RECLAMATION

Managing Water in the West

Proposed Boundary Adjustment Westland Irrigation District, Umatilla Project, Oregon

Final Environmental Assessment and Finding of No Significant Impact

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Lower Columbia Area Office
Portland, Oregon

June 2004

Proposed Boundary Adjustment Westland Irrigation District, Umatilla Project, Oregon

Final Environmental Assessment and Finding of No Significant Impact

U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Lower Columbia Area Office
Portland, Oregon

June 2004

MISSION STATEMENTS

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

FINDING OF NO SIGNIFICANT IMPACT
Westland Irrigation District Boundary Adjustment
PN-FONSI-04-07

Introduction

The Bureau of Reclamation (Reclamation) has prepared an Environmental Assessment (EA) for adjusting the federally recognized boundaries of the Westland Irrigation District (Westland). This adjustment would include lands that Westland has irrigated in past years under a series of Temporary Water Service Contracts (TWSC) with Reclamation. The lands included in Westland's petition for boundary adjustment are all currently farmed and irrigated.

The requested boundary adjustment would not increase the amount of irrigated land nor the quantity of water available for diversion by Westland. Diversions quantities used in the analysis included Westland's historic live flow and McKay Reservoir storage diversions which included all diversions made under Westland's existing Federal contract.

The lands to be included within the Federal boundaries are lands identified as Category I, II, and III lands. By definition, Category I lands are lands with primary (decreed or permitted) and secondary (McKay Reservoir permit 7400) water rights which are being assessed but which the districts report were inadvertently omitted from the district boundaries. Category II lands are lands outside the district boundaries to which water rights were transferred, pursuant to Oregon law, from lands which were included within the district boundaries. Category III lands are lands which have water delivery contracts with the irrigation district and which lie outside the district boundaries.

Alternatives Considered

Three alternatives were developed and evaluated in the Draft and Final EAs: No Action (as required by the National Environmental Policy Act), Full Boundary Adjustment, and Partial Boundary Adjustment. The Full Boundary Adjustment Alternative provided for the full 10,337.8 acre adjustment requested by Westland while the Partial Adjustment Alternative considered only 1,482.3 acres to be included into the district boundaries.

The Recommended Alternative

Reclamation has selected the Full Boundary Adjustment as the recommended alternative for implementation.

Proposal

Reclamation proposes to adjust the federally recognized boundaries of Westland to include the Category I, II, and III lands. This proposal would adjust Westland boundaries to allow for McKay water service by Westland to an additional 10,337.8 acres; of which only 5,759 acres of Category III lands would be eligible to receive McKay water in any given irrigation season. This action will bring the total amount of land eligible to receive McKay water in Westland to about 17,774 acres; of which only 14,680 acres would actually receive McKay water in any given year. The proposal would adjust the federally recognized boundaries to make them consistent with the State boundaries.

Consultation, Coordination, and Public Involvement

Reclamation found that the proposed action may affect, but was not likely to adversely affect species listed under the Endangered Species Act (ESA). Informal consultations under Section 7 of the ESA have been completed with the U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration (NOAA)-Fisheries for the proposed action, and each agency has concurred with Reclamation's determination.

Public scoping meetings, held in November of 1993 and January of 1994, addressed proposed boundary adjustments by all the irrigation districts in the Umatilla Project. Approximately 57 comments were received from the public scoping meetings. The comments received were broken down 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. These issues were considered in the analysis sections of the Draft and Final EAs.

Reclamation staff also met with Westland, Oregon Water Resources, Bureau of Indian Affairs, and Confederated Tribes of the Umatilla Indian Reservation (CTUIR) staffs in various individual meetings to discuss the proposed project.

Summary of Significant Review Comments and Reclamations Responses

The significant review comments are summarized below along with Reclamation's responses.

Comment:

> What effect does the irrigation of these additional lands have on the West Extension Irrigation District?

Response:

The RiverWare model identified an effect on the West Extension Irrigation District (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 Extention 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.

Comment:

The proposed mitigation/enhancement allows for water to stay in McKay Reservoir and be available for fisheries. Why isn't this water available to West Extension Irrigation District?

Response:

Based on RiverWare model results, 895 acre-feet of water is being provided as mitigation to instream flow impacts. Westland has also committed to the CTUIR that they will provide an additional 605 acre-feet of water from their McKay allocation as a fishery enhancement measure. Both quantities of water 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.

Comment:

With projected lower flows in September above Westland's diversion dam, the amount of suitable habitat area would be reduced from both a temperature and wetted-area perspective.

Response:

Irrigation releases under the Full Boundary Adjustment alternative would cease in the last week of September, potentially reducing flows above Westland's diversion dam compared to the No Action alternative, under which releases for irrigation continue until early October. Storage releases from McKay for instream flow purposes, however, are already underway by the last week of September. Consequently, releases for irrigation and releases for instream flows overlap by several days which ensures that the cessation of irrigation releases doesn't result in changes to suitable habitat. In 2003, when this overlap occurred, releases from McKay Reservoir rose in the period of overlap from about 80- 130 cfs to around 200 cfs and then fell to around 150 cfs when irrigation releases ceased. The instream flow releases are made in September to augment flows all the way to the mouth of the river.

Comment:

Since fish augmentation water must be released during this period to maintain rearing habitat, this water is unavailable to fish when they need it during passage periods, which causes lower flows during spring and/or fall fish migration.

Response:

The fish augmentation water, to maintain rearing habitat, would not need to be released until after McKay Reservoir releases for Westland end. In the past Westland has foregone use of up to about 6,300 acre-feet of McKay storage water as mitigation under the Temporary Water Service Contracts (TWSC). Because of that mitigation commitment, Westland has not had enough water to irrigate past the middle of September. The fish augmentation water has been used by fisheries managers after Westland had stopped irrigating but before McKay releases were needed to augment flows for fish migration. With Westland providing 1,500 acre-feet of water for instream flow augmentation, 895 acre-feet as mitigation for the boundary adjustment and, as an additional commitment to the CTUIR, 605 acre-feet as a fishery enhancement measure, instead of 6,300 acre-feet, they can continue to divert water into the latter part of September. Consequently, storage releases to augment flows for fish migration will already be underway before Westland stops irrigating, so releases to maintain habitat conditions above Westland's diversion dam wouldn't be needed.

Comment:

Page 8 – Provides that "[c]ategory III are lands that lie outside Westland's boundaries and consist of 8,855.5 acres of which 5,759 would be irrigated in any given year." The Draft EA, however, does not provide any discussion of how the BOR intends to monitor this and similar limitations on water use provided in the document, how will the agency assure that these limitations are carried out?

Response:

Since 2001, Reclamation has implemented an effort to identify unauthorized use by implementing a district review process. In implementing this review process, Reclamation has committed to periodic on-site reviews to determine whether the annual use of water is in accordance with existing contract terms. During these reviews, Reclamation staff will travel to the irrigation district office to make an onsite review of a number of items related to the use of project water, including the acres of lands served, water delivery records and water-master records. If it is found that the district is not complying with the contract terms, then Reclamation will advise the district of the actions required to bring them into compliance.

Findings

Based on the environmental analysis presented in the Final EA and the comments received from the Draft EA, Reclamation concludes that implementation of the preferred action and associated environmental commitments would have no significant impact on the quality of the human environment or the natural resources in the affected area. With respect to the most significant issue, impacts to Umatilla River stream flows, the average impacts, as determined by the RiverWare model on an annual basis are about 895 acre-feet. To address that impact Westland will provide 895 acre-feet from McKay Reservoir to augment instream flows for fish. Westland has also committed to the CTUIR that they will provide an additional 605 acre-feet of water from their McKay allocation as a fishery enhancement measure. This water will be managed by both the CTUIR and Oregon Department of Fish and Wildlife for anadromous species.

Impacts demonstrated by the Riverware model runs to return flow indicate that during the months of July, August to mid-September, irrigation supplies are reduced by about 450 acre feet. Westland will address this concern by obligating 500 acre-feet of McKay Reservoir water for release during the July through mid-September period to eliminate the impact to return flows. 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.

This Finding of No Significant Impact has therefore been prepared and submitted to document the environmental review and evaluation accomplished by the Final EA in compliance with the National Environmental Policy Act of 1969, as amended.

The EA is available at (http://www.usbr.gov/pn/).

Recommended:

Upper Columbia Area Environmental Manager — Date: JUN 07 2004

Concurred:

Lower Columbia Office Area Manager — Date: JUN 07 2004

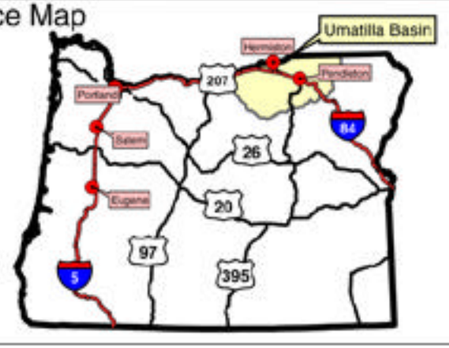
Approved:

Regional Director, Pacific Northwest Region — Date: JUN 07 2004

Proposed Boundary Adjustments, Westland Irrigation District, Umatilla Project, OR

Columbia River
RM 290
RM 300
730
37
206
395
84
82
Umatilla
Irrigon
UMAO
Threemile Falls Dam
Hermiston North
Hermiston South
Bridge Road Springs 1, 2, 3
Maxwell
Hermiston
UMIO
Minahaha Springs
RM 10
Courtney
Maxwell Canal
W Dillon
E Dillon
Umatilla River
RM 20
Stanfield
Stanfield
Pomeroy
UMDO
Dillon Dam
Echo
UMUC
Westland Dam
Feed Canal Dam
RM 30
Stanfield Dam
YOKO
RM 40
Cold Springs Reservoir
Birch Creek
RM 43
Pendleton
MCKO
McKay Dam
MORROW
UMATILLA
Butter Creek

Reference Map



0 0.5 1 2 3 4 5 6 7 8 Miles
0 1 2 4 6 8 10 12 Kilometers
1:160,000

Legend

- HydroMet Stations
- River Mile Markers
- Water Bodies
- Drains and Inflows
- County Boundaries
- Township and Range
- Fish Ladders
- Interstates and Highways
- Category I & II Lands
- Diversions
- Rivers, Streams, Creeks
- Category III Lands
- Canals, Ditches
- Westland Irrigation District
- McKay Dam
- Umatilla River

Contents

Tables

Figures

Acronyms and Abbreviations

APE	Area of potential effect
CADSWES	Center for Advanced Decision Support for Water and Environmental Systems
CEQ	Council on Environmental Quality
cfs	Cubic feet per second
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
EA	Environmental assessment
EIS	Environmental impact statement
EO	Executive order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FCRPS	Federal Columbia River Power System
ID	Irrigation district
ITA	Indian trust assets
Kaf	Thousand acre-feet
MCR	Middle Columbia River
MOA	Memorandum of agreement
MYKO	McKay Creek above McKay Reservoir
NEPA	National Environmental Policy Act of 1967
NHPA	National Historic Preservation Act of 1966
NMFS	National Marine Fisheries Service (now NOAA Fisheries)
NMI	No measurable impact
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OB	Out of boundary
ODFW	Oregon Department of Fish and Wildlife
OWQI	Oregon Water Quality Index
PDTO	Umatilla River at Pendleton
Project	Umatilla Basin Project

Reclamation	Bureau of Reclamation
RM	River mile
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCS	Soil Conservation Service (now NRCS)
SHPO	State Historic Preservation Officer
TMDL	Total maximum daily load
TWSC	Temporary water service contracts
UMAO	Umatilla River at Umatilla
UMUO	Umatilla River below Feed Diversion
UMDO	Umatilla River below Dillon Diversion
USDA	U.S. Department of Agriculture
FWS	U.S. Fish and Wildlife Service
Westland	Westland Irrigation District
YOKO	Umatilla River at Yoakum

Summary

The Westland Irrigation District (Westland) has requested that the Bureau of Reclamation (Reclamation) adjust its federally recognized irrigation district boundaries. This adjustment would include lands that Westland has irrigated in past years under a series of temporary water service contracts (TWSC) with Reclamation. The lands proposed for inclusion are all currently farmed and irrigated. The requested boundary adjustment would not increase the amount of irrigated land in the basin, nor the water quantity diverted by Westland. Westland is located in north-central Oregon, predominantly in Umatilla County.

