Table 14.—Estimated mean flows at UMUO for wet, average, and dry years for the No Action, Partial Adjustment, and Full Adjustment Alternatives

Month	UMUO, Umatilla River downstream of Feed Diversion (RM28), average daily flows (cfs)								
	Wet years			Average years			Dry years		
	NA	Partial	Full	NA	Partial	Full	NA	Partial	Full
January	1,226.3	1,226.3	1,226.3	681.5	681.5	681.5	568.8	568.8	568.8
February	2,363.1	2,363.1	2,363.1	721.5	721.5	721.5	292.9	292.9	293.0
March	1,547.6	1,547.6	1,547.6	1,250.7	1,250.7	1,250.7	841.9	841.9	841.9
April	1,412.8	1,412.8	1,412.8	1,486.3	1,486.3	1,486.3	790.8	790.8	790.8
May	1,138.9	1,138.9	1,138.9	759.5	759.5	759.5	700.2	700.2	700.2
June	334.3	325.5	311.3	465.3	456.6	442.3	362.4	360.6	361.5
July	196.2	199.5	211.2	236.0	242.4	258.8	200.8	203.4	214.4
August	172.8	184.1	200.2	189.6	198.2	213.8	169.0	175.3	180.0
September	153.0	151.2	145.4	175.0	170.4	157.5	158.8	153.7	140.8
October	241.8	237.3	229.0	221.7	219.5	213.9	195.1	192.9	188.8
November	476.8	476.8	476.8	248.3	248.3	248.3	307.4	307.4	307.4
December	851.6	851.6	851.6	358.0	358.0	358.0	659.4	659.4	659.4
Annual difference (acre-feet)		**0**	**0**		**0**	**0**		**0**	**0**

Table 15.—Mean volume differences at UMUO for wet, average, and dry years for the Partial Adjustment and Full Adjustment Alternatives when compared to the No Action Alternative

Month	UMUO, Umatilla River downstream of Feed Diversion (RM28), volume differences (acre-feet)								
	Wet years			Average years			Dry years		
		Partial	Full		Partial	Full		Partial	Full
January		0	0		0	0		0	0
February		0	0		0	0		0	0
March		0	0		0	0		0	0
April		0	0		0	0		0	0
May		0	0		0	0		0	0
June		-521	-1,364		-521	-1,366		-109	-54
July		205	921		205	1,401		156	833
August		696	1,686		696	1,488		388	675
September		-104	-453		-104	-1,042		-300	-1,070
October		-276	-790		-276	-481		-135	-384
November		0	0		0	0		0	0
December		0	0		0	0		0	0
Annual difference (acre-feet)		**0**	**0**		**0**	**0**		**0**	**0**

UMDO (Umatilla River downstream of Dillon Diversion)

Flows at UMDO and any point along the Umatilla River upstream of UMDO and downstream of the Westland Diversion are the same under any alternative. Westland diverts any storage water that it releases for irrigation. Therefore, any changes in McKay storage releases are not realized downstream of the Westland Diversion and upstream of the Dillon Diversion. Live flow diversions at Westland are the same for any alternative. Estimated flows at UMDO are shown in table 16 for all three alternatives and for wet, average, and dry years.

Table 16.—Estimated mean flows at UMDO for wet, average, and dry years for the No Action, Partial Adjustment, and Full Adjustment Alternatives

	UMDO, Umatilla River downstream of Dillon Diversion (RM24), average daily flows (cfs)								
	Wet years			Average years			Dry years		
Month	NA	Partial	Full	NA	Partial	Full	NA	Partial	Full
January	1,184.1	1,184.1	1,184.1	596.1	596.1	596.1	597.9	597.9	597.9
February	2,326.4	2,326.4	2,326.4	651.3	651.3	651.3	289.4	289.4	289.4
March	1,757.9	1,757.9	1,757.9	1,282.3	1,282.3	1,282.3	879.7	879.7	879.7
April	1,496.4	1,496.4	1,496.4	1,354.9	1,354.9	1,354.9	760.8	760.8	760.8
May	772.6	772.6	772.6	515.7	515.7	515.7	512.4	512.4	512.4
June	138.7	138.7	138.7	227.5	227.5	227.5	157.4	157.4	157.4
July	5.8	5.8	5.8	55.9	55.9	55.9	22.2	22.2	22.2
August	4.1	4.1	4.1	26.7	26.7	26.7	7.2	7.2	7.2
September	36.7	36.7	36.7	76.1	76.1	76.1	43.1	43.1	43.1
October	182.5	182.5	182.5	194.0	194.0	194.0	156.4	156.4	156.4
November	408.0	408.0	408.0	250.3	250.3	250.3	298.4	298.4	298.4
December	694.9	694.9	694.9	323.4	323.4	323.4	667.4	667.4	667.4
Annual difference (acre-feet)		**0**	**0**		**0**	**0**		**0**	**0**

UMAO (Umatilla River at Umatilla)

Flows at UMAO would be affected by return flows from Westland, which will vary, depending on the alternative. Return flow impacts are realized at UMAO only if West Extension and/or Maxwell do not divert any additional return flows that may be available under the No Action Alternative. Presently, West Extension is diverting the majority of return flows to the Umatilla River from about July 10 to August 15. The Umatilla River immediately upstream of the West Extension Diversion would be a better location to examine impacts from return flows. However, there is no gauge at this location, so UMAO was chosen with the before mentioned assumption about West Extension's diversion during the summer. The majority of return flows return to the Umatilla River downstream of UMDO;

therefore, any impacts to the river, due to changes in return flows, would potentially affect only the reach from UMDO to the mouth of the Umatilla River. Estimated flows at UMAO are shown in table 17 for all three alternatives and for wet, average, and dry years. Table 18 shows mean volume differences between the alternatives.

Table 17.—Estimated mean flows at UMAO for wet, average, and dry years for the No Action, Partial Adjustment, and Full Adjustment Alternatives

	UMAO, Umatilla River at Umatilla (RM2.2), average daily flows (cfs)								
	Wet years			Average years			Dry years		
Month	NA	Partial	Full	NA	Partial	Full	NA	Partial	Full
January	1,368.5	1,368.6	1,367.9	667.1	667.2	666.7	530.9	531.1	530.5
February	2,695.2	2,695.3	2,694.8	688.4	688.6	688.2	341.6	341.8	341.3
March	1,942.1	1,942.2	1,941.5	1,285.5	1,285.7	1,285.1	917.4	917.5	916.8
April	1,496.7	1,497.0	1,496.2	1,288.9	1,289.0	1,288.4	702.9	703.1	702.4
May	1,224.6	1,224.6	1,224.0	451.1	451.3	450.8	605.8	605.9	605.3
June	201.1	201.2	200.5	240.2	240.4	239.8	219.0	219.3	218.7
July	15.5	14.5	12.3	65.7	64.7	62.5	28.6	27.9	25.8
August	40.6	39.8	37.4	54.6	53.9	51.6	33.0	32.2	29.8
September	123.0	122.3	120.6	136.1	135.3	133.8	107.4	106.5	105.2
October	275.9	275.1	274.3	243.7	243.0	241.9	233.0	232.1	231.2
November	496.2	495.7	494.8	297.6	297.3	296.4	366.0	365.6	364.8
December	870.4	870.4	869.7	365.2	365.3	364.6	678.8	678.8	678.2
Annual Difference (acre-feet)		**-189**	**-948**		**-146**	**-863**		**-161**	**-874**

Table 18.—Mean volume differences at UMAO for wet, average, and dry years for the Partial Adjustment and Full Adjustment Alternatives when compared to the No Action Alternative

	UMAO, Umatilla River at Umatilla (RM2.2), volume differences (acre-feet)								
	Wet years			Average years			Dry years		
Month		Partial	Full		Partial	Full		Partial	Full
January		6	-34		9	-20		10	-26
February		9	-23		11	-13		11	-18
March		4	-34		9	-25		7	-32
April		17	-30		5	-27		10	-31
May		5	-32		11	-24		7	-30
June		10	-31		12	-27		16	-17
July		-62	-199		-60	-197		-47	-173
August		-49	-194		-42	-181		-48	-198
September		-45	-143		-44	-134		-53	-133
October		-54	-101		-41	-106		-57	-112
November		-29	-85		-19	-71		-19	-67
December		-1	-42		3	-38		2	-37
Annual difference (acre-feet)		-189	**-948**		-146	**-863**		**-161**	**-874**

MCKO (McKay Creek below McKay Reservoir)

Estimated flows at MCKO, which is downstream of McKay Reservoir, are shown in table 19 for all three alternatives and for wet, average, and dry years. Table 20 shows mean volume differences between the alternatives. The differences in flows at MCKO are due to differences in the magnitude and timing of McKay storage water releases for the three alternatives.

Table 19.—Estimated mean flows at MCKO for wet, average, and dry years for No Action, Partial Adjustment, and Full Adjustment Alternatives

	MCKO, McKay Creek below McKay Reservoir, average daily flows (cfs)								
	Wet years			Average years			Dry years		
Month	NA	Partial	Full	NA	Partial	Full	NA	Partial	Full
January	45.7	45.7	45.7	10.1	10.1	10.1	10.1	10.1	10.1
February	186.7	186.7	186.7	10.0	10.0	10.0	10.0	10.0	10.0
March	246.6	246.6	246.6	10.1	10.1	10.1	10.1	10.1	10.1
April	230.7	230.7	230.7	118.4	118.4	118.4	23.3	23.3	23.3
May	260.4	260.4	260.4	58.1	58.1	58.1	66.4	66.4	66.4
June	179.3	170.5	156.3	175.4	166.8	152.4	214.2	212.3	213.2
July	191.9	195.2	206.9	197.9	204.2	220.6	209.1	211.6	222.6
August	203.5	214.9	231.0	171.5	180.1	195.7	180.4	186.7	191.4
September	155.3	153.6	147.7	140.8	136.3	123.3	146.2	141.1	128.2
October	149.4	144.9	136.5	145.3	143.1	137.5	143.3	142.1	138.0
November	24.2	24.2	24.2	87.5	87.5	87.5	51.9	51.9	51.9
December	10.1	10.1	10.1	10.4	10.4	10.4	10.1	10.1	10.1
Annual Difference (acre-feet)		**0**	**0**		**0**	**0**		**0**	**0**

Table 20.—Mean volume differences at MCKO for wet, average, and dry years for the Partial Adjustment and Full Adjustment Alternatives when compared to the No Action Alternative

	MCKO, McKay Creek below McKay Reservoir, volume differences (acre-feet)								
	Wet years			Average years			Wet years		
Month		Partial	Full		Partial	Full		Partial	Full
January		0	0		0	0		0	0
February		0	0		0	0		0	0
March		0	0		0	0		0	0
April		0	0		0	0		0	0
May		0	0		0	0		0	0
June		-521	-1,364		-521	-1,366		-109	-54
July		205	921		205	1,401		156	833
August		696	1,686		696	1,488		388	675
September		-104	-453		-104	-1,042		-300	-1,070
October		-276	-790		-276	-481		-135	-384
November		0	0		0	0		0	0
December		0	0		0	0		0	0
Annual difference (acre-feet)		**0**	**0**		**0**	**0**		**0**	**0**

Summary

Adjustment of the existing federally recognized boundaries for Westland Irrigation District has been shown by this modeling effort to potentially reduce flows, during certain periods of the year, in the Umatilla River. These impacts are in several locations along the Umatilla River and in McKay Creek below McKay Reservoir:

Upstream of the Westland diversion: Impacts to the Umatilla River are due to differences in the timing and magnitude of storage water releases from McKay Reservoir. These differences reflect the different management scenarios of the modeled alternatives. The impacts are monthly variations that occur during the irrigation season. Diversions are higher in July and August and lower in June, September, and October for the boundary adjustment alternatives. It is important to note there is no difference in annual diversion volumes; the annual amount of water being diverted is equivalent for all of the modeled alternatives.

Downstream of Dillon diversion: Impacts to the Umatilla River are a result of differences in the timing and magnitude of return flows from Westland. The impacts, estimated by the model, to flows below the Dillon diversion are smaller than the errors in the actual streamflow measurements used as input for the model. Average annual modeled return flow impacts were 895 acre-feet for the Full Adjustment Alternative. However, full mitigation is provided for the impact to reduced return flows.

The model identified an effect on West Extension because West Extension's irrigation water is, in part, based on return flows from upstream irrigators. Based on the hydrologic modeling done for the EA, the preferred alternative would reduce flows at Threemile Falls Dam during the irrigation season. This would reduce the amount of water available for diversion at Threemile Falls Dam by West Extension in July, August and the first half of September by 450 acre-feet. It should be noted that the impacts estimated by the model are smaller than the errors in the actual streamflow measurements used as input of the model. Because Westland will address this concern by obligating 500 acre-feet of McKay water as part of the proposed action for use by West Extension, any potential impact to West Extension is alleviated. The 500 acre-feet accounts for conveyance losses from McKay to Threemile Falls Dam. Allocation and distribution of this water will comply with Oregon State Water laws.

