, and can be accepted or ignored by the Department of Ecology. Current DOE practice is to issue water permits if water, above that recommended to be retained instream, is available for allocation. Virtually all domestic use requests are approved as are many non-domestic requests. The impacts of specific withdrawals on fish resources is often unclear, however, the cumulative impact of the new withdrawals is less instream water and negative impacts on fish populations.

The majority of Washington's streams do not have minimum flows established. Yet the Ecology Department continues to issue permits for diversion and water withdrawal. It is unlikely that the current system will change until the Joint Legislative Committee on Water Resources Policy defines state policy in this area. The committee's decision could have a major impact on the future of the state's fisheries resources.

The fisheries agencies have requested that for most streams, instream flows be protected at levels that would maintain <u>existing</u> fish production, including the full range of variations that occurs naturally due to environmental conditions. For some streams, like the Yakima River, the fisheries agencies request flows to levels that would achieve <u>potential</u> production. This potential production would be determined by analyzing what could reasonably and practically be expected to return to the stream in the future.

In those streams that have already been overappropriated, establishment of instream flows may limit losses of fish resources to that which has already occurred. In many of these streams, restoration of instream flows is requisite for increasing or re-establishing fish runs.

In support of the continuing investments by the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program, the following recommendations are made relative to instream flows and fisheries resources.

1) No new out-of-stream appropriations of any kind should be issued unless appropriate instream flow levels are established for the stream to be impacted either through comment on the water right application or through the adoption of an instream flow regulation.

2) There should not be any exceptions to the minimum flow levels, including domestic use.

3) Minimum flows should be impacted only if concurrence is obtained from the state and federal fish resource agencies and tribes and adequate mitigation is provided.

4) Minimum instream flow levels should be adequate to protect existing and potential (where appropriate) fish production.

5) State law should be changed so that saved, purchased or donated water can be dedicated to instream flows.

Critical Data Gaps

The information and data required to protect anadromous salmonid habitat in the subbasin is available. Lack of instream flows and inadequate programs to reduce sediment yield from agricultural land are the most intractable problems confronting protection of fish habitat in the subbasin.

Importantly, while the information necessary to protect fish habitat is available, there is a lack of information on the distribution and use of habitat, and on flow-habitat relationships within the subbasin. No reliable data exists for spring chinook, which have been absent for many years. This information could best be obtained by a reintroduction and monitoring program.

Habitat Protection Objectives and Strategies

Objectives

1. Provide adequate passage conditions for migrating adult and juvenile fish to and from natural production habitats within the subbasin.

   Low streamflows, inadequately screened irrigation canals, and inadequately laddered irrigation diversion dams currently limit fish passage conditions in the lower Walla Walla River.

2. Establish and maintain minimum streamflows for all subbasin migration, spawning and rearing habitats.

   Fish habitat is at risk in streams without minimum streamflow requirements and that have not been withdrawn from appropriation.

3. Protect riparian zones from degradation by domestic livestock, forestry and agricultural practices, and by urban, suburban and commercial development.

   Degraded riparian zones reduce water yield and/or adversely alter timing of yield, result in destabilized streambanks and stream channels, increase sedimentation and water temperatures and decrease fish cover and food availability.

Riparian protection improves the quality and quantity of water, and enhances both fish and wildlife habitats.

4. Protect fish habitat from point and non-point source pollution, including sediments.

   Low summer streamflows concentrate point and non-point source pollutants at levels inimical to juvenile survival. Sedimentation from extensive sources such as logging, livestock grazing and farming severely reduces production potential in the mid and lower reaches of the subbasin.

5. Improve instream habitat for adult holding and juvenile rearing.

   Predominant riffle habitat and general lack of instream habitat diversity currently limits smolt production capacity in many Walla Walla Basin streams.

Strategies

Several initiatives are aimed at achieving the objective of providing adequate fish passage to and from natural production habitats within the subbasin. The Washington Department of Wildlife is working to improve fish passage at Washington irrigation diversions. The Oregon Department of Fish and Wildlife plans to screen all unscreened diversions and improve adult passage facilities in the Oregon portion of the subbasin.

The Oregon Department of Water Resources established minimum streamflows for the Walla Walla River from the confluence of the North and South forks to the Little Walla Walla Diversion, for the North Fork Walla Walla River from Little Meadow Creek to the mouth, for the South Fork Walla Walla River from Elbow Creek to the mouth, for Mill Creek from the city of Walla Walla to the state line, and for Couse Creek at the mouth (OWRD 1988b). The newly adopted minimum streamflows (March 31, 1988, priority date) did not consider spring chinook salmon needs. The Umatilla Tribes have proposed increasing the minimum streamflow levels (instream water rights) in all potential spring chinook production areas. The river from and including the Little Walla Walla Diversion to the state line was withdrawn from further appropriation. All streams within the Washington portion of the subbasin are withdrawn from further appropriation during the irrigation season. Washington law provides for establishment of base flows for instream purposes, however, no base flows have been established because surface waters are fully appropriated.

Flow augmentation, through constructing additional storage and/or obtaining senior irrigation water rights for instream purposes, is required to address depleted streamflows in the subbasin. The Columbia River Basin Fish and Wildlife Program authorizes a feasibility study for constructing a reservoir with the primary purpose of enhancing instream flows for anadromous fish (NPPC 1987). The Bureau of Reclamation has previously identified storage sites on the upper Touchet River below the confluence of the North Fork and Wolf Fork (Dayton Dam, BOR 1976) and on the upper Walla Walla River below the confluence of the North and South forks (Joe West Dam, BOR 1971). Neither the Dayton or the Joe West dams are recommended because of probable migration problems and loss to spawning and rearing habitat. The Oregon Water Resources Commission also set aside water for up to 40,000 acre-feet of storage in the Walla Walla River headwaters for various purposes, including fish life (OWRD 1988b).

State streambank and stream channel alteration regulations are in place in the Walla Walla Subbasin. The Washington Shorelines Act regulates land use and development within 200 feet of all shorelines. Umatilla County, Oregon requires 100-foot setbacks to protect riparian values in new developments. These measures notwithstanding, riparian areas have relatively scant protection from degradation by domestic livestock grazing and farming operations.

Piecemeal riparian protection initiatives are in place, programmed and under way in various areas of the subbasin important to anadromous fish. Several miles of Washington streambanks are being considered for acquisition under the Lower Snake River Compensation Plan to protect riparian habitat. Oregon Water Resources Department funded projects include the North Fork Walla Walla and Rhea Creek Rehabilitation projects. Riparian and instream habitat improvement projects are included in the current Columbia River Basin Fish and Wildlife Program, but none have been implemented yet by Oregon's Fish and Wildlife Department, the Washington Wildlife Department, and the U.S. Forest Service.

In addition to the above, a more comprehensive, subbasinwide riparian protection strategy is needed. This strategy should be a joint effort of all local, county, state, tribal and federal governmental units within the subbasin. Riparian protection in Walla Walla Subbasin headwaters should have highest priority in the policies and programs of the Umatilla National Forest.

Point-source pollutants generally are effectively controlled under existing law and regulations. Non-point sources of pollution are both more intractable and less effectively regulated. An effective, comprehensive riparian protection strategy (Objective 3 above) would substantially ameliorate non-point source pollution from many sources in the subbasin. Alone, it would not adequately address the prodigious yield of sediment from agricultural land, particularly from extensive dryland farming operations on midelevation uplands.

The Walla Walla and Columbia County conservation districts have programs to reduce sediment yield from farmed land. A far more comprehensive, subbasinwide erosion and sediment control strategy is needed. This strategy should be a joint effort of all relevant local, county, state, tribal and federal entities. An effective strategy must avoid the traditional limited vision of short-term, on-site cost-effectiveness and focus on long-term benefits and costs both on and off site. In addition, the Oregon Water Resources Department (1988b) recommended watershed management practices including cooperation and education; a Conservation Reserve Program to retire highly erodible cropland from production; riparian and channel enhancement; and ground and surface water quality monitoring enforcement.

PART III. CONSTRAINTS AND OPPORTUNITIES FOR ESTABLISHING PRODUCTION OBJECTIVES

Institutional Considerations

A large number and wide variety of governmental entities are directly or indirectly involved in land and water management in the Walla Walla River Subbasin:

Federal
- Forest Service
- Bureau of Land Management
- Bureau of Reclamation
- Army Corps of Engineers
- Bureau of Indian Affairs
- Fish and Wildlife Service
- National Marine Fisheries Service
- Bonneville Power Administration
- Soil Conservation Service
- Agricultural Stabilization and Conservation Service
- Federal Energy Regulatory Commission
- Environmental Protection Agency
- Geological Survey

Tribal
- Confederated Tribes of the Umatilla Indian Reservation
- Columbia River Inter-Tribal Fish Commission

State
- Washington Department of Wildlife
- Washington Department of Fisheries
- Washington Department of Ecology

- Oregon Department of Fish and Wildlife
- Oregon Water Resources Commission and Department
- Oregon Department of Environmental Quality
- Oregon Department of Forestry
- Oregon Division of State Lands
- Oregon Land Conservation and Development Commission

County
- Walla Walla County Regional Planning Commission
- Walla Walla County Commission
- Columbia County Commission
- Umatilla County Board of Commissioners
- Walla Walla County Conservation District
- Columbia County Conservation District
- Umatilla County Soil and Water Conservation District

Municipal
- Milton-Freewater
- Walla Walla
- College Place
- Touchet
- Lowden
- Lamar
- Prescott
- Waitsburg
- Dayton
- Weston

Irrigation Districts, Companies and Unincorporated Ditches

- Oregon
  - Eastside
  - Little Walla Walla Coop Irrigation Union
  - Pleasant View Irrigation Company
  - Hudson Bay District Improvement Company
  - Powell Ditch Company
  - Milton Ditch

- Washington
  - Gardena
  - Westside/Eastside
  - Lowden Two
  - Old Lowden
  - Garden City
  - Bergevin-Williams
  - Smith Ditch
  - Blalock
  - Green Tank

Existing Cooperation and Plans

The Umatilla Tribes and the Oregon Department of Fish and Wildlife have developed cooperative plans to enhance steelhead and reintroduce spring chinook in the Walla Walla Subbasin (ODFW 1987). Managers will be investigating the South Fork Walla Walla drainage as a possible site for a proposed northeast Oregon spring chinook hatchery.

To complement ODFW wild fish management in the Oregon portion of the subbasin, the Washington Department of Wildlife placed restrictions on recreational steelhead fishing beginning in 1986, limiting sport harvest to fin-clipped fish of hatchery origin (NPPC 1986).

The Umatilla Tribes and the ODFW cooperated with the Oregon Water Resources Department in updating the state water program for the Oregon portion of the subbasin. The draft program (OWRD

1988) addresses the need for improved instream flows for anadromous fish.

The Umatilla Tribes, Oregon Department of Fish and Wildlife, Washington Department of Fisheries and U.S. Forest Service cooperated in the development of proposed instream flow augmentation and habitat improvement amendments to the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program (NPPC 1986).

Recent multi-million dollar upgrades of the Walla Walla, Dayton and Waitsburg municipal waste water treatment facilities were in part driven by fishery concerns. The Walla Walla and Dayton facilities are equipped and operated to minimize the effect of chlorine discharges on anadromous fish (WDOE, pers. commun.).

Walla Walla and Columbia County conservation districts have programs to reduce sediment yield from farmed land. Substantial acreage has been seeded to grass under the federal Conservation Reserve Program. To date little effort has been targeted on riparian area protection (WDW, pers. commun.).

Through the cooperative effort of state and local agencies, in recent years there has been better control of the timing and mechanics of work within streambeds in Washington. The Walla Walla County Regional Planning Commission has been effective in administering the Washington State Shorelines Management Act to control activities in and adjacent to the Walla Walla River (WDOE, pers. commun.).

The long-standing streamflow depletion problems in the mainstem Walla Walla and Touchet rivers historically have delayed anadromous fish enhancement activities in the subbasin. In recent years, the subbasin's significant potential for fish production, judicial reaffirmation of treaty-reserved rights to fish, implementation of the Columbia River Basin Fish and Wildlife Program, and growing political support for restoring subbasin fisheries have focused attention on the problems and opportunities. These problems and opportunities will require a high level of sustained cooperation among fisheries and land and water management entities in the subbasin.

Near-term opportunities include proposed instream flow and habitat amendments to the Columbia River Basin Fish and Wildlife Program, improvement of juvenile and adult fish passage at irrigation diversions and other passage barriers, implementation of riparian improvements proposed under the Lower Snake River Fish and Wildlife Enhancement Studies (USFWS 1982), and facilitation of interstate cooperation in water management necessary to resolve irrigation dewatering of the mainstem Walla Walla River at the state line. In addition, fisheries interests need to forge a formal alliance and long-term strategy with private and governmental entities attempting to deal with the horrendous soil erosion degrading fish habitat in the subbasin.

Legal Considerations

The Umatilla Indians reserved certain rights, including the right to fish, in the 1855 treaty ceding to the U.S. government a vast area of land including portions of the Walla Walla Subbasin in Oregon and Washington. This reserved right provides the basis for a wide range of rights and interests in the protection, enhancement, management and harvest of anadromous fish in the Walla Walla Subbasin. Appendix D summarizes major provisions of the Treaty of 1855 and related federal case law.

The treaty entitles the tribe and its members to engage in fishing activities both throughout this ceded area as well as at other usual and accustomed fishing places. The treaty authorizes the tribe to adopt and enforce laws that regulate treaty fishing activity of tribal members; to participate in the management of the fishery resources; and to implement management practices to protect the fishery resources.

Under the treaty, the Umatilla Tribes can engage in fishing activities free from state regulation except to the extent that the state can show that state regulation is necessary and reasonable for conservation of the resource. The treaty provides the basis for tribal co-management of off-reservation treaty fish resources.

The major problems affecting anadromous fish in the subbasin are the result of irrigation-depleted streamflows and associated degradation of water quality. In Oregon, water is managed by the Water Resources Commission pursuant to ORS 536.300 and 536.310. Minimum perennial streamflows were established in 1985 (Table 4). Prior to 1985, there were few limits on appropriation of surface water in the Oregon portion of the Walla Walla Subbasin. A 1936 Supreme Court decision allows Oregon water users to divert the entire flow of the Walla Walla River before it enters Washington, and they do during summer months. Tables 5 and 6 list water rights by area and use. In January 1987, the Water Resources Commission withdrew from further appropriation the Walla Walla River and tributaries from and including the Little Walla Walla Diversion to the state line; up to 35 cubic feet per second (cfs) may be used from March 1 to May 15 for frost protection of orchards. The withdrawal has no effect on past appropriations primarily responsible for dewatering the mainstem Walla Walla River during times of anadromous fish migration.

Table 4. Minimum perennial streamflows (in cfs) (OWRD 1988b).