Purpose of and Need for Action

Reclamation proposes to respond to Westland's request to adjust its federally recognized boundaries to include up to 10,338 acres of currently irrigated land. This action would eliminate the need for future TWSCs.

Authorization

A standard paragraph of Westland's 1949 Repayment Contract (Contract No. Ilr-1550, dated November 18, 1949) with Reclamation provided that the boundaries of the irrigation district may be modified upon approval of the Secretary of the Interior.

Alternatives

No Action Alternative

The irrigation district boundaries would remain as they are, and Reclamation would not provide federally allocated Umatilla Project (Project) water to lands outside the currently recognized irrigation district boundaries. Temporary water service contracts for Project water deliveries to out-of-boundary lands would no longer be issued.

Partial Adjustment Alternative

Under this alternative, Westland's boundaries would be adjusted to include category I and category II lands, which would increase Westland's size by 1,482.3 acres. Category I lands are lands with primary (decreed or permitted) and secondary (McKay Reservoir certificate 79439) water rights which are being assessed, but which were inadvertently omitted from the district boundaries. Category II lands are lands outside the district boundaries to which water rights were transferred, pursuant to Oregon law, from lands which were included within the district boundaries. The full water supply would be used on the current and adjusted boundaries. To adjust Westland's boundaries under this alternative would require a supplement to their 1949 Amendatory Contract with the United States. Water use would need to comply with the terms of the amended contract and State water law.

Full Adjustment Alternative

Under this alternative, Reclamation would fully implement a district boundary adjustment for category I, II, and III irrigated lands. Category III lands are lands that lie outside Westland's boundaries, and consist of 8,855.5 acres of which 5,759 would be irrigated in any given year. The total adjustment under this alternative would be up to 10,338 acres. To adjust Westland's boundaries under this alternative would require a supplement to their 1949 Amendatory Contract with the United States. Water use would need to comply with the terms of the amended contract and State water law. The alternatives are summarized in table S-1 on the next page.

Summary Comparison of the Environmental Impacts of the Alternatives

For this evaluation, a hydrologic model was developed for the lower Umatilla River. The model was used to estimate the hydrologic impacts of using a portion of Westland's McKay Reservoir storage on lands currently outside of its federally recognized boundary. The estimated flows for the lower Umatilla River, generated by the model, formed the basis for the analysis.

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.

Table S-1.—Features of the alternatives

Description (irrigated acreage)	Alternatives			
	No Action	Partial Adjustment	Full Adjustment Irrigated	Total
Current Westland boundary (acres)	7,437	7,437	7,437	7,437.0
Category I Category II		398.4 1,083.9 1,482.3	1,482.3	398.4 1,083.9 1,482.3
Category III (total acres) (irrigated acres from storage)			5,759 [1/]	8,855.5
Total additional acres Total irrigated acres from storage Total Westland acres	7,437 7,437	1,482.3 8,919.3 8,919.3	7,241.3 14,680	10,337.8 17,774.8
Water use	Not outside current Federal boundary; no temporary water contracts	Full water use on current and adjusted lands	Full water use on current and adjusted lands	
Description of change	Cease issuance of temporary contracts for Project water delivery to out-of-district lands	Would correct past administrative oversights of lands not included that district claimed were transferred and inadvertently omitted	Includes all lands that currently have a temporary water service contract to receive Project water	

[1/] Of 8,855.5 acres of category III lands, 5,759 acres are to be provided storage water and included in the adjustment in any given year.

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 Irrigation District (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.

Therefore, the analysis of the hydrology has determined that no major impacts would occur from implementation of either the Partial Adjustment or Full Adjustment Alternatives. Because the hydrology impacts are minor, any other resource that depends upon hydrology also would be minor.

Chapter 1

Purpose and Need

The Westland Irrigation District (Westland) has requested that the Bureau of Reclamation (Reclamation) adjust its federally recognized irrigation district boundaries. This adjustment would include lands that Westland has irrigated in past years under a series of temporary water service contracts (TWSC) with Reclamation. This chapter outlines the purpose and need for action, the description of the general area, history and background, the authorization, relationship to other projects in the area, and scoping process and issues. The lands included in Westland's petition for boundary adjustment are all currently farmed and irrigated. The requested boundary adjustment would not increase the amount of irrigated land in the basin, nor the water quantity diverted by Westland.

Purpose of and Need for Action

Reclamation proposes to respond to Westland's 1993 request to adjust its federally recognized boundaries to include up to 10,338 acres of currently irrigated land. The Secretary of the Interior will decide whether to adjust the boundaries to include any or all of these previously irrigated lands. An affirmative decision would allow lands to be added to the Westland boundaries and allow Westland to continue irrigating those lands. This action would eliminate the need for future TWSCs.

General Description of the Area

Westland is located in north-central Oregon, predominantly in Umatilla County. Umatilla County has a semi-arid climate with dry, warm summers and moderately cold winters. This climate supports shrub-steppe plant communities in the undisturbed areas. The topography is gently rolling hills and plateaus. The soil is sandy loam, is generally free from alkali, and has little hardpan. It is well suited to growing alfalfa, asparagus, beans, corn, grass hay, melons, mint, onions, peas, potatoes, winter wheat, and produces excellent pasture. All the lands included in Westland's petition for boundary adjustment, which would be eligible to receive McKay Reservoir storage under the proposed boundary adjustment, are currently irrigated and farmed and have a State water right.

History and Background

Treaty of 1855

In 1855, the United States entered into a treaty with the Cayuse, Umatilla, and Walla Walla Tribes (now the Confederated Tribes of the Umatilla Indian Reservation—CTUIR). In this treaty, the CTUIR ceded title to the United States of 6.4 million acres of land in what is now the States of Oregon and Washington. It is the CTUIR's position that they explicitly reserved certain rights or privileges on the open and unclaimed ceded lands, specifically their fishing, hunting, and gathering rights and privileges, and implicitly reserved sufficient water instream to maintain the treaty-protected fishery. Their position is that these rights have a priority date of time immemorial for the instream flow water right to maintain the fishery.

Umatilla Project—1905 Authorization

The Umatilla Project, authorized in 1905 by the Secretary of the Interior, provides multipurpose benefits to the people of northeastern Oregon by providing for the storage and diversion of water from the Umatilla River for irrigation. The project has provided for agricultural development on 31,000 acres of land; important fish and wildlife habitat, including two national wildlife refuges; recreational opportunities; and provides flood control benefits. Four irrigation districts—Stanfield, Westland, Hermiston, and West Extension—are served by this project.

The four districts entered into separate water service and repayment contracts with the United States to repay a portion of the construction costs for the Federal facilities on the Umatilla Project. The most recent amendatory contracts for the Westland Irrigation District were approved in 1949 and the West Extension Irrigation District in 1954. Westland is a private irrigation district and has fully repaid its obligation to the U.S. for its share of costs associated with the Umatilla Project. The Stanfield and Hermiston Irrigation Districts had their contracts amended in 2003, adjusting their irrigation district boundaries. These contracts specify that only lands within the district boundaries can be irrigated with Federal water through Federal facilities. Incorporated into those contracts is language stating that any proposals to include additional lands or exclude lands already identified in the respective contracts must be approved by the Secretary of the Interior or his/her designee.

Umatilla Basin Project Act—1988 Authorization

In the 1980s, the State of Oregon, the U.S., the CTUIR, Umatilla Project irrigation districts, including Westland, and local officials initiated a collaborative effort to reintroduce extirpated salmon into the Umatilla River. This successful effort culminated with the passage of the historic 1988 Umatilla Basin Project Act (P.L. 100-557).

The Act authorized construction of the Umatilla Basin Project (Project) to restore anadromous fishery resources in the Umatilla basin and continue water service to the districts. The Act authorized construction of new fish ladders and protective screens at major irrigation diversion sites, and provided for construction of water exchange facilities (Phases I and II) to deliver irrigation replacement water from the Columbia River to three of the four irrigation districts that make up the Umatilla Basin Project in exchange for foregone diversions of Umatilla River waters that could be diverted. The only Project irrigation district not involved in the exchange is Westland.

Under the exchanges, 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 to benefit anadromous fisheries. Up to an estimated annual average of 61,300 acre-feet of irrigation exchange water could be pumped from the Columbia River. An equivalent amount of exchange water could be used to supplement live flows or McKay reservoir releases to benefit the Umatilla River's fishery. The Project is helping to satisfy objectives of the CTUIR to restore salmon and steelhead runs in the Umatilla River to desirable levels.

Operation and Location of Facilities

The Umatilla Project consists of McKay Dam and Reservoir near Pendleton, Oregon (which provides storage capacity to the privately constructed Westland and Stanfield Irrigation Districts), and Cold Springs Reservoir, an offstream storage facility near Hermiston, Oregon. McKay Dam is on McKay Creek, about 6 miles south of Pendleton, Oregon, and about 6 miles above the confluence of McKay Creek with the Umatilla River. Additional Project facilities include the diversion and delivery facilities for the Hermiston and West Extension Irrigation Districts. Other Project facilities include canals, pipelines, and pumping plants built as part of the Umatilla Basin Project to facilitate the water exchanges.

Westland diverts water from the Umatilla River into the Westland Main Canal at the Westland Diversion Dam, located 1 mile south of Echo and 1 mile downstream from Hermiston Irrigation District's Feed Canal Diversion Dam. The Westland Main Canal and Diversion Dam are privately owned and are not Project facilities. Westland also diverts water released from McKay Reservoir at its diversion dam. This federally supplied water is delivered to lands within the current district boundaries, as well as to lands covered by TWSCs discussed below. Currently, Westland diverts about 55,000 acre-feet for delivery to district patrons. Westland also delivers an additional water supply to private ditch companies and individual water right holders.

Lands Authorized for Water Delivery from the Umatilla Project and the Temporary Water Service Contracts

During development of the Umatilla Basin Project Act, it became apparent that some of the Project districts were delivering water outside of their federally recognized district boundaries without proper authorization. In late 1991, Reclamation notified Westland that they could not provide any Federal Project water, through federally constructed facilities, to any lands outside the official federally established district boundaries after the 1992 irrigation season. In 1993, Westland and the CTUIR entered into a memorandum of agreement (MOA) which allowed for the continued irrigation of these lands in exchange for an interim, but higher, instream flow release as mitigation for potential return flow impacts. (On April 29, 2003, a memorandum of agreement was signed between Westland and the CTUIR, which replaced the 1993 MOA.)

Starting in 1995, Reclamation has required Westland to provide data on the amount of project water delivered to out-of-boundary lands and authorized that delivery through TWSCs. In the development of the TWSCs, Westland, the Natural Resources Department of the CTUIR, and Reclamation cooperated to provide temporary water for irrigation of the specified out-of-boundary land while facilitating water delivery for fish flows. All of the lands irrigated by Westland, including the out-of-boundary lands, are classified as irrigable by Reclamation and have a certified water right under Oregon law.

Except for rights temporarily provided by the State of Oregon, the proposed action will not address the issue of past State water rights or create any new rights or obligations.

Authorization

A standard paragraph of Westland's 1949 Repayment Contract (Contract No. Ilr-1550, dated November 18, 1949) with Reclamation provided that the boundaries of the irrigation district may be modified upon approval of the Secretary of the Interior.

Relationship to Other Projects and Activities

A Planning Report-Final Environmental Statement for the Umatilla Basin Project Act was prepared in 1988. It includes the analysis for a large pumping complex on the Columbia River that would supply irrigators within the existing Umatilla Project with exchange water so that flows now diverted from the Umatilla River for irrigation could remain in the river to enhance flows for salmon and steelhead migration, spawning, and rearing.

Various Categorical Exclusion Checklists were prepared for TWSCs between 1995 and 2003. These TWSCs allowed Westland to irrigate those lands outside of the Federal boundaries until National Environmental Policy Act (NEPA) compliance was complete on the boundary adjustment.

Reclamation completed environmental assessments and Findings of No Significant Impacts for the Hermiston and Stanfield Irrigation Districts in April and May 2002, respectively, to allow their district boundaries to be adjusted.

On April 29, 2003, a memorandum of agreement was signed between Westland and the CTUIR which replaced the 1993 MOA. Under the MOA, the CTUIR agreed to support completion of Federal review of Westland's boundary adjustment request.

Scoping Process and Issues

Public scoping meetings on adjusting district boundaries were held in November 1993 and January 1994, which addressed all the districts within the Project. About 57 comments were received at that time. Reclamation staff also recently met with the staffs of the CTUIR and Westland in various individual meetings to discuss the proposal.