Mitigation

If the proposed action results in a reduction in streamflow in the Umatilla River, a "replacement" volume of water would be provided from McKay Reservoir to offset the reduction in streamflows. The mitigation would be 895 acre-feet under the Full Adjustment Alternative. Mitigation would be included in both the Partial Adjustment and the Full Adjustment Alternatives. Westland would provide water from McKay Reservoir storage to fulfill the mitigation requirements. The water provided for mitigation would be released from McKay Reservoir at the request of the fishery managers (CTUIR and Oregon Department of Fish and Wildlife) and would be protected from diversion to the mouth of the Umatilla River. Other options for mitigation may be considered in the future if such methods can be shown to provide equivalent mitigation. Should alternative methods of mitigation be considered in the future, appropriate additional environmental compliance would be completed prior to implementation.

Water Quality

Affected Environment

This section describes the affected environment of the Umatilla River pertaining to water quality. The water quality affected environment for the Westland boundary change is limited to the reach on the Umatilla River from the Westland Canal diversion point near the town of Echo to the mouth of the river. Numerous processes upstream of the Westland Canal diversion point affect Umatilla River water quality, but these processes are not affected by any of the alternatives under consideration. Also, the water quality parameters of concern in the Umatilla River will be limited to those parameters identified in the State's total maximum daily loads (TMDLs) for the river and can be affected by irrigation. TMDLs have been developed for all parameters listed in previous 303(d) listings for the river. The way in which irrigation affects water quality of the Umatilla River is primarily due to the return flows.

The Environmental Protection Agency (EPA) approved TMDLs for the Umatilla River in May 2001. The TMDL parameters included temperature, bacteria, pH, algae, sedimentation, turbidity, and aquatic weeds. The primary water quality concerns for the reach of the Umatilla River from Echo to the mouth of the river include elevated temperature, turbidity, sedimentation, toxic levels of ammonia (in the lower part of the river in the Hermiston area), and bacteria concentrations (in the river near the town of Echo). Water quality concerns associated with ammonia and bacteria in the lower reach of the Umatilla River below Echo are affected primarily by wastewater treatment plant discharges. Irrigated agriculture does not contribute ammonia and generally contributes little bacteria to the river. Therefore, the most important water quality parameters associated with irrigated agriculture in the lower Umatilla River are in stream temperature, turbidity, and sedimentation issues.

Every year, the Oregon State Department of Environmental Quality determines a water quality index for each stream in the State to classify water quality into categories ranging from excellent to very poor. The Oregon Water Quality Index (OWQI) analyzes a defined set of water quality variables and produces a score describing general water quality. The variables included in the OWQI are temperature, dissolved oxygen (percent saturation and concentration), biochemical oxygen demand, pH, total solids, ammonia and nitrate nitrogen, total phosphorous, and fecal coliform. The most recent OWQI index values for the lower Umatilla River result in the river being classified in the poor to very poor category for the winter period and summer period, respectively. Also, the State has indicated that there currently is no major trend in water quality for this reach of the river.

The lands in the area below Echo are heavily irrigated and used intensively for agriculture. The area of the lower Umatilla basin has been designated as a groundwater management area, as excessive levels of nitrate nitrogen and other constituents are present in the water table. During the summer, when flow in the Umatilla is lowest, most of the flow in the river is either from irrigation returns or from groundwater discharge. Summarily, water quality in this area of the Umatilla is severely limited.

Butter Creek is the largest natural tributary to the Umatilla below the town of Echo, and it drains areas used for agriculture and nurseries. At the Westland Road bridge over the Umatilla River, nitrate nitrogen has the most major impact on the water quality conditions at this site, followed by high dissolved oxygen supersaturation, which is due to eutrophication and which indicates an abundant supply of nitrogen and phosphates in the water. These river conditions not only occur in the lower reach below Echo, but upstream as well. At Yoakum, about 10 miles upstream of Echo, poor water quality conditions have been documented. Eutrophication is active during the low-flow summer months, when water temperatures are high, as indicated by high levels of pH and dissolved oxygen supersaturation. High concentrations of biochemical oxygen demand during the summer indicate the presence of algae and other organic material. Eutrophication in this part of the river is fueled by high concentrations of total phosphates.

Moderately high levels of total solids, resulting mainly from erosion, are most likely related to surface water irrigation return flows in the lower reach of the river below Echo. However, levels of turbidity (suspended sediment) are generally in the same range in the mid-portions of the Umatilla River as well. The low flows, combined with high solar radiation during the summer months, are conducive to warming the river in this lower reach, thus increasing the instream water temperatures. The most intensive temperature data collection in the lower reach of the river occurred in the summer of 1998. The maximum 7-day instream temperatures were generally in the range of 71 to 78 °F. However, maximum 7-day instream temperatures exceeding 76 °F were also common in the middle and upper reaches of the river. Elevated instream temperatures in the river are not

limited to the present time period and are not due solely to the effects of man. Historically, there is evidence that high summertime instream temperatures also occurred before man's impacts became predominant. One of the early known accounting of stream temperatures is as follows:

> The Umatilla River was examined August 23 near its mouth, and on August 12 [in the year 1892] near Pendleton, Oregon. At Pendleton, it had an average width of 25 feet, depth of 14 inches, and a velocity of 1 foot. Temperature at 11:00 a.m. was 70 degrees F. The bottom was of coarse gravel covered with algae, and the water was clear.
>
> Bulletin of the U.S. Fish Commission, 1894

Environmental Consequences

The parameters of concern associated with irrigated agriculture in the lower Umatilla River are stream temperature, turbidity, and sedimentation. The water quality impacts in the river below Echo are closely related to the differences in the timing of storage releases out of McKay Reservoir and the subsequent irrigation of agricultural lands with this storage water, as well as the impacts on the timing of irrigation return flows. The impacts on water quality essentially follow and are the same as the effects on flows in the river that have been discussed previously in the Hydrology section.

For the Partial Adjustment and Full Adjustment Alternatives, there are no measurable impacts on water quality at any location along the Umatilla River. The modeling effort has shown that the alternatives could potentially reduce flows, during certain periods of the year, in the Umatilla River due to differences in the timing and magnitude of return flows from Westland.

Soils and Lands

Affected Environment

The lands in Westland are within Umatilla County, Oregon, and nearly all are located in township 3 North, Range 28 East, and Sections 17, 18, 19, 20, 21, 29, and 30, of 3 North and Range 29 East. Sections 1 and 2 are located in township 2 North and Range 28 East (see frontispiece location map).

An average size farm in the area is approximately 960 acres, and the major crops grown on these farms include alfalfa, asparagus, beans, corn, grass hay, melons, mint, onions, peas, potatoes, winter wheat, and pasture. Established alfalfa is double cropped after winter wheat in the crop rotation.

The lands are gently rolling with a general slope to the north-northeast of 1 to 5 percent. The soils are typically 15 feet of loessial fine sandy loam over a

5-foot-thick glacial lakebed deposit. The soils are well drained, free of salinity, and well adapted for growing most crops.

The Natural Resources Conservation Service (NRCS), in the U.S. Department of Agriculture (USDA), 1948 Umatilla County soil survey identified two major groups of soils in the area. These soils groups include (1) soils that formed in eolian sand, loess alluvium, and lacustrine sediment on terraces of the Columbia River and (2) soils that formed in loess, lacustrine sediment, and alluvium on hills, terraces, and piedmonts. The predominant soils recognized include Ephrata fine sandy loam to sand, Hermiston silt loam to Hermiston fine sandy loam, and Quincy fine sand to loamy fine sand (USDA, 1948).

The NRCS 1988 Umatilla County soil survey identified the following soil types:

- Quincy-Winchester-Burbank: deep excessively drained soils that formed in eolian sand and gravelly alluvium on terraces
- Adkins-Sagehill-Quincy: deep well drained and excessively drained soils that formed in eolian sand, gravelly alluvium, and lacustrine sediment on terraces
- Shano-Burke: deep and moderately deep, well drained soils that formed in loess overlying lacustrine sediment and cemented alluvium on fan terraces
- Ritzville, deep well drained soils formed in loess on hills (USDA, 1988).

Table 21 shows some of the critical arability factors for the predominant soils in the area.

Table 21.—Critical arability factors for predominant soils in the area

Soil type	Texture [1/] (USDA)	Clay (percent)	Permeability (inches/hour)	Soil reaction (pH)	Salinity (Mmhos/cm [2/])	Organic matter (percent)
Adkins	fsl-fsl	4-8	0.6-2.0	6.6-7.8	<2	0.7-1
Burbank	Lfs-grfsl	0-5	0.6-2.0	7.4-8.4	<2	0.5-1
Burke	lfs-grs	5-15	0.6-2.0	7.4-9.0	<2	1.0-2
Quincy	fs-s	1-7	6.0-20	7.9-8.4	<2	0.8-1
Ritzville	vfsl-sil	5-10	0.6-2.0	6.6-7.8	<2	1.0-2
Sagehill	fsl-vfs	2-8	0.6-2.0	7.9-9.0	<2	1.0-2
Shano	sil-sil	5-10	0.0-2.0	7.4-9.0	<2	1.0-2
Winchester	s-cos	0-5	6.0-20	6.6-8.4	<2	0.5-1

[1/] fsl = fine sandy loam, lfs = loamy fine sand, grfsl = gravelly fine sandy loam, grs = gravelly sand, fs = fine sand, s = sand, vfsl = very fine sandy loam, sil = silt loam, vfs = very fine sand, s = sand, cos = coarse sand

[2/] mmhos/cm = millimhos per centimeter

Land classification is only one of a number of actions that must be completed before lands can be approved to receive Project water. An approval of the land for arability was granted by Reclamation's Commissioner on March 9, 1994, that found the lands to be technically adequate to support arability (Reclamation, 1994).

Reclamation has performed several land suitability classification studies in the area beginning in 1948, and they include semi-detailed (1948), detailed gravity (1961), and detailed sprinkler (1965) (Reclamation, 1993a). The February 1970 Lands Appendix described a detailed land classification of the Westland area, which was supplemented with the 1993 Land Classification Report of the same area (Reclamation, 1993b). This Reclamation suitability land classification identifies most of the lands in the area as suitable for irrigation. The lands are summarized by their arability in table 22.

Table 22.—Acreage summary, March 1994, Land Classification Report

Class 1	Class 2	Class 3	Class 4P	Total
2,558.2	3,737.1	4,461.4	67.2	10,823.9

All of the lands in Westland, and those currently receiving water under TWSCs, have been classified as suitable for irrigation and have been certified irrigable by the Oregon Department of Water Resources.

Severe dust problems, leading to air quality concerns, can occur during high winds. If there is no irrigation and the land has been plowed, the dust problem would increase. However, if the land has not been plowed, the dust should be contained by the previous vegetation growth.

Environmental Consequences

Under the No Action Alternative, severe dust problems could occur during high winds. The erosion on the nonirrigated fields would depend mainly on what vegetation cover the land would have. If the lands were not plowed in the spring, there may be less erosion than on the cultivated fields.

Neither the Partial nor Full Adjustment Alternatives would affect soils or land classification in the area. Lands that are to be included within district boundaries have been classified and certified as suitable to receive irrigation district water. The lands are currently farmed and irrigated so the adjustment of district boundaries would not affect soil erosion.

Vegetation and Wildlife Habitat

Affected Environment

The climate of the Umatilla basin in Umatilla County is semi-arid, with light to moderate precipitation. Warm, dry conditions exist in these lower portions where summertime weather commonly reaches 100 °F and annual precipitation averages about 9 inches (Saul et al., 2001). The topography ranges from moderate slopes to level terrain, and the valley physiographic province is comprised of tertiary and quaternary loess, alluvium, glaciofluvial, and lacustrine sediment deposits. There is little hardpan, and the soil is sandy loam and generally free from alkali. These highly productive soils, which make the region famous for its agriculture, are largely derived from these quaternary and tertiary deposits (Saul et al., 2001).

These conditions support shrub-steppe plant communities in the undisturbed open areas. However, there are few undisturbed open areas within the project area. The region is fairly well developed throughout the project area, with farms interspersed along the entire length of McKay Creek downstream of McKay Reservoir and along the Umatilla River to its confluence with the Columbia River. Much of McKay Creek and Umatilla River have been channelized. The agricultural lands are large fields that have been intensively cultivated for many years (refer also to Soils and Lands section).

The wildlife habitat available is largely limited to riparian corridors, two wetland complexes (addressed separately), and agricultural lands.

Environmental Consequences

A slight shift in the types of crops grown in some areas, and a slightly shorter growing/watering season under the Partial Adjustment and Full Adjustment Alternatives could occur, when compared to the No Action Alternative. This slight shift in cropping patterns and vegetation could cause some wildlife species to shift their foraging behavior or even their home ranges on a local scale, but it is not likely to be sufficient to have an adverse effect on the overall landscape of wildlife habitat. If any shift in cropping patterns results from implementing one of the alternatives, large areas of intensively managed crops would still be surrounded by other large, homogeneous, intensively managed crops (refer also to Agriculture section). The only federally listed species in the project area is the bald eagle, and this species is not dependent on agricultural fields.

Overall, the habitat value would remain relatively unchanged. Other potential impacts to wildlife and wildlife habitat are addressed in the wetlands and riparian habitat sections.