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	PRIORITY DATE
WALLA WALLA SUBBASIN													
Walla Walla River from the confluence of the North Fork and South Fork to the Little Walla Walla diversion.													
	30	30	70	70	95	95	95	95	70	50	50	50	11-3-83
North Fork Walla Walla River from below the confluence of Little Meadow Creek to the mouth.													
	5	5	25	25	36	36	36	36	25	15	15	15	3-31-88
South Fork Walla Walla River from below the confluence of Elbow Creek to the mouth.													
	25	25	60	60	80	80	80	80	60	40	40	40	3-31-88
Mill Creek from the City of Walla Walla Diversion to the stateline.													
	32	35	37	44	53	63	86	64	39	32	31	31	3-31-88
Couse Creek at the mouth.													
	5	10	25	25	25	25	25	25	10	5	5	2	3-31-88

Table 5. Water rights (in cfs) (OWRD 1988).

	IRRIGATION	DOMESTIC	LIVESTOCK	MUNICIPAL	INDUST./MANUF.	COMMERCIAL	FIRE PROTECTION	TEMP. CONTROL	SEWAGE EFF.	STORAGE	POWER	FISH	WILDLIFE	MINING
Walla Walla Subbasin	436.859	3.8	.81	151.44	32	.035	.65	23.44	0	48.4 AF	379.19	1.01	0	0
Walla Walla River	124.649	1.311	.25	89.24	31	.002	0	0	0	0	155.75	0	0	0
Little Walla Walla River	158.78	.44	0	0	0	0	0	14.12	0	0	1	0	0	0
North Fork Walla Walla	8.627	.007	.2	0	0	0	0	0	0	0	0	0	0	0
South Fork Walla Walla	18.86	.12	0	5.8	0	0	0	0	0	0	190.5	0	0	0
Couse Creek	7.747	.162	.1	0	0	0	0	0	0	0	0	0	0	0
Pine Creek Subbasin	75.691	1.01	.032	1	0	.033	0	0	0	48.4 AF	15	1.011	0	0
Pine Creek	43.695	0	.007	1	0	0	0	0	0	0	0	0	0	0

*All rights in cfs except where noted
*These water rights tabulations are provisional
*These figures do not incorporate diversion rates for alternate uses
Diversions would be double counted if that were the case
*Storage is separate from the use of stored water
*Assumptions operated under:
1) Irrigation rights are for purposes of calculation 180 days
2) Primary and supplemental rights are combined

Table 6. Summary of surface water classification, June 24, 1988 (OWRD 1988).

	Domestic	Livestock	1/2 Acre Irrig.	Irrigation	Municipal	Industrial	Power	Mining	Artif. Ground Water Recharge	Fish Life	Wildlife	Recreation	Public Instream	Frost Control	Pollution Abatement	Minimum Stream	Storage
1. WALLA WALLA SUBBASIN																	
Walla Walla Subbasin generally 1/	X	X		X	X	X	X	X	X	X	X	X	X	X 2/	X X	X	X
Walla Walla River & Tributaries upstream from Little Walla Walla diversion	X	X	X		X			X	X	X	X	X	X			X	X
Mill Creek & Tributaries	X	X	X		X				X	X	X	X	X		X	X	X
Couse & Pine Creeks & Tributaries	X	X	X						X	X	X		X		X	X 3/	X
2. WILDHORSE CREEK SUBBASIN																	
Wildhorse Creek & Tributaries 4/	X	X	X				X	X	X	X	X	X	X		X		X
3. UPPER UMATILLA SUBBASIN																	
Upper Umatilla River & Tributaries 5/	X	X	X		X	X	X	X	X	X	X	X	X		X	X 6/	X
4. BIRCH & MCKAY CREEKS SUBBASIN																	
Birch & McKay Creek & Tributaries 7/	X	X	X		X	X	X	X	X	X	X	X	X		X	X 8/	
5. COLUMBIA - UMATILLA PLATEAU SUBBASIN																	
Umatilla River Main Stem 9/	X	X	X		X	X		X	X	X	X	X	X	X	X	X 10/	X
Umatilla River Tributaries 9/	X	X		X			X	X	X					X	X		X
Non-Umatilla River Tributaries	X	X		X			X	X	X					X			X
6. BUTTER CREEK SUBBASIN																	
Butter Creek & Tributaries 11/	X	X	X				X		X	X	X	X	X		X		X
7. WILLOW CREEK SUBBASIN																	
Willow Creek & Tributaries	X	X	X		X	X	X	X	X	X	X	X	X		X		X

1/ Walla River and tributaries withdrawn from and including Little Walla Walla diversion to the stateline.

/2 Water for frost control from Walla Walla River limited to total permits of 33 cfs with priority after December 2, 1985.

3/ Minimum flows on Couse Creek and tributaries only.

4/ Wildhorse Creek and tributaries withdrawn from June 1 through October 31 classified uses allowed only from November 1 through May 31.

5/ Upper Umatilla River and tributaries withdrawn from June 1 through Oct. 31. Classified uses allowed only from November 1 through May 31.

6/ Minimum flows on main stem Umatilla River and several tributaries

7/ Birch and McKay Creeks and tributaries withdrawn from June 1 through Oct. 31. Classified uses allowed only from November 1 through May 31.

8/ Minimum flows on Birch Creek and tributaries.

9/ Umatilla River and tributaries withdrawn from June 1 to October 31.

10/ Minimum flows on main stem Umatilla River.

11/ Butter Creek and tributaries withdrawn from June 1 to October 31. Classified uses allowed only from November 1 through May 31.

In 1987 through 1988, the OWRD updated the state water resource program for the Oregon portion of the Walla Walla Subbasin. As amendment to this draft, the Umatilla Tribes and ODFW proposed additional instream flow recommendations (Table 7). The resulting draft policies and programs (OWRD 1988) portend to improve future water management and begin the long, tortuous process of addressing problems resulting from past management.

In Washington, pursuant to WAC 173-532-060, all streams within the Walla Walla Subbasin are closed to further appropriation during the irrigation season (WDOE 1977) (Table 8). WAC 173-532-030 provides for establishment of base flows for instream purposes; no base flows have been established pending new water storage projects because surface waters are fully appropriated.

In the fall of 1987, the Umatilla National Forest released its Proposed Land and Resource Management Plan (USDA/FS 1987). The plan is designed to direct management of forest lands for the next 10 to 15 years, including portions of subbasin headwaters.

Table 7. Minimum instream flow recommendations (in cfs) by month for Walla Walla River. 1/

Stream Name	Location	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
NF Walla Walla R.	Mouth	36	50	50	50	50	36	30	30	24	24	24	36
SF Walla Walla R.	Mouth	100	136	136	136	136	100	70	70	70	70	70	100
Mill Creek	Stateline to City	44	53	63	86	64	39	32	31	32	32	35	37
Couse Creek	Mouth	25	25	25	25	25	10	5	5	5	5	10	25

1/ Developed by CTUIR Office of Fisheries, and ODFW, Pendleton District and submitted by CTUIR as comment to the OWRD Umatilla River Basin Water Resource Plan (1988).

Table 8. Surface Water Closures* (WDOE 1977).

STREAM NAME	AFFECTED REACH	EFFECTIVE DATE OF CLOSURE	PERIOD OF CLOSURE
Blue Creek	Mouth to Headwaters	Date of Adoption	June 1 - Oct. 31
Mill Creek	Mouth to State Line	2-6-1957	May 1 - Oct. 1
Walla Walla River	Mouth to State Line	Date of Adoption	May 1 - Nov. 30
Dry Creek	Mouth to Headwaters	Date of Adoption	April 15 - Nov. 15 or whenever Walla Walla at USGS Gage 14.0185 drops below 91.8 cfs.
Touchet River	Mouth to Headwaters	Date of Adoption	June 1 - Oct. 31
Coppei Creek	Mouth to Headwaters	Date of Adoption	April 1 - Nov. 10
Doan Creek	Mouth to Headwaters	Date of Adoption	June 1 - Oct. 1
Mud Creek	Mouth to Headwaters	Date of Adoption	May 1 - Oct. 31 or whenever Walla Walla below confluence with Mud Creek falls below 50 cfs.
Pine Creek	Mouth to Headwaters	Date of Adoption	May 1 - Oct. 31 or whenever Walla Walla River at confluence with Pine Creek or below Touchet River drops below 50 cfs.
Stone Creek	Mouth to Headwaters	Date of Adoption	May 1 - Oct. 31

* Exception for single-domestic and stock water where no other practical source is available

PART IV. ANADROMOUS FISH PRODUCTION PLANS

SUMMER STEELHEAD AND SPRING CHINOOK SALMON

Introduction

The Walla Walla River once produced spring chinook and summer steelhead that supported productive tribal and non-tribal fisheries. Salmon have been eliminated from the subbasin; the last notable chinook run was reported in 1925 (Van Cleave and Ting 1960). Steelhead have been reduced to a small fraction of their former abundance. The principal factor in the decline of anadromous fish in the subbasin is irrigation diversions that block and impede fish passage and dewater reaches of the mainstem Walla Walla and tributaries. Contributing factors are widespread degradation of spawning and rearing habitat, and adult and juvenile mortalities at mainstem Columbia River hydroelectric projects.

Summer steelhead are the only native anadromous salmonid remaining in the the subbasin. In recent years, the Washington Department of Wildlife has released hatchery reared summer steelhead in the subbasin. The Oregon Department of Fish and Wildlife and Confederated Tribes of the Umatilla Indian Reservation are planning a hatchery steelhead and spring chinook supplementation program (Salmon and Trout Enhancement Program is already under way for steelhead) for the Walla Walla Subbasin. The Confederated Tribes of the Umatilla Indian Reservation is also planning on investigating the feasibility of fall chinook, coho and chum salmon restoration.

This plan is intended to:

1. Be consistent with tribal treaty-reserved rights to fish.

2. Be consistent with United States-Canada Pacific Salmon Treaty and United States vs. Oregon harvest and production agreements, and with other applicable laws and regulations.

3. Be consistent with state and tribal habitat protection and natural production initiatives and regulations.

4. Restore stocks of fish historically produced in the Walla Walla Subbasin.

5. Achieve optimum fish production from existing and potential natural habitats.

6. Contribute to Northwest Power Planning Council doubling goal.

7. Restore historic tribal and non-tribal fisheries within subbasin.

8. Contribute to tributary, Columbia River and ocean tribal and non-tribal fisheries.

9. Protect genetic resources of existing summer steelhead.

Summer Steelhead Resources

Natural Production

Life History and Status

Historically summer steelhead spawned and reared throughout a large area of the middle and upper reaches of the mainstem Walla Walla and Touchet rivers and their tributaries. Widespread habitat degradation resulting from irrigation, dryland farming, livestock grazing and logging has reduced usable spawning habitat by approximately 50 percent (WDG 1985).

Steelhead enter the subbasin from December through March, with peak numbers entering February through March (ODFW 1987) (Table 9). No accurate estimates of historical run sizes exist; annual runs are believed to have contained 4,000 fish to 5,000 fish (ODFW 1987). For run years 1977 through 1987, an estimated 1,090 to 1,817 native summer steelhead annually returned to the subbasin (Table 10).

Limited biological and life history information necessary for management exists. In recent years, more information has become available as result of monitoring and evaluation of Lower Snake River Compensation Plan activities. Since 1984, the Washington Wildlife Department has conducted spawning ground surveys and electrofishing for juveniles to evaluate hatchery smolt outplants under the Lower Snake River Compensation Program (M. Schuck, WDW, pers. commun.).

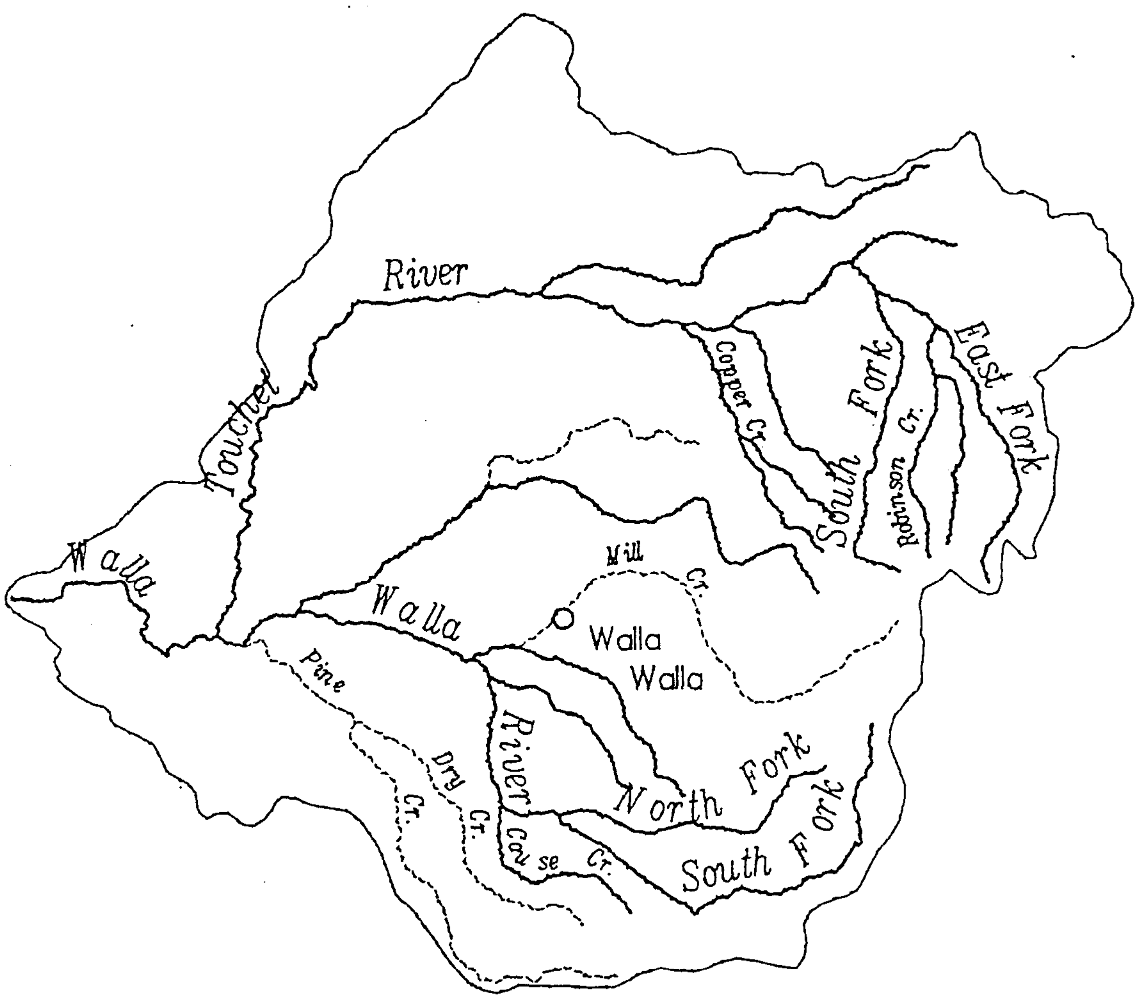
Age information was derived from 13 wild fish sampled from run years 1985-1986, and 1986-1987 (CTUIR 1987). All were 1-ocean or 2-ocean fish.

Limited sex information for 20 wild fish was sampled from run years 1984 through 1987 (CTUIR 1987). Sixteen were female and four, male.

Biologists also collected length information for 20 wild steelhead sampled from run years 1984 through 1987 (CTUIR 1987). Average length was 26.53 inches. No weight information is available.