These comments addressed the Umatilla Project boundary adjustment in general, not specifically the proposed adjustment for Westland. 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 decade since the public scoping process was initiated, many of the concerns have been resolved by other actions of the Umatilla Basin Project. Remaining relevant issues were considered in the analysis sections of this environmental assessment (EA).

Chapter 4 addresses other public involvement information and coordination and consultation among Reclamation, CTUIR, and Westland.

Chapter 2

Alternatives

This chapter discusses the alternatives considered and the alternative considered but eliminated from detailed study, and provides a comparison of the environmental impacts of the alternatives.

Alternatives Considered in Detail

This section describes the alternatives considered in detail, including the No Action Alternative, which the National Environmental Policy Act (NEPA) requires be evaluated, and which is used as a base to compare impacts of the alternatives.

Reclamation proposes under the two action alternatives to adjust the federally recognized boundaries to make them consistent with the State boundaries. Only a portion of the lands potentially to be included in the federally recognized district boundaries would be eligible to receive McKay Reservoir storage water from Westland's allocation.

No Action Alternative

The irrigation district boundaries would remain as they are, and Reclamation would not provide federally allocated Project water to lands outside the currently recognized irrigation district boundaries. Temporary water service contracts for Project water deliveries to out-of-boundary lands would no longer be issued.

Westland's repayment contract would not be modified under this alternative, and all water supplied under the existing contract would have to be applied within the existing federally recognized irrigation district boundaries. Use of federally supplied water from McKay Reservoir would have to comply with the terms of the existing contracts and State water right certificate. Figure 1 shows the No Action Alternative boundaries.

Partial Adjustment Alternative

Under this alternative, Westland's boundaries would be adjusted to include category I and category II lands, which would increase Westland's size by 1,482.3 acres. Category I lands are lands with primary (decreed or permitted) and

secondary (McKay Reservoir certificate 79439) water rights which are being assessed, but which were inadvertently omitted from the district boundaries. Category II lands are lands outside the district boundaries to which water rights were transferred, pursuant to Oregon law, from lands which were included within the district boundaries. The full water supply would be used on the current and adjusted boundaries. To adjust Westland's boundaries under this alternative would require a supplement to their 1949 Amendatory Contract with the United States. Water use would need to comply with the terms of the amended contract and State Water law. Figure 2 shows the Partial Adjustment Alternative boundaries.

Full Adjustment Alternative

Under this alternative, Reclamation would fully implement a district boundary adjustment for category I, II, and III irrigated lands. Category III lands are lands that lie outside Westland's boundaries, and consist of 8,855.5 acres of which 5,759 would be irrigated in any given year. The total adjustment under this alternative would include up to 10,338 acres on which federally supplied water from McKay Reservoir could be used. To adjust Westland's boundaries under this alternative would require a supplement to their 1949 Amendatory Contract with the United States. Water use would need to comply with the terms of the amended contract and State water law. Figure 3 shows the Full Adjustment Alternative boundaries.

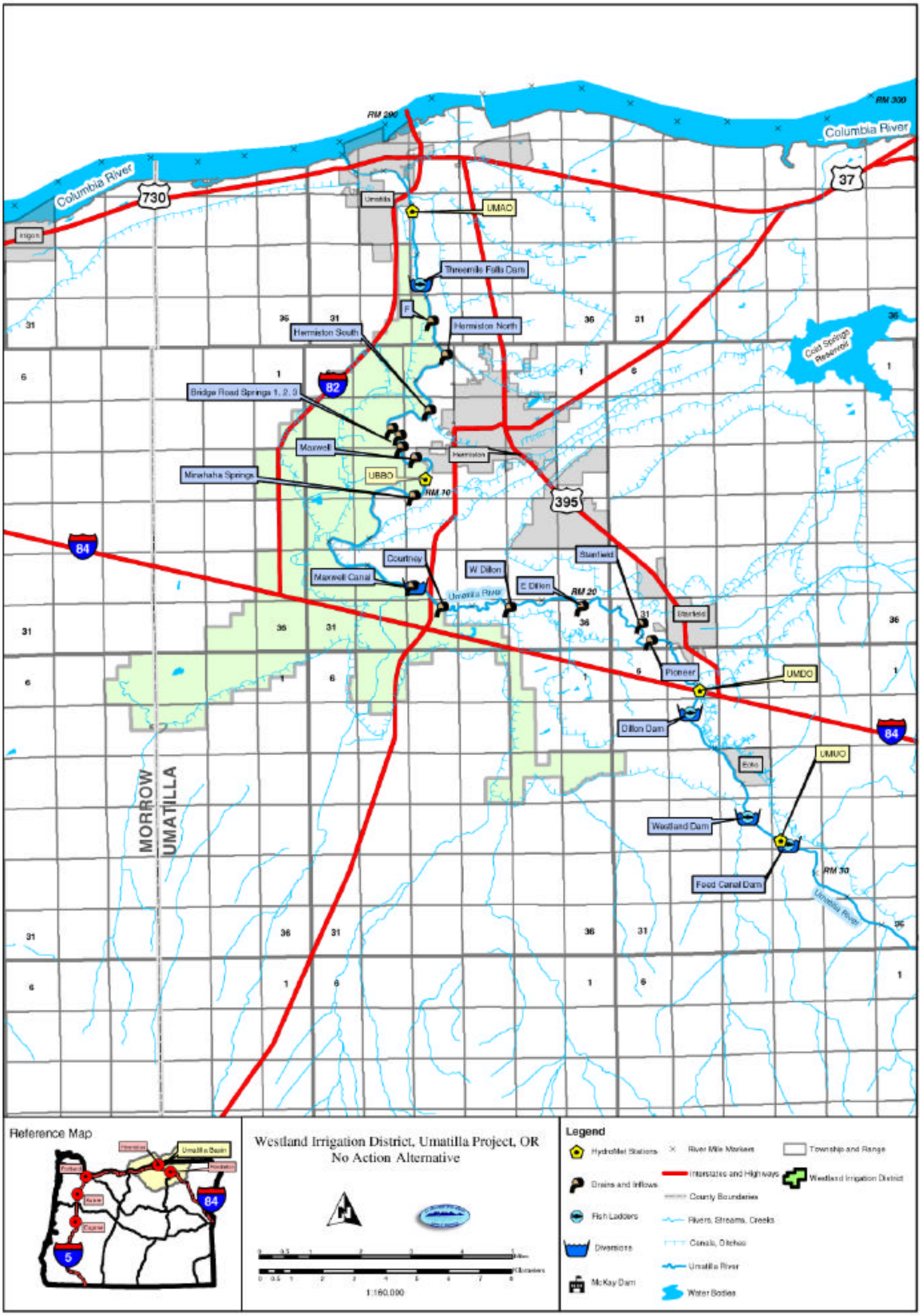
Summary of the Alternatives

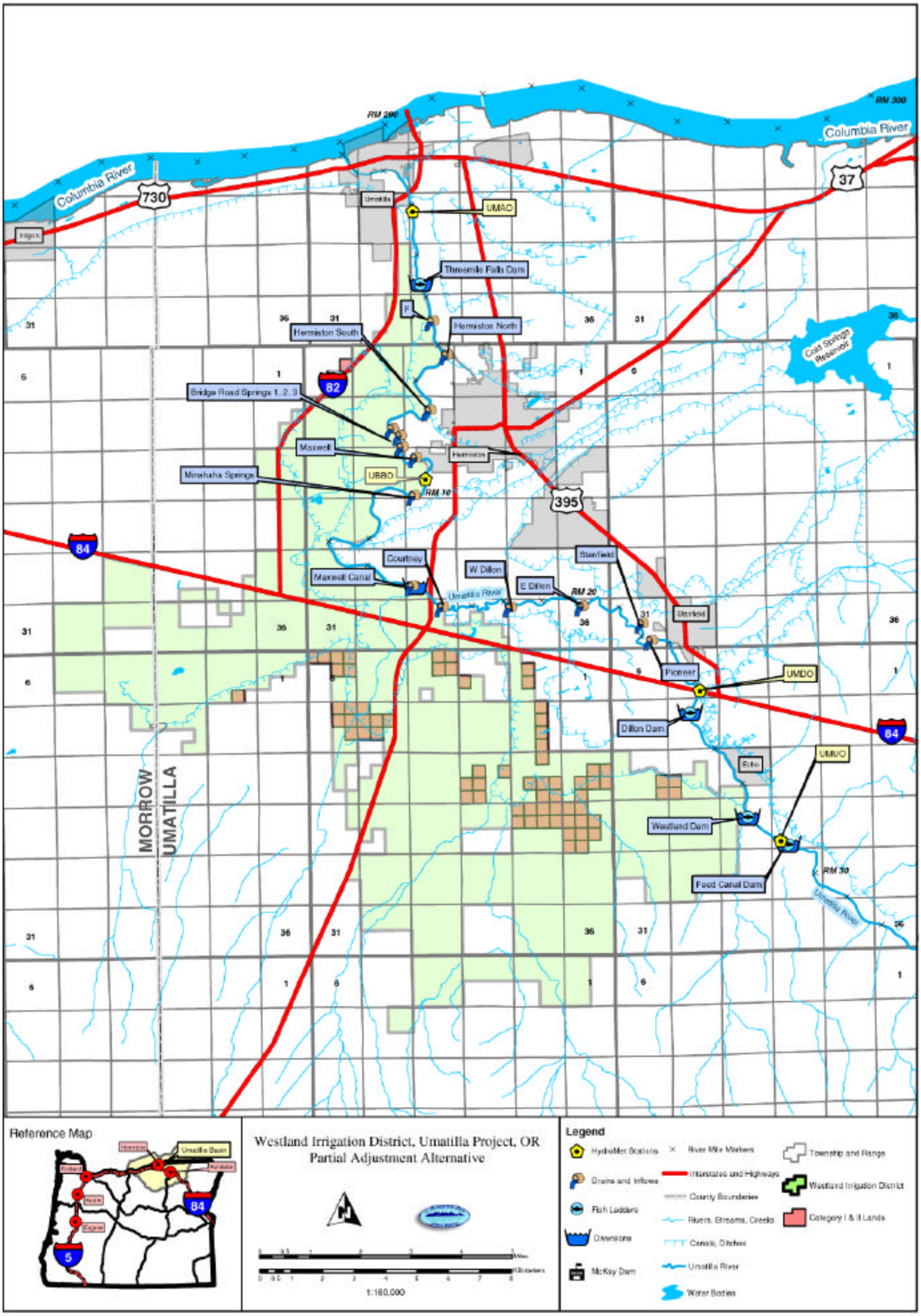
The alternatives are summarized in table 1, shown on the next page.

Summary Comparison of the Environmental Impacts of the Alternatives

For this evaluation, a hydrologic model was developed for the lower Umatilla River. The model was used to estimate the hydrologic impacts of using a portion of Westland's McKay Reservoir storage on lands currently outside of its federally recognized boundary. The estimated flows for the lower Umatilla River, generated by the model, formed the basis for the analysis.

To assess the differences among the alternatives, the environmental impacts of each alternative are compared against the environmental impacts that would result under the No Action Alternative. The environmental consequences of all the alternatives are described by resource or environmental factor in chapter 3. The terms "environmental consequences" and "environmental impacts" are synonymous in this document.