Riparian Habitat

Affected Environment

National Wetlands Inventory (NWI) maps, aerial photos from the year 2000, and the literature were reviewed to assess wetlands and riparian habitat in the Project's affected environment. Much of the Umatilla River and McKay Creek have been channelized, and overbank flooding occurs infrequently as the climate in this region is semi-arid. Seventy-nine of the lower 90 miles of the mainstem Umatilla River, from the mouth to the forks have undergone human-caused channel alteration, restriction, and/or diking (Saul et al., 2001).

An 8-acre cottonwood gallery adjoins a 5-acre riverine wetland along the Umatilla River near RM 47 (Saul et al., 2001) (also addressed in the wetlands section). Riparian habitat along the mainstem Umatilla River and McKay Creek is very limited. Much of the area has been cleared for urban development, forestry, and agriculture. These land uses, combined with chanellization, and other anthropogenic factors, have greatly reduced the amount of riparian habitat and, hence, shading along these waterways. In many places, the corridor is completely devoid of woody riparian vegetation. In other places, it has been reduced to single isolated trees or narrow bands of cover located on one side of the river. In a few places, however, especially along wider portions of the river, wider bands of riparian habitat exist on both banks of the river, but these corridors are rather disjunctive. Conditions of poor shading and cover have resulted because land use has been relatively intense in the area. This, in turn, has resulted in poor instream habitat diversity and riparian conditions (Saul et al., 2001).

Environmental Consequences

Compared to the No Action Alternative, the Partial Adjustment Alternative would result in some increased flows in the Umatilla River for the months of July and August and decreased flows for the months of June, September, and October, according to the hydrology model. The Full Adjustment Alternative would follow similar trends but to a larger extent. However, modeled flow differences depict that the average monthly flows may change somewhat in the summer and fall months, but they will remain unchanged among the alternatives when averaged over an annual basis for the majority of the River (see tables 10 - 15, and 18 and 19). At the very lowest portions of the river, near Threemile Falls Dam, the largest changes in flow are about 3 cfs. This area is a well developed urban area and the vegetation here is unlikely to be affected by any of the project alternatives. Along the rest of the River, any established cottonwoods have a deep root system and would not likely be seriously affected by changes in flow with implementation of any of the alternatives (Thullen, 2003). Depending on the water depth, however, some of the plant species along the river, as well as along the irrigation/drainage ditches, could be affected. This is addressed further in the wetlands section.

Wetlands

Affected Environment

The National Wetlands Inventory maps identify two wetland areas within the Project area. The first is along the mid-lower river corridor west of Pendleton, at river mile 47 (Saul et al., 2001). This area contains braided river channels and a cottonwood gallery, with approximately 8 acres of palustrine wetlands and 5 acres of riverine wetlands (Saul et al., 2001).

The second area, the Echo-Umatilla Meadows complex, is identified by the NWI maps as inland herbaceous wetland. The complex is located to the northwest of Echo, between RM 18 and 24. This wetland complex results from the broadening of the river's floodplain to nearly 10 times its upstream width. Saul et al. (2001) determined that this area contains an estimated 862 acres of palustrine wetlands and 152 acres of riverine wetlands. Today, it is believed that these wetlands are fed largely by water seepage from irrigation or drainage canals (Tiedeman, 2003). These wetlands are surrounded by intensively managed croplands; have also been affected by roadways, railways, diking, and urbanization; and are considered to be of low wildlife habitat value, providing very limited wildlife cover. There are no plans in the foreseeable future to repair the seepage (Tiedeman, 2003).

Environmental Consequences

As mentioned in the riparian section, when compared to No Action, the Partial Adjustment Alternative would provide some higher river flows during the months of July and August, and lower flows during the months of June, September, and October, according to the hydrology model. The Full Adjustment Alternative follows a similar pattern, but to a greater extent.

The upper wetland, being located along the river, could be affected somewhat by the changes in river flows. In the summer and fall months, the differences in flows resulting from implementation of the different alternatives are relatively small, and any effects to this wetland would likely be unnoticeable. Wetland plants can be very resilient and some may withstand such temporary changes relatively unscathed. The decrease in flow in June will be somewhat offset by the increase in flows in July and August. Compared to No Action Alternative, the decreased water flows expected in September and October would likely not have much effect on the wetland vegetation in this wetland or in the ditches.

The effects to this upper wetland are anticipated to be relatively minor. There may be a slight shift in species composition toward more water-tolerant species in the lower elevations and the "dryer" wetland plants may shift somewhat toward the outer perimeter of the wetland or ditches. However, since this upper wetland is adjoining an 8-acre cottonwood gallery, these cottonwoods would likely have a limiting role on the growth of the riverine wetland regardless of the increased

water supply predicted by the model in July and August. Similarly, the ditch banks would limit the wetland vegetation from expanding much. Because the changes in flows are temporary (slight increase in July and August and decrease in June, September, and October under the Full Adjustment Alternative), most of the existing wetland plants would likely endure (Thullen, 2003). The increased flows anticipated under July and August under the Full Adjustment Alternative would also be unlikely to choke out the plants (Thullen, 2003).

The other wetland area is different. This lower wetland complex at Echo-Umatilla Meadows is largely fed by drainage and irrigation water seepage. Under No Action and Partial Adjustment Alternatives, cropping practices would likely include dryland farming or low water-dependent crops because groundwater pumping costs could be prohibitive (see Socioeconomics Section). Further, if groundwater pumping is high, the low water table may negatively affect the water supply to the Echo-Umatilla Meadows wetland complex. Compared to the No Action Alternative, this wetland complex would likely experience a slight positive effect with the Full Adjustment Alternative.

Fisheries

Affected Environment

The lower mainstem of the Umatilla River in the vicinity of Westland provides habitat for 11 introduced warm water fish species. Introduced warm water game fish are shown in table 23. Other non-native nongame fish, native nongame fish, native cold water fish, sport fish, game fish, and commercial fish found in the lower Umatilla River are also included in table 23.

Salmonids Status

The Umatilla River historically supported large populations of steelhead, coho, and spring and fall chinook. Within the Umatilla River watershed, irrigation and agricultural development in the early 1900s are believed to be the primary cause of the decline of steelhead and the extirpation of the salmon stocks (Saul et al., 2001). Water development and subsequent habitat modifications throughout the Lower Columbia River system, however, also adversely affected these species (Reclamation, 2003).

Salmon

The reintroduction of three salmon species historically found in the Umatilla River began in 1983-1986, and is an ongoing fisheries management practice. The first reintroduced salmon species was fall chinook salmon, which was reintroduced in 1983; the first adults returned in 1985 and have ranged from 85 to 6,028 fish (1985-2002). Spring chinook salmon were reintroduced in 1986, and adults began returning in 1988, ranging from 13 to 5,246 adults (1988-2003).

Coho salmon were reintroduced in 1986, and adults began returning in 1988, ranging from 29 to 22,872 fish (1987-2002) (CTUIR, 2004).

Table 23.—Fisheries found in the lower Umatilla River

Introduced warm water game fish	
Largemouth bass	*Micropterus salmoides*
Smallmouth bass	*M. dolomieu*
Channel catfish	*Ictalurus punctatus*
Brown bullhead	*Ameiurus nebulosus*
Yellow perch	*Perca flavescens*
Black crappie	*Pomoxis nigromaculatus*
White crappie	*P. annularis*
Bluegill	*Lepomis macrochirus*
Pumpkinseed	*L. gibbosus*
Non-native nongame fish	
Common carp	*Cyprinus carpio*
Western mosquitofish	*Gambusia affinis*
Native nongame fish	
Northern pikeminnow	*Ptychocheilus oregonensis*
Redside shiner	*Richardsonius balteatus*
Chiselmouth	*Acrocheilus alutaceus*
Peamouth	*Mylocheilus caurinus*
Sucker species	*Catostomidae* spp.
Four dace species	*Rhinichthys* spp.
Three sculpin species	*Cottus* spp.
Native cold water sport, game, and commercial fish	
Bull trout	*Salvelinus confluentus*
Redband trout/summer steelhead	*Oncorhynchus mykiss*
Spring and fall chinook salmon	*O. tshawytscha*
Coho salmon	*O. kisutch*
Mountain whitefish	*Prosopium williamsoni*
Other fish found in the basin	
Pacific lamprey	*Lampetra tridentate*
Western brook lamprey	*L. richardsoni*
Source: Saul et al., 2001	

Steelhead Trout

Redband/steelhead trout were not completely extirpated from the Umatilla River basin. The steelhead population that inhabits the Umatilla River basin is a part of the Middle Columbia River (MCR) Evolutionarily Significant Unit (ESU) steelhead population (National Marine Fisheries Service [NMFS], 2002). For more information about steelhead, see the Threatened and Endangered Species section.

MCR summer steelhead was listed as a threatened species (Endangered Species Act of 1973) on March 25, 1999 (64 FR 14517) (NMFS, 2002).

Essential Fish Habitat

Public Law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act) and required that Federal agencies evaluate project impacts on "Essential Fish Habitat" (EFH) and consult with the NMFS (now National Oceanic and Atmospheric Administration [NOAA Fisheries]) when a project may adversely affect EFH. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Essential fish habitat found within the project area includes chinook migration corridors and rearing areas. In the project area, EFH is designated only for chinook salmon (Pacific Fisheries Management Council, 1999).

Streamflow

The hydrologic regime dictates the dynamic character of river systems that result from the quantity, timing, and natural variability of streamflow (Reiser, 1991). The natural variability of streamflow benefits salmonids in two critical ways: (1) it provides temporally and spatially appropriate water quantities to support specific life stages, and (2) it ensures self-sustaining ecosystem processes by which salmonid habitat is created and maintained over time (NMFS, 2002).

The Umatilla River downstream of McKay Creek is currently used by key species as outlined in table 24. As noted in the table, research near Echo indicates this reach is only usable by bull trout during the months of November to early May (Umatilla/Walla Walla Bull Trout Working Group, 1999). The hatchery populations of coho and chinook have yet to establish sizeable natural populations, and natural reproduction is limited for both species.

Table 24.—Key species season of use for the Umatilla River below McKay Creek (Saul, et al., 2001)

Key species	Type of use	Season of use
Steelhead—-summer rearing	Adult migration	September – June
	Juvenile migration	March – June
	Juvenile rearing	January – December
Spring chinook	Adult migration	April – July
	Juvenile migration	April – July
Bull trout	Overwintering	November – May

Water Quality / Temperature

Temperatures in the Umatilla River below McKay Creek are seasonally limiting, reaching in excess of 82 °F (28 °C) at Threemile Falls Dam (RM 4) in August of 1998 (Boyd et al., 1999). As water temperatures increase in summer months, more of the lower subbasin becomes temperature limiting to fish. In the summer of 1998, temperature increased from RM 47 to RM 5 by nearly 41 °F (5 °C) during the temperature-limited period. Temperatures rise above the 70 °F (21 °C) threshold for increasingly longer times progressively downstream. At RM 47, the river remained below the threshold, due to cool water input from McKay Creek. Downstream at RM 42, the river was above the threshold value from early July to early August. By RM 5, the Umatilla River rose above the threshold before monitoring began in June until mid-September. The temperature limitations result from a variety of impacts including high width-to-depth ratios, limited riparian shading, limited interaction between the stream channel and the floodplain during high flow recharge periods, and reduced flow volume (Saul et al., 2001).

Salmonid Life Stages

This section reviews the life cycles of salmonids and their habitat needs. The areas of the Umatilla where salmonids occur are also described.

Adult Migration

Moderate to high streamflows at key time periods are required to attract salmonids to commence upstream migration. Streamflows that are too high or too low can act as barriers to migration, as can water quality, particularly water temperature. Reduced streamflows can cause undesirable delays in migration, forcing some species to remain and mature in the mainstem instead of its natal tributary. High streamflows at the wrong time can create false attraction flows (NMFS, 2002).

McCullough (1999) found that adult chinook salmon and steelhead die at temperatures of 71 °F to 76 °F (22 °C to 24 °C), which suggests that salmon and steelhead adults may have less tolerance for elevated temperatures than juveniles of the same species. In addition, Sauter, et al. (2001) suggests that upstream migration ceased at temperatures over 68 °F (20 °C) and was cued at 50 °F to 55 °F (10 °C to 13 °C) (NMFS, 2002).

Salmonid Spawning

Fall chinook and coho salmon spawning have been observed in the river reaches affected by the proposed project. Fall chinook spawning has been observed primarily from the mouth of the Umatilla to the confluence of Meacham Creek (RM 79), with most of the spawning in the Barnhart (RM 42) to Yoakum (RM 37)

reach. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) estimates that most of the spawning (December through March) occurs just below Barnhart, where the majority of adult spawners are released (Saul et al., 2001).

Spawning survey crews have observed many coho redds (December through March) and spawned-out adult carcasses through the years in the Umatilla River from the mouth to Meacham Creek. Coho have been observed in low numbers in some of the mid-basin tributaries such as Squaw Creek, Buckaroo Creek, and Meacham Creek (Saul et al., 2001).

Salmonid Egg Incubation

Streamflow influences the reproductive success of spawning fall chinook salmonid adults by affecting subsurface flow and the velocity of intergravel flows that provide dissolved oxygen to the eggs. Low dissolved oxygen or reduced velocity of inter-gravel water results either in high mortality or in the reduced size of hatching fry. High water temperatures decrease the amount of dissolved oxygen and also directly influence the success of egg incubation and fry emergence. The egg stage is the most temperature sensitive stage in salmonid life history. According to Reiser and Bjornn (1979), optimum temperatures for salmon and steelhead egg incubation range from 39 °F to 58 °F (4 °C to 14 °C) (NMFS, 2002).