Peak spawning occurs from April through May (Table 9). The average number of eggs per female was 3,975 from nine upper Walla Walla River wild steelhead spawned from the 1986-1987 run year (CTUIR 1987).

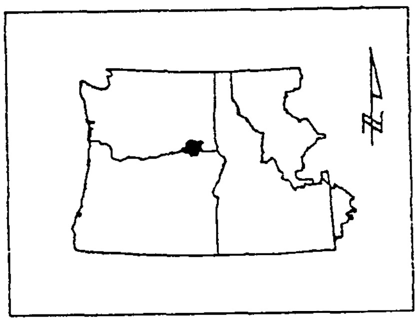
WALLA WALLA SUBBASIN



SUMMER STEELHEAD DISTRIBUTION*

——————— PRESENT/POTENTIAL

- - - - - - - - - ABSENT

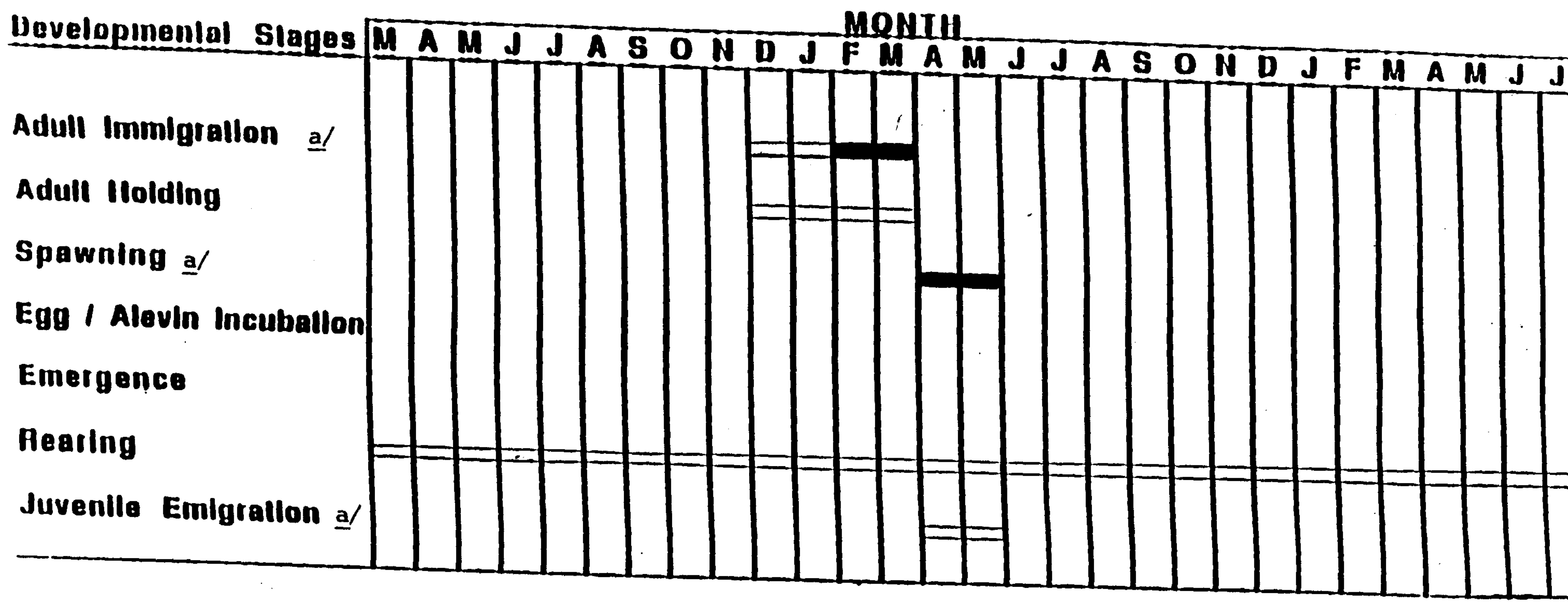


GEOGRAPHIC INFORMATION SYSTEM

BONNEVILLE POWER ADMINISTRATION

* Due to the limitations of scale, all streams which support anadromous fish are not shown on this map.

Table 9. Freshwater life history of summer steelhead in the Walla Walla River Subbasin.



Notes:

1. The developmental stage timing represents basin wide averages, local conditions may cause some variability.
2. Solid bars indicate periods of heaviest adult immigration, spawning, and juvenile emigration.

a/ U.S. v Oregon Production Report

Table 10. Summer steelhead stock abundance and harvest data for the Walla Walla River, 1977 to 87 (CTUIR 1987).

Run Year 1/	Sport Catch Adults				Tribal Catch 4/	Total Return Adults
	Washington 2/		Oregon 3/			
	Touchet	Walla Walla	Walla Walla	Total		
1977-78	76	340	58	474		1090-1817 5/
1978-79	8	60	90	158		
1979-80	160	406	35	601		
1980-81	140	271	224	635		
1981-82	100	355	80	535		
1982-83	69	205	164	438		
1983-84	121	342	126	589		
1984-85	158	686	126	970		
1985-86	464	1828	283	2575		
1986-87	291	1584	NA	1875+		

1/ Run years 1977-78 to 1983-84 consisted of native Walla Walla River stock. In 1984, State of Washington began release of wells stock steelhead from Lyons ferry hatchery (refer to Table 3) and regulated a hatchery only harvest during 1986-87.
2/ Mark Schuck (WDW).
3/ ODFW (1987).
4/ Don Sampson (CTUIR): Tribal harvest is negligible.
5/ For run years 1977-78 to 1983-84 the average harvest was 545 fish (excluding the unusual run year 1978-79). Assuming 30-50% of the fish entering the river are harvested, 1090-1817 native summer steelhead returned to the Walla Walla River (Mark Schuck, WDW and Jim Phelps, ODFW, personal comm.).

Emergence occurs from May through July (Table 9). Most juveniles rear for two years prior to emigration, however, substantial numbers of 1-year-old juveniles emigrate from Oregon headwaters (ODFW 1987). Most juveniles emigrate from late April through May (Table 9). No information on egg-to-smolt or smolt-to-adult survival rates exists.

Using System Planning Model (SPM) methodology, the subbasin has a carrying capacity of 100,167 smolts and has 4,707 acres (340 stream miles) of summer steelhead spawning and rearing habitat.

Fish Production Constraints

Considerable information exists on steelhead habitat problems, constraints and solutions confronting steelhead production in the Walla Walla Subbasin. Low streamflow is the chief factor limiting steelhead production in the subbasin. Naturally low summer streamflows are severely compounded by extensive irrigation withdrawals. The mainstem Walla Walla River at the Oregon/Washington border chronically is dried up by Oregon diversions. Diversions on the lower Touchet River can create similar conditions during low flow years. Numerous tributary diversions deplete streamflows, which reduce and degrade rearing habitat and increase juvenile mortalities at diversion bypass screens.

Three permanent irrigation diversion structures exist on the mainstem Walla Walla River. There is no operable fishway on the Burlingame Diversion (RM 36.0); adult fish passage is impeded at all flows and can be blocked during low flows. Nursery Bridge Dam (RM 45.8) has effective adult fish passage facilities with proper streamflow; most years the entire river is diverted from July through September, dewatering about three miles of stream. The Little Walla Walla Diversion Dam (RM 47.1) impedes fish passage at low streamflows. Marie Dorian Dam (RM 48.2) has no fish passage facilities; fish are impeded, but pass at most flows (NPPC 1986). The Walla Walla municipal water supply intake diversion on Mill Creek blocks steelhead from about seven miles of spawning and rearing habitat (NPPC 1986).

Hoffer and Maiden dams are on the mainstem Touchet River above Touchet, Washington. Both dams impede adult passage; during low flows Hoffer Dam (RM 3.8) blocks up to 50 percent of the run and Maiden Dam (RM 4.8) up to 10 percent.

All streamflow diversions in Washington are screened. In Oregon, there are four diversions on the mainstem Walla Walla River, nine on the North Fork Walla Walla, and 10 on the South Fork that have recently been fitted with new screens (1986-1988) by the Oregon Department of Fish and Wildlife under National

Marine Fisheries Service funding. These unscreened diversions formerly posed serious problems for wild downstream migrant steelhead (ODFW 1987).

The Little Walla Walla River diversion often dewaters sections of the mainstem Walla Walla River below. A barrier is needed at the mouth of the Little Walla Walla Diversion to prevent adults from entering the irrigation system. In the future, this diversion may be considered as an artificial stream for juvenile and adult passage. In this event, the adult barrier would not be needed and additional small fish screens would need to be installed throughout the Little Walla Walla system.

Overgrazing by domestic livestock and agricultural practices have extensively degraded riparian areas throughout the subbasin. This degradation has contributed to greater than normal seasonal variations in streamflow and temperature, destabilized streambanks making them more susceptible to erosion, reduced instream cover and decreased production of food organisms used by juvenile steelhead.

Sections of the mainstem Walla Walla River, the North and South forks, and the mainstem Touchet River have been channelized for flood control, dramatically decreasing the quantity and quality of rearing habitat in these areas. Steelhead habitat in the upper North Fork drainage has been adversely affected by logging and road building. Steelhead habitat in the upper South Fork drainage is relatively unaltered (ODFW 1987). Table 11 summarizes major habitat constraints.

Supplementation History

In 1983 the Washington Department of Wildlife began releasing hatchery steelhead smolts into the subbasin as part of the Lower Snake River Compensation Plan (LSRCP). Fish primarily were Wells stock, reared at Lyons Ferry Hatchery for spring release as yearlings into the mainstem Walla Walla River, Mill Creek and Touchet River (Table 12). The Lower Snake Compensation Plan goal for the Walla Walla River Subbasin in Washington is 310,000 hatchery smolts (135,000 Touchet River and 175,000 Walla Walla River) returning 1,550 adult steelhead (675 Touchet River and 875 Walla Walla River) (WDW 1987).

Table 11. Major Habitat Constraints in the Walla Walla Subbasin.

Location	Anadromous Fish Present	Sedimentation Problems	Low Flow Problems	Water Quality	Migration Barriers	Other
Walla Walla River (RM 0-47)	STS	---------	During Spring & Fall irrigation	High Temps. in Spring & Fall	Irrig. Dams at low flows	False attraction Lit. Walla Walla mouth
N. Fork Walla Walla River (RM 0-10)	STS	Moderate - bankcutting	During Summer	High Summer Temp.	---------	
Couse Creek (RM 0-8)	STS	Severe - land mngmt. bankcutting	During Summer	High Summer Temp.	---------	------------
Mill Creek (RM 014-27)	STS	---------	During Summer	High Summer Temp.	Irrig. Dam at low flow	------------
Birch Creek (RM 0-17)	STS	Moderate - bankcutting	During Summer	High Summer Temp.	---------	------------
Dry Creek (RM 0-24)	STS	Moderate - bankcutting	During Summer	High Summer Temp.	---------	------------
Touchet River (RM 0-36)	STS	Moderate -	During Summer	High Summer Temp.	Irrig. Dams at low flows	------------
S. Fk. Touchet River (RM 0-20)	STS	--------	During Summer	High Summer Temp.	---------	------------
Coppei Creek (RM 0-11)	STS	Moderate - bankcutting	During Summer	High Summer Temp.	---------	------------

Table 12. Lyons Ferry Hatchery summer steelhead smolt releases for the Walla Walla River Subbasin.

Release Year 1/	Date (MM-DD)	Location	Number Smolts2/	Pounds Released	Size #/lb	Stock	Mark
1983	05-10	Walla 2	91,260	12,950	7.0	Wells	None
	05-11	Mill Cr.	28,200	4,000	7.1	Wells	None
	05-12	Touchet	76,250	10,950	7.1	Wells	None
	Total		195,710				
1984	04-12	Walla 2	52,945	11,300	4.7	Wells	None
	04-17	Walla 2	55,370	11,300	4.9	Wells	None
	04-20	Walla 2	24,920	4,450	5.6	Wells	None
	04-18	Mill Cr.	30,510	5,650	5.4	Wells	None
	04-10	Touchet	21,360	4,450	4.8	Wells	None
	04-11	Touchet	32,900	7,000	4.7	Wells	None
	04-16	Touchet	27,685	5,650	4.9	Wells	None
	04-16	Touchet	32,775	5,750	5.7	Wells	None
	04-18	Touchet	29,945	5,650	5.3	Wells	None
	Total		308,410				
1985	04-17	Walla 2	67,600	12,000	5.6	Wells	ad-clip
	04-18	Walla 2	22,800	4,000	5.7	Wells	ad-clip
	04-19	Walla 2	24,800	4,000	6.2	Wells	ad-clip
	04-18	Mill Cr.	24,000	4,000	6.0	Wells	ad-clip
	04-15	Touchet	23,400	4,500	5.2	Wells	ad-clip
	04-16	Touchet	69,430	12,400	5.6	Wells	ad-clip
	04-19	Touchet	40,119	6,403	6.3	Wells	ad-clip
	05-08	Touchet	16,716	1,990	8.4	Wallowa	ad-clip
	Total		288,865				
1986	04-22	Touchet	16,800	3,200	5.2	Wells	ad-clip
	04-23	Touchet	21,800	4,000	5.5	Wells	ad-clip
	04-24	Touchet	43,520	7,950	5.5	Wells	ad-clip
	04-29	Touchet	46,185	7,150	6.5	Wells	ad-clip
	04-30	Touchet	27,300	4,200	6.5	Wells	ad-clip
	04-22	Walla 2	18,900	3,500	5.4	Wells	ad-clip
	04-23	Walla 2	44,400	8,000	5.5	Wells	ad-clip
	04-24	Walla 2	21,600	4,000	5.4	Wells	ad-clip
	04-30	Walla 2	53,945	8,050	6.7	Wells	ad-clip
	04-30	Mill Cr.	25,830	4,100	6.3	Wells	ad-clip
	Total		320,280				

1/ Data for release years 1983 and 1984 is modified from WDW (1986). Data for release years 1985 and 1986 from M.Schuck (WDW), pers. comm. 1987

2/ Only yearling fish have been released.

The purpose of the Washington Wildlife Department hatchery releases is to provide harvest, and maintain and enhance the naturally spawning population of steelhead in the Washington portion of the Walla Walla Subbasin. Only hatchery return adults (adipose fin marked) are allowed to be harvested in the sport fishery. The Oregon produced fish are also protected from harvest under these regulations.

Managers have not released hatchery smolts into the Walla Walla watershed in Oregon (ODFW 1987). In 1987, the Oregon Department of Fish and Wildlife and the Milton-Freewater Steelhead Enhancement Club spawned nine females and three males and placed approximately 35,000 fertilized eggs in hatch boxes for incubation and eventual release as juveniles (Phelps and Unterwegner, ODFW, pers. commun.). In 1988, the Milton-Freewater Steelhead Enhancement Club took approximately 45,000 eggs from wild steelhead for the hatch box program. Fry were released in upper Walla Walla River tributaries in Oregon.

Future releases of hatchery steelhead smolts into the Washington portion of the Walla Walla River are expected to be similar to past releases (M. Schuck, WDW, pers. commun.). Annual hatchery releases of 100,000 steelhead smolts into the Oregon portion of the subbasin are being proposed in the Northeast Oregon Hatchery Master Plan. The goal of these releases is to "achieve full utilization of existing and potential habitat for natural production and provide sustainable Indian and non-Indian harvest." (CTUIR 1990).