Columbia River
RM 290
RM 300
730
37
Umatilla
UMAO
Threemile Falls Dam
Hermiston South
Hermiston North
Cold Springs Reservoir
82
Bridge Road Springs 1, 2, 3
Maxwell
Hermiston
Minehaha Springs
UBBO
RM 10
395
84
Courtney
Maxwell Canal
W Dillon
E Dillon
Umatilla River
RM 20
Stanfield
Pioneer
UMDO
Dillon Dam
UMUO
Echo
Westland Dam
Feed Canal Dam
RM 30
MORROW
UMATILLA
Reference Map
Umatilla Basin
5
Westland Irrigation District, Umatilla Project, OR
No Action Alternative
1:160,000
Legend
Hydromet Stations
River Mile Markers
Township and Range
Interstates and Highways
Westland Irrigation District
Drains and Inflows
County Boundaries
Fish Ladders
Rivers, Streams, Creeks
Diversions
Canals, Ditches
Umatilla River
McKay Dam
Water Bodies


Columbia River
RM 290
RM 330
730
37
UMAO
Umatilla
Irrigon
Threemile Falls Dam
Hermiston South
Hermiston North
Cold Springs Reservoir
82
Bridge Road Springs 1, 2, 3
Maxwell
Hermiston
UBBO
Minthaha Springs
RM 10
395
84
Courtney
Maxwell Canal
W Dillon
E Dillon
Umatilla River
RM 20
Stanfield
Pioneer
UMDO
Dillon Dam
UMUO
Echo
Westland Dam
RM 30
Feed Canal Dam
MORROW
UMATILLA
Reference Map
Umatilla Basin
Portland
Pendleton
Salem
Eugene
84
5
Westland Irrigation District, Umatilla Project, OR
Partial Adjustment Alternative
1:160,000
Legend
HydroMet Stations
River Mile Markers
Township and Range
Drains and Inflows
Interstates and Highways
Westland Irrigation District
County Boundaries
Fish Ladders
Rivers, Streams, Creeks
Category I & II Lands
Diversions
Canals, Ditches
McKay Dam
Umatilla River
Water Bodies

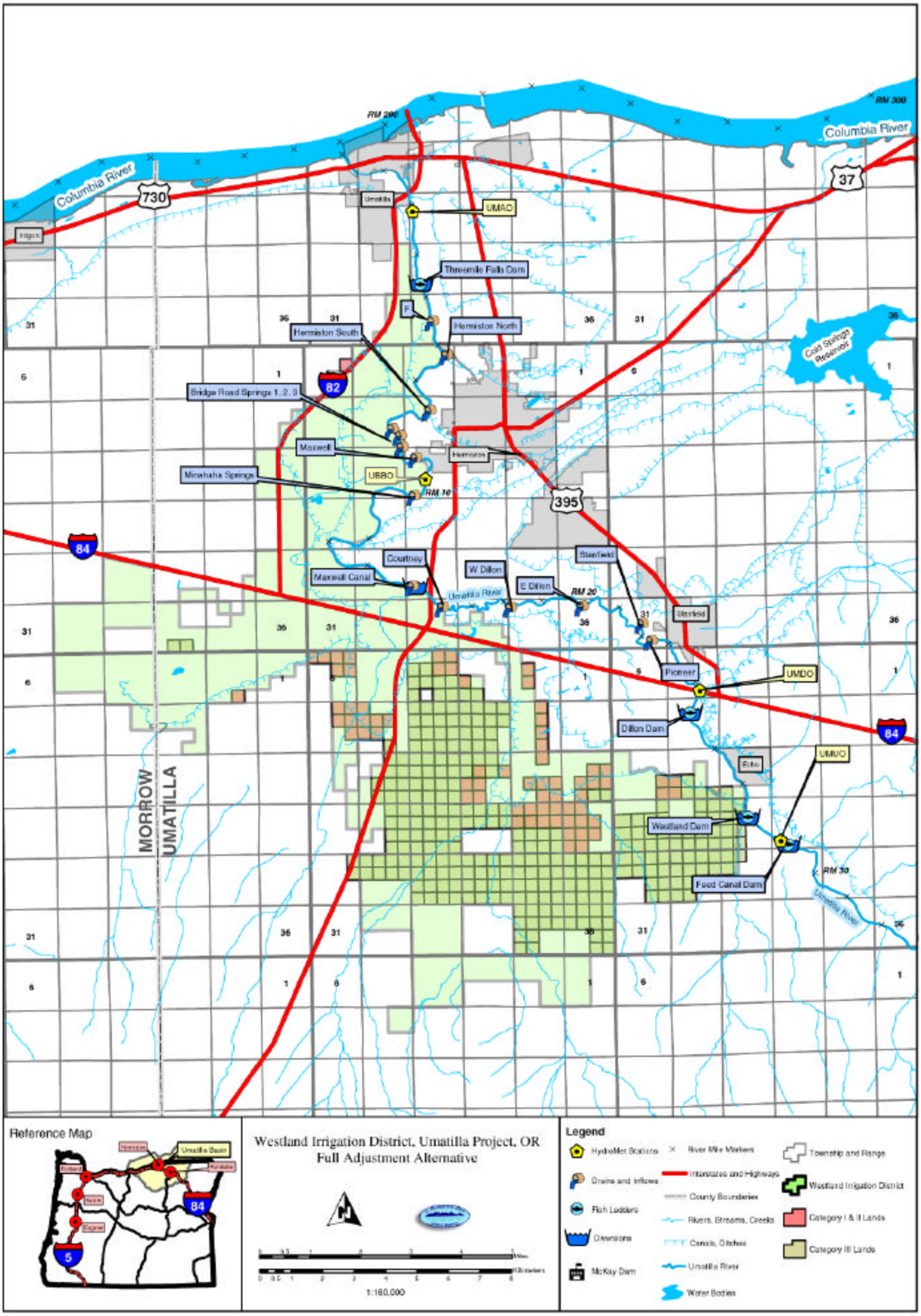

Columbia River
RM 290
RM 330
730
37
Umatilla
UMAO
Irrigon
Threemile Falls Dam
F
Hermiston South
Hermiston North
Cold Springs Reservoir
82
Bridge Road Springs 1, 2, 3
Maxwell
Hermiston
Minthaha Springs
UBBO
RM 10
395
84
Courtney
Stanfield
W Dillon
Maxwell Canal
E Dillon
Umatilla River
RM 20
Pioneer
UMDO
Dillon Dam
Echo
UMUO
Westland Dam
RM 30
Feed Canal Dam
MORROW
UMATILLA
Reference Map
Umatilla Basin
Portland
Pendleton
Salem
Eugene
84
5
Westland Irrigation District, Umatilla Project, OR
Full Adjustment Alternative
1:160,000
Legend
HydroMet Stations
River Mile Markers
Township and Range
Drains and Inflows
Interstates and Highways
Westland Irrigation District
County Boundaries
Fish Ladders
Rivers, Streams, Creeks
Category I & II Lands
Diversions
Canals, Ditches
Category III Lands
McKay Dam
Umatilla River
Water Bodies

Table 1.—Features of the alternatives

Description (irrigated acreage)	Alternatives			
	No Action	Partial Adjustment	Full Adjustment Irrigated	Full Adjustment Total
Current Westland boundary (acres)	7,437	7,437	7,437	7,437.0
Category I Category II		398.4 1,083.9 1,482.3	 1,482.3	398.4 1,083.9 1,482.3
Category III (total acres) (irrigated acres from storage)			 5,759 [1/]	8,855.5
Total additional acres Total irrigated acres from storage Total Westland acres	 7,437 7,437	1,482.3 8,919.3 8,919.3	7,241.3 14,680	10,337.8 17,774.8
Water use	Not outside current Federal boundary; no temporary water contracts	Full water use on current and adjusted lands	Full water use on current and adjusted lands	
Description of change	Cease issuance of temporary contracts for Project water delivery to out-of-district lands	Correct past administrative oversights of lands not included that district claimed were transferred and inadvertently omitted	Includes all lands that currently have a temporary water service contract to receive Project water	

[1/] Of 8,855.5 acres of category III lands, 5,759 acres are to be provided storage water and included in the adjustment in any given year.

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 Irrigation District (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.

Therefore, the analysis of the hydrology has determined that no major impacts would occur from implementation of either the Partial Adjustment or Full Adjustment Alternatives. Because the hydrology impacts are minor, any other resource that depends upon hydrology also would be minor.

Alternatives Considered but Eliminated from Detailed Study

The alternative to implement the proposed boundary adjustment for only category I irrigated lands (398.4 acres) was considered but eliminated from further study. Westland has indicated they would not accept a boundary adjustment of only Category I lands, partly because it is less than 400 acres. It is not reasonable for Westland to go through a contract modification to include just that small area. They would accept only an adjustment of 1,482.3 acres that includes the entire area of oversight (the Partial Adjustment Alternative) or the Full Adjustment Alternative.

Chapter 3

Affected Environment and Environmental Consequences

This chapter explores the affected environment of resources or environmental factors that may be affected by the alternatives. It also presents the environmental consequences of the alternatives on these resources or environmental factors.

Hydrology

A hydrologic model was developed for the lower Umatilla River using the RiverWare™ modeling framework developed by the Center for Advanced Decision Support for Water and Environmental Systems (CADSWES), University of Colorado, Boulder, Colorado. The resulting model was used to estimate the hydrologic impacts of using a portion of Westland's McKay Reservoir storage (storage) on lands currently outside of its federally recognized boundaries. The model was used to estimate return flows from irrigated acreage and to estimate the magnitude and timing of storage water releases under various alternatives. The No Action Alternative represents the condition in which the federally recognized irrigation boundaries are not adjusted and only lands within the boundaries may receive McKay storage water.

All other alternatives involve the irrigation of a certain number of acres outside of the currently recognized Westland boundaries with McKay storage water. The impacts of these "Action" alternatives were compared to the impacts of the No Action Alternative to estimate a level of impact. The level of impact was measured at different points along the Umatilla River and represents differences in the magnitude and timing of return flows from irrigated acreage and differences in the magnitude and timing of storage water releases and diversions from the river. Surface water diversions from the Umatilla River include storage water from McKay Reservoir and live flow based on live flow water rights. Seasonal differences in diversions result from changes in storage water releases from McKay Reservoir and would affect flows in the Umatilla River upstream of the Westland Diversion and in McKay Creek downstream of the reservoir. Total annual diversions of both live flow and McKay Reservoir storage were equivalent for all of the alternatives and included all diversions made under Westland's existing Federal contract. The majority of return flows in the lower Umatilla

River basin enter the river downstream of the Dillon diversion (UMDO) and upstream of Threemile Falls Dam. Therefore, differences in return flows would cause subsequent effects to flows in the Umatilla River downstream of UMDO. Figure 4 shows the relative location of the major gauging points along the Umatilla River.

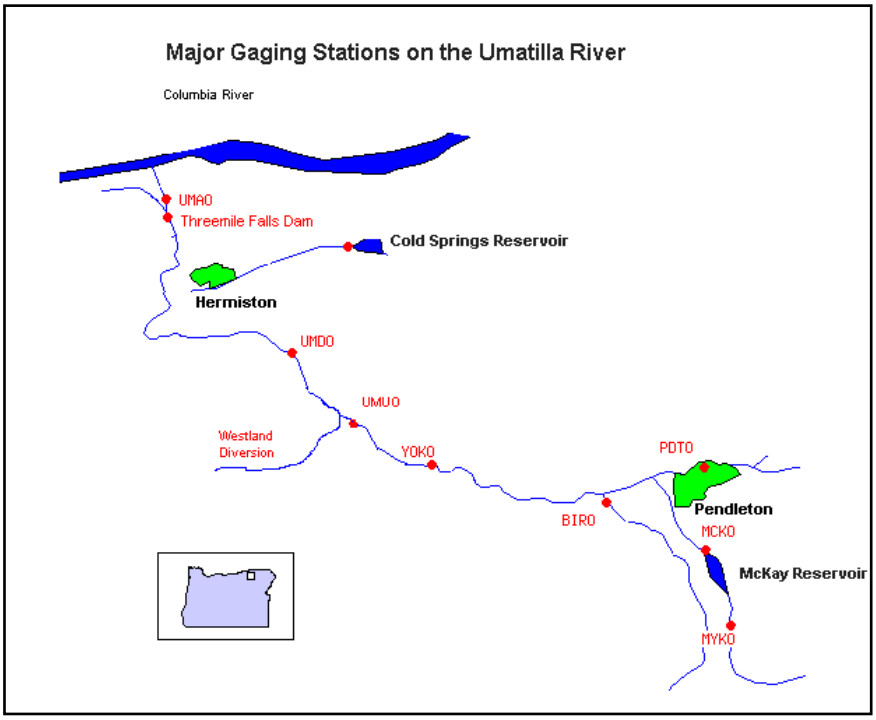


Figure 4.—Major gauging stations on the Umatilla River.

Model Methodology

RiverWare™, a general river basin modeling software tool developed by CADSWES, was used to estimate the hydrologic impacts of adjusting Westland's boundaries. The model was based on a calibrated historic (1947-1992) model of the Umatilla River. The calibration model was the result of a collaborative effort of a model development team, which consisted of hydrologists from the Bureau of Reclamation's Pacific Northwest Regional Office and Upper Columbia Area Office, the Confederated Tribes of the Umatilla Indian Reservation, the Principals Group (representing the Westland Irrigation District), and Natural Resources Consulting Engineers, Inc. (NRCE). NRCE functioned on the team in an oversight role for the Bureau of Indian Affairs, Northwest Regional Office. The calibration model used surface water hydrology and an interrelationship with groundwater, by using response functions to route groundwater return flows from irrigated acreage back to the Umatilla River.