Salmonid Juvenile Rearing

Successful juvenile rearing requires access to food, cover/shelter, and space in the stream system, all of which are markedly affected by flowing water. In general, food production in streams is the highest on riffles, and streamflow provides for drift of these food organisms downstream. Occasionally, freshets contribute food to the system by dislodging organisms from the bottom (Saul, et al., 2001).

Available juvenile rearing space is directly determined by discharge and velocity. Discharge, which is a function of velocity, area, and depth, determines the available space for rearing life stages. Velocity and discharge also influence food production, as well as the spatial requirements for, and competitive behavior of fish. Reduced velocities can cause larger fish to expand their territory and force smaller, less aggressive juveniles to select and occupy less desirable feeding stations for longer periods of time. The effect of temperature on the juvenile life stage depends, in part, on the length of time juveniles are exposed to warm water temperatures. Juvenile rearing densities may decrease at high temperatures, and juveniles are absent in waters reaching 70 °F to 73 °F (21 °C to 23 °C) (NMFS, 2002).

Suitable summer rearing habitat in the mainstem Umatilla River for steelhead is reported to exist in reaches upstream from Meacham Creek, and the reach from the mouth of McKay Creek to the Furnish Diversion Dam (about RM 32.4)

(J. Germond, 2000) where mainstem flows are augmented by releases from McKay Reservoir in the summer. Summertime water temperatures for juvenile rearing are generally unsuitable in the mainstem river downstream from Meacham Creek to McKay Creek, and from below the Furnish Diversion Dam to the river mouth. However, water temperature data and modeling results indicate that cooler water releases from McKay Reservoir have a beneficial impact on water temperature in most years (meets Oregon Department of Environmental Quality water temperature criterion for anadromous salmonids of 64 °F). This temperature criterion is met on about 2.5 miles of the mainstem Umatilla River downstream from the mouth of McKay Creek throughout summer, depending on operations and cool water pool volume at McKay Reservoir (Reclamation, 2000).

The distribution of most juvenile spring chinook rearing habitat is limited to the North Fork Umatilla River and the mainstem Umatilla River above the mouth of Meacham Creek; however, juvenile spring chinook are also found in low numbers in the more favorable reaches of many of the tributaries used by juvenile steelhead (Contor et al., 1998).

Production of fall chinook fry has also been documented. Oregon Department of Fish and Wildlife (ODFW) (Knapp et al., 2000) has estimated that 141,000 fall chinook fry migrated from the Umatilla River in 1998. Fry survival has been compromised by warm water temperatures during outmigration below Westland Dam, where most of the early summer flows are extracted. Additional water has been released into July during the last several years to assist downstream migration and enhance survival (Saul et al., 2001).

Prior to 1999, summer rearing conditions in the Umatilla River in and around the coho spawning areas below the mouth of McKay Creek was unsuitably warm for a number of weeks each summer. Juvenile coho were frequently observed in the lower reaches and were always associated with spring seeps or other thermal refuge. Fish were often in poor condition. However, since the summer of 1999, additional summer rearing habitat has been available from the mouth of McKay Creek (RM 50.5), downstream approximately 20 miles (depending on water temperatures). Cool water is released from McKay Reservoir for irrigation use during most of each summer. In the past, water released from McKay Reservoir fluctuated during early and late summer, depending on irrigation needs. Water temperatures were often suitable for juvenile coho throughout the reach during all but 1 or 2 weeks during the summer. Beginning in 1999, flows were augmented during those times so that water temperatures remained suitable. This represents a major increase in suitable mainstem summer rearing habitat. Monitoring in 1999 and 2000 indicates the areas were utilized by many juvenile coho salmon. Coho juveniles have been in excellent health and are a large size for a given age (Contor et al. report in progress). The management of lower McKay Creek has also been changed and now flows perennially. Since July of 2000, Reclamation has maintained a minimum flow of 10 cfs or natural streamflows, whichever is

less. These flows are ramped down to encourage outmigration and reduce stranding of salmonids (Saul et al., 2001).

Bull Trout

The U.S. Fish and Wildlife Service (FWS, 2003) considers the bull trout population in the Umatilla subbasin a part of the Columbia River Distinct Population Segment, which represents an evolutionarily significant unit (Umatilla/Walla Walla Bull Trout Working Group, 1999). Because of poor water quality conditions in much of the Umatilla subbasin, bull trout are, to a large extent, isolated in the headwaters of the Umatilla River and Meacham Creek. Currently, bull trout are found in the mainstem Umatilla River upstream of Thorn Hollow, at elevations above 1600 feet. Spawning and rearing occurs in the North and South Forks of the Umatilla River and in the North Fork of Meacham Creek (Saul et al., 2001). For more information on bull trout, see the Threatened and Endangered Species section.

Mountain Whitefish

The CTUIR monitoring and evaluation crews have observed mountain whitefish throughout the mainstem of the Umatilla River in low abundance (RM 0 to 90). Mountain whitefish are culturally significant to the CTUIR. Mountain whitefish comprised 6 percent of salmonids collected during electrofishing surveys during the summer of 1995 from the upper portion of the Umatilla River (RM 82 to 90). The CTUIR has also observed a low abundance (<0.2 percent of salmonids) in Meacham Creek and the Umatilla from RM 60 to 82 during the summer of 1993. During the winter and spring, several mountain whitefish have been observed at Westland Dam (RM 29) and in backwaters near the mouth. Some adult mountain whitefish remain in the lower river during the summer in cool water refuge areas. Twelve whitefish (10.5 to 16 inches) were collected during surveys in 1996 from RM 1 to RM 52 during June, July, and August of 1996 (Contor et al., 1994-2000 and Saul et al., 2001).

Lamprey

Historically, Pacific lamprey (*Lampetra tridentate*) were abundant in this subbasin (Close et al., 1995) and are culturally significant to the CTUIR. Much of the lamprey harvest occurred at the current site of Threemile Falls Dam prior to construction of the dam. Harvest also occurred in the North and South Forks of the Umatilla River (Swindell, 1941). Pacific lamprey populations in the Umatilla River basin are depressed. Currently, the Umatilla River basin does not support a tribal harvest of Pacific lamprey (Saul et al., 2001).

Data from systematic surveys of lamprey abundance in the past are unavailable, but screen-trap records from the Umatilla basin for several years were reviewed as an indicator of abundance. In 1986, 1988 to 1990, and 1992 to 1994, records

show that no juvenile lamprey was captured at any of the screen-trap boxes in this subbasin. From December 1994 to May 1996, 11 adults and 57 juveniles were sampled by ODFW at a rotary-screw trap. Lamprey were keyed to species, and length measurements were taken. Lengths ranged from 0.25 to 6.5 inches (Saul et al., 2001).

In addition, electrofishing for salmonids by the Umatilla Basin Natural Production Monitoring and Evaluation Project produced one live, one dead, and one near dead adult Pacific lamprey below Threemile Falls Dam in June 1996 (Contor et al., 1998). From September through October 1998, the CTUIR staff captured nine ammocoetes below RM 6. In 1997 and 1998, the CTUIR did not capture any adult Pacific lamprey at the Threemile Falls Dam adult trap. The CTUIR observed one adult Pacific lamprey at Westland (RM 27) in July of 1996, and 12 adult Pacific lampreys in the ladder at Threemile Falls Dam during dewatering in April 1996 (Saul et al., 2001).

Technicians have observed one or two adult Pacific lamprey several times per year in the viewing window and ladder at Threemile Falls Dam during spring operations. To monitor adult counts of Pacific lamprey, the CTUIR staff installed video recorders at the viewing window at Threemile Falls Dam (RM 3.7) in June 1998. To date (August 2001), five upstream migrating lampreys have been observed at the window. However, the existing bar space could allow upstream migrating lamprey to pass through diffusers inside the ladder and avoid detection (Saul et al., 2001).

Shellfish

Shellfish were an important food for tribal peoples of the Columbia River and are culturally significant to the CTUIR. Ethnographic surveys of Columbia Basin tribes reported that Native Americans collected mussels in late summer and in late winter through early spring during salmon fishing (Ray, 1933, Post, 1938). A few tribal elders from the Columbia and Snake River basins recalled that mussels were collected whenever conditions of the river were favorable (Hunn, 1990). Museum records indicate four species were historically present in the Umatilla River. These species are the pearlshell (*Margaritifera falcate*), western ridgemussel (*Gonidiea angulata*), Oregon floater (*Anodonta oregonensis*), and California floater (*Anodonta californiensis*) (Saul et al., 2001).

Environmental Consequences

This section explores the environmental consequences of the alternatives on the fisheries and essential fish habitat.

Under the Partial and Full Adjustment Alternatives, flows do not differ from the No Action Alternative throughout the year for wet, average, and dry years at UMDO (below Westland Diversion). The projected reduction in return flows

under the Partial and Full Adjustment Alternatives might affect fisheries or essential fish habitat; however, the estimated reductions are unmeasureable under both alternatives. Moreover, the estimated return flow impact of 895 acre-feet annually would be mitigated by Westland using water from McKay Reservoir.

Besides a possible slight reduction in return flows to the Umatilla River, the two boundary adjustment alternatives also result in a seasonal shift in McKay storage releases, which affects streamflows in lower McKay Creek and in the Umatilla River from the mouth of McKay Creek to the Westland Diversion. Juvenile salmonids rear in lower McKay Creek and a portion of the Umatilla River below the mouth of McKay Creek throughout the year, including the summer months when storage releases from McKay Reservoir help maintain suitable salmonid rearing temperatures. As shown in table 10, flows above Westland Diversion would be higher in July and August and lower in June, September, and October under the boundary adjustment alternatives compared to the No Action Alternative. No changes to flow are found in all other months (see table 10).

The slight increases in flows in July and August might provide slight, but likely immeasurable, improvements in water temperature. The slight decrease in June flows would have little effect on available salmonid rearing habitat which is limited by flows later in the summer when temperatures are higher and flows are 100-200 cfs lower.

The lower projected flows in September under the Full Adjustment Alternative might affect juvenile salmonid rearing habitat in McKay Creek and a short reach of the Umatilla River downsteam of McKay Creek. Conditions for rearing salmonids are suitable in the summer months in these areas so long as storage releases are being made for irrigation. Under the No Action and Partial Adjustment Alternatives, these releases continue through September whereas they cease in the Full Adjustment Alternative in late September. Table 10 shows a "deficit" at Westland's Diversion Dam of 769 acre-feet in September and 497 acre-feet in October in an average year in the Full Adjustment Alternative compared to No Action. This is about 4-5 days of storage releases and diversions and indicates that irrigation releases in an average year would cease a few days before the end of September under the Full Adjustment Alternative.

As part of the Umatilla Basin Project exchange, releases from McKay Reservoir to supplement instream flows begin in September. These releases enhance flows in the river from McKay Creek to the mouth of the Umatilla River for adult chinook, steelhead, and coho migration. These releases are also sufficient to maintain adequate rearing conditions in McKay Creek and the short reach of the Umatilla River below the mouth of McKay Creek.

The RiverWare model estimates that McKay releases for irrigation are lower in September in the Full Adjustment Alternative. However, impacts to rearing fish would not normally occur because adequate conditions are maintained in McKay Creek and a short reach of the Umatilla River above Westland's Diversion Dam

as a result of McKay fish flow releases, which would occur under all alternatives. For example, the model results indicate that under the Full Adjustment Alternative, Westland would cease deliveries the last few days of September. In 2003, deliveries, which included service to the lands in the Full Adjustment Alternative under a TWSC, ceased on September 29. In the same year, releases for instream flow enhancement began on September 22, at the direction of the CTUIR. Late September is normally the time when these releases begin. In 2003, which mimicked conditions under the Full Boundary Adjustment because of the TWSC, fish flow releases overlapped with irrigation releases and rearing habitat above Westland's Diversion Dam was unaffected. As occurred in 2003, flow releases for irrigation and fish should overlap, or nearly so, under the Full Adjustment Alternative.

Changes in October flows in the reach above Westland's diversions should also not affect use of water stored in McKay Reservoir for fish. As noted above, by October, storage releases are made for fish to improve flows for adult salmon and steelhead migrants down to the mouth of the Umatilla River. These releases, made under all alternatives, would maintain rearing habitat in the reaches used by rearing salmonids above Westland's Diversion Dam.

Threatened and Endangered Species

This section describes the endangered and threatened species that are found in the project area. The description of the consultation and coordination with FWS and NOAA Fisheries are found in chapter 4.

On April 15, 2003, Reclamation received a list of threatened and endangered species that may occur within the project area from the U.S. Fish and Wildlife Service (FWS in response to Reclamation's March 17, 2003, written request.) Table 25 displays the federally listed threatened and endangered species that the FWS has identified as potentially occurring in the project area. Some of the threatened and endangered species listed below are discussed more fully under the Fisheries section.