Hatchery Production

In Washington, the Dayton Conditioning Pond is located on the Touchet River in the city of Dayton. The Dayton Conditioning Pond is an earthen-rock rearing pond with asphalt bottom and is designed for extended rearing and acclimation of 150,000 summer steelhead smolts from March through April for release into the Touchet River in May. Managers released the first 136,727 juveniles (26,294 pounds) in 1987 and 152,724 smolts (35,924 pounds) in 1988 (M. Schuck, WDW, pers. commun.). Managers used and reared Wells stock steelhead at the Lyons Ferry Hatchery. The goal of Dayton Conditioning Pond is to improve survival and homing of hatchery steelhead. In addition to the Dayton Conditioning Pond release, approximately 175,000 smolts are reared at Lyons Ferry Hatchery and released directly in the Walla Walla River and Mill Creek (Table 12).

The hatchery run size (2,000 to 3,200 fish) is estimated to be twice that of the estimated hatchery harvest (1,000 to 1,600 fish). Approximately 1 percent of Lyons Ferry Wells stock steelhead smolts return to the subbasin as adults (M. Schuck, WDW, pers. commun.). There were no returns to the Dayton

Conditioning Pond as of spring of 1988. Hatchery steelhead return to the subbasin from December through February (M. Schuck, WDW, pers. commun.).

Limited age structure data is available on Wells stock hatchery returns to the Walla Walla River. Ninety-seven percent to 99 percent of the Wells stock adults returning to Lyons Ferry Hatchery have been 1-ocean and 2-ocean fish (M. Schuck, WDW, pers. commun.).

No separate sex ratio data are available for Wells stock returns to Lyons Ferry hatchery; of all trapped fish sorted for spawning in 1986, approximately 75 percent were female and 25 percent male (WDW 1987). No adult weight and length information is available.

Managers spawn Wells stock steelhead at Lyons Ferry Hatchery in March. Egg incubation occurs in March through April. No separate fecundity data is available for Wells stock returns to Lyons Ferry Hatchery; of all trapped fish sorted for spawning in the fall of 1986, average fecundity was 4,450 eggs per female (WDW 1987).

All hatchery steelhead released into the Walla Walla Subbasin were yearlings. These smolts emigrate from April through May. In 1985, 90.5 percent of Lyons Ferry Hatchery Wells stock eggs survived to smolts (WDW 1987). In 1988 survival was approximately 85 percent due to more rigorous culling (M. Schuck, WDW, pers. commun.).

The same habitat factors limiting survival of natural and wild smolts constrain hatchery juvenile survival (see previous discussion and Table 11.) Improved migrant survival could be achieved by improved streamflow and resultant improved water quality and passage conditions at diversions.

Evaluation of Lower Snake Compensation Plan hatchery practices is ongoing (WDW 1987). In addition, the Washington Department of Wildlife is considering switching to a new brood stock for hatchery steelhead released into the Walla Walla River under the Lower Snake River Compensation Plan (M. Schuck, WDW, pers. commun.). Wells stock returns to Lyons Ferry Hatchery are currently used for brood stock. To reduce straying of returning adults, the Wildlife Department is considering using Wells stock returns to the Walla Walla River for brood stock. As Walla Walla River natural steelhead production improves, the department may consider using native Walla Walla stock for brood stock. Trapping facilities as part of the proposed Northeast Oregon Hatchery program could provide the necessary brood stock collection facility. Brood stock needs would be approximately

of Fish and Wildlife personnel monitor and enforce harvest (J. Phelps, ODFW, pers. commun.).

In Washington a relatively higher level of harvest monitoring and enforcement activity exists due in part to higher levels of effort and to monitoring and evaluation of Lower Snake River Compensation Plan enhancement activities. Washington Department of Wildlife conservation officers, creel census and biological personnel monitor and enforce harvest (M. Schuck, WDW, pers. commun.).

Spring Chinook Salmon Resources

Natural Production

Although once abundant in the Walla Walla River Subbasin, spring chinook have not been present for many years. "The last run of importance was reported in 1925 and entered the river in May and early June," (Van Cleave and Ting 1960). Nine Mile Dam, built in 1905, on the mainstem Walla Walla River is believed to be the main cause for eliminating salmon from the Walla Walla and Touchet rivers (Van Cleave and Ting 1960). This dam is no longer in place. Managers have not tried to re-establish spring chinook.

Based on Northwest Power Planning Council methodology (NPPC 1988), there are an estimated 61 stream miles of spring chinook spawning and rearing habitat in the Walla Walla Basin, including the upper mainstem Walla Walla River and the South Fork in Oregon and upper mainstem Touchet River, North and South Fork Touchet rivers, and the Wolf, Burnt, and Griffin forks (Table 13).

Based on the Northwest Power Planning Council smolt density model, the estimated spring chinook natural smolt production capacity of the subbasin under existing habitat conditions is 364,656 smolts. The United States vs. Oregon Production Report (ODFW 1987) estimated the current spring chinook natural production capacity at 25,350 smolts (507 adults) in Oregon and 38,300 smolts (766 adults) in Washington. The Umatilla Tribes, the Washington Department of Fisheries and Oregon Department of Fish and Wildlife feel that the latter estimate is the more accurate. Spring chinook natural production constraints (Table 11) are the same as previously discussed for summer steelhead. After passage and habitat improvements, fisheries managers consider an adult return of 2,000 spring chinook a reasonable natural production objective for the Walla Walla Subbasin.

The Umatilla Tribes and the Oregon Department of Fish and Wildlife envision the purpose of a future spring chinook reintroduction program will be to restore a naturally spawning population of spring chinook, provide brood stock for continuing and expanding hatchery operations, provide tribal and non-tribal harvest, comply with the Umatilla Tribes' treaty-reserved right to fish, and assist in meeting Columbia River basinwide fish production goals established in the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program.

Table 13. Miles of potential spring chinook habitat in the upper Walla Walla River in Oregon and tributaries of the Touchet River in Washington.[1]

Stream	Miles of Habitat
Oregon	
Upper Mainstem Walla Walla	3.5
S. F. Walla Walla	20.9
N. F. Walla Walla	0
	24.4
Washington	
Upper Mainstem Touchet	19.3
N.F. Touchet	14.0
Wolf Fork	3.4
	36.7
Total Oregon and Washington	61.1

[1] Based on NPPC Fish and Wildlife Data Base, species presence/absence file methodology.

Information necessary for management of spring chinook in the subbasin is nonexistent. Planners recommend a monitoring and evaluation program immediately following reintroduction efforts to gain knowledge on performance and program effectiveness.

Hatchery Production

The Umatilla Tribes, Oregon Department of Fish and Wildlife, and Washington Fisheries Department favor reestablishment of spring chinook runs in the Walla Walla Subbasin. Since spring chinook runs no longer exist, a hatchery production program will be necessary for meeting hatchery adult return goals and eventually natural production goals using hatchery supplementation.

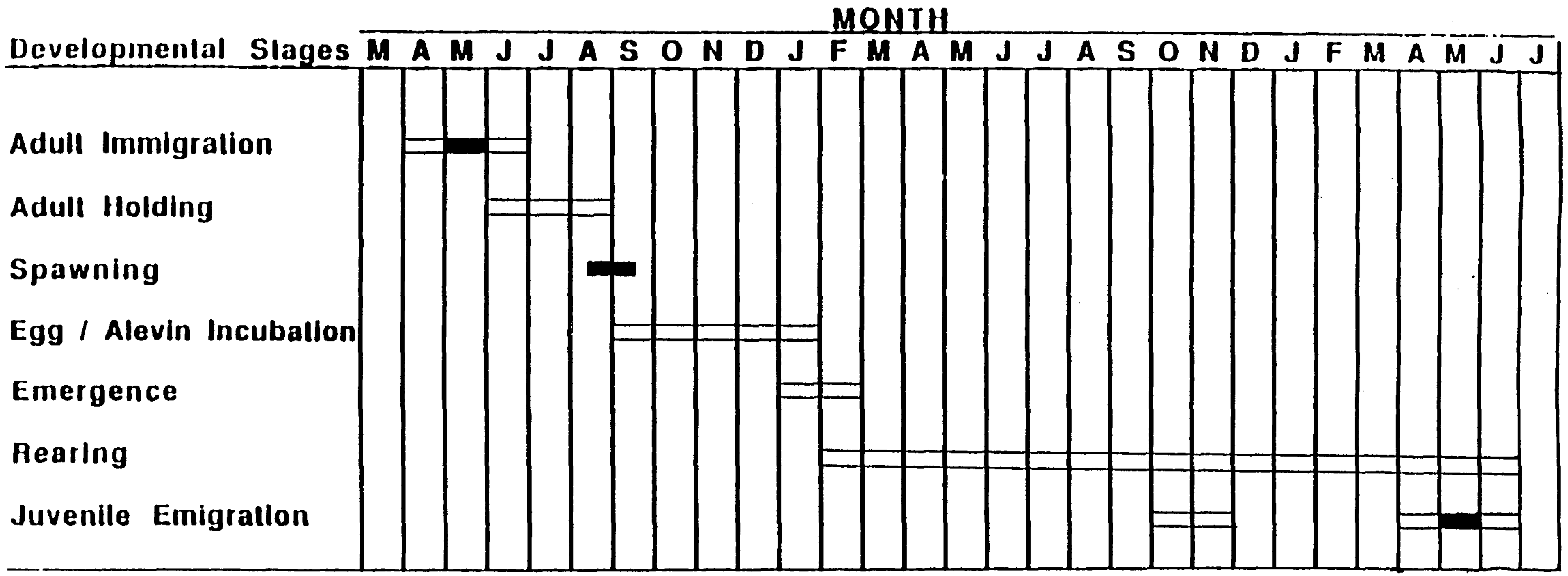
The Carson spring chinook stock was included in a proposed list of preferred and acceptable salmon stocks for supplementation of natural production in the Walla Walla Subbasin (NPPC 1987b). The Carson stock is being used for the ongoing spring chinook reintroduction program in the neighboring Umatilla Subbasin. This may be another future brood stock source if the program is successful. Other brood stock sources managers are considering include the Yakima or Tucannon stocks in Washington, and the Rapid River stock in Idaho. Managers hope that eventually the entire hatchery egg-take will be from fish returning to the Walla Walla River. Spring chinook entry into the Walla Walla River will depend on the seasonal quantity and temperature of available streamflow. As adults return, brood stock could be selected for early arrivers to fit the optimum streamflow regime (Table 14).

Managers are most likely to use Carson stock for reestablishing spring chinook in the Walla Walla Subbasin. For this reason, the life history characteristics of the Carson Hatchery stock are discussed below.

Carson stock spring chinook return to Carson and Little White Salmon Hatcheries primarily as 4- and 5-year-old adults and in lesser numbers as 3-year-old jacks (ODFW et al. 1985). In samples at Carson Hatchery, females comprised an average of 66 percent of 4-year-old returning fish. Females averaged 52 percent of returning 5-year-old fish (ODFW et al. 1985). At Carson Hatchery, spawning occurs from about August 10 to September 7 (ODFW et al. 1985) (Table 14).

Planning estimates for the neighboring Umatilla Basin Carson stock hatchery program are 0.0020 smolt-to-adult survival for spring release subyearlings, 0.0040 for fall release subyearlings and 0.0075 for yearlings (ODFW/CTUIR 1989). Smolt-to-adult survival for Walla Walla Subbasin would be lower than for the Umatilla Subbasin because of one additional mainstem dam to pass. Smolt-to-adult survival estimate for yearling spring chinook released above four mainstem Columbia River dams is 0.005 (ODFW 1987). Based on the above survival estimates, 600,000 hatchery smolts would return 3,000 adult spring chinook to the Walla Walla Subbasin (CTUIR 1990).

Table 14. Freshwater life history of hatchery spring chinook (Carson Hatchery stock).



Notes:

1. The developmental stage timing represents basin-wide averages, local conditions may cause some variability.
2. Solid bars indicate periods of heaviest adult immigration, spawning, and juvenile emigration.

The Northeast Oregon Hatchery master planning effort will include a feasibility study for the siting of a steelhead and spring chinook hatchery facility in the upper Walla Walla drainage in Oregon. The South Fork Walla Walla River has the best quantity and quality of water in this drainage. Average streamflows in the South Fork (Table 2) exceed the recommended minimum streamflow levels (Table 7). If constructed, a hatchery facility in Oregon may also produce the spring chinook smolts necessary for a reintroduction program in the Touchet River or other local river systems. The recently completed Lyons Ferry chinook hatchery in Washington could be another possible source for chinook enhancement activities in the Touchet River (NPPC 1987). Both adult holding and juvenile rearing capabilities would be needed as a part of a Walla Walla hatchery program. The Northeast Oregon Hatchery master plan includes facilities to hold 559 adults, incubate 1,071,500 eggs, and rear 600,000 spring chinook smolts for the Walla Walla Subbasin (CTUIR 1990).

An adult trapping facility, probably in the lower Walla Walla River, would be necessary for taking brood stock and for trapping and hauling fish (when necessary) past the irrigation-depleted lower and middle mainstem Walla Walla and Touchet rivers. Managers would truck adults to adult holding facilities in the upper basin (for brood stock) or release them above irrigation diversions (for natural production). Managers are implementing a similar program in the Umatilla Subbasin.

Harvest

Very little historic spring chinook catch data exists for the Walla Walla Subbasin. The last sport catches reported by the Oregon Game Commission for 1955 and 1956 were 18 fish and 35 fish, respectively (Van Cleave and Ting 1960). The Confederated Tribes of the Umatilla Indian Reservation have usual and accustomed fishing sites throughout the subbasin. No historical Indian harvest data is available, although the mouth of the Walla Walla River was a major encampment area and fishery for Indians historically.

Specific Considerations

The Walla Walla River Subbasin:

- Lies above four mainstem Columbia River hydroelectric projects;
- Lies just above the Columbia River Zone 6 treaty fishing area;
- Lies within close proximity to southeastern Washington and northeastern Oregon population centers.
- Contains important usual and accustomed fishing sites of the Confederated Tribes of the Umatilla Indian Reservation, which have treaty-reserved rights to fish.
- Is easily accessible to fishermen and provides geographically extensive opportunities for a variety of tribal and non-tribal fisheries.

Summer Steelhead

The objective of the current Washington Wildlife Department steelhead supplementation program is to return 1,550 adult fish to the subbasin to enhance natural production and fisheries while protecting the genetic integrity of native steelhead. All hatchery fish are marked; fishermen cannot retain unmarked fish. Oregon allows fishermen to keep unmarked fish, but subbasin regulations are more restrictive than the Oregon norm.

The key problem and constraint on production in the subbasin is low summer streamflows and associated increased water temperatures and juvenile and adult passage problems. Degraded riparian areas and sedimentation are the most geographically extensive problems.

Significant potential for enhancing summer steelhead habitat exists in the subbasin. Historical runs are believed to have contained 4,000 fish to 5,000 fish. During the past decade, runs have been estimated to contain 1,000 to 1,800 fish.