The response functions used in the model were derived from an independently developed groundwater model that used the USGS program, *Modflow*. The

calibration model supplied parameters that were used in the alternatives model. These parameters include groundwater response functions, canal seepages, and onfarm efficiencies. The alternatives model includes the major irrigation districts in the lower Umatilla River basin (Stanfield, Hermiston, and Westland Irrigation Districts), the Umatilla River from the Yoakum gauge (YOKO) to the Umatilla gauge (UMAO), and all major diversions between these two gauges.

The model used a monthly time-step and a 55-year period (1947-2002) for the analysis. The period 1994-2002 was examined to determine impacts. This period was chosen because it most accurately represents current conditions and diversion patterns. The period 1994-2002 contains a range of water supply conditions that can be used to review a typical dry, average, or wet year scenario. Table 2 shows combined volume runoff for McKay Creek above McKay Reservoir (MYKO) and for the Umatilla River at the Pendleton gauge (PDTO) for the period January through July. Years with runoff volumes above 454 thousand acre-feet (kaf) were considered as wet years (1995, 1996, 1997), years with runoff volumes between 326 kaf and 454 kaf were considered as average years (1999, 2000, 2002), and years with runoff volumes below 326 kaf were considered as dry years (1994, 1998, 2001). When examining runoff volumes for the years 1947 through 2002, approximately one-third of the years fall into each of the above categories.

Table 2.—Runoff volumes at PDTO+MYKO

Year	January-July volume runoff at PDTO+MYKO (kaf)
1994	265
1995	493
1996	534
1997	558
1998	305
1999	371
2000	387
2001	258
2002	329

Modeled Alternatives

Three alternatives were modeled to analyze the impacts of the proposed Westland boundary adjustment. These alternatives include the No Action Alternative, the Partial Adjustment Alternative, and the Full Adjustment Alternative. The modeled alternatives reflect different management scenarios for Westland; therefore, conditions in all other irrigation districts in the model were held equivalent for all of the alternative runs. In this manner, impacts to the Umatilla River were isolated to varying practices in Westland only. In all three alternatives, the following assumptions apply for Westland:

- Surface water diversions are routed and groundwater pumping is calculated based on acreage amounts, as listed in tables 3, 7, and 8.

- Peak onfarm efficiencies are at 82 percent for surface water applications; peak efficiencies occur in mid-summer. Lower farm efficiencies occur during other months of the irrigation season.

- Onfarm efficiencies for groundwater and conjunctive use applications are at 85 percent year round.

- Westland is divided into three subareas within the model (Westland South, Westland North, and Westland Out-of-Boundary).

- There are six distinct combinations of source-water for the irrigated lands: (1) Flood-storage (flood primary, reservoir storage secondary); (2) Flood-shallow (flood primary, alluvial groundwater secondary); (3) Shallow (alluvial groundwater); (4) Flood-deep (flood primary, basalt groundwater secondary); (5) Deep (basalt groundwater); and (6) Flood (flood water).

- Groundwater pumping rates per acre are the same for all three alternative model runs.

- Parameters that were derived and/or confirmed in the calibration model (i.e., groundwater response functions, canal seepage, onfarm efficiencies, etc.) were used in all three alternative model runs.

No Action Alternative

This is the base condition in which the Federal irrigation district boundaries are not adjusted and only lands within the existing boundaries and with an existing primary water right are eligible to receive McKay Reservoir storage water. The amount of storage water used on out-of-boundary (OB) lands in the Full Adjustment Alternative (approximately 7,300 acre-feet in a full water supply year) would be used on existing eligible in-boundary lands for the No Action Alternative.

Throughout the rest of this document, storage water that was used by OB lands under the Full Adjustment Alternative will be referred to as OB storage water. In this alternative, OB storage water would be used on in-boundary lands to supplement the currently available water supply. Lands eligible to receive OB storage water are listed in table 3. This table lists total acreage amounts in Westland classified by RiverWare subarea and water supply source for the No Action Alternative. These acreage amounts were compiled and derived from water rights data received from the Oregon Water Resources Department (OWRD) and represents the latest data available. Subarea designations represent areas in the model within Westland and water supply source indicates what type

of water source is used to supply irrigation water to the tabulated acreage amounts (i.e. Flood-shallow GW uses flood water as a primary source and shallow groundwater as a secondary source of irrigation water). Lands listed in the flood-storage category are eligible to receive storage water.

Table 3.—No Action Alternative source water categories

Subarea	Water supply source (primary-secondary)					
	Flood-storage (acres)	Flood-shallow GW (acres)	Shallow GW (acres)	Flood-deep GW (acres)	Deep GW (acres)	Flood (acres)
Westland South	4,907.5	126.2	2,158.5	15.7	157.2	0
Westland North	3,150.9	0.0	0.0	0.0	0.0	0
Westland OB	**0.0**	387.1	537.1	**5,903.0**	429.1	**7,254.1**

To determine how to distribute the OB storage water to in-boundary lands for the No Action Alternative, a method was developed to determine the magnitude and timing of water that could be used by in-boundary lands if it became available to them. This method included (1) developing a potential crop mixture to determine potential irrigation requirements, (2) deriving crop consumptive use data for the crop mixture, and (3) developing a method to deliver the OB storage water to attempt to fulfill the potential consumptive use requirements.

1. A crop mixture was assumed using statistics for Umatilla County developed by the USDA National Agriculture Statistical Service for water year 2001. The crop mixture was limited to three different crops common to the area. Table 4 shows the crop mixture that was used to determine potential consumptive use requirements for the No Action Alternative.

Table 4.—Potential crop mixture used in the No Action Alternative

Crop	Percent of total eligible in-boundary acreage (percent)
Alfalfa	68.0
Pasture	16.1
Potatoes	15.9

2. After determining a potential crop mixture, crop evapotranspiration (ET) requirements were calculated using data from Reclamation's Agrimet program. Crop ET requirements for the three identified crops were calculated using the *1982 Kimberly-Penman method* and data from the Hermiston, Oregon, site. This calculated crop ET data represents the potential or maximum

amount of water a crop could use if it was available. Actual monthly data for years 1994-2002 was used in the model for examined years 1994-2002. Previous years in the model used 1994-2002 monthly averages. Table 5 shows annual crop irrigation requirements for years 1994-2002.

Table 5.—Annual crop irrigation requirements for various crops at Hermiston, Oregon

	Annual crop irrigation requirements (inches)			
Year	Alfalfa	Pasture	Potatoes	Mixed Crop
1994	42.56	33.33	25.84	38.41
1995	39.66	30.50	22.58	35.46
1996	41.13	32.07	24.60	37.04
1997	39.12	30.40	22.60	35.08
1998	37.69	29.24	23.86	34.13
1999	41.19	32.53	23.75	37.02
2000	40.51	32.02	22.39	36.26
2001	39.46	30.84	25.83	35.90
2002	40.84	32.17	28.89	37.54
Average	40.24	31.46	24.48	36.32

3. After potential crop irrigation requirements were calculated, a method was developed to deliver the OB storage water to eligible in-boundary lands to satisfy or attempt to satisfy the monthly calculated crop irrigation requirements. This water was applied to in-boundary lands during the months of June through October for the No Action Alternative. Figure 5 shows average monthly potential crop irrigation requirements and average monthly modeled depletions for in-boundary lands. These depletions represent average monthly depletions for the No Action Alternative for years 1994 through 2002 after the apportionment of the OB storage water.

Partial Adjustment Alternative

This alternative would adjust the Federal irrigation district boundaries to include some additional lands. These additional lands include 398.4 omitted acres (category I lands) and 1,083.9 transferred acres (category II lands). Under this alternative, storage water is used on existing in-boundary lands and the category I and II lands. The same method that was used to distribute OB storage water in the No Action Alternative was used to distribute storage water used by category III lands in the Full Adjustment Alternative onto eligible in-boundary and category I and II lands for the Partial Adjustment Alternative.

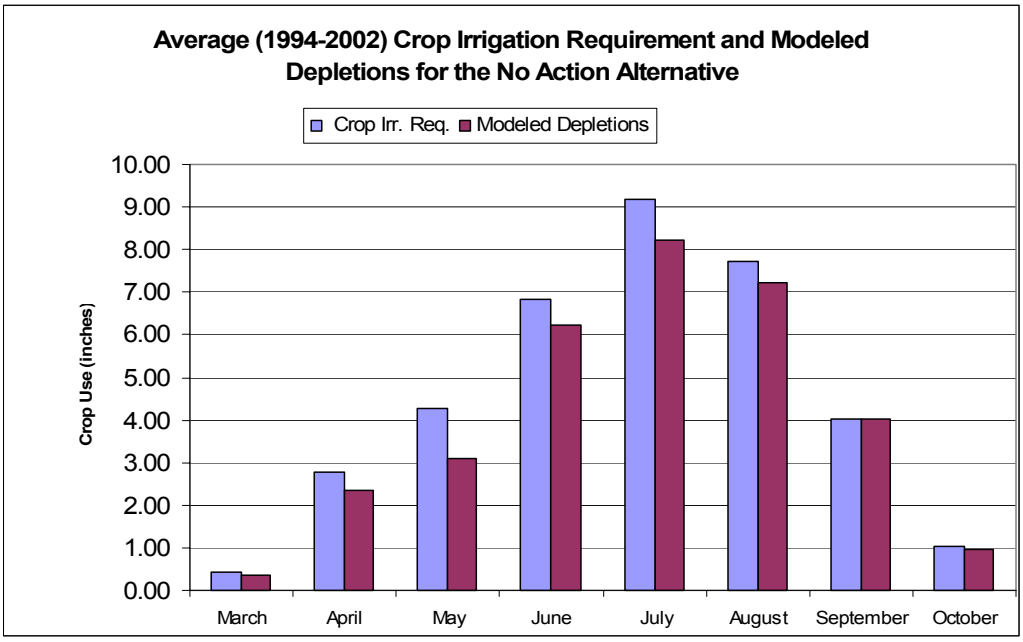


Figure 5.—Average (1994-2002) monthly potential crop irrigation requirements and average monthly modeled depletions for in-boundary lands for the No Action Alternative.

Table 6 lists acreage amounts, in the model, classified by subarea and water supply source for the Partial Adjustment Alternative. Acres in the flood-storage category are eligible to receive storage water.

Table 6.—Partial Adjustment Alternative source water categories

Subarea	Water supply source (primary-secondary)					
	Flood-storage (acres)	Flood-shallow GW (acres)	Shallow GW (acres)	Flood-deep GW (acres)	Deep GW (acres)	Flood (acres)
Westland South	4,813.3	126.2	2,158.5	15.7	157.2	94.2
Westland North	2,623.7	0.0	0.0	0.0	0.0	527.2
Westland OB	**1,482.3**	387.1	537.1	**5,903.0**	429.1	**5,771.8**

Full Adjustment Alternative

This alternative would adjust the Federal irrigation district boundaries to include additional lands that would be eligible to receive storage water. These additional lands include 398.4 omitted acres (category I lands), 1,083.9 transferred acres (category II lands), and 8,855.5 contracted acres (category III lands). Of the

8,855.5 category III lands, 5,759 acres would receive storage water in a given year.

Table 7 lists acreage amounts, in the model, classified by subarea and water supply source for the Full Adjustment Alternative. Acres in the flood-storage category are eligible to receive storage water.

Table 7.—Full Adjustment Alternative source water categories

Subarea	Water supply source (primary-secondary)					
	Flood-storage (acres)	Flood-shallow GW (acres)	Shallow GW (acres)	Flood-deep GW (acres)	Deep GW (acres)	Flood (acres)
Westland South	4,813.3	126.2	2,158.5	15.7	157.2	94.2
Westland North	2,623.7	0.0	0.0	0.0	0.0	527.2
Westland OB	**7,241.3**	387.1	537.1	**3,643.5**	429.1	**2,272.3**

Table 8 lists the acreage and estimated water delivery amounts to out-of-boundary lands in the Full Adjustment Alternative. These values also represent the current conditions or the affected environment.