Table 25.—Federally listed threatened and endangered species potentially occurring in the project area

Listed Species	Status
Bald eagle (*Haliaeetus leucocephalus*)	T
Sockeye salmon – Salmon River tributaries to Snake River, Idaho (*Oncorhynchus nerka*)	E
Chinook salmon – Snake River spring/summer and fall (*Oncorhynchus tshawytscha*)	T
Upper Columbia River spring chinook salmon (*Oncorhynchus tshawytscha*)	E
Snake River steelhead (*Oncorhynchus mykiss*)	T
Upper Columbia River steelhead (*Oncorhynchus mykiss*)	E
Mid-Columbia River steelhead (*Oncorhynchus mykiss*)	T
Bull Trout – Columbia River population (*Salvelinus confluentus*)	T

T = Threatened, E = Endangered

Affected Environment

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is currently listed as threatened in the 48 contiguous States. The bald eagle is known to occur in the project area. The species migrate through the area and winter along the Umatilla River. Two nest sites have been documented in the area.

Nest trees tend to be located in uneven aged stands with old growth characteristics (FWS, 1986). Bald eagle nests are large structures usually positioned within the top 20 feet of the tree. Nest trees are generally among the tallest in a stand, allowing the birds to have an unobstructed view of a water body from which most of their prey is obtained. A tree that has the characteristics necessary to support a large nest is chosen, regardless of tree species. Nest trees typically have sturdy upper branches to support the nest, which are approximately 2-3 feet deep and 5 feet in diameter. Bald eagle pairs often build more than one nest in their breeding territory to use in case the primary nest is destroyed. Bald eagles return to the same territory to breed each year and often reuse the same nest by maintaining it with the addition of nest materials.

The breeding season for bald eagles in the Pacific Northwest generally extends from January to mid-August. Young are usually fledged in July and may stay near the nest for several weeks after fledging. Bald eagles are extremely sensitive to human disturbance during the breeding season. Human activities have been known to cause abandonment of nests and failed attempts at reproduction (FWS, 1986).

Two bald eagle nests have been sighted near the project area (Rimbach, 2003). One was located 0.41 miles southwest of the junction of Highway 395 and Main Street in Stanfield. The other is 0.49 miles northwest (274 degrees) from the

junction of Highway 730 and the Umatilla River. Frank Isaacs of Oregon State University stated that the nest tree near Stanfield had been surveyed in March 2003. The tree has blown down and the nest no longer exists (Isaacs, 2003). He further stated that the other nest near the mouth of the Umatilla River was present on March 12, 2003, but no eagles were sighted. Eagle incubation activity has never been documented on either nest site (Isaacs, 2003). Isaacs also stated that eagle population growth has been expanding and nesting pairs seem to be expanding along the Umatilla River upstream of the mouth.

Among the factors that affect bald eagle nesting success are weather, food, competition, human activities, and changes in nesting pairs (it takes 1 year for a new pair to breed).

Habitat for bald eagles outside of the breeding season consists of daytime perches and nighttime communal roosts. Perches are used for resting and for locating prey in the home range. A good perch site is one that is located close to a food source and has a clear view of the surrounding area. Therefore, perching trees tend to be tall deciduous trees. Eagles have been known to use artificial perches where suitable natural perches are not available (FWS, 1986). Nighttime communal roosts are near rich food sources, isolated from human disturbance and in uneven aged stands with some old growth forest patches within the stand, and offering more protection from the elements than daytime perches.

Mid-Columbia River Steelhead

The Mid-Columbia River summer steelhead (*Oncorhynchus mykiss*) were listed as a "Threatened" species on March 25, 1999 (64 FR 14517). Major Columbia River tributaries known to support this ESU are the Deschutes, John Day, Klickitat, Umatilla, Walla Walla, and Yakima Rivers, as well as the Columbia River and Estuary.

Summer steelhead spawn throughout the Umatilla River basin where habitat conditions are suitable and accessible. Most steelhead spawn in Umatilla River tributaries and upper reaches of the Umatilla River above Meacham Creek. No steelhead spawning occurs in the reaches affected by this proposed action. The Umatilla River basin contains an estimated 314 miles of usable spawning/rearing habitat for steelhead trout (CTUIR, 1990). Peak entry time into the Umatilla River is variable and depends on the quantity and temperature of the streamflows. Steelhead will hold in the Columbia or the lower Deschutes Rivers until water temperatures are suitable and flows are sufficient in the Umatilla River. Steelhead may begin entering the Umatilla River in August, with peak migration (enumerated at Threemile Falls Dam) occurring between December and April.

Wild summer steelhead juveniles rear in the Umatilla basin for 1 to 3 years before migrating to the ocean as smolts. Current suitable summer rearing habitat in the mainstem river exists in reaches upstream of Meacham Creek and the reach from

McKay Creek to the Furnish Dam (Germond, 2000), where mainstem flows are augmented by McKay Reservoir releases in the summer. Water temperatures are generally unsuitable for steelhead in the mainstem river below Meacham Creek to McKay Creek, and below the Furnish Diversion Dam to the river mouth, during summer months; however steelhead do spawn in the lower McKay Creek Rearing fish thrive in moderate gradient streams with high quality water (summer water temperatures ranging from 50 to 65 degrees Fahrenheit) and complex instream forms of cover. Winter rearing habitat is widespread throughout the basin, including the entire mainstem river (Germond, 2000). Smolt migration out of the Umatilla basin into the Columbia River occurs between January and July, and peaks in May (Reclamation, 2003). Cumulative capture studies show that over 99 percent of the steelhead smolts have out-migrated from the Umatilla basin by early to mid-June (BPA, 1996). Most out-migrant smolts are 2-year old fish.

Bull Trout

The Columbia River bull trout (*Salvelinus confluentus*) was listed as a "Threatened" species on June 10, 1998 (63 FR 31647). The U.S. Fish and Wildlife Service considers the bull trout population in the Umatilla subbasin a part of the Columbia River Distinct Population Segment, which represents an evolutionarily significant unit (Umatilla/Walla Walla Bull Trout Working Group 1999) (NMFS, 2002). This population segment includes all drainages within the Columbia River Basin, including the Umatilla River drainage. Critical habitat was proposed on November 19, 2002, and includes the reaches accessible to listed bull trout in the Umatilla River.

According to the Buchanan et al. (1997), bull trout in the Umatilla River basin show fluvial and resident life history patterns, but most are believed to be resident fish. Bull trout utilize the Umatilla River within the project area, primarily as migrants. Fluvial adults and sub-adults occasionally may be present in the lower Umatilla River below the Westland Diversion in the period between November and April (Saul et al., 2001). Bull trout are found in the mainstem Umatilla River and several tributaries upstream from Thorn Hollow (River mile 69) at elevations above 1650 feet. This is well upstream of the project area. Spawning and rearing occurs in the north and south forks of the Umatilla River and in North Fork Meacham Creek. Suitable spawning and rearing habitat occurs in East Fork Meacham Creek, but bull trout have not been observed there. Rearing and migration activities occur in Squaw Creek, Ryan Creek, North Fork Umatilla River, Coyote Creek, Shimmiehorn Creek, McKay Creek (below the dam), and Meacham Creek. CTUIR reports that a few adults (5) have been captured, over the past years, at Threemile Falls Dam in the months of May and June. Occasional sightings of bull trout have been recorded in the lower Umatilla River in winter and early spring and these individuals are considered migrants, moving up or downstream.

Other Listed Fish Stocks

Except for bull trout and Mid-Columbia River steelhead, which are present in the Umatilla River, all the other listed fish species shown in table 25 occur in the project in the Columbia River. All of these stocks migrate in the Columbia River past the mouth of the Umatilla River. They migrate upstream as adults with spring chinook in the area starting in late March, and fall chinook and steelhead present as late as December (BPA et al., 1999). Juveniles of all these stocks also migrate through the area with spring chinook and steelhead in the area as early as April, and fall chinook in the area into August (BPA, et al., 1999). This reach of the Columbia River is not suitable spawning habitat for spring chinook salmon, sockeye salmon, or steelhead trout. Fall chinook salmon spawn in the Hanford Reach of the Columbia River, about 40 miles upstream of the pumping plant. Juvenile fall chinook and other migrating juvenile salmonids may rear and feed in this river reach, in the vicinity of the pumping plant.

Environmental Consequences

Bald Eagle

The small change in flows to the Umatilla River that would result from a boundary adjustment is very unlikely to cause a change in habitat or food base for the bald eagle. The minor changes in the water supply in the streams would not likely affect the prey of the bald eagle, and no structural changes to its habitat would occur. Based on this, and on Rimbach (2003), it is not likely that the bald eagle would experience any adverse effects under any of the project alternatives.

Mid Columbia Steelhead and Bull Trout

As discussed above under the Hydrology and Fisheries sections, under all alternatives, flows in the Umatilla River would be reduced below Westland Diversion by amounts which are essentially slight reductions from current conditions. The estimated impacts to flows are far smaller than the errors inherent in the actual streamflow measurements used as input for the model. Use of the river below Westland Diversion by steelhead is, for the most part, limited to adult and juvenile migration. Steelhead pre-smolts also rear in this reach the winter before migrating. Steelhead may be present in the lower river from August through July with most use in the period from September till mid-June. Bull trout use of the lower river may occur within this time period as well from November through April. During the period when steelhead and bull trout may be present in the lower river, the model results showed maximum declines in average monthly flows at the mouth of about 1-2 cfs in the fall. These declines were estimated to occur when average monthly flows would be about equal to or greater than 300 cfs.

In the reach above the Westland Diversion, measurable changes in stream flows would occur on a seasonal basis. These changes are outlined in the Hydrology section and further discussed in the Fisheries section. As noted in those previous sections, flows would be higher in the reach from McKay Dam to the Westland Diversion in July and August under both the Partial and Full Adjustment Alternatives. This could improve conditions for rearing juvenile steelhead in this area, but the increase in flow is relatively slight as would be any improvement in habitat conditions.

As discussed in the Hydrology and Fisheries sections, flows in the reach from McKay Dam to Westland's Diversion Dam would be lower in September under the Full Adjustment Alternative compared to No Action. Steelhead juveniles may rear in a portion of this reach, primarily in lower McKay Creek and the first few miles of the Umatilla River below the mouth of McKay Creek, where McKay Dam releases maintain adequate temperatures for salmonids. Bull trout adult or sub-adults may also be present, as evidenced by the CTUIR's 1999 capture of a bull trout in McKay Creek.

Releases from McKay Reservoir to supplement instream flows are made starting in September. These releases are made to enhance flows in the river from McKay Creek to the mouth of the Umatilla River for adult chinook, steelhead, and coho migration. These releases are also sufficient to maintain adequate rearing conditions in McKay Creek and the short reach of the Umatilla River below the mouth of McKay Creek for steelhead and bull trout.

The RiverWare model indicates that under the Full Adjustment Alternative, Westland would cease deliveries the last few days of September. By that time, as outlined in the Fisheries section, however, McKay Reservoir releases of water to enhance instream flows down to the mouth of the Umatilla River are underway. Because the releases for instream flows begin before irrigation releases would be terminated under the Full Adjustment Alternative, rearing habitat for steelhead or bull trout would be maintained in McKay Creek and in a short reach of the Umatilla River above Westland's Diversion Dam.

The model-calculated effects to stream flows below Westland Diversion are far smaller than the errors inherent in the actual streamflow measurements used as input for the model and, as such, are immeasurable. Consequently, they would have no adverse effect on the ability of steelhead adults or juveniles to migrate through the lower river. During periods when bull trout may be present, the modeled changes would not affect attributes of the habitat important for feeding, migration, or overwintering. The provision of storage in McKay Reservoir for instream flow augmentation, as mitigation, would further reduce the likelihood of impacts to steelhead or bull trout from the modeled reductions in return flow.

Above Westland Diversion, impacts to rearing steelhead, as a result of changes in September and October McKay irrigation storage releases, would not likely occur.

Flows throughout the period would be sustained by McKay storage releases for fish, which would occur under all alternatives starting in late September.

Reclamation concludes that the Partial Adjustment and Full Adjustment Alternatives may affect, but are not likely to adversely affect, Mid-Columbia steelhead or the Columbia River bull trout.

Other Listed Fish Stocks

Impacts of the operation of the entire Umatilla Project on the mainstem of the Columbia River and the fish stocks which occur there were included in the analysis for the Federal Columbia River Power System (FCRPS) and those impacts were covered in the Biological Opinion issued for the FCRPS on December 21, 2000 (NMFS, 2000). That Biological Opinion is currently being revised as a result of a District Court decision, but impacts of Umatilla Project operations on the Columbia River will continue to be addressed in that consultation. No effects to fish stocks in the Columbia River within the project area, in addition to those addressed in the FCRPS Biological Opinion, were identified in this analysis.

Recreation

Affected Environment

The study area is located in the northeastern portion of the State of Oregon. As cited within the Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP) recently completed in 2003, Oregonians are actively engaged in all types of outdoor recreation activities. With abundant recreational resources within the State, surveys conducted as part of the SCORP preparation process show that about 73 percent of Oregon households participated in outdoor recreation activities within the past 12 months. This means that outdoor recreation is an important part of the everyday lives of Oregonians and is an important contributor to their quality of life.

The City of Umatilla is situated on the shoreline of the Columbia River and the City of Hermiston is 6 miles south of the River. Additionally, Hermiston is a favored destination for persons pursuing fishing, hunting, and camping. As can be imagined, water sports are popular in the area. Swimming, boating, water-skiing, wind surfing, personal watercraft, as well as fishing are activities enjoyed by residents as well as visitors to the area.