Spring Chinook Salmon

The Walla Walla Subbasin once produced substantial numbers of spring chinook, however the run was exterminated. Managers believe the subbasin has significant natural production potential for spring chinook in the upper Walla Walla and Touchet River drainages and offers opportunity for hatchery supplementation and reintroduction.

Objectives

Biological Objective

Reestablish runs of spring chinook and enhance summer steelhead (Table 15) to achieve full use of existing and potential habitat for natural production, and acquire brood stock necessary for a Walla Walla Basin artificial production program.

Utilization Objective

Provide sustainable Indian and non-Indian harvest of salmon and steelhead from the mouth of the Walla Walla River and tributaries to the headwaters (Table 15).

Table 15. Walla Walla Subbasin salmon and steelhead run size objectives.

Species	Biological Objective			Utilization Objective
	Hat. Prod	Nat. Prod	Total	Harvest[1]
Spring Chinook	3,000	2,000	5,000	2,441
Summer Steelhead	8,000	3,000	11,000	7,680

[1] Biological objective total minus natural production minus anticipated future brood stock needs. Brood stock need for spring chinook is approximately 559 adults for 600,000 hatchery smolts produced. Brood stock need for summer steelhead is approximately 80 adults for 100,000 smolts produced for Oregon supplementation and 240 adults for 300,000 smolts produced for Washington supplementation. This interim harvest objective may be adjusted as the Umatilla Tribes, Washington Department of Fisheries, Oregon Department of Fish and Wildlife, and Washington Department of Wildlife evaluate both hatchery and natural production success in the subbasin.

Alternative Strategies

Modeling results for each strategy are presented in Tables 17a and 17b as fish produced at "maximum sustainable yield" (MSY). The sustainable yield of a fish population refers to that portion of the population that exceeds the number of fish required to spawn and maintain the population over time. Sustainable yield can be "maximized," termed MSY, for each stock at a specific harvest level. The MSY is estimated using a formula (Beverton-Holt function) that analyzes a broad range of harvest rates. Subbasin planners have used MSY as a tool to standardize results so that decision makers can compare stocks and strategies.

In MSY management, managers set a spawning escapement level and the remaining fish (yield) could theoretically be harvested. In practice, a portion of the yield may be reserved as a buffer or to aid rebuilding. Thus, managers may raise the escapement level to meet a biological objective at the expense of a higher utilization objective.

The amount of buffer appropriate for each stock is a management question not addressed in the subbasin plans. For this reason, the utilization objective, which usually refers to harvest, may not be directly comparable to the MSY shown in Tables 17a and 17b. At a minimum, a strategy should produce an estimated MSY equal to or greater than the utilization objective. A MSY substantially larger than the subbasin utilization objective may be needed to meet subbasin biological objectives.

Estimated costs of the alternative strategies below are summarized in Tables 17c and 17d.

STRATEGY 1: Substantially increase the spring chinook salmon and summer steelhead runs to the Walla Walla River Subbasin.

Strategy 1 includes adult and juvenile passage improvements (Action IA); holding, spawning and rearing improvements (Action IB); instream flow enhancement (Action IIA); existing hatchery production for summer steelhead (Action IIIA); initiation of spring chinook releases from existing hatcheries (Action IIIB); and maximum tribal and sport harvest opportunities (Action IV). Action items in Strategy 1 are currently in the planning state prior to implementation.

Major Hypotheses: The action items in Strategy 1 will improve pre-spawning, smolt-to-smolt, egg-to-smolt and post-release survival and also increase natural smolt capacity. Hatchery production will be initiated for spring chinook smolt releases (Table 16).

Table 16. Major hypotheses underlying strategies to improve salmon and steelhead runs in the Walla Walla River Subbasin.

Strategy	Action	Species	Parameter	Major Hypotheses Baseline	After Act
1	I.A.I.	Sts	Pre-spawn survival 1/	0.80	0.90
		Chs		0.50	0.75
	I.A.2.	Sts	Smolt to smolt survival 1/	0.80	0.95
		Chs		0.80	0.95
	I.B.	Sts	Natural egg to smolt survival 2/	0.03	0.04
		Chs		0.16	0.21
	I.B.	StS	Natural smolt capacity 3/	100,117	144,481
		Chs		364,656	613,356
	II.A.	Chs	Pre-spawn survival 1/	0.50	0.80
	III.A.	Sts	Utilize existing hatchery production	300,000	300,000
	III.B.	Chs	Initiate hatchery production	100,000	100,000
2	III.C.	Sts	Expand Hatchery smolt capacity	300,000	400,000
		Chs		100,000	600,000
	II.B	Chs	Pre-spawn survival 1/	0.50	0.90
3	II.B.	Sts	Smolt to smolt survival 1/	0.80	1.0
		Chs		0.80	1.0
	II.B.	Sts	Natural smolt capacity 4/	100,117	NA
		Chs		364,656	NA

1/ Estimated by CTUIR Biologists (based on Umatilla subbasin).
2/ Used John Day Subbasin calibration method for Sts and Chs.
Net system effect from Tributary Production Model.
3/ Smolt Density Model results.
4/ Sites and potential benefits from headwater storage needs further investigation.

Critical Assumptions: A critical assumption for both salmon and steelhead is that habitat improvements will be implemented. Hatchery production will be initiated for spring chinook.

Summer Steelhead: The System Planning Model was calibrated at 0.20 percent natural and 0.50 percent hatchery harvest rates to obtain a 1,500-natural and 2,500-hatchery adult return to subbasin.

Spring Chinook: No spring chinook salmon currently return to the Walla Walla River. A critical assumption is that the natural production capacity prior to implementation of Strategy 1 is 1,024 adults (using Umatilla Basin 0.6 natural fitting parameter). The hatchery smolt-to-adult survival is 0.5 percent (ODFW 1987).

Potential Production using System Planning Model: After Strategy 1, total return to subbasin at maximum sustainable yield (MSY) increased 53 percent for summer steelhead, and from zero to 2,491 fish for spring chinook (Tables 17a and 17b).

STRATEGY 2: Implement Strategy 1 and Northeast Oregon Hatchery production (Action III-C), and conduct a headwater storage feasibility study (Action II-B1). The Northeast Oregon Hatchery is expected to provide the additional smolts necessary to achieve the Walla Walla Subbasin adult return objective.

Major Hypotheses: Strategy 2 (Action III C and Strategy 1) will further increase hatchery production of spring chinook from 100,000 to 600,000 smolts, and summer steelhead from 300,000 to 400,000 smolts (Table 16).

Critical Assumptions: A critical assumption is the completion of Northeast Oregon Hatchery including the master plan, design, construction and operation. Planners also assume that summer steelhead and spring chinook smolts produced at this new facility will be designated for release into the Walla Walla River.

Potential Production using System Planning Model: After Strategy 2, total return to subbasin at MSY increased 14 percent for summer steelhead and 107 percent for spring chinook from Strategy 1 (Tables 17a and 17b).

STRATEGY 3: Implement Strategy 2 and use headwater storage to enhance flows (Action II.B.). Headwater storage would be used for enhancement of flows during critical fish rearing and migration periods (probably summer through early fall). Headwater storage feasibility needs further evaluation.

Major Hypotheses: Strategy 3 (Action IIB and Strategy 2) will increase spring chinook pre-spawning survival, summer steelhead and spring chinook smolt-to-smolt survival, and summer steelhead and spring chinook natural smolt capacity (Table 16).

Potential Production using System Planning Model: After Strategy 3, total return to subbasin at MSY increased 11 percent for summer steelhead and 7 percent for spring chinook from Strategy 2 (Tables 17a and 17b).

Table 17a. System Planning Model results for spring chinook in the Walla Walla Subbasin. Baseline value is for pre-mainstem implementation, all other values are post-implementation.

Utilization Objective:
Provide sustainable Indian and non-Indian harvest from the mouth of the Walla Walla River and tributaries to the headwaters. 2,500 harvest.

Biological Objective:
Reestablish runs of spring chinook to achieve full utilization of existing and potential habitat for natural production, and acquire brood stock necessary for Walla Walla Basin artificial production program. 3,000 hatchery production, 2,000 natural production.

Strategy[1]	Maximum[2] Sustainable Yield (MSY)	Total[3] Spawning Return	Total[4] Return to Subbasin	Out of[5] Subbasin Harvest	Contribution[6] To Council's Goal (Index)
Baseline	0 -N	0	0	0	0(1.00)[7]
All Nat	1,129 -C	801	2,130	486	0( )[7]
1	1,445 -C	837	2,491	554	4,392( )[7]
2*	3,454 -N	1,767	5,663	1,208	9,930( )[7]
3	3,881 -N	1,965	6,064	1,294	10,634( )[7]

*Recommended strategy.

[1]Strategy descriptions:

For comparison, an "all natural" strategy was modeled. It represents only the natural production (non-hatchery) components of the proposed strategies plus current management (which may include hatchery production). The all natural strategy may be equivalent to one of the alternative strategies below.

1. Improve adult and juvenile passage, and holding, spawning and rearing habitat; instream flow enhancement; initiate releases from existing hatcheries; max. tribal and sport harvest opp. All these actions currently in planning. Post Mainstem Implementation.
2. Strategy 1 plus Northeast Oregon Hatchery production. Post Mainstem Implementation.
3. Strategy 2 plus headwater storage to enhance flows. Post Mainstem Implementation.

[2] MSY is the number of fish in excess to those required to spawn and maintain the population size (see text). These yields should equal or exceed the utilization objective. C = the model projections where the sustainable yield is maximized for the natural and hatchery components combined and the natural spawning component exceeds 500 fish. N = the model projection where sustainable yield is maximized for the naturally spawning component and is shown when the combined MSY rate results in a natural spawning escapement of less than 500 fish.

[3] Total return to subbasin minus MSY minus pre-spawning mortality equals total spawning return.

[4] Total return to the mouth of the subbasin.

[5] Includes ocean, estuary, and mainstem Columbia harvest.

[6] The increase in the total return to the mouth of the Columbia plus prior ocean harvest (as defined by the Northwest Power Council's Fish and Wildlife Program), from the baseline scenario. The index () is the strategy's total production divided by the baseline's total production.

[7] The index () cannot be calculated because the baseline contribution is zero.

Table 17b. System Planning Model results for summer steelhead (A's) in the Walla Walla Subbasin. Baseline value is for pre-mainstem implementation, all other values are post-implementation.

Utilization Objective:
Provide sustainable Indian and non-Indian harvest from the mouth of the Walla Walla River and tributaries to the headwaters. 7,680 harvest.

Biological Objective:
Enhance summer steelhead to achieve full utilization of existing and potential habitat for natural production, and acquire brood stock necessary for Walla Walla Basin artificial production program. 8,000 hatchery production, 3,000 natural production.

Strategy[1]	Maximum[2] Sustainable Yield (MSY)	Total[3] Spawning Return	Total[4] Return to Subbasin	Out of[5] Subbasin Harvest	Contribution[6] To Council's Goal (Index)
Baseline	1,198 -N	1,703	3,327	668	0(1.00)
All Nat	728 -C	2,192	3,163	635	- 287(0.95)
1	2,859 -C	2,022	5,105	1,025	3,118(1.53)
2*	3,719 -C	1,883	5,811	1,167	4,353(1.75)
3	4,000 -C	2,207	6,452	1,296	5,477(1.94)

*Recommended strategy.

[1]Strategy descriptions:

For comparison, an "all natural" strategy was modeled. It represents only the natural production (non-hatchery) components of the proposed strategies plus current management (which may include hatchery production). The all natural strategy may be equivalent to one of the alternative strategies below.

1. Improve adult and juvenile passage, and holding, spawning and rearing habitat; instream flow enhancement; existing hatchery production; max. tribal and sport harvest opp. All these actions currently in planning. Post Mainstem Implementation.
2. Strategy 1 plus Northeast Oregon Hatchery production. Post Mainstem Implementation.
3. Strategy 2 plus headwater storage to enhance flows. Post Mainstem Implementation.

[2]MSY is the number of fish in excess to those required to spawn and maintain the population size (see text). These yields should equal or exceed the utilization objective. C = the model projections where the sustainable yield is maximized for the natural and hatchery components combined and the natural spawning component exceeds 500 fish. N = the model projection where sustainable yield is maximized for the naturally spawning component and is shown when the combined MSY rate results in a natural spawning escapement of less than 500 fish.

[3]Total return to subbasin minus MSY minus pre-spawning mortality equals total spawning return.

[4]Total return to the mouth of the subbasin.

[5]Includes ocean, estuary, and mainstem Columbia harvest.

[6]The increase in the total return to the mouth of the Columbia plus prior ocean harvest (as defined by the Northwest Power Council's Fish and Wildlife Program), from the baseline scenario. The index () is the strategy's total production divided by the baseline's total production.

Table 17c. Estimated costs of alternative strategies for Walla Walla spring chinook. Cost estimates represent new or additional costs to the 1987 Columbia River Basin Fish and Wildlife Program; they do not represent projects funded under other programs, such as the Lower Snake River Compensation Plan or a public utility district settlement agreement. (For itemized costs, see Appendix C.)

	Proposed Strategies		
	1	2*	3
Hatchery Costs			
Capital[1]	0	0	0
O&M/yr[2]	3,500	3,500	3,500
Other Costs			
Capital[3]	1,475,000	1,475,000	201,475,000
O&M/yr[4]	304,000	384,000	584,000
Total Costs			
Capital	1,475,000	1,475,000	201,475,000
O&M/yr	307,500	387,500	587,500

* Recommended strategy.

[1] Estimated capital costs of constructing a new, modern fish hatchery. In some subbasins, costs may be reduced by expanding existing facilities. For consistency, estimate is based on $23/pound of fish produced. Note that actual costs can vary greatly, especially depending on whether surface or well water is used and, if the latter, the number and depth of the wells.

[2] Estimated operation and maintenance costs per year directly associated with new hatchery production. Estimates are based on $2.50/pound of fish produced. For consistency, O&M costs are based on 50 years.

[3] Capital costs of projects (other than direct hatchery costs) proposed under a particular strategy, such as enhancing habitat, screening diversions, removing passage barriers, and installing net pens (see text for specific actions).

[4] Estimated operation and maintenance costs per year of projects other than those directly associated with new hatchery production. For consistency, O&M costs are based on 50 years.

Table 17d. Estimated costs of alternative strategies for Walla Walla summer steelhead. Cost estimates represent new or additional costs to the 1987 Columbia River Basin Fish and Wildlife Program; they do not represent projects funded under other programs, such as the Lower Snake River Compensation Plan or a public utility district settlement agreement. (For itemized costs, see Appendix C.)

	Proposed Strategies		
	1	2*	3
Hatchery Costs			
Capital[1]	0	0	0
O&M/yr[2]	0	0	0
Other Costs			
Capital[3]	1,475,000	1,475,000	201,475,000
O&M/yr[4]	304,000	384,000	584,000
Total Costs			
Capital	1,475,000	1,475,000	201,475,000
O&M/yr	304,000	384,000	584,000

* Recommended strategy.

[1] Estimated capital costs of constructing a new, modern fish hatchery. In some subbasins, costs may be reduced by expanding existing facilities. For consistency, estimate is based on $23/pound of fish produced. Note that actual costs can vary greatly, especially depending on whether surface or well water is used and, if the latter, the number and depth of the wells.