Table 8.—Full Adjustment Alternative total acres and McKay storage water delivered

Land category	Total acres to receive McKay storage water in an irrigation season	Estimated net delivery of McKay storage water (acre-feet)[1/]
Category I	398.4	717 (at 1.8 acre-feet/acre)
Category II	1,083.9	1,951 (at 1.8 acre-feet/acre)
Category III	5,759.0[2/]	4,607 (at 0.8 acre-feet/acre)
Total	7,241.3	7,275

[1/] These amounts are based on a full water supply year and would be less during a dry year.
[2/] These acres represent the amount of acreage irrigated in a given year. A total of 8,855.5 category III lands are to be included in the boundary adjustment.

Table 9 shows the differences in acreage amounts between the action alternatives and the No Action Alternative for each source water category and subarea. Differences are shown between the flood-storage and flood categories in Westland North and Westland South. The listed differences in these subareas reflect that 621.4 acres would be receiving supplemental McKay water in the No Action Alternative but only primary surface water in the action alternatives. In Westland OB for the Full Adjustment Alternative, there are 7,241.3 acres in the flood-storage category. In comparison, the No Action Alternative has an additional 2,259.5 acres in the flood-deep GW category—indicating an increase in deep groundwater pumping. These 2,259.5 acres have a deep groundwater pumping right, and it is assumed that these lands would use this right if they no

longer received storage water. There is an additional 4,981.8 acres in the flood category in the No Action Alternative than there is in the Full Adjustment Alternative. This indicates that since these lands have only a surface water right, they would receive only flood water if storage water was unavailable. It is important to note that the total amount of irrigated acreage remains the same for every alternative. In fact, the total amount of acreage that receives primary surface water does not change for any alternative or for any subarea. The only changes are in the supplemental water source.

Table 9.—Differences in acreage amounts in each subarea classified by source water category between the Full and Partial Adjustment Alternatives and the No Action Alternative

Source Water Category (acres)	Full Adjustment			Partial Adjustment		
	Westland South	Westland North	Westland OB	Westland South	Westland North	Westland OB
Flood-storage	-94.2	-527.2	7241.3	-94.2	-527.2	1482.3
Flood-shallow GW	0	0	0	0	0	0
Shallow GW	0	0	0	0	0	0
Flood-deep GW	0	0	-2259.5	0	0	0
Deep GW	0	0	0	0	0	0
Flood	94.2	527.2	-4981.8	94.2	527.2	-1482.3
Total	0	0	0	0	0	0

Affected Environment

In recent years, Westland has been delivering Federal project water to about 7,400 acres within their federally recognized boundaries and to about 7,240 acres of about 10,338 acres outside of their federally recognized boundaries in any given year. Federal project water to Westland comes exclusively from releases of stored water from McKay Reservoir. Since 1995, Reclamation has issued an annual temporary water service contract (TWSC) to Westland, authorizing delivery of Federal water to out-of-boundary lands. As an interim mitigation measure for the annual TWSCs, Westland has dedicated a portion of its McKay Reservoir water for Umatilla River instream flows.

The Westland Diversion Dam diverts live river flows and supplemental McKay Reservoir water releases from the Umatilla River at river mile (RM) 28 into Westland's canal system. The dam structure and canals are owned and maintained by Westland as private facilities. In 1991, a new fish ladder, at the dam, and canal fish screens were constructed. Bonneville Power Administration owns the fish protection and passage facilities, and it contracts the operations and maintenance of the fish screens and fish ladder through Westland.

Westland has a mixture of both private and Federal water rights. They hold a supplementary water storage contract in McKay Reservoir (Federal water) for 30 percent of its annual storage. This amount is based on a full reservoir. Westland has also typically received 10 percent of the reserved and 30 percent of the residual storage space in McKay Reservoir. Over the years, Westland has been granted private live flow water rights in cubic feet per second (cfs) from the Umatilla River, including in 1903 (33.5 cfs), 1907 (53.2 cfs), 1961 (35.72 cfs), 1976 (2.4 cfs), and 1981 (2.25 cfs) rights.

McKay Dam and Reservoir are located on McKay Creek, about 6 miles south of Pendleton, Oregon. McKay Dam is an earthfill structure, 165 feet high, constructed by Reclamation from 1923 to 1927. There are no fish passage facilities at McKay Dam. In 1992, a sedimentation survey estimated the total active reservoir capacity at 71,534 acre-feet. The original design active capacity at construction was 73,800 acre-feet. The current water storage capacity of the reservoir is about 65,534 acre-feet, which factors in 6,000 acre-feet held exclusively for flood control space. The average annual discharge (acre-feet) of McKay Creek above McKay Dam is about 71,000 acre-feet (Reclamation, 2000).

Environmental Consequences

The modeled results of the Partial Adjustment and Full Adjustment Alternatives were compared to the modeled results of the No Action Alternative to estimate magnitude and timing of any impacts to the Umatilla River and to McKay Creek. Impacts to the Umatilla River were realized in several locations.

> **Upstream of the Westland diversion:** Impacts 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.
>
> **Downstream of Dillon diversion:** Impacts are a result of differences in the timing and magnitude of return flows from Westland.

It is important to note that the projected downstream and upstream impacts are generated by a single action, boundary adjustment, and are not independent effects of separate actions.

Impacts Upstream of Westland Diversion

Impacts to the Umatilla River upstream of the Westland Diversion, as a result of boundary adjustment, are due to the differences in the magnitude and timing of storage water releases from McKay Reservoir. Table 10 shows the modeled average monthly differences in diversions (1994-2002) at Westland Diversion for the two boundary adjustment alternatives, when compared to the No Action

Alternative. Differences in diversions are realized upstream of the Westland Diversion in the Umatilla River and in McKay Creek. Diversions are higher in July and August and lower in June, September, and October for the boundary adjustment alternatives. Note the zero annual difference in diversion volumes; the annual amount of water being diverted is equivalent for all of the modeled alternatives.

Table 10.—Modeled average monthly (1994-2002) flow and volume diversion differences between the two boundary adjustment alternatives, when compared to the No Action Alternative, at the Westland Diversion

Average of all years	Partial Adjustment Alternative		Full Adjustment Alternative	
	Flow difference (average daily) (cfs)	Volume difference (acre-feet)	Flow difference (average daily) (cfs)	Volume difference (acre-feet)
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	-5.8	-343	-14.0	-835
July	3.7	226	15.4	946
August	7.9	484	18.8	1,155
September	-3.4	-202	-12.9	-769
October	-2.7	-165	-8.1	-497
November	0.0	0	0.0	0
December	0.0	0	0.0	0
Annual		**0**		**0**

Impacts Downstream of the Dillon Diversion

Impacts to the Umatilla River, downstream of the Dillon Diversion, are due to differences in return flows from Westland. The differences in return flows are caused by differences in diversions, differences in groundwater response timing in the different model subareas, additional deep-groundwater pumping in the No Action Alternative model run, and differences in monthly onfarm efficiencies. Table 11 shows the modeled average monthly differences in return flows (1994-2002) from Westland, as measured in the Umatilla River upstream of the West Extension diversion for the two boundary adjustment alternatives, when compared to the No Action Alternative.

The model identified an effect on West Extension because much of 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.

Table 11.—Modeled average monthly (1994-2002) flow and volume return flow differences between the two adjustment alternatives, when compared to the No Action Alternative, as measured in the Umatilla River upstream of the West Extension Diversion

Average of all years	Partial Adjustment Alternative		Full Adjustment Alternative	
	Flow difference (average daily) (cfs)	Volume difference (acre-feet)	Flow difference (average daily) (cfs)	Volume difference (acre-feet)
January	0.1	8	-0.4	-27
February	0.2	10	-0.3	-18
March	0.1	6	-0.5	-30
April	0.2	11	-0.5	-29
May	0.1	8	-0.5	-29
June	0.2	12	-0.4	-25
July	-0.9	-56	-3.1	-190
August	-0.8	-46	-3.1	-191
September	-0.8	-47	-2.3	-137
October	-0.8	-51	-1.7	-106
November	-0.4	-22	-1.3	-74
December	0.0	1	-0.6	-39
Annual		**-165**		**-895**

Modeled Flows at Various Locations along the Umatilla River

Modeled impacts to the Umatilla River and McKay Creek were examined for years 1994 through 2002. The actual historical flows (1994-2002) at Umatilla River at Yoakum (YOKO), Umatilla River below Feed Diversion (UMUO), Umatilla River below Dillon Diversion (UMDO), Umatilla River at Umatilla (UMAO), and McKay Creek below McKay Reservoir (MCKO) adjusted to include minimum flows below McKay Reservoir, reflect operations that include deliveries to OB lands under TWSCs. This "current" operation includes conditions that would be similar to those that would occur under full adjustment. Therefore, these historic flows will be used to estimate the flows that would occur under the Full Adjustment Alternative. The period 1994-2002 contains a range of water supply conditions that can be used to review a typical dry, average, or wet

year scenario. The years 1995, 1996, and 1997 were wet years; 1999, 2000, 2002 were average years; and 1994, 1998, and 2001 were dry years. Years of a similar category were averaged together to obtain mean monthly flows for wet, average, and dry years. To estimate the flows at these points along the river for the No Action Alternative, subtract the "modeled full impact" from the historic flows. To estimate the flows at these points along the river for Partial Adjustment Alternative, add the "modeled partial impact" to the No Action flows.

YOKO (Umatilla River at Yoakum)

Flows at YOKO, which is upstream of the Westland Diversion, are shown in table 12 for all three alternatives and for wet, average, and dry years. Table 13 shows mean volume differences between the alternatives. The differences in flows at YOKO are due to the differences in the magnitude and timing of McKay storage water releases for the three alternatives. This explanation of flows at YOKO is true for any point on the Umatilla River from McKay Creek to the Westland Diversion and for McKay Creek downstream of McKay Reservoir.

Table 12.—Mean flows at YOKO for wet, average, and dry years for the No Action, Partial Adjustment, and Full Adjustment Alternatives

	YOKO, Umatilla River at Yoakum (RM38), average daily flows (cfs)								
	Wet years			Average years			Dry years		
Month	NA	Partial	Full	NA	Partial	Full	NA	Partial	Full
January	1,361.7	1,361.7	1,361.7	744.2	744.2	744.2	619.6	619.6	619.6
February	2,513.4	2,513.4	2,513.4	834.4	834.4	834.4	433.5	433.5	433.5
March	1,977.0	1,977.0	1,977.0	1,415.7	1,415.7	1,415.7	1,095.3	1,095.3	1,095.3
April	1,843.3	1,843.3	1,843.3	1,625.4	1,625.4	1,625.4	1,044.6	1,044.6	1,044.6
May	1,558.0	1,558.0	1,558.0	801.1	801.1	801.1	870.0	870.0	870.0
June	458.1	449.4	435.2	476.4	467.8	453.5	434.1	432.2	433.1
July	280.8	284.1	295.8	253.5	259.9	276.3	256.3	258.9	269.9
August	245.3	256.6	272.7	201.5	210.1	225.7	208.7	215.0	219.7
September	210.3	208.5	202.6	185.0	180.4	167.5	179.8	174.8	161.9
October	237.1	232.6	224.2	226.2	224.0	218.4	201.5	199.3	195.2
November	445.4	445.4	445.4	240.1	240.1	240.1	347.6	347.6	347.6
December	902.6	902.6	902.6	345.7	345.7	345.7	765.9	765.9	765.9
Annual difference (acre-feet)		**0**	**0**		**0**	**0**		**0**	**0**

Table 13.—Mean volume differences at YOKO for wet, average, and dry years for the Partial Adjustment and Full Adjustment Alternatives when compared to the No Action Alternative

Month	YOKO, Umatilla River at Yoakum (RM38), 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**

UMUO (Umatilla River downstream of Feed Diversion)

Estimated flows at UMUO, which is upstream of the Westland Diversion and downstream of the Feed Diversion, are shown in table 14 for all three alternatives and for wet, average, and dry years. Table 15 shows mean volume differences between the alternatives. The differences in flows at UMUO are due to differences in the magnitude and timing of McKay storage water releases between the three alternatives.

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.