Angling is a particularly popular activity in the Umatilla area. Walleye, sturgeon, bass, salmon, and steelhead are primary species commonly pursued in the area. Both the Oregon and Washington State records for several species of fish have come from the Columbia River in proximity to the City of Umatilla.

Environmental Consequences

Many of the recreational activities take place on and around the Columbia and Umatilla Rivers, primarily during the summer months. The only negative hydrologic impacts resulting from implementing either of the boundary adjustment alternatives occur upstream of Westland's Diversion Dam. During the summer, the effects on flows in the Umatilla River from the Full Adjustment Alternative are relatively small in this reach, ranging from a decrease in flows of about 14 cfs to an increase of about 19 cfs. Changes under the Partial Adjustment Alternative are even less. River-based recreation can be affected by flows which are either too high or too low to allow access to and use of the river. The two action alternatives would have either no effect or slightly beneficial effects in the reach by reducing high flows in June and increasing low flows in July and August.

Historic Properties

Historic properties are finite, nonrenewable, and often fragile remnants of past human activity. These resources have a broad range and include artifacts, objects, structures, or buildings; a specific place associated with a traditional ceremony; and historic landscapes or features associated with a period of time, a person, or a historical movement. Federal agencies are required to identify and evaluate significance of cultural resources located within the area of potential effect (APE) of any Federal undertaking.

Federal agencies' responsibility to consider and protect cultural resources is based on numerous Federal preservation laws and regulations. The National Historic Preservation Act of 1966, as amended, and its implementing regulations for Section 106 of that act, detail the requirements and processes to identify and evaluate cultural resources, assess effects to these resources, and mitigate effects to major resources that occur as a result of the agency's undertaking.

Historic Setting

Thousands of years before Euroamerican immigration and settlement, the region that surrounds the Columbia River basin in northeastern Oregon and southeastern Washington was home to three Plateau Culture Indian tribes: Cayuse, Umatilla, and Walla Walla. These tribes currently comprise the federally recognized the CTUIR. Although the APE is not part of the Umatilla Indian Reservation proper, APE lands are still considered part of the 6.4 million acres "ceded" by the CTUIR as part of the Treaty of 1855 that created the reservation (CTUIR, 2003).

Similar to other semi-arid regions in the early 20th century American West, the Federal Government's quest to provide irrigated lands for agrarian-centered settlement took hold in northern Oregon. In 1903, studies commenced for a federally-sponsored irrigation project for Umatilla and northern Morrow

Counties, after U.S. Reclamation Service officials recommended 60,000 acres of bench lands south of the Columbia River for irrigation. On December 4, 1905, Interior Secretary Ethan Hitchcock authorized the Umatilla Project as Reclamation's first Oregon venture. Almost immediately, the creation of water users associations followed. In 1906, the Umatilla Water Users Association organized, preceding the establishment of future irrigation districts like Westland, which, in 1924, was the last to formally organize (Stene, 1993).

As federally sponsored irrigating and farming expanded in the area, so, too, did the towns closest to Westland. In 1904, about the time Reclamation recommended western Umatilla County lands for irrigation and settlement, the town of Hermiston was platted. The same year of Hermiston's creation, Dr. Henry Coe platted another town adjoining Westland, Stanfield. Stanfield's growth, much like Hermiston's, began in earnest with the Umatilla Project's creation and the increasing availability of irrigated lands not only in Westland, but in other nearby districts (Umatilla County, 1981).

One town near Westland, however, existed long before the Federal Government's involvement in large-scale irrigation practices. Echo, founded in 1880 by J.H. Koontz and named after his daughter Echo, was an important transportation and service hub for western Umatilla County. Yet, even before the town's creation, the Echo area was a major convergence point for Indian and non-Indian travelers on various trails: the Oregon Trail runs adjacent to the present-day town site, and archeological evidence points to five Indian trails (three within the APE) that intersected with the Oregon Trail near Echo. Much later, the Union Pacific railroad and U.S. Highway 30 (later I-84) provided even more means of transport (City of Echo, 2002).

Echo is also the town located closest to the proposed boundary adjustments. Already extensively irrigated for general agricultural purposes, most of the lands slated for formal inclusion lie immediately south of I-84 and west and southwest of Echo to Oregon Highway 207, in areas known as Teal and Echo Meadows. It is within eight sections of these lands that Oregon Trail rut remnants still exist—but not many. Surrounded by the APE, the Bureau of Land Management's Oregon Trail interpretive site is located in Echo Meadows, a few miles west of Echo.

Indian trail remnants are also evident within the APE. In a 1985 report that provided the background for the 2002 Echo Cultural Resource Inventory, independent archeologist John Woodward documented the presence of five Cayuse/Umatilla Indian trails, three of which are located on private lands within the proposed boundary adjustments. Two trails start near the Oregon Trail west of Echo, then wind one-quarter mile apart in a south-southwesterly direction past Hunt Ditch. Woodward also documented a third, shorter trail west of Echo Meadows road; this trail ran parallel to the other two and terminates at the Echo-Lexington highway. Woodward provides context:

> …the presence of a system of Indian Trails near the present site of Echo … indicates significant Native utilization of the area's resources. [They] also may reflect the mobility of the Cayuse bands after obtaining the horse…. It was not uncommon during the immigrant season—late summer and early fall—for the Cayuses to ride along the Immigrant Trail … to trade their horses for worn-out cattle…. They continued to trade with immigrants after the latter reached the Willamette Valley (City of Echo, 2002).

Affected Environment

Westland is located in western Umatilla County in semi-arid northern Oregon on the south bench of the Columbia River near Hermiston, Stanfield, and Echo. It is one of four irrigation districts that comprise Reclamation's Umatilla Project; the others are Stanfield, Hermiston, and West Extension. Most of the primarily flat and gently rolling prairie lands lie between 250-600 feet above sea level. Approximately 7,400 acres are irrigated within Westland's current boundaries. Completed in 1927, McKay Dam and Reservoir, located 6 miles south of Pendleton on McKay Creek (a Umatilla River tributary), stores and supplies Westland water (Reclamation, 1993a).

The APE for the proposed boundary readjustment consists of up to 10,338 acres of mostly irrigated private lands that adjoin the present district's southern and western boundaries. The proposed boundary extension lands are within Umatilla County, south of I-84 and the Umatilla Ordnance Depot.

On July 1, 2003, a records search was conducted at the Oregon State Historic Preservation Office (SHPO) in Salem. This search revealed little cultural resource survey work done within the APE, probably because most of the lands are privately owned. Research also revealed that with the exception of scattered Oregon Trail remnants running through eight sections of private, state, and small tracts of BLM land west of Echo—along with the documented evidence of three Indian trails also west of Echo—no cultural resources were identified on APE lands included in all alternatives of the boundary adjustment proposal. While most Indian trail remnants have been disturbed or eliminated due to extensive agricultural practices, Woodward claimed that some trail remnants are visible on private lands in the prairie above Hunt Ditch near Echo (Woodward, 1985).

Environmental Consequences

This proposal for adjusting Westland's boundaries—under all alternatives—include neither new construction, ground disturbances, new agricultural practices, nor new land acquisitions. The lands being considered for boundary adjustment under both the Partial Adjustment and Full Adjustment Alternatives are private and farmed. The proposed boundary adjustments, under all alternatives, would not increase the amount of water currently diverted by Westland. Therefore, all

alternatives, including the No Action Alternative, would not affect known cultural properties. The Oregon State Historic Preservation Office concurred with this assessment in a June 18, 2003, letter. The CTUIR's cultural resource representative tentatively concurred with this assessment.

Socioeconomic Analysis

The following briefly discusses irrigated agricultural production and the current regional economy, using sales, income, and employment as indicators.

Affected Environment

Westland delivers supplemental water from McKay Reservoir to approximately 7,400 acres of the federally recognized district boundary, and about 7,200 acres outside Westland's boundary, at any one time. These lands are located in Umatilla and Morrow Counties in Oregon, which make up the economic region for this analysis. Adjacent counties may also be economically related; however, potential impacts in these other counties were considered negligible compared to the overall economic base.

Manufacturing, service, and the agricultural industries provide the largest percentage of industry output to the region as shown in figure 6. Figure 7 shows that the largest number of employees works in the trade, services, government, or agricultural sectors.

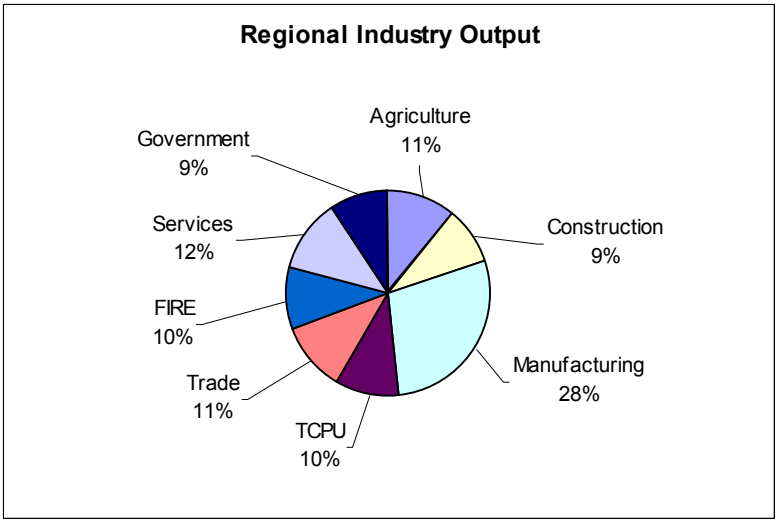

Figure 6.—Regional output by industry.

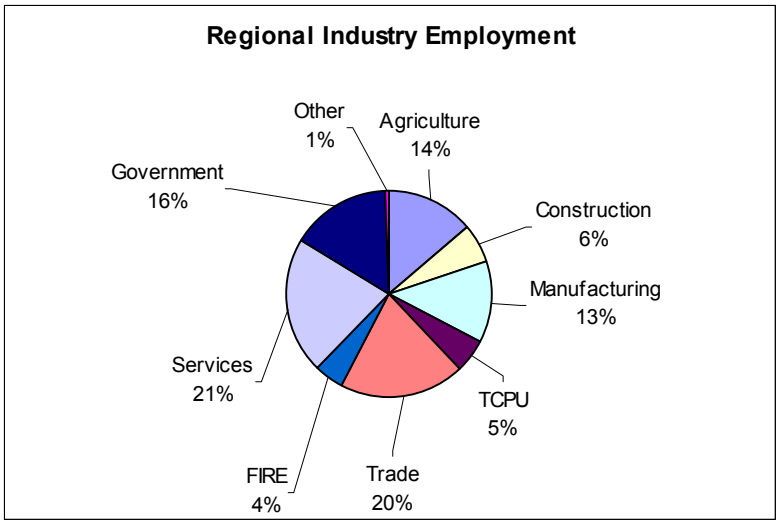

Figure 7.—Regional employment percentages by industry.

Umatilla and Morrow County information is provided in table 26.

Table 26.—Umatilla and Morrow County statistics

Item	Umatilla County	Morrow County
Population [1/]	70,548	10,995
Unemployment rate [2/]	7.2 percent	10.8 percent
Per capita income [3/]	$22,024	$16,841
Gross farm sales Rank in state	275.5 million third	146.5 million eighth

[1/] U.S. Census Bureau, 2000.
[2/] Oregon Economic and Community Development Department, 2001; State unemployment rate is 6.3 percent.
[3/] Oregon Economic and Community Development Department, 1999.

The agricultural sector accounts for 14 percent of the region's employment and 11 percent of regional output. Umatilla and Morrow Counties rank third and eighth, respectively, among Oregon's counties in gross farm and ranch sales. Umatilla County generates $275.5 million in farm and ranch sales while Morrow County generates $146.5 million in farm and ranch sales.

Umatilla and Morrow Counties are the top potato and wheat producing counties in Oregon. Umatilla tops the State in hay production.

Alfalfa and grass hay production make up about half of the irrigated acres within the Federal boundary of Westland. Irrigated pasture and grain production account for another 20 percent. The remaining acres grow potatoes, corn, melons, peas, asparagus, beans, mint, and onions.

The cropping pattern on the lands outside the Federal project boundary, but inside the area proposed to be adjusted, are heavily weighted to high value crops. Potatoes make up about 50 percent of this production; peas, beans, and grass seed account for about 15 percent each. The remaining acres are planted in carrots, sweet corn, onions, asparagus, and grain.

Environmental Consequences

No Action Alternative

Cropping patterns are not anticipated to change in either the in-boundary or out-of-boundary areas under the No Action Alternative. However, the costs of production would increase from the current operation in some of the out-of-boundary areas (2,260 acres) as a result of selection of this alternative. Without McKay storage water, some growers would have to rely on more expensive groundwater. Depending on the location and pumping efficiency, costs for pumping canal water range from $35 to $45 per acre-foot; whereas, groundwater pumping costs range from $80 to $90 per acre-foot. Therefore, pumping costs may rise between $45 and $55 per acre-foot if McKay storage water is no longer available under the No Action Alternative. Electricity payments are made outside the area; therefore, higher electricity payments would/may affect the viability of the individual farming operations.