[2] Estimated operation and maintenance costs per year directly associated with new hatchery production. Estimates are based on $2.50/pound of fish produced. For consistency, O&M costs are based on 50 years.

[3] Capital costs of projects (other than direct hatchery costs) proposed under a particular strategy, such as enhancing habitat, screening diversions, removing passage barriers, and installing net pens (see text for specific actions).

[4] Estimated operation and maintenance costs per year of projects other than those directly associated with new hatchery production. For consistency, O&M costs are based on 50 years.

Actions

A listing of individual Walla Walla Subbasin project action items are presented in Table 19 along with project status, anticipated funding source, and cost estimates for each. Various action items are contained in each of the three fisheries enhancement strategies. Estimated capital and annual operation and maintenance costs for each strategy are presented in Table 20.

ACTION I. Improve habitat.

A. Improve juvenile and adult fish passage.

1) Provide adequate adult passage conditions at problem areas:

Burlingame Diversion Dam (needs operable ladder)

Mouth of Little Walla Walla diversion (prevent adults from entering; or evaluate this system as a "stream" for fish passage)

Nursery Bridge Dam (needs better attraction to ladder entrance)

Little Walla Walla Dam (needs low flow ladder)

Marie Dorian Dam (need to remove dam or portion)

Hoffer Dam (possible passage problem at low flows)

Maiden Dam (possible passage problem at low flows)

Mill Creek: Gose Street Bridge and Rooks Park Dam (possible passage problems at low flows)

Implement trap and haul program to capture spring chinook at a lower Walla Walla River trap site and artificially transport above low flow problem areas (when necessary) to the upper Walla Walla and Touchet rivers.

Secure annual O&M funds for the above projects

2) Provide adequate juvenile passage conditions at problem areas:

Hoffer Dam (provide smolt passage or trap and haul)

Little Walla Walla Diversion (needs improved smolt trapping capability for trap and haul program during low flow periods; development of juvenile release site in lower Walla Walla River would also be needed).

Nursery Bridge (Hudson Bay Frost Control - needs screen)

Screens will be needed in the future if the Little Walla Walla system is used as a fish passage corridor. In this event, existing screens near the headgate would be raised while smolts enter and migrate down the Little Walla Walla Canal.

Secure annual operation and maintenance (O&M) funds for the above projects.

B. Improve juvenile and adult rearing, holding, and spawning habitat.

1) Protect riparian zones from degradation by domestic livestock, forestry and agricultural practices, and by urban, suburban and commercial development.

Coordinate with the Soil Conservation Service; the Soil and Water Conservation District; USFS; Oregon Department of Forestry; Walla Walla, Umatilla and Columbia counties; Oregon Division of State Lands; Oregon Land Conservation and Development Commission; Corps of Engineers, Oregon Department of Agriculture; and other participating agencies.

Deal more with private landowners through education programs and technical assistance.

2) Promote enhancement of degraded riparian and instream habitat.

BPA-funded projects (develop 5-year plans and eventually 6- to 10-year plans for project implementation) (Table 18).

Governor's Watershed Enhancement Board-funded projects (ongoing, needs to continue efforts with steelhead club)

OWRD-funded projects (ongoing, ASCS and steelhead club)

Table 18. Instream and riparain habitat enhancement projects for the Walla Walla Basin

Stream 1/	Reach		Mi. of Work	Cost	Impl. Agency
TOUCHET RIVER SYSTEM					
1 McKay Creek	Rm 0 to 27		2.7	95,600	WDW
2 Touchet River	Rm 36-59		12.0	647,500	WDW
3 Coppei	Rm 3 to 11		4.0	141,600	WDW
4 N. Fk Coppei	Rm 0 to 6		3.0	106,200	WDW
5 Patit	Rm 0 to 3		1.5	53,100	WDW
6 S. Fk Touchet	Rm 0 to 20		8.0	431,700	WDW
7 Griffen Fk	Rm 0 to 1		1.0	35,400	WDW
8 Burnt	Rm 0 to 1.5		1.5	53,100	WDW
9 N. Fk Touchet	Rm 0 to 14		7.0	377,700	WDW
10 N. Fk. Touchet	Rm 14 to 19		3.0	137,850	USFS
11 Spangler Creek	Rm 0 to 1		1.0	45,950	USFS
12 Wolf Fk.	Rm 0 to 9		4.5	242,100	WDW
13 Robinson Creek	Rm 0 to 3		3.0	106,200	WDW
14 Lewis Creek	Rm 0 to 1		1.0	35,400	WDW
			------	---------	
		Subtotals	53.2	2,509,400	
WALLA WALLA SYSTEM					
15 Dry Creek	Rm 12 to 24		6.0	212,500	ODFW
16 Mill Creek	Rm 14 to 27		7.0	377,700	WDW/ODFW
17 Yellowhawk Creek	Rm 2.4 to 2.4		2.0	70,800	WDW
18 N. Fk Cottonwood	Rm 0 to 4		2.0	70,800	ODFW
19 Cottonwood Creek	Rm 7.0 - 11.2		2.0	70,800	ODFW
20 Birch Creek	Rm 4 to 17		3.5	123,900	ODFW
21 Walla Walla River	Rm 47 to 52		4.0	391,600	ODFW
22 Couse Creek	Rm 0 to 8		4.0	141,600	ODFW
23 S. Fk. Walla Walla	Rm 0 to 13		6.5	350,700	ODFW
24 S. Fk. Walla Walla	Rm 13 to 16		3.0	137,850	USFS
25 N. Fk Walla Walla	Rm 0 to 11		8.0	431,700	ODFW
			------	----------	
		Subtotals	48.0	2,379,950	
			------	----------	
		Grand Totals	101.2	4,889,350	

1/ Most of these projects are already in the NPPC Fish & Wildlife Program but no implementation plans have been developed at this time.

USFS Knutsen-Vandenburg (K-V) funds

Secure funds and implement an O&M program for the above riparian and instream projects.

ACTION II. Enhance instream flows.

A. Provide improved instream flow conditions for passage of adult and juvenile migrating fish in the mainstem Walla Walla River.

1) Establish minimum streamflows for all migration, spawning and rearing habitats.

2) Promote water conservation through coordination with irrigators and state management entities.

3) Purchase or lease water rights for instream flow enhancement during critical spring and/or fall fish migration periods.

B. Use headwater storage in the upper Walla Walla and Touchet Rivers for enhancement of flows during critical fish migration periods.

1) Conduct a headwater storage feasibility study to identify suitable storage sites and develop cost estimates.

2) Construct headwater storage sites pending results of the feasibility study.

ACTION III. Continue hatchery production.

A. Continue existing hatchery production for juvenile summer steelhead (STS) release in the Walla Walla Basin.

1) Continue Lower Snake River Compensation Plan steelhead program of releasing approximately 300,000 steelhead smolts from Lyons Ferry Hatchery and Dayton Conditioning Pond into the Walla Walla and Touchet rivers.

2) Continue STEP (ODFW's Salmon and Trout Enhancement Program).

B. Initiate spring chinook (CHS) releases from existing facilities (at least 100,000 smolts) prior to construction of new hatchery facilities (Action III.C. below).

C. Use potential (new or expanded) artificial production facilities to provide additional summer steelhead and spring chinook juveniles for release in the Walla Walla Basin.

   1) Conduct hatchery site feasibility studies in the upper Touchet and Walla Walla rivers.

   2) Coordinate upper Walla Walla River Hatchery citing and planning with the ongoing Northeast Oregon Hatchery master plan.

   3) Evaluate potential of expanding Lyons Ferry/Tucannon spring chinook program to incorporate Touchet River outplanting.

   4) Pursue construction of new hatchery and/or acclimation facilities at feasible sites to provide the numbers of juveniles necessary to accomplish the adult return goals.

   5) Install trapping and holding facilities for hatchery brood stock collection.

   6) Monitor and evaluate artificial production programs to assess the degree to which objectives are being met.

ACTION IV. Provide tribal and sport harvest opportunity to fully use harvestable surplus adult return goals.

1) Jointly (state and tribes) design and implement a harvest allocation plan that provides for increasing levels of harvest, brood stock, and natural production as the total run size increases.

2) Implement angling regulations that will allow for meeting the required escapement levels of adults and smolts for natural production without limiting fishery objectives. (Although brood stock and escapement are high priority objectives, regulations will be designed to allow a fishery as runs are rebuilding).

3) Monitor and enforce compliance with angling regulations and evaluate fisheries to assess the degree to which objectives are being met.

4) Determine what Columbia River and ocean harvest rates are on Walla Walla fish, and the corresponding proportions of that harvest on the total Walla Walla return.

Recommended Strategy

The Umatilla Tribes, Washington Department of Wildlife, Washington Department of Fisheries, and Oregon Department of Fish and Wildlife recommend that all project action items in Strategy 2 be implemented. Strategy 2 provides a combination of habitat improvements, flow enhancement, and artificial production needed to achieve summer steelhead and spring chinook run size objectives. System modeling indicates spring chinook run size objectives can be met with Strategy 2 (Table 17a). For steelhead system modeling indicates run size objectives cannot be met with any strategy (Table 17b). Smolt-to-adult survival rates used in the United States vs. Oregon production report (ODFW 1987) indicate steelhead run size objectives can be met with Strategy 2. Strategy 2 was also given the highest rating by the SMART analysis (Appendix B).

Strategy 1 is not recommended because it does not provide the artificial production necessary to achieve the summer steelhead or spring chinook goal. Strategy 3 (headwater storage) would take the longest to implement, is very expensive and will be pursued pending the results from the headwater storage feasibility study recommended in Strategy 2. Actions I.B. (fish holding, spawning and rearing improvements), II.B. (headwater storage feasibility studies) and III.C. (Northeast Oregon Hatchery facility) are already contained in the Columbia River Basin Fish and Wildlife Program (Table 19).

The three strategies presented for the Walla Walla Subbasin will all benefit spring chinook and summer steelhead. The strategies are cumulative so that higher numbered strategies include previous strategies. Strategy 1 includes passage improvements; holding, spawning and rearing improvements; instream flow enhancement; continued hatchery production for summer steelhead; and initiation of hatchery production for spring chinook. Strategy 2 adds substantially increased hatchery production for spring chinook and moderate increases for summer steelhead. Additional hatchery facilities could also be in place relatively soon (studies are ongoing now and implementation could occur within five to 10 years). Strategy 2 also includes an evaluation of headwater storage in the upper Walla Walla and

Touchet Rivers. Strategy 3 adds headwater storage construction and will be pursued pending the results from the evaluation.

Table 19. Walla Walla Subbasin Plan fisheries enhancement action items, projects, and costs.

ACTION ITEM	PROJECT	STATUS	FUNDING	COST 1/ CAPITAL	ANNUAL
I.A.	1. Burlingame Dam adult passage improvement	No action at this time	BPA ?	0	10,000
I.A.	2. Nursery Bridge Dam adult passage improvement	No action at this time	BPA ?	0	20,000
I.A.	3. Little Walla Walla Dam adult passage improvement	No action at this time	BPA ?	20,000	5,000
I.A.	4. Little Walla Walla diversion screen	No action at this time	BPA ?	300,000	10,000
I.A.	5. Marie Dorian Dam adult passage improvement	No action at this time	BPA ?	100,000	10,000
I.A.	6. Mouth of Little Walla Walla adult blockage	No action at this time	BPA ?	150,000	20,000
I.A.	7. Hofer Dam adult passage improvement	No action at this time	BPA ?	200,000	5,000
I.A.	8. Maiden Dam adult passage improvement	No action at this time	BPA ?	100,000	5,000
I.A.	9. Mill Cr. adult pass. imprmt. - Gose St. Bridge	No action at this time	BPA ?	25,000	2,000
I.A.	10. Mill Cr. adult pass. imprmt. - Rooks Park Dam	No action at this time	BPA ?	0	2,000
I.A.	11. Adult and juvenile trap & haul program	No action at this time	BPA ?	530,000 2/	200,000 3/
I.A.	12. Hudson Bay frost control diversion screen	No action at this time	BPA ?	50,000	5,000
I.B. 4/	13. Instream and riparian fish habitat enhan.	No action at this time	BPA ?	3,910,000	65,300 5/
II.A.	14. Improve mainstem WW River flows for fish	Initial efforts ongoing	various 6/	? 7/	? 7/
II.B. 4/	15. Recon. & site feas. studies -WW & Touchet storage	No action at this time	BPA ?	600,000 8/	0
II.B.	16. WW & Touchet headwater storage projects	No action at this time	?	200,000,000 9/	200,000
III.A.	17. Continue existing StS production (300,000)	Ongoing part of LSRCP	COE	0	125,000 10/
III.B.	18. Initiate CHS smolt releases (100,000)	No action at this time	?	0	35,000 10/
III.C. 4/	19. Expand hatchery production for CHS & StS	NE OR Hatchery planning ongoing	BPA	3,835,000 13/	220,000 10/
III.C.	20. Monitor & evaluate WW artif. prod. pgm.	NE OR Hatchery planning ongoing	BPA	0	400,000 14/

1/ All costs are rough estimates & not based on preliminary studies or designs unless otherwise noted.
2/ Includes smolt traps on the Little WW & Hofer Diversions, adult traps at Hofer Dam Burlingame Dam, one 3,000 gallon liberation truck and two 400 gallon tanker trailers.
3/ Based on similar trap & haul program O & M in Umatilla Basin.
4/ Projects already in NPPC Columbia Basin Fish & Wildlife Program
5/ Average annual O & M costs for 15-20 yrs (annual costs would be lower initally and higher later on when all projects are in place).
6/ Numerous state, federal, tribal, private, & conservation type entities to be involved.
7/ No cost indicated now; future costs may include water conservation projects or instream water right purchases.
8/ Based on one-year reconnaissaince study and two-year site feasibility study @ $200,00 per year.
9/ Assumes construction of two storage projects @ $100,000,000 per project.
10/ Based on $3.50/lb to produce CHS and $2.50 for Sts (includes rearing, trucking, and administrative costs).
11/ CHS would come from existing hatcheries operated by USFWS, WDF, or ODFW.
12/ Would expand total WW subbasin production to 400,000 StS (300,000 released in WA & 100,000 in OR) & 600,000 CHS (300,000 released in both OR & WA).
13/ Based on facility construction cost of $50.00 per lb. of fish produced (100,000 Sts @6/lb = 16,700 lbs; 600,000 CHS @ 10/16 - 60,000 lbs)
14/ Based on similar artificial production monitoring & evaluation program in Umatilla Basin.

Table 20. Walla Walla Subbasin fisheries enhancement strategies, descriptions, and cost summaries.