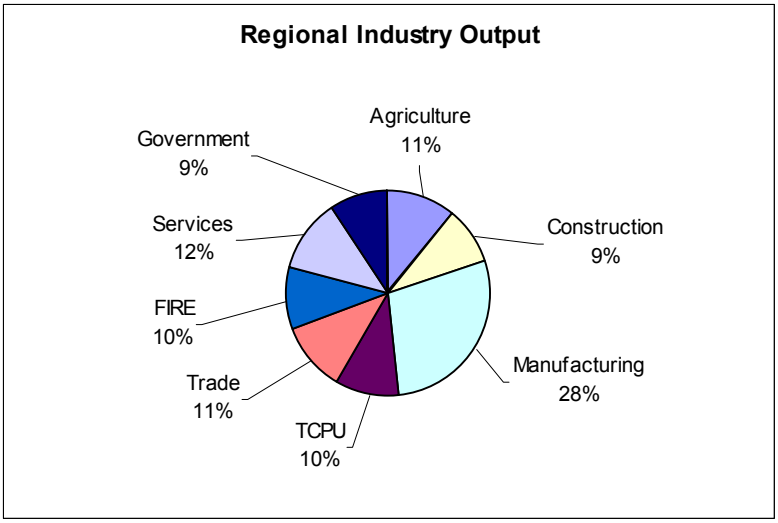


Figure 6.—Regional output by industry.

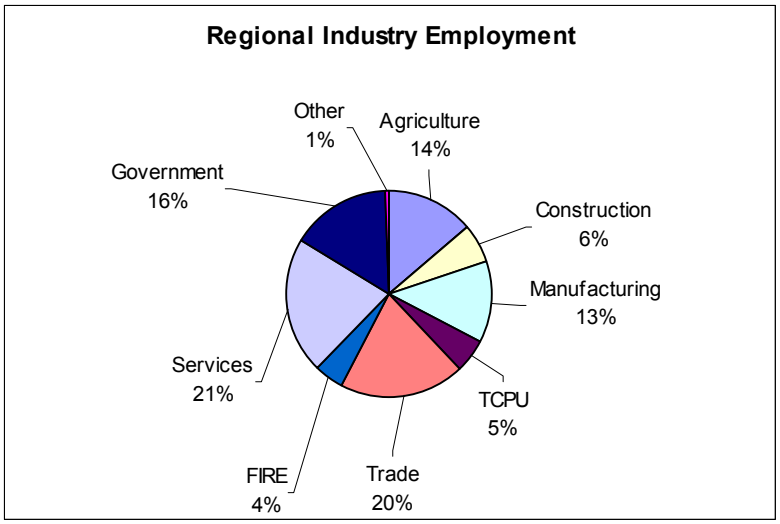


Figure 7.—Regional employment percentages by industry.

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.

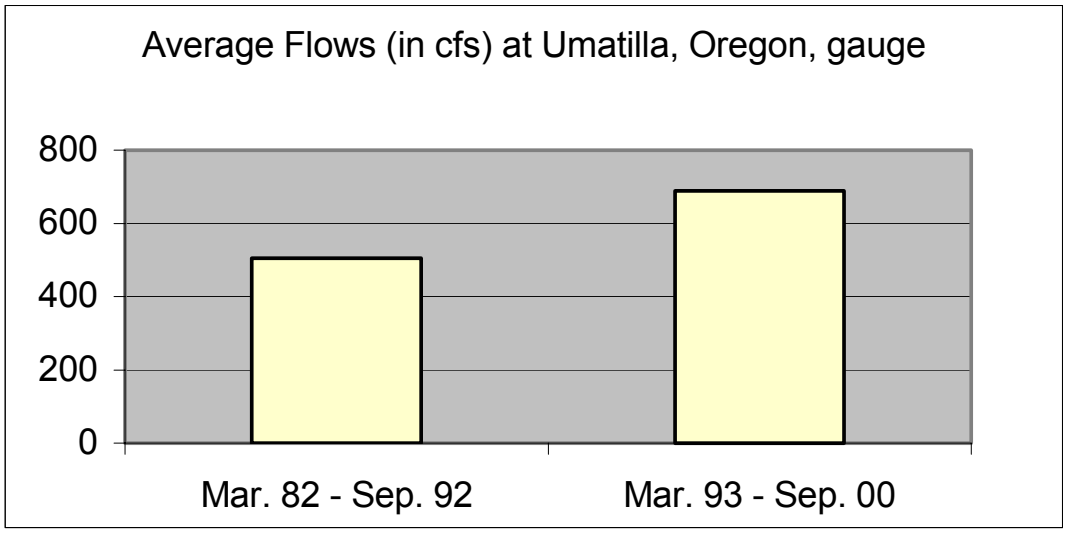


Figure 8.—Comparison of flows before and after pump exchange.

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

List of Preparers

This draft environmental assessment was prepared by employees in the Pacific Northwest Regional Office, 1150 North Curtis Road, Suite 100, Boise, ID 83704-1234; Upper Columbia Area Office, 1917 Marsh Road, Yakima, WA 98907-1749; and in the Technical Service Center, PO Box 25007, Denver, CO 80225-0007. A list of persons who prepared various sections of the assessment or participated to a significant degree in preparing the assessment is presented below in alphabetical order by office.

Name	Title	Contribution
Technical Service Center, Denver, Colorado		
James Bailey	Historian	Cultural resources, Indian sacred sites
Raymond Bark	Fisheries biologist	Fisheries and essential fish habitat
Yvonne Bernal	Biologist	Vegetation, riparian habitat, wetlands, wild-life, threatened and endangered species
Susan Black	Social Science Analyst	Public involvement, Indian trust assets, environmental justice, and social analysis
Chad DeVore	Recreation specialist	Recreation
Paula Engel	Economist	Economic analysis
Willie Forest	Land suitability	Soils and lands
Patty Gillespie	Technical writer-editor	Writing and editing
Marlene Johnson	Natural resource planner	Assistant team leader
Ken Mangelson	Water resource engineer	Water quality
Teri Manross	Technical editor	Editing and desktop publishing
Erin Quinn	Natural resource planner	Team leader
Upper Columbia Area Office, Yakima, Washington		
John Evans	Environmental protection specialist	Environmental team lead
Dave Kaumheimer	Manager, Environmental Programs	Environmental oversight
Warren Sharp	Hydrologist	Surface water analysis
Pacific Northwest Regional Office, Boise, Idaho		
John Roache	Hydrologist	Surface water analysis
John Tiedeman	Activity Manager	Regional activity manager

Environmental Commitments

This list includes the environmental commitments made in the project plan and environmental assessment. Reclamation has the primary responsibility to see that these commitments are met if the proposed action is implemented.

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 fully offset the reduction in streamflows. It is anticipated the mitigation would be 895 acre-feet. This mitigation would be incorporated under both the Partial Adjustment and the Full Adjustment Alternatives. Westland would use McKay storage water to fulfill the mitigation requirements.

Glossary

Acre-foot. A volume of water that would cover 1 acre to a depth of 1 foot (325,850 gallons, 43,560 cubic feet, 1,233.5 cubic meters).

Adfluvial. Adfluvial fish spawn in streams but live in lakes; fluvial fish spawn in headwaters streams but live downstream in larger rivers.

Anadromous. Fish that migrate from the sea (salt water) up a river (fresh water) to spawn.

Catadromous fish (lamprey). Fish that migrate down a river (fresh water) to the sea (salt water) to spawn.

Cultural resource. A term for which the meaning is largely derived from and limited by Federal law, regulation, and Executive orders, and departmental or agency standards or policies. "Cultural resources" are specific places that may be or are important in the history of the nation and its peoples. These resources include prehistoric or historic period archeological sites; buildings or structures of architectural, engineering, or historical associative value; places of importance in history or tradition; and traditional cultural properties, which are resources important in maintaining the traditional lifeways of a community. Within the broad range of cultural resources are those that have recognized "historical significance." Locations or buildings that retain physical integrity and meet the criteria for listing on the *National Register of Historic Places* specifically are "historic properties" (see below). A fishing ground or site may be an example of a "cultural resource" (and may even be a "historic property" if it meets the *National Register* eligibility criteria).

Culturally important resource. Culturally defined sets of relationships exist between a group of people, their culture, and their world. These relationships define and are defined by the values, uses, meanings, and relevance people hold for their natural, cultural, and spiritual world. Some natural or other resources are essential for maintenance of a culture and can be considered "culturally important resources." Culturally important resources must be defined, understood, and treated within the context of the culture that identifies and values them. The fish that are taken at a fishing site would be an example of a "culturally important resource," as might be special plants used to build or maintain the site and its appurtenances.

Economic analysis. A procedure that includes both tangible and intangible factors to evaluate various alternatives.

Economic evaluation. A procedure or process used to verify that good business decisions are being made based on sound economic principles.

Extirpated species. A species that has become extinct in a given area.

Historic property or historic resource. As defined in the National Historic Preservation Act, Title III, Section 301 (16 U.S.C. 470w)(5), a historic property or historic resource means "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the *National Register*, including artifacts, records, and material remains related to such a property or resource." The criteria defining eligibility to the *National Register* are provided in regulations (36 CFR 60.4).

Hydrology. Scientific study of water in nature: its properties, distribution, and behavior. The science that treats the occurrence, circulation properties, and distribution of the waters of the earth and their reaction to the environment.

Instream flows. Waterflows for uses within a defined stream channel; e.g., flows designed for fish and wildlife.

Mainstem. The main course of a stream.

Redds. Redds or salmon redds are the spawn of a fish; spawning ground or nest of fishes.

Salmonids. Family of fish that includes salmon and steelhead.

Scoping. Scoping, as defined in the Council on Environmental Quality (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." It is a process by which the agency solicits information and concerns from the public through meetings, workshops, and other means.

Spawning. To lay eggs; refers mostly to fish.

References

Bastasch, Rick. 1998. Waters of Oregon: A Sourcebook on Oregon's Water and Water Management. Corvallis: Oregon State Univ. Press.

Bjornn, T.C., and D. W. Reiser. 1991. "Habitat Requirements of Salmonids in Streams" In: "Influences of Forest and Rangeland Management on Salmonid Fishes and their Habitats." *American Fisheries Society Special Publication,* vol. 19, pp. 83-138.

Bonneville Power Administration. 1996. *Evaluation of Juvenile Salmonid Out-migration and Survival in the Lower Umatilla River Basin.* Annual Report Prepared for BPA by Oregon Department of Fish and Wildlife.

Bonneville Power Administration, Reclamation, and U.S. Army Corps of Engineers. 1999. Biological Assessment of the Federal Columbia River Power System. Submitted to NMFS and USFWS. December 21, 1999.

Boyd, M., D. Butcher, B. Kasper, and P. Leinenbach. 1999. Umatilla Subbasin Draft Temperature Assessment. Oregon Department of Environmental Quality.

Buchanan, D.V., M.L. Hanson, and R.M. Hooton. 1997. *Status of Oregon's Bull Trout: Distribution, Life History, Limiting Factors, Management Considerations, and Status*. Portland: Oregon Department of Fish and Wildlife.

City of Echo. 2002. Echo's Cultural Resource Inventory. pp. 25, 22-23. <http://www.uplinkos.com/>

Close, D.M., M. Fitzpatrick, H. Li, B. Parker, D. Hatch, and G. James. 1995. *Status Report of the Pacific Lamprey (Lampetra tridentate) in the Columbia River Basin.* U.S. Dept. of Energy, Bonneville Power Administration Report, Project No. 94-026, Contact No. 95B139067.

Confederated Tribes of the Umatilla Indian Reservation. 2003. History & Culture of the Cayuse, Umatilla, and Walla Walla Indians. <http://www.umatilla.nsn.us/>

Confederated Tribes of the Umatilla Indian Reservation. 1990. Confederated Tribes of the Umatilla Indian Reservation and Oregon Department of Fish and Wildlife. 1990. Columbia Basin System Planning Salmon and Steelhead Production Plan. Umatilla River Subbasin. Prepared for the Northwest Power Planning Council, Portland Oregon. Pendleton, Oregon.

Contor, C.R., E. Hoverson, and P. Kissner. Report in Progress. 2003. *Umatilla Basin Natural Production Monitoring and Evaluation, Annual Progress Report 2000 – 2002.* Portland, Oregon. Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources.

Contor, C.R., E. Hoverson, P. Kissner and J. Volkman**.** 1995, 1996, 1997, 1998, 2000. *Umatilla Basin Natural Production Monitoring and Evaluation, Annual Progress Report 1995 – 2000*. Portland, Oregon. Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources.

Contor, C.R., E. Hoverson and P. Kissner. 1998. *Umatilla Basin Natural Production Monitoring and Evaluation, Annual Progress Report 1996-1997*. Portland: Confederated Tribes of the Umatilla Indian Reservation, Department of Natural Resources.

Environmental Protection Agency. 2001. <http://es.epa.gov/oeca/main/ej/index.html. EPA website, Shonn Taylor, webmaster. November 2001.