Higher pumping costs may cause some higher-valued crops to go out of production, due to the higher production costs. Well pumping restrictions may also lower the amount of water available, which may impact the number of acres that can be irrigated using groundwater.

Without providing supplemental water to the out-of-boundary land, the full water supply would be available within the federally recognized boundary. This additional water would extend the irrigation season by roughly 2 weeks. Extending the irrigation season may result in higher crop yields, raising the gross value of production.

These gross returns resulting from higher yields, however, may be offset by an increase in operation and maintenance costs. Currently, Westland receives payments from the out-of-boundary growers for operation and maintenance. Losing these payments would require the district to redistribute these costs to in-boundary growers.

Partial Adjustment Alternative

The economic impacts stemming from the Partial Adjustment Alternative would be slightly less than those described for the No Action Alternative, due to the addition of the category I and II lands. Costs of production would be slightly less, due to the availability of project surface water. Expanding the boundary to

include category I and II lands would also generate some revenue for operation and maintenance costs. This alternative may also extend the irrigation season, which may result in higher yields.

Full Adjustment Alternative

No changes from existing conditions in agricultural production are projected under the Full Adjustment Alternative. Compared to the No Action Alternative, however, pumping costs would be slightly lower, and the number of acres in production would be slightly higher. Lands currently farmed would remain in production. No new lands would be brought into production. Therefore, the Full Adjustment Alternative would have no impact on regional employment, sales, or income.

The hydrology model shows a decrease in river flows at Threemile Falls Dam (see tables 11, 17, and 18), which could reduce the amount of water available for diversion by West Extension to meet its demands. These impacts would occur during July, August, and the first half of September. This is the period when West Extension's demands cannot be met by either live flow diversion or exchange and must be augmented by other water supplies. Before July and by mid-September, flows are generally more than adequate in the Umatilla River to allow West Extension to meet its demands by exchange. Model results shown in table 18 show July reductions of 191 acre-feet, August reductions of 190 acre-feet and reductions for half of September of 68.5 acre-feet. Consequently, the Full Boundary Adjustment would reduce the amount of water available for diversion at Threemile Falls Dam by West Extension by about 450 acre-feet.

Westland will address this concern by obligating 500 acre-feet of McKay water as part of the proposed action for use by West Extension. Consequently, any potential impact to West Extension is alleviated. The 500 acre-feet accounts for conveyance losses from McKay to Threemile Falls Dam. Allocation and distribution of this water will comply with Oregon State Water laws.

Environmental Justice

Executive Order 12898 requires each Federal agency to consider environmental justice as part of its decisionmaking process by identifying and addressing disproportionately high adverse human health or environmental effects, including social and economic effects, of its programs and activities on minority populations and low-income populations of the United States.

Environmental justice ensures that Reclamation programs, policies, and activities affecting human health or the environment do not exclude minorities and low-income groups from participation in or the benefits of programs or activities based on race or economic status. The Environmental Protection Agency (EPA) defines environmental justice as "the fair treatment and meaningful involvement of all

people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies." (EPA, 2001)

Affected Environment

The area in and around Westland has a relatively small population of racial minorities (11 percent in Umatilla County, compared to 7 percent statewide). According to the 2000 Census, the Hispanic population (a minority ethnic group) in Umatilla County is 16 percent of the total population, compared to 8 percent for the State of Oregon. The Native American population for the county is 3 percent of the total population and 1 percent statewide (U.S. Census Bureau, 2000). The Umatilla Indian Reservation is located near Pendleton, Oregon, approximately 30 miles from Westland boundaries.

Estimated median household income for the Umatilla County in 1999 was $36,249 per year, compared to $40,916 for the State of Oregon (U.S. Census Bureau, 2000).

Environmental Consequences

When assessing the effects of each action alternative on minority and low income groups, considering the economic analysis, the effects to these groups are minimal and not disproportionate when compared to other groups.

As stated in the Hydrology and Fisheries sections, only minor changes in the hydrology occur upstream of Westland Diversion and downstream from Dillon Diversion as a result of the boundary adjustment. Therefore, there would be no adverse effect to subsistence fishing from either boundary adjustment alternative.

Indian Trust Assets

The United States has a trust obligation to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and EO. This section describes the Indian trust assets (ITA) as they occur in the project area and their consequences from the proposed action, if any.

Affected Environment

Indian Trust Assets are legal interests in property or rights held in trust by the Federal Government for federally recognized Indian tribes or individual Indians.

Trust status originates from rights imparted by treaty, statutes, or Executive orders. Examples of ITAs include lands, minerals, and hunting and fishing rights. A defining characteristic of an ITA is that an asset cannot be alienated, sold, leased, or used for easement without approval from the United States. The Umatilla and Columbia Rivers have been identified as a usual and accustomed (U&A) fishing site for the CTUIR. The CTUIR has identified the fishery and the instream flows that support that fishery in the Umatilla and Columbia Rivers as an ITA.

Environmental Consequences

ITAs would not be affected by implementation of this boundary adjustment. As discussed above under Hydrology and Fisheries, instream flows in the Umatilla River that support anadromous fish, catadromous fish (lamprey), and shellfish (mussels) would not be measurably affected by the proposed boundary adjustment nor would the habitat for these fish be adversely affected.

Indian Sacred Sites

Affected Environment

Executive Order (EO) 13007, Indian Sacred Sites (May 24, 1996), directs executive branch agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites on Federal lands. The agencies are further directed to ensure reasonable notice is provided of proposed land actions or policies that may restrict future access to or ceremonial use of, or adversely affect the physical integrity of, sacred sites. The EO defines a sacred site as a "specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion."

Environmental Consequences

Reclamation has no knowledge of any sacred sites on the private properties involved in this proposed action. Since there are no Federal lands involved in the proposed action, it would not affect the physical integrity of or limit access to any Indian sacred sites on Federal lands.

Cumulative Effects

The Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) implementing the procedural provisions of the National Environmental

Policy Act (NEPA), as amended (42 USC 4321 et seq.), define cumulative effects as follows: "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7).

A single project may have individually minor impacts; however, when considered together with other projects, the effects may be collectively significant. Therefore, a cumulative impact is the additive effect of all past, present, and reasonably foreseeable future actions in the local area.

Other Federal, State, and local projects not addressed in this environmental assessment (EA) may affect resources in the Umatilla basin. Not all of those affected resources would be affected by this proposed action. This section of the EA addresses the cumulative impacts to resources that could be affected by this proposed adjustment of Westland boundaries, streamflows, and fisheries.

Conservation Practices

In 1983, Westland implemented a water conservation program in cooperation with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) (formerly known as the Soil Conservation Service—SCS). That project involved the installation of an underground pressurized pipeline system, and resulted in a major savings of water. Some of the conserved water was sold to farmers who own land in areas considered outside of Westland's boundaries to augment their overall water supplies. The conservation activities reduced seepage from portions of Westland water conveyance system, which was expected to result in a change in diversions from, and return flows to, the Umatilla River (SCS, 1983).

The analysis completed for the original conservation project (SCS, 1983) did not assume that the conserved water would continue to be used either inside or outside of the Westland boundaries. To estimate the effects of this activity on riverflows, a preconservation scenario was constructed. This scenario is the No Action Alternative with the conveyance efficiencies for portions of Westland system returned to their preconservation levels. Comparing the preconservation conditions to the No Action Alternative isolates the effects of the conservation actions from the effects associated with a potential boundary adjustment. It identifies what effects the conservation project had, assuming the conserved water could be used inside the existing Westland boundaries. This is consistent with the No Action Alternative, which assumes that Westland continues to use its full water supply within the existing district boundaries. In comparing the No Action Alternative with the preconservation scenario, the model indicates an average annual impact of approximately 3,700 acre-feet as a result of the conservation project initiated in 1984. (See preconservation scenario attachment).

Slight impacts also occur in the reach above Westland's diversion dam under the pre-conservation scenario. Under that scenario, slightly higher flows occur throughout the summer as higher rates of diversion are needed to make onfarm deliveries with a less efficient carriage system. Consequently, under the pre-conservation scenario, McKay storage is used up sooner and late season flows, mostly in October, are lower in comparison to flows under No Action.

Hermiston Irrigation District (Hermiston) has proposed conservation measures within the district which would involve piping and lining canals that are currently open. The amount of conserved water, by Reclamation calculations, would be approximately 1,057 acre-feet per year, enough to irrigate about 175 acres of land. The conserved water would likely be used on current in-boundary lands to extend the irrigation season. According to Reclamation, calculations used in the recently completed Hermiston boundary adjustment (Reclamation, 2002a), it was estimated that applying water to lands inside the district from surface and storage supplies would reduce return flows to the river by about 2.8 acre-feet per acre. If the full 175 acres were irrigated, then return flows would be reduced by as much as 490 acre-feet. Averaged over an entire year, this would be about 0.7 cfs.

Exchange Program

The Umatilla Basin Project led to the implementation of a series of "water exchanges" (Phase I and Phase II). Through this project, Columbia River waters are pumped and delivered for use by three irrigation districts in exchange for allowing natural Umatilla River flows and McKay Reservoir releases (which they are entitled to divert) to remain instream for the benefit of anadromous fisheries. Up to an estimated annual average of 61,300 acre-feet of Columbia River water has been exchanged for Umatilla River water. These previously diverted Umatilla River waters are now jointly managed by ODFW, Reclamation, and the CTUIR for the benefit of the Umatilla River fishery.

Three districts participate in the exchange program—West Extension (Phase I), and Hermiston and Stanfield (Phase II). Westland is now working with Reclamation, the State of Oregon, the CTUIR, and other stakeholders in the Umatilla basin on the initial planning stages for the third and final phase of the exchange program. Under Phase III, Westland might replace all of its private Umatilla River water rights and McKay Reservoir water supply with Columbia River water. Overall, this exchange could increase instream fishery flows in the Umatilla River.

Exchange flows in the Umatilla River are protected from further diversion to the Columbia River. Protected flows are blocks of water released from McKay Reservoir specifically for fishery habitat needs or Umatilla River flows not diverted (foregone) by Stanfield, Hermiston, and West Extension. The Umatilla Basin Project Act of 1988 did not establish a separate instream flow right for fish, because this designation is under the authority of the State of Oregon. It only

allowed for the exchange of McKay Reservoir water or water that carries senior live flow rights.

Through the 1988 Act, target instream flows for the Umatilla River were established. Target flows for the Umatilla River were developed by the CTUIR and the ODFW and are defined as streamflows to provide adequate migration conditions and habitat for anadromous fish runs. Flow targets for the lower 50 miles of the Umatilla River range from 250-300 cfs from August 16 to June 30 of each year (see table 27). The flows are adaptively managed by ODFW and the CTUIR and are subject to modifications. ODFW and the CTUIR have varied flow strategies for reaches of the Umatilla River in regard to fish passage. The river reach below the Dillon Ditch Diversion (as measured at the Dillon [UMDO] gauging station near RM 24) has been allowed to drop below target flows (250 to 300 cfs) if there is not adequate exchange water available for supplementation. The flows below Threemile Falls Dam are generally maintained at or above target.

Table 27.—Current Umatilla Basin Project target flows, McKay Creek to mouth

Period	Target flow (cfs)
October 1 to November 15	300
November 16 to June 30	250
July 1 to September 15	0
September 16 to September 30	250

Target flows (see table 27) are not in effect from July 1 to September 15 each year, although water exchanges do occur with West Extension up to mid-July and after mid-August. Between July 1 and August 15, West Extension diverts the entire natural flow (up to its water right amount) of the Umatilla River at Threemile Falls Dam, as target flows currently are zero. In July and August of 2000, ODFW and the CTUIR experimented with 50 cfs of McKay Reservoir water releases in an effort to restore a perennial flow in the lower Umatilla River. Additionally, during the July 1 to September 15 time period each year, McKay Reservoir releases for Westland provide instream flows from the reservoir to Westland's diversion point.

The Umatilla Basin Project Act has increased instream fishery flows in the Umatilla River. Effects of the exchange are illustrated in figure 8. Before the exchange, the average daily flow at the gauging station at Umatilla, Oregon, from March 1982 through September 1992 (pre-Phase I and II) was 500 cfs per day. Once Phase I and II of the exchange were in effect—for the period March 1993 (date that Phase I started) through September 2000—the average daily flow was 690 cfs per day. The data show that the flows below Threemile Falls Dam were higher after the Columbia River Pump Exchange went into effect.