STRATEGY	ACTION ITEM	DESCRIPTION	COST CAPITAL	COST ANNUAL
1	I.A.	Adult and juvenile passage improvements	1,475,000	304,000
	I.B.	Instream and riparian habitat enhancement	3,910,000	65,300
	II.A.	Enhance flows in mainstem Walla Walla R.	0	0
	III.A.	Continue existing hatchery production for STS	0	125,000
	III.B.	Initiate CHS releases from existing hatcheries	0	35,000
		TOTAL	5,385,000	529,300
2	Above Items	See description above	5,385,000	529,300
	III.C.	Utilize new hatchery production for CHS & STS	3,835,000	620,000
	II.B.1.	Headwater storage feasibility study	600,000	0
		TOTAL	9,220,000	1,149,300
3	Above Items	See description above	9,220,000	1,149,300
	II.B.2.	Walla Walla & Touchet headwater storage	200,000,000	200,000
		TOTAL	209,820,000	1,349,300

OTHER SALMON RESOURCES

Fisheries biologists believe that fall chinook, coho and chum salmon also existed in the Walla Walla Subbasin. Swindell (1942) in Lane and Lane (1979), described fishing sites in the Walla Walla River used by Walla Walla tribal fishermen harvesting chum, coho, and steelhead. Umatilla Tribes planners recommend further investigation of the historical presence of these other salmon resources in the Walla Walla Subbasin and the feasibility for restoration.

PART V. SUMMARY AND IMPLEMENTATION

Objectives and Recommended Strategy

Spring Chinook

The objective is to achieve an annual adult return of 5,000 (3,000 hatchery and 2,000 naturally produced) spring chinook salmon to the Walla Walla Subbasin. The above return would provide an inbasin harvest of 2,500 adults for sport and tribal fisheries.

Planners recommend Strategy 2. Strategy 2 includes habitat and passage improvements, instream flow enhancement, and hatchery production of 600,000 smolts.

Summer Steelhead

The objective is to achieve an annual adult return of 11,000 (8,000 hatchery and 3,000 naturally produced) summer steelhead salmon to the Walla Walla Subbasin. The above return would provide an inbasin harvest of 7,680 adults for sport and tribal fisheries.

Planners recommend Strategy 2. Strategy 2 includes habitat and passage improvements, instream flow enhancement, and hatchery production of 400,000 smolts.

Coho, Chum and Fall Chinook

Planners call for further investigation of the historical presence and the feasibility of restoration to the Walla Walla Subbasin.

Implementation

In the summer of 1990, the Columbia Basin Fish and Wildlife Authority submitted to the Northwest Power Planning Council the Integrated System Plan for salmon and steelhead in the Columbia Basin, which includes all 31 subbasin plans. The system plan attempts to integrate this subbasin plan with the 30 others in the Columbia River Basin, prioritizing fish enhancement projects and critical uncertainties that need to be addressed.

From here, the Northwest Power Planning Council will begin its own public review process, which will eventually lead to amending its Columbia River Basin Fish and Wildlife Program. The actual implementation schedule of specific projects or measures proposed in the system plan will materialize as the council's adoption process unfolds.

LITERATURE CITED
AND OTHER REFERENCES

Bureau of Reclamation (BOR). 1976. Walla Walla project, Touchet division, Oregon and Washington. Definite Plan Report. Pacific Northwest Region, Boise, Idaho.

Bureau of Reclamation. 1971. Walla Walla project, Milton-Freewater division, Oregon and Washington. Pacific Northwest Region, Boise, Idaho.

Confederated Tribes of the Umatilla Indian Reservation (CTUIR). 1987. Walla Walla River subbasin modeling data needs for Columbia River system planning. Unpublished report. Pendleton, Oregon.

Confederated Tribes of the Umatilla Indian Reservation. 1990. Walla Walla basin master plan, Final draft - phase I, March 21, 1990. Pendleton, Oregon.

Lane R.B. and B. Lane. 1979. Traditional fisheries of the Walla Walla, Cayuse and Umatilla. Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon.

McIntyre, J.D. 1985. A model for estimating deficits in the size of spawning stocks of spring chinook salmon in tributaries of the upper Columbia River. U.S. Fish & Wildl. Serv., unpubl. manuscript, Seattle, Washington.

Northwest Power Planning Council (NPPC). 1986. Application for amendment, Columbia River basin fish and wildlife program; Walla Walla River basin flow augmentation. Submitted by Wash. Dept. of Game and Oregon Dept. Fish & Wildl.

Northwest Power Planning Council. 1987a. Columbia River basin fish and wildlife program. Portland, Oregon.

Northwest Power Planning Council. 1987b. Columbia Basin planning data standardization report. Developed by the System Planning Group and the Monitoring and Evaluation Group. September 1987. Portland, Oregon.

Northwest Power Planning Council. 1988. Anadromous species presence/absence files for the Walla Walla Basin. Portland, Oregon.

Oregon Department of Fish and Wildlife (ODFW). 1987. United States vs. Oregon subbasin production reports. Portland, Oregon.

Oregon Department of Fish and Wildlife, and Confederated Tribes of the Umatilla Indian Reservation. 1989. Umatilla hatchery master plan for the Northwest Power Planning Council. Portland, Oregon.

Oregon Department Fish and Wildlife, Washington Department of Fisheries, Washington Department of Game, and Idaho Department of Fish and Game. 1985. Stock assessment of Columbia River anadromous salmonids, Volumes I and II. 1984 Final Report to Bonneville Power Administration, Portland, Oregon.

Oregon Water Resources Department (OWRD). 1988a. Draft Umatilla River basin report (March 1988 draft). Salem, Oregon.

Oregon Water Resources Department. 1988b. Umatilla River basin report (August 1988 final). Salem, Oregon.

Swindell E.G. 1942. Report on source, nature and extent of the fishing, hunting and miscellaneous rights of certain Indian tribes in Washington and Oregon together with affidavits showing location of a number of usual and accustomed fishing grounds and stations. Office of Indian Affairs, Division of Forestry and Grazing, Los Angeles, California.

USDA Forest Service (USDA/FS). 1987. Proposed land and resource management plan (draft). Umatilla National Forest. Pendleton, Oregon.

U.S. Fish and Wildlife Service (USFWS). 1982. Lower Snake River enhancement study. Unpubl. Rep. Ecological Services Office, Boise, Idaho.

Van Cleave, R. and R. Ting. 1960. The condition of salmon stocks in the John Day, Umatilla, Walla Walla, Grande Ronde, and Imnaha rivers as reported by various fisheries agencies. Publisher unknown.

Washington Department of Ecology (WDOE). 1977. Water resources management program, Walla Walla River Basin. Olympia, Washington.

Washington Department of Game (WDG). 1985. Assessment of steelhead trout stocks in Washington's portion of the Columbia River Basin. Olympia, Washington.

Washington Department of Wildlife (WDW). 1987. Lyons Ferry evaluation study part II: 1985-86 annual report. Fisheries Management Division. Dayton, Washington.

Washington Department of Wildlife. 1986. Lyons Ferry evaluation study, part II, assessment of production from Lyons Ferry/Tucannon Hatchery Complex; and estimates of return of marked fish to compensation plan streams in Washington. Report No. FRI/LSR-85-25, Fisheries Management Division, Dayton, Washington.

APPENDIX A
NORTHWEST POWER PLANNING COUNCIL
SYSTEM POLICIES

In Section 204 of the 1987 Columbia River Basin Fish and Wildlife Program, the Northwest Power Planning Council describes seven policies to guide the systemwide effort in doubling the salmon and steelhead runs. Pursuant to the council's plan, the basin's fisheries agencies and Indian tribes have used these policies, and others of their own, to guide the system planning process. The seven policies are paraphrased below.

1) The area above Bonneville Dam is accorded priority.

Efforts to increase salmon and steelhead runs above Bonneville Dam will take precedence over those in subbasins below Bonneville Dam. In the past, most of the mitigation for fish losses has taken the form of hatcheries in the lower Columbia Basin. According to the council's fish and wildlife program, however, the vast majority of salmon and steelhead losses have occurred in the upper Columbia and Snake river areas. System planners turned their attention first to the 22 major subbasins above Bonneville Dam, and then to the nine below.

2) Genetic risks must be assessed.

Because of the importance of maintaining genetic diversity among the various salmon and steelhead populations in the Columbia River Basin, each project or strategy designed to increase fish numbers must be evaluated for its risks to genetic diversity. Over millions of years, each fish run has evolved a set of characteristics that makes it the best suited run for that particular stream, the key to surviving and reproducing year after year. System planners were to exercise caution in their selection of production strategies so that the genetic integrity of existing fish populations is not jeopardized.

3) Mainstem survival must be improved expeditiously.

Ensuring safe passage through the reservoirs and past the dams on the Columbia and Snake River mainstems is crucial to the success of many efforts that will increase fish numbers, particularly the upriver runs. Juvenile fish mortality in the reservoirs and at the dams is a major cause of salmon and steelhead losses. According to estimates, an average of 15 percent to 30 percent of downstream migrants perish at each dam, while 5 percent to 10 percent of the adult fish traveling upstream perish. Projects to rebuild runs in the tributaries have and will represent major expenditures by the region's ratepayers -- expenditures and long-term projects that should be protected in the mainstem.

4) Increased production will result from a mix of methods.

To rebuild the basin's salmon and steelhead runs, fisheries managers are to use a mixture of wild, natural and hatchery production. Because many questions still exist as to whether wild and natural stocks can coexist with significant numbers of hatchery fish, no one method of production will be solely responsible for increasing fish numbers. System planners were to take extra precaution when considering outplanting hatchery fish into natural areas that still produce wild fish. The council is relying on the fish and wildlife agencies and tribes to balance artificial production with wild and natural production.

5) Harvest management must support rebuilding.

Like improved mainstem passage, effective harvest management is critical to the success of rebuilding efforts. A variety of fisheries management entities from Alaska to California manage harvest of the Columbia Basin's salmon and steelhead runs. The council is calling on those entities to regulate harvest, especially in mixed-stock fisheries, in ways that support the basin's efforts to double its runs.

6) System integration will be necessary to assure consistency.

The Northwest Power Planning Council intends to evaluate efforts to protect and rebuild Columbia River Basin salmon and steelhead from a systemwide perspective. Doubling the runs will require improvements in mainstem passage, fish production and harvest management -- three extremely interdependent components. System planners from all parts of the basin are to coordinate their efforts so, for example, activities in the lower Columbia are consistent with and complement the activities 800 miles upstream in Idaho's Salmon River. The fisheries management organizations and their plans vary from subbasin to subbasin, but the council is calling upon the agencies and tribes to help resolve conflicts that arise.

7) Adaptive management should guide action and improve knowledge.

System planners were to design projects so that information can be collected to improve future management decisions. By designing projects that test quantitative hypotheses and lend themselves to monitoring and evaluation, managers can learn from their efforts. This learning by doing is called "adaptive management." Using such an approach, managers can move ahead with plans to rebuild the Columbia Basin's salmon and steelhead runs, despite many unanswered questions about how best to accomplish their goal. With time, the useful information revealed by these "experiments" can guide future projects.

APPENDIX B
SMART ANALYSIS

To help select the preferred strategies for each subbasin, planners used a decision-making tool known as Simple Multi-Attribute Rating Technique (SMART). SMART examined each proposed strategy according to the following five criteria. In all cases, SMART assumed that all of the Columbia River mainstem passage improvements would be implemented on schedule.

1) Extent the subbasin objectives were met

2) Change in maximum sustainable yield

3) Impact on genetics

4) Technological and biological feasibility

5) Public support

Once SMART assigned a rating for each criteria, it multiplied each rating by a specific weight applied to each criteria to get the "utility" value (see following tables). Because the criteria were given equal weights, utility values were proportional to ratings. The confidence in assigning the ratings was taken into consideration by adjusting the weighted values, (multiplying the utility value by the confidence level) to get the "discount utility." SMART then totaled the utility values and discount utility values for all five criteria, obtaining a "total value" and a "discount value" for each strategy.

System planners used these utility and discount values to determine which strategy for a particular fish stock rated highest across all five criteria. If more than one of the proposed strategies shared the same or similar discount value, system planners considered other factors, such as cost, in the selection process. Some special cases arose where the planners' preferred strategy did not correspond with the SMART results. In those cases, the planners provide the rationale for their selection.

SUBBASIN: WALLA WALLA

STOCK: SPRING CHINOOK

STRATEGY: 1

CRITERIA	RATING	CONFIDENCE	WEIGHT	UTILITY	DISCOUNT UTILITY
1 EXT OBJ	8	0.6	20	160	96
2 CHG MSY	8	0.6	20	160	96
3 GEN IMP	10	0.9	20	200	180
4 TECH FEAS	7	0.6	20	140	84
5 PUB SUPT	7	0.6	20	140	84
TOTAL VALUE				800	
DISCOUNT VALUE					540
CONFIDENCE VALUE					0.675

SUBBASIN: WALLA WALLA

STOCK: SPRING CHINOOK

STRATEGY: 2

CRITERIA	RATING	CONFIDENCE	WEIGHT	UTILITY	DISCOUNT UTILITY
1 EXT OBJ	9	0.6	20	180	108
2 CHG MSY	9	0.6	20	180	108
3 GEN IMP	10	0.9	20	200	180
4 TECH FEAS	7	0.6	20	140	84
5 PUB SUPT	7	0.6	20	140	84
TOTAL VALUE				840	
DISCOUNT VALUE					564
CONFIDENCE VALUE					0.67142857

SUBBASIN: WALLA WALLA

STOCK: SPRING CHINOOK

STRATEGY: 3

CRITERIA	RATING	CONFIDENCE	WEIGHT	UTILITY	DISCOUNT UTILITY
1 EXT OBJ	9	0.6	20	180	108
2 CHG MSY	9	0.6	20	180	108
3 GEN IMP	10	0.9	20	200	180
4 TECH FEAS	5	0.6	20	100	60
5 PUB SUPT	7	0.6	20	140	84

TOTAL VALUE 800

DISCOUNT VALUE 540

CONFIDENCE VALUE 0.675

SUBBASIN: WALLA WALLA

STOCK: SUMMER STEELHEAD

STRATEGY: 1

CRITERIA	RATING	CONFIDENCE	WEIGHT	UTILITY	DISCOUNT UTILITY
1 EXT OBJ	7	0.9	20	140	126
2 CHG MSY	5	0.9	20	100	90
3 GEN IMP	5	0.3	20	100	30
4 TECH FEAS	7	0.6	20	140	84
5 PUB SUPT	7	0.6	20	140	84

TOTAL VALUE 620

DISCOUNT VALUE 414

CONFIDENCE VALUE 0.66774193

SUBBASIN: WALLA WALLA

STOCK: SUMMER STEELHEAD

STRATEGY: 2

CRITERIA	RATING	CONFIDENCE	WEIGHT	UTILITY	DISCOUNT UTILITY
1 EXT OBJ	7	0.9	20	140	126
2 CHG MSY	6	0.9	20	120	108
3 GEN IMP	6	0.3	20	120	36
4 TECH FEAS	7	0.6	20	140	84
5 PUB SUPT	7	0.6	20	140	84

TOTAL VALUE 660

DISCOUNT VALUE 438

CONFIDENCE VALUE 0.66363636

SUBBASIN: WALLA WALLA

STOCK: SUMMER STEELHEAD

STRATEGY: 3

CRITERIA	RATING	CONFIDENCE	WEIGHT	UTILITY	DISCOUNT UTILITY
1 EXT OBJ	8	0.6	20	160	96
2 CHG MSY	7	0.6	20	140	84
3 GEN IMP	6	0.3	20	120	36
4 TECH FEAS	5	0.6	20	100	60
5 PUB SUPT	7	0.6	20	140	84

TOTAL VALUE 660

DISCOUNT VALUE 360

CONFIDENCE VALUE 0.54545454

APPENDIX C
SUMMARY OF COST ESTIMATES

The cost estimates provided in the following summary tables represent new or additional costs necessary to implement the alternative strategies. Although many strategies involve projects already planned or being implemented under the Columbia River Basin Fish and Wildlife Program or other programs, such as the Lower Snake River Compensation Plan, the associated costs and hatchery production do not appear in the following tables.