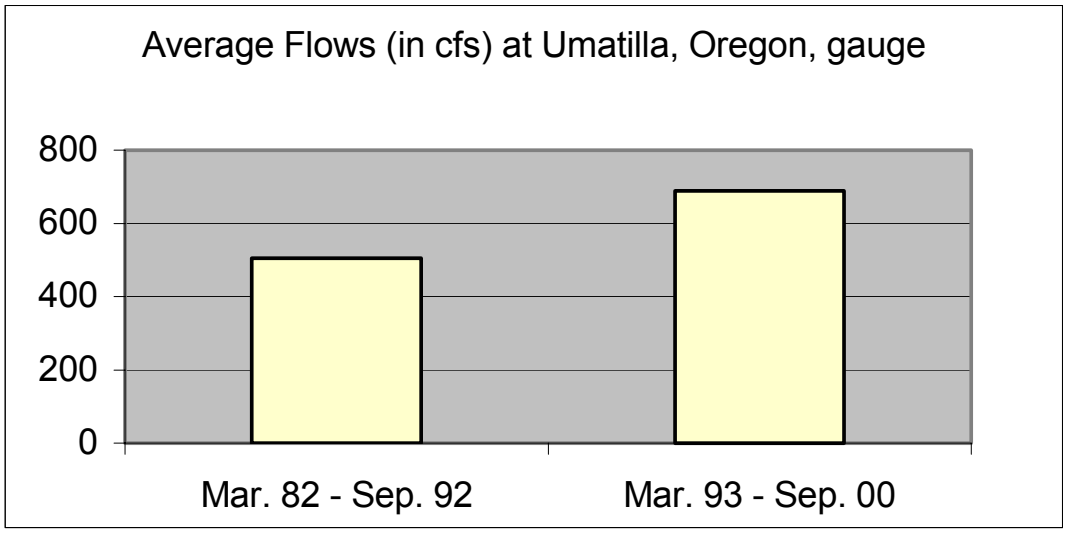

Figure 8.—Comparison of flows before and after pump exchange.

Boundary Adjustments

In 1993, Reclamation entered into a memorandum of agreement (MOA) with the CTUIR and others concerning implementation of Phase II of the Umatilla Basin Project and the boundary adjustment process. As part of that agreement, Reclamation agreed that it would "approve no boundary expansion that would cause a net adverse effect on flows needed for the fishery." That MOA is still in force, and Reclamation will continue to abide by its commitment. In 1993, Westland and the CTUIR entered into a similar MOA addressing boundary adjustment and Umatilla Basin Project implementation issues. The CTUIR and Westland adopted an April 29, 2003, MOA that builds upon and supersedes the provisions of the 1993 MOA.

Under Reclamation's analysis, each individual boundary adjustment, if approved, would have no net adverse impact on flows needed for the Umatilla River fishery. This may require modification of the boundary adjustment proposals or mitigation, as included in this proposal, if adverse impacts are identified. From a cumulative impacts standpoint, however, if each approved boundary adjustment has no net adverse impact, then there would be no cumulative impacts associated with the approved adjustments. Essentially, if the individual actions have no impact, then the sum of those actions also has no impact.

Two other districts in the project—Hermiston and Stanfield—have already adjusted their federally recognized boundaries. Impacts to the Umatilla River are negated by mitigation. When combined with the boundary adjustment for Westland, there is no net adverse effect to the Umatilla River (Reclamation, 2002a, 2002b).

West Extension has also proposed to adjust their boundaries. If approved by Reclamation, this boundary adjustment would involve diversions from three points: Threemile Falls Dam on the Umatilla River; the West Extension Columbia River pump station in the John Day pool at the mouth of the Umatilla River; and the McNary Dam diversion for the Phase I exchange. For West Extension, the adjustment would involve an estimated 6,000 acres of land, 3,000 acres of which have been irrigated since 1968 and 3,000 acres planned for future irrigation with nonproject water supplies diverted at Threemile Falls Dam and the West Extension Columbia River Pumping Plant. Under the West Extension boundary adjustment, the nonproject water supplies would become project water supplies "co-owned" by West Extension and Reclamation. The boundary adjustment would bring the lands now served by the nonproject supplies into the West Extension and service them with the supplies they currently receive. As a result of the adjustment, the total acreage served and the total amount of water diverted would not change from current conditions. Consequently, diversions from the Umatilla River and return flows to the Columbia River would not change.

West Extension has also indicated that, as part of the boundary adjustment proposal, it would be willing to limit its use of the Columbia River pumping plant at the mouth of the Umatilla River. Concerns have been raised over the adequacy of the existing fish screens at the plant and potential impacts of the plant on juvenile anadromous fish. Restricting the use of the plant as part of the boundary adjustment actions would potentially benefit fish in that area.

Additionally, West Extension has asked that new lands be included into the district which currently do not receive either project or nonproject water from West Extension ID. If the adjustment were approved, these lands could only receive water from West Extension if an equal amount of land receiving project supplies was removed from West Extension ID. Because no additional lands would be served by this portion of the West Extension boundary adjustment proposal, the analysis may show no effect to Umatilla River diversions or Columbia River return flows.

Chapter 4

Consultation and Coordination

This chapter includes information on public involvement activities and coordination with State and Federal agencies, Native American Tribes, and private organizations that have occurred to date, including future actions that will occur during the processing of this document.

Public Involvement

Public involvement is a process in which interested and affected individuals, organizations, agencies, and governmental entities are consulted and included in Reclamation's decisionmaking process. Reclamation solicited responses regarding the public's needs, values, and evaluations of the proposed alternatives when the boundary adjustments were considered in 1993. Both formal and informal input have been encouraged and used in the preparation of this environmental assessment. This section on public involvement also serves as the public involvement summary report for this proposed action.

Scoping, as defined in the CEQ regulations of 1978, is "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." The scoping process helps to:

- Identify issues, concerns, and possible impacts
- Identify existing information sources
- Develop alternatives

Public scoping meetings were held in November 1993 and January 1994 in the Hermiston-Pendleton area to address proposed boundary adjustments by all the irrigation districts in the Umatilla Project. Approximately 57 comments were received from public scoping. These comments addressed the Umatilla Project boundary adjustment in general, not specifically Westland Irrigation District. The comments received were divided into various categories—water resource issues, general issues and concerns, fisheries issues, land use issues, suggestions for alternative analysis and mitigating measures, and other related comments. In the interim, many of the concerns in 1993 and 1994 have been resolved by other actions of the Umatilla Basin Project. Remaining relevant issues were considered in the resource sections of this environmental assessment (EA).

Reclamation staff met with Westland and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) staffs in various individual meetings to discuss the proposal.

The draft EA was circulated for a 30-day public review and comment period. All public comments received were reviewed and considered during preparation of this final EA.

Cooperating Agencies

The cooperation between Reclamation, Westland, and the CTUIR should be acknowledged. This collaborative effort to prepare an environmental assessment exemplifies teamwork and the ability of parties with dissimilar viewpoints to get along and work together.

By letter dated March 13, 2003, Reclamation invited the Confederated Tribes of the Umatilla Indian Reservation, Morrow County Board of Commissioners, Umatilla County Board of Commissioners, and Environmental Protection Agency Region 10 to participate as cooperating agencies for the Westland Irrigation District Boundary Adjustment, Umatilla Project, Oregon, Environmental Impact Statement (EIS). The role of cooperating agency was identified as reviewing the administrative drafts of the EIS and providing comments in their areas of expertise and/or authority. A copy of the draft 16-month schedule for completing the EIS was included. A response to the invitation was requested by April 14, 2003.

The Umatilla County Board of Commissioners advised Reclamation that it would participate as a cooperating agency, by letter dated March 27, 2003. The CTUIR advised Reclamation, by letter dated March 21, 2003, it would participate as a cooperating agency. Environmental Protection Agency (EPA) Region 10 informally advised Reclamation it would not participate as a cooperating agency. No response was received from the Morrow County Board of Commissioners. During the summer 2003, Reclamation decided to prepare an environmental assessment and continued the relationship with the cooperating agencies.

A copy of the administrative draft EA was provided to the CTUIR and Umatilla County Board of Commissioners for review and comment by letter dated August 29, 2003. Comments were requested to be provided to Reclamation by September 19, 2003.

Following the administrative draft review, Reclamation received comments from Westland, Bureau of Indian Affairs contractor Natural Resource Consulting Engineers, CTUIR, and Umatilla County Board of Commissioners. As a result of these comments, in cooperation with the Oregon State Water Resources Department, changes were made to the acres of lands in the various water source

categories. The model was then run and changes were made to the appropriate parts of the document.

The Bureau of Indian Affairs contributed in the analysis of the RiverWare model.

Agency Consultation and Coordination

Endangered Species Act, Section 7

Informal consultations under Section 7 of Endangered Species Act (ESA) have been completed with U.S. Fish and Wildlife Service (FWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries for the proposed action, and each agency has concurred with Reclamation's determination.

On March 12, 2003, Reclamation sent the FWS and NOAA Fisheries a letter requesting information on ESA listed species within the project area.

On April 4, 2003, FWS sent a list (see table 25 in chapter 3) of ESA listed species that may be present in the project area.

On April 8, 2003, NOAA Fisheries responded and provided a list of those ESA-listed species in the State under their jurisdiction, identified one federally listed species (Middle Columbia River steelhead) that may be present in the project area, and identified essential fish habitat in the project area per the Magnuson-Stevens Fishery Conservation and Management Act (see chapter 3).

In a letter dated March 25, 2004, the FWS concurred with Reclamation's finding that the Full Boundary Adjustment alternative was not likely to adversely affect listed species under its jurisdiction. NOAA Fisheries concurred in a letter dated June 4, 2004.

National Historic Preservation Act Consultation and Native American Graves Protection and Repatriation Act

The National Historic Preservation Act of 1966 (NHPA) (as amended in 1992) requires that Federal agencies consider the effects that their projects have upon historic properties. Section 106 of this act and its implementing regulations (36 CR Part 800) provide procedures that Federal agencies must follow to comply with NHPA on specific undertakings. Other Federal legislation further promotes and requires the protection of historic and archeological resources by the Federal Government. Among these laws are the Archeological Resources Protection Act of 1979 and the Native American Graves Protection and Repatriation Act of 1990.

To comply with Section 106 of NHPA, Federal agencies must consult with the State Historic Preservation Officer (SHPO), Native American tribes with a traditional or religious interest in the study area, and the interested public.

Federal agencies must show that a good faith effort has been made to identify historic properties in the area of potential effect for a project. The significance of historic properties must be evaluated, the effect of the project on the historic properties must be determined, and the Federal agency must mitigate adverse effects the project may cause on major resources.

Reclamation staff met with SHPO and the CTUIR on separate occasions in July 2003. Known historic properties and probable impacts are described under "Historic Properties" in chapter 3. The proposed boundary adjustments, under all alternatives, would not increase the amount of water currently diverted by Westland. Therefore, Reclamation believes that no alternative, including the No Action Alternative, would affect known cultural properties. The Oregon State Historic Preservation Office has concurred with Reclamation's assessment in a June 18, 2003, letter. The CTUIR's cultural resource representative tentatively concurred with this assessment.

Executive Orders and Other Guidelines

Executive Order (EO) 11990 requires minimization of the destruction, loss, or degradation of wetlands and preservation and enhancement of the natural and beneficial values of wetlands. Wetlands are recognized as an important wildlife habitat resource. EO 11990 also requires public disclosure of project effects on wetlands. This EA provides that disclosure and solicits public responses concerning wetland impacts.

Executive Order 13007, Indian Sacred Sites, is discussed in chapter 3 under "Indian Sacred Sites." Reclamation has no knowledge of any sacred sites on the private properties involved in this proposed action.

Executive Order 12898 established environmental justice as a Federal agency priority to ensure that minority and low-income groups are not disproportionately adversely affected by Federal actions. Minority and low-income groups would not be disproportionately affected by the proposed action.

Indian trust assets (ITA) policy was authorized under 64 Stat. 1262, issued in Secretarial Order 3175, and incorporated into the Departmental Manual at 512 DM 2. It has been determined that ITA would not be affected in the study area.

Distribution List

This final environmental assessment is being sent to the following agencies, groups, and individuals for their information and review. Those marked with an asterisk (*) commented on the draft.

All locations are in the State of Oregon unless otherwise noted.

Congressional—Federal

Senator Gordon Smith, Pendleton
Senator Ron Wyden, La Grande
Representative Greg Walden, District 2, Bend

Congressional—State

Senator David Nelson, District 29, Pendleton
Representative Bob Jensen, District 58, Pendleton
Representative Greg Smith, District 57, Heppner

Tribe

*Confederated Tribes of the Umatilla Indian Reservation, Mission

Federal Agencies

Department of Commerce
    National Marine Fisheries Service/NOAA Fisheries, Portland
Department of Energy
    Bonneville Power Administration, Portland
Department of the Interior
    *Bureau of Indian Affairs, Portland
    Fish and Wildlife Service, La Grande

State and Local Government Agencies

State of Oregon
- Department of Environmental Quality, Pendleton
- Department of Fish and Wildlife, Pendleton
- Parks and Recreation Department
  - State Historic Preservation Office, Salem
- Water Resources Department, Pendleton

Morrow County
- Board of Commissioners, Heppner
- *County Court, Heppner

Umatilla County
- Board of County Commissioners, Pendleton

Irrigation Districts

Hermiston Irrigation District, Hermiston
Stanfield Irrigation District, Stanfield
*West Extension Irrigation District, Irrigon
*Westland Irrigation District, Hermiston

Libraries

Hermiston Public Library, Hermiston
Pendleton Public Library, Pendleton
Stanfield Public Library, Stanfield

Interested Entities and Individuals

Dadoly, John P., Pendleton
Fredericks, Pelcyger, and Hester, Louisville, Colorado
Greenwalt, Larry, Umatilla
Natural Resources Consulting Engineers, Fort Collins, Colorado
Pacific Comm, Portland
Principals Group, Portland
Reuter, Robert, Hermiston
*Strebin Farms, Inc., Irrigon
WaterWatch of Oregon, Portland