In many cases, the following costs are no more than approximations based on familiarity with general costs of similar projects constructed elsewhere. Although the costs are very general, they can be used to evaluate relative, rather than absolute, costs of alternative strategies within a subbasin.

Particular actions are frequently included in strategies for more than one species or race of anadromous fish. In these cases, the same costs appear in several tables, but would only be incurred once, to the benefit of some, if not all, of the species and races of salmon and steelhead in the subbasin.

Subbasin planners used standardized costs for actions "universal" to the Columbia River system, such as costs for installing instream structures, improving riparian areas, and screening water diversions (see the Preliminary System Analysis Report, March 1989). For other actions, including the removal of instream barriers, subbasin planners developed their own cost estimates in consultation with resident experts.

Planners also standardized costs for all new hatchery production basinwide. To account for the variability in fish stocking sizes, estimates were based upon the cost per pound of fish produced. For consistency, estimated capital costs of constructing a new, modern fish hatchery were based on $23 per pound of fish produced. Estimated operation and maintenance costs per year were based on $2.50 per pound of fish produced.

All actions have a life expectancy, a period of time in which benefits are realized. Because of the variation in life expectancy among actions, total costs were standardized to a 50-year period. Some actions had life expectancies of 50 years or greater and thus costs were added as shown. Other actions (such as instream habitat enhancements) are expected to be long term, but may only have life expectancies of 25 years. Thus the action would have to be repeated (and its cost doubled) to meet the 50-year standard. Still other actions (such as a study or a short-term supplementation program) may have life expectancies of 10 years after which no further action would be taken. In this case, operation and maintenance costs were amortized over 50 years to develop the total O&M per year estimate. Capital costs, being up-front, one-time expenditures, were added directly.

Subbasin planners have estimated all direct costs of alternative strategies except for the purchase of water rights. No cost estimates have been or will be made for actions that involve purchasing water. Indirect costs, such as changes in water flows or changes in hydroelectric system operations, are not addressed.

ESTIMATED COSTS FOR ALTERNATIVE STRATEGIES

Subbasin: Walla Walla River
Stock: Spring Chinook

Action	Cost Categories*	Proposed Strategies 1	2**	3
Habitat Enhancement	Capital:			
	O&M/yr:			
	Life:			
Passage	Capital:	1,475,000	1,475,000	1,475,000
	O&M/yr:	304,000	304,000	304,000
	Life:	50	50	50
WW/Touchet Headwater Storage	Capital:			200,000,000
	O&M/yr:			200,000
	Life:			50
Misc. Projects	Capital:		0	0
	O&M/yr:		400,000	400,000
	Life:		10	10
Hatchery Production	Capital:	0	0	0
	O&M/yr:	35,000[a]	35,000[a]	35,000[a]
	Life:	5	5	5
TOTAL COSTS	Capital:	1,475,000	1,475,000	201,475,000
	O&M/yr:	307,500	387,500	587,500
	Years:	50	50	50
Water Acquisition		Y	Y	Y
Fish to Stock	Number/yr:	100,000	100,000	100,000
	Size:	S, 10/lb.	S, 10/lb.	S, 10/lb.
	Years:	5	5	5

* Life expectancy of the project is defined in years. Water acquisition is defined as either Y = yes, the strategy includes water acquisition; N = no, water acquisition is not part of the strategy. The size of fish to stock is defined as E = eggs; F = fry; J = juvenile, fingerling, parr, subsmolt; S = smolt; A = adult.

** Recommended strategy.

[a] Estimated hatchery costs come directly from the Umatilla Hatchery Master Plan, January 1989 (based on $3.50/lb. of fish to produce spring chinook).

ESTIMATED COSTS FOR ALTERNATIVE STRATEGIES

Subbasin: Walla Walla River
Stock: Summer Steelhead

Action	Cost Categories*	Proposed Strategies 1	2**	3
Habitat Enhancement	Capital:			
	O&M/yr:			
	Life:			
Passage	Capital:	1,475,000	1,475,000	1,475,000
	O&M/yr:	304,000	304,000	304,000
	Life:	50	50	50
WW/Touchet Headwater Storage	Capital:			200,000,000
	O&M/yr:			200,000
	Life:			50
Misc. Projects	Capital:		0	0
	O&M/yr:		400,000	400,000
	Life:		10	10
Hatchery Production	Capital:			
	O&M/yr:			
	Life:			
TOTAL COSTS	Capital:	1,475,000	1,475,000	201,475,000
	O&M/yr:	304,000	384,000	584,000
	Years:	50	50	50
Water Acquisition		Y	Y	Y
Fish to Stock	Number/yr:			
	Size:			
	Years:			

* Life expectancy of the project is defined in years. Water acquisition is defined as either Y = yes, the strategy includes water acquisition; N = no, water acquisition is not part of the strategy. The size of fish to stock is defined as E = eggs; F = fry; J = juvenile, fingerling, parr, subsmolt; S = smolt; A = adult.

** Recommended strategy.

APPENDIX D
SUMMARY OF THE TREATY OF 1855
AND RELATED FEDERAL AND TRIBAL LAWS

Treaty of June 9, 1855, 12 Stat. 945

The Treaty of 1855 between the United States and the Walla Walla, Cayuse, and Umatilla Tribes (hereinafter "Confederated Tribes") is the basis for tribal involvement in the fisheries management activities in this subbasin plan. The treaty is a legal document that was negotiated by the parties. Through the treaty, the Confederated Tribes gave up ownership of a vast territory of land extending from the lower Yakima River and along the mid-Columbia River to beyond the Blue Mountains into the Grande Ronde River drainage, south to the Powder River, west into the John Day River, and north into the Willow Creek drainage. Included within this territory are parts of the Snake, Imnaha, Tucannon, Burnt, and Malheur River drainages. In return, the Confederated Tribes reserved the following things.

- The Umatilla Indian Reservation as a permanent homeland.
- The right to maintain their own form of government and the right to make and enforce laws within their territorial jurisdiction.
- The exclusive right of taking fish in the streams running through and bordering the reservation as well as the right to fish at all other usual and accustomed stations in common with citizens of the United States.

The Treaty of 1855 does not expressly mention the reservation of water rights by the Confederated Tribes. However, in a case decided by the U.S. Supreme Court in 1908 (Winters vs. United States, 207 U.S. 564) involving the right of a tribe in Montana to use water for agricultural purposes from a stream running through the reservation, it was decided that the tribe's right to use the water was impliedly reserved in the 1888 agreement between the United States and the tribes, which established the Montana reservation. Further, the implicit reserved right to water was for a sufficient amount of water to fulfill the purposes of the reservation and the priority date for the water was the date the reservation was created.

Federal Case Law Interpreting Treaty Fishing Rights

1) United States vs. Brookfield Fisheries, Inc., 24 F. Supp. 712 (D. Ore. 1938).

This case was brought by the United States on behalf of several tribes, including the Confederated Tribes of the Umatilla Indian Reservation and interprets the treaty language "the right to fish at all other usual and accustomed stations:" to mean:

- Tribal members are extended the right to fish at places where they had always fished and gave to tribal members an easement of ingress to and egress from such usual and accustomed stations.

- That a fishery in a gross was attached to all real property in and around the usual and accustomed stations, and was reserved like an easement by the United States in the grants of such land to non-Indians as if written in the grant of land itself.

2) Confederated Tribes of the Umatilla Indian Reservation vs. H.B. Maison, 186 F.Supp. 519 (D. Oreg. 1960).

This case decided whether and under what conditions state fishing regulations may be imposed upon off-reservation treaty fishing activity by tribal members. The court ruled that while the state does have authority to impose regulations on off-reservation treaty fishing activity, the state must show that such regulatory restrictions are necessary for conservation of the fish. The court held further that where alternative methods of achieving state conservation objectives are available, such methods should be implemented first before the state tries to curtail the treaty fishing rights of tribal members.

3) H.G. Maison vs. Confederated Tribes of the Umatilla Indian Reservation, 314 F.2d 169 (9th Cir. 1963).

This case involved the appeal of the foregoing case. On appeal, the court ruled that restriction of treaty fishing by tribal members is justifiable only if necessary conservation cannot be accomplished by restriction of fishing of others. The court based its ruling on an earlier opinion by the United States Supreme Court in Tulee vs. Washington, 315 U.S. 681, 62 S.Ct. 862 L.Ed. 1115 (1942), in which it was determined that for a state regulation to be "necessary", it must be indispensable to the effectiveness of a state conservation program.

4) <u>Sohappy vs. Smith (United States v. Oregon),</u> 302 F.Supp. 899 (D.Ore. 1969).

The United States and several tribes, including the Confederated Tribes of the Umatilla Indian Reservation, are parties to this case involving a challenge to state regulation of off-reservation treaty fishing activity along the Columbia River. The court ruled that:

- Indian treaties entered into by the United States are part of the supreme law of the land that the states and their officials are bound to observe.

- There are limitations on a state's power to regulate the exercise of treaty fishing activities. The regulation must be necessary for conservation of the fish and the state restrictions on treaty fishing must not discriminate against Indians.

- The state regulation must not subordinate treaty fishing right to some other state objective or policy and state regulation of treaty fishing rights may be allowed only when necessary to prevent the exercise of that right in a manner that will imperil continued existence of the fish resource.

- The state cannot so manage the fishery that little or no harvestable portion of the run remains to reach the upper portions of the stream where the historic Indian fishing places are mostly located.

- In the case of state regulations affecting Indian treaty fishing rights, the protection of the treaty right to take fish at the usual and accustomed places must be an objective of the state's regulatory policy coequal with the conservation of fish runs for other users.

- Agreements with tribes of deference to tribal preference of regulation on specific aspects pertaining to the exercise of treaty fishing rights are means that the state may adopt in the exercise of its jurisdiction over such fishing rights. The court stressed that the state and the tribes should be encouraged to pursue such a cooperative approach.

5) Sohappy vs. Smith (United States v. Oregon and Washington), 529 F.2d 570 (9th Cir. 1976).

This case is the appeal of some issues in the ongoing and continuation of the foregoing case. On appeal, the court ruled that:

- The states are not permitted to regulate off-reservation treaty fishing activity unless the states establish that the particular regulation is reasonable and necessary to conserve the fish resources, and does not discriminate against Indians.

- Treaty fisherman are entitled to take a fair share of the fish run and a 50/50 allocation is not an unreasonable allocation.

6) Confederated Tribes of the Umatilla Indian Reservation vs. Alexander, 440 F.Supp. 553 (D.Ore. 1977).

In this case the Confederated Tribes objected to the construction of a dam in a tributary of the Grande Ronde River that would flood and destroy usual and accustomed fishing stations. The court held that the flooding and destruction of usual and accustomed fishing stations would be a nullification of treaty rights and Congress had to act expressly and specifically to so nullify treaty fishing rights. The court refused to agree that nullification of treaty fishing rights could be inferred from general legislation authorizing the construction of the dam.

7) Confederated Tribes of the Umatilla Indian Reservation vs. Calloway, Civ. No. 72-211 slip op. (d.Ore. August 17, 1973).

This case involved the threat to fishing sites posed by the Corps of Engineers' manipulation of water in the pools behind The Dalles and John Day dams to achieve greater generation of power (commonly referred to as a "peaking" proposal). The Corps proposal would impact the use of treaty fishing sites. The court held that the Corps could not implement its proposal until it had adequately protected the Indian fishing sites.

8) Settler vs. Lameer, 507 F.2d 231 (9th Cir. 1973).

This case involved a challenge to laws promulgated by the Yakima Indian Nation regulating off-reservation fishing activity by tribal members. The Yakima Treaty was negotiated at the same time as the Treaty for the Walla Walla, Cayuse and Umatilla, and Settler involved an interpretation of a treaty provision common to both treaties. Settler stands for the proposition that the treaty reserved to the tribe the right to regulate and enforce tribal laws at off-reservation usual and accustomed fishing grounds against tribal members. This right includes the ability to arrest tribal members off-reservation from tribal fishing violations and does not infringe upon state sovereignty.

Tribal Laws

1) Wildlife Code of the Confederated Tribes of the Umatilla Indian Reservation (applicable to all CTUIR subbasins).

The tribal wildlife code delegates to the Fish and Wildlife Committee the authority to set seasons and establish other management restrictions, issue permits and engage in programs or actions that will protect, promote, or enhance the wildlife resources the Confederated Tribes have an interest pursuant to the Treaty of 1855.

2) Land Development Code of the Confederated Tribes of the Umatilla Indian Reservation (applicable to only the Umatilla Indian Reservation).

This is a land use and zoning code that is designed to 1) promote orderly land development on the reservation; and 2) conserve and enhance vegetation, soils, air, water, and fish and wildlife resources. Pursuant to the code, the board has approved an official Master Land Use Map of the Umatilla Indian Reservation establishing the various land use zones for the reservation, such as exclusive farm use, small farm, agri-business, rural residential, industrial, commercial, big game winter grazing, and flood hazard.

3) Interim Water Code and Stream Zone Alteration Regulations of the Confederated Tribes of the Umatilla Indian Reservation (applicable to only the Umatilla Indian Reservation).

The purpose of the interim water code is to provide an orderly system for the use of water resources on the reservation; to insure that all residents of the reservation have adequate water for domestic purposes; and to protect the water resources of the reservation from overappropriation, pollution, and contamination.

The Stream Zone Alteration Regulations establish policies and procedures and prescribe regulations that will protect and conserve the quality and quantity of the natural and cultural resources in the stream zones of the reservation. The intent of the regulations is to 1) promote activities in the stream zones that will improve water quality and quantity; 2) prevent the degradation of wildlife and fish habitat; 3) prevent the destabilization of soils and streambanks; and 4) prevent the contamination or pollution of ground and surface waters.

Summary

The Treaty of 1855 entitles the tribe and its members to engage in fishing activities both on and off the reservation throughout all or parts of the mainstem Columbia River, the Umatilla, Grande Ronde, Walla Walla, Tucannon, Yakima, Imnaha, Powder, Burnt, Malheur, Willow Creek, and John Day drainages.

The Treaty of 1855 authorizes the tribe to adopt and enforce laws that regulate treaty fishing activity of tribal members; to participate in the management of the fishery resources; and to implement management practices to protect the fishery resources.

The Treaty of 1855 allows the tribe to engage in fishing activities free from state regulation except to the extent that the state can show that state regulation is necessary and reasonable for conservation of the resource.

The Treaty of 1855 impliedly reserves to the tribe the right to a sufficient quantity of water of adequate quality to fulfill the purposes for which the reservation was created -- agriculture, fisheries, wildlife, and permanent homeland.

The Treaty of 1855 provides the basis for tribal co-management of treaty fishery resources off-reservation in the affected drainages.