Geist, David R., Timothy P. Hanrahan, Even V. Arntzen, Geoffery A. McMichael, Christopher J. Murray, and Yi-Ju Chien. 2002. "Physiochemical Characteristics of the Hyporheic Zone Affect Redd Site Selection by Chum Salmon and Fall Chinook Salmon in the Columbia River." *North American Journal of Fisheries Management,* Vol. 22, pp. 1077-1085.

Germond, J. 2000. Assistant District Fish Biologist, Umatilla District. Oregon Department of Fish and Wildlife, Personal communication.

Groot, C., and L. Margolis, eds. 1991. *Pacific Salmon Life Histories*. University of British Columbia Press. Vancouver, B.C. 564 p.

Hunn, E.S. 1990. Nch'I-Wana "The Big River." *Mid-Columbia Indians and Their Land*. Univ. of Washington Press. Seattle, Washington.

Isaacs, Frank. 2003. Personal communication. Senior Faculty Research Assistant, Oregon State University, Corvallis, Oregon. September 5, 2003.

Isaacs, Frank B., and Robert G. Anthony. 2000. *Bald Eagle Nest Locations and History of Use in Oregon and the Washington Portion of the Columbia River Recovery Zone 1971 through 2000*. Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University, Corvallis, Oregon. 21 pp.

Knapp, S.M., R.W. Carmichal, D.L. Ehlers, S.M. Focher, T.A. Jones, and J.C. Kern. 2000. *Evaluation of Juvenile Salmonid Outmigration and Survival in the Lower Umatilla River Basin. 1997 – 1998 Annual Progress Report to Bonneville Power Administration*, Portland Oregon.

McCullough, D.A. 1999. *A Review and Synthesis of the Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids, with Special Reference to Chinook Salmon*. EPA, 910-R-99-010. U.S. Environmental Protection Agency, Region 10, Seattle, Washington, 279 pp.

Marshall, David B., Mark Chilcote, and Hal Weeks. 1996. Species at Risk: Sensitive, Threatened and Endangered Vertebrates of Oregon. Oregon Department of Fish and Wildlife.

Minnesota IMPLAN Group, Inc., IMPLAN System (data and software), 1725 Tower Drive West, Suite 140, Stillwater MN 55082, <www.implan.com> 1997.

National Marine Fisheries Service. 2002. *Draft Biological Opinion on the Operation of the Umatilla Basin Project.* Endangered Species Act – Section 7 Consultation, Operation of the Umatilla Basin Project Umatilla and Morrow Counties, Oregon. National Marine Fisheries Service, Northwest Region, OSB-2001-0062-FEC.

National Marine Fisheries Service. 2000. Biological OpinionCReinitiation of Consultation on Operation of the Federal Columbia River Power System, Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin, http://www.nwr.noaa.gov/1hydrop/hydroweb/docs/Final/2000Biop.html

National Register of Historic Places. 2003. *National Register of Historic Places*, Umatilla County. <http://arcweb.sos.state.or.us/shpo/umatilla>

Northrop, M. 1997. *Bull Trout Spawning Ground Survey Results for the Northern Blue Mountains for the Years 1994, 1995, and 1996.* Walla Walla Ranger District, Walla Walla, Washington.

Oregon Agricultural and Fisheries Statistics, USDA Oregon Agricultural Statistic Service, various years.

Oregon Economic and Community Development Department. 2001. County Economic Indicators, various years, including 2001 and 1999.

Oregon Trail Advisory Council. 1988. Our Oregon Trail: A Report to the Governor. Salem, Oregon: Oregon Trail Advisory Council.

Oregon State Parks Department. 2003. Oregon Statewide Comprehensive Outdoor Recreation Plan.

Poff, N. L., J.D. Allen, M.B. Bain, J.R. Karr, K.L. Prestengaard, B.D. Richter, R.E. Sparks, and J.C. Stromberg. 1997. "The Natural Flow Regime." *Bioscience*, Vol. 47, No. 11.

Poff, N.L., and J.V. Ward. 1990. "Physical Habitat Template of Lotic Systems: Recovery in the Context of Historical Pattern of Spatiotemporal Heterogeneity." *Environmental Management*, Vol. 14, pp. 629-645.

Post, R.H. 1938. "The Subsistence Quest: In the Sinkaietk or Southern Okanogan of Washington," L. Spier, editor, pp. 9-34. In *General Series in Anthropology, No. 6.* Menasha.

Ray, V.F. 1933. "The Sanpoil and Nespelm Salishan Peoples of Northwestern Washington." *Publications in Anthropology, Vol. 5.* Univ. of Washington.

Reiser, D.W., and T.C. Bjornn. 1979. *Habitat Requirements of Anadromous Salmonids*. U.S. Forest Service, General Technical Report PNW-96: 1-54.

Rimbach, Greg. June 23, 2003. Personal Communication. Assistant District Wildlife Biologist, Oregon Department of Fish and Wildlife, Pendleton, Oregon.

Saul, Darin; Craig Rabe; Anne Davidson; Dora Rollins. 2001. Draft Umatilla Subbasin/Willow Creek Subbasin Summary. Prepared for the Northwest Power Planning Council. August 3, 2001. 347 pp.

Sauter, S., J. McMillan, and J. Dunham. 2001. "Salmonid Behavior and Water Temperature." U.S. EPA 910-D-01-001. Issue Paper 1 for the EPA Region 10 Temperature Water Quality Criteria Guidance Development Project.

Spinden, H.J. 1908. "The Nez Perce Indians." In: *Memoirs of the American Anthropological Association*. Vol. 2(3): pp. 167-274.

Stene, Eric A. 1993. The Umatilla Project. Denver: U.S. Bureau of Reclamation History Project (unpublished). pp. 3, 4.

Swindell. 1941. "Accustomed Fishing Sites of the Umatilla Indian Reservation." Unpublished Report, on file at the Department of Natural Resources, Confederated Tribes of the Umatilla Indian Reservation.

Thullen, Joan. 2003. Personal communication. Professional wetland scientist, Society of Wetland Scientists. Littleton, Colorado. September 15, 2003.

Tiedeman, John. June 13, 2003. Personal Communication. Activity Manager, U.S. Bureau of Reclamation, Pacific Northwest Regional Office, Boise, Idaho.

Umatilla County Commercial Club Federation, the County Farm Bureau and the County Court. 1923. Umatilla County, Oregon: A Truthful Exposition of the Facts and Future Possibilities of the Leading Agricultural County of the State. Pendleton, Oregon: Umatilla County Commercial Club Federation, the County Farm Bureau and the County Court.

Umatilla County Historic Society. 1981. *Umatilla County: A Backward Glanc*e. Pendleton, Oregon: Umatilla County Historic Society. pp. 8, 27.

Umatilla/Walla Walla Bull Trout Working Group. 1999. Meeting Minutes: March 1, Pendleton, Oregon.

U.S. Census Bureau. 2000. Population of Umatilla and Morrow Counties. U.S. Department of Commerce.

U.S. Census Bureau. 2000. Oregon 2000 Census Information, *American FactFinder*. July 18, 2003. <http://factfinder.census.gov/ > (accessed July 18, 2003)

U.S. Department of the Interior, Bureau of Reclamation, 2003. Supplement to the August 2001 Biological Assessment for the Umatilla Project and the Umatilla Basin Project, May 2003. Upper Columbia Area Office, Yakima, Washington.

U.S. Department of the Interior, Bureau of Reclamation, 2002a. Final Environmental Assessment for Hermiston Irrigation District Boundary Adjustment. Upper Columbia Area Office, Yakima, Washington.

U.S. Department of the Interior, Bureau of Reclamation, 2002b. Final Environmental Assessment for Stanfield Irrigation District Boundary Adjustment. Upper Columbia Area Office, Yakima, Washington.

U.S. Department of the Interior, Bureau of Reclamation. 2000. *Biological Assessment of Effects to Listed Salmonid Species From Continued Operations and Maintenance of the Umatilla Project and Umatilla River Basin*. Prepared for National Marine Fisheries Service, Boise, Idaho, and U.S. Fish and Wildlife Service, Portland, Oregon. To fulfill consultation requirements under section 7 of the Endangered Species Act. Prepared by Gary Torretta, Upper Columbia Area Office, Yakima, Washington, September 2000.

U.S. Department of the Interior, Bureau of Reclamation Memorandum. 1994. To Regional Director, From Deputy Commissioner, Land Classification Approval – Stanfield, Westland, and West Extension Irrigation Districts, Umatilla Basin Project, Oregon. March 9, 1994.

U.S. Department of the Interior, Bureau of Reclamation. 1993a. 1993 Land Classification Report for the Expansion of Stanfield Irrigation District, Westland Irrigation District, West Extension Irrigation District. Boise: U.S. Bureau of Reclamation, Pacific Northwestern Regional Office.

U.S. Department of the Interior, Bureau of Reclamation. 1993b. Land Classification Report for Expansion of Stanfield Irrigation, Westland, and West Extension Irrigation Districts, Supplement to 1970 Lands Appendix, Umatilla Basin Project, Oregon.

U.S. Department of the Interior, Bureau of Reclamation, 1988. Umatilla Basin Project Planning Report/Final Environmental Statement. February, 1988.

U.S. Department of Agriculture. Soil Conservation Service (currently known as Natural Resources Conservation Service). 1983. Westland Irrigation District Water Conservation and Distribution System, RC&D Project Plan. Portland, Oregon, August 1983.

U.S. Department of Agriculture. 1948. Soil Survey, The Umatilla Area, Oregon. Series 1937, No. 21, issued March 1948.

U.S. Department of Agriculture. 1988. Soil Survey of Umatilla County Area, Oregon, United States Department of Agriculture, November 1988.

U.S. Fish and Wildlife Service. 2003. Letter to Reclamation regarding endangered species in project area.

U.S. Fish and Wildlife Service. 1999. Proposed Rule to Remove the Bald Eagle in the Lower 48 States From the List of Endangered and Threatened Wildlife. *Federal Register*. 64(128): 36454-36464.

U.S. Fish and Wildlife Service. 1986. Pacific Bald Eagle Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 163 pps.

U.S. Fish Commission. *Bulletin of the U.S. Fish Commission*. 1894. In: *Umatilla River Basin Total Maximum Daily Load and Water Quality Management Implementation Plan*, March 2001. Oregon Department of Environmental Quality.

Wick, Mike. 2003. Personal communication (e-mail) to Paula Engel. Economics relating to boundary change. May 30, 2003.

Woodward, John A. 1985. "A Report on Cultural Resource Investigations Within the Echo Urban Growth Boundaries." Unpublished report submitted to the City of Echo.

Attachment A

Preconservation Scenario

Preconservation Scenario

As part of the cumulative effects analysis, Reclamation has analyzed the 1983 conservation program that Westland initiated. Westland and the CTUIR agreed that Reclamation would analyze the impacts of this program; however, it is not part of the proposed action in this environmental assessment.

A Preconservation Scenario was analyzed using the RiverWare™ model to determine the effects of water conservation practices that occurred in the Westland Irrigation District (Westland) in 1983. This scenario was compared to the No Action Alternative to estimate impacts to flows in the Umatilla River as a result of these water conservation practices. Impacts to the Umatilla River were realized in the following locations along the Umatilla River: (1) Upstream of the Westland Diversion. Impacts 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 Preconservation Scenario and the No Action Alternative. (2) Downstream of the Dillon Diversion. Impacts are a result of differences in the timing and magnitude of return flows from Westland.

Modeling Assumptions and Methodology

The modeling assumptions, inputs, and methodology used in the Preconservation Scenario were the same as those used in the No Action Alternative model run with the following exceptions and/or additions:

1. Canal seepage in the Westland North RiverWare subarea set to 40 percent to reflect preconservation conditions. This canal delivers water to 3,150 in-boundary acres that receive McKay storage water as a supplemental water supply.

2. Water deliveries to the Westland North subarea were increased to overcome seepage losses. In other words, gross water deliveries (pre-canal-seepage) to Westland North were greater per acre than the rest of Westland to achieve the same net delivery (post-canal-seepage) amount throughout the district.

Storage water that was used by out-of boundary lands in the Full Adjustment Alternative (OB storage water) was used by in-boundary lands in the Preconservation Scenario. The same method that was used in the No Action Alternative was used in the Preconservation Scenario to deliver the OB storage water.

Figure 1 shows average monthly potential crop irrigation requirements and average monthly modeled depletions for in-boundary lands. These depletions represent average monthly depletions for the Preconservation Scenario for years 1994 through 2002 after the apportionment of the OB storage water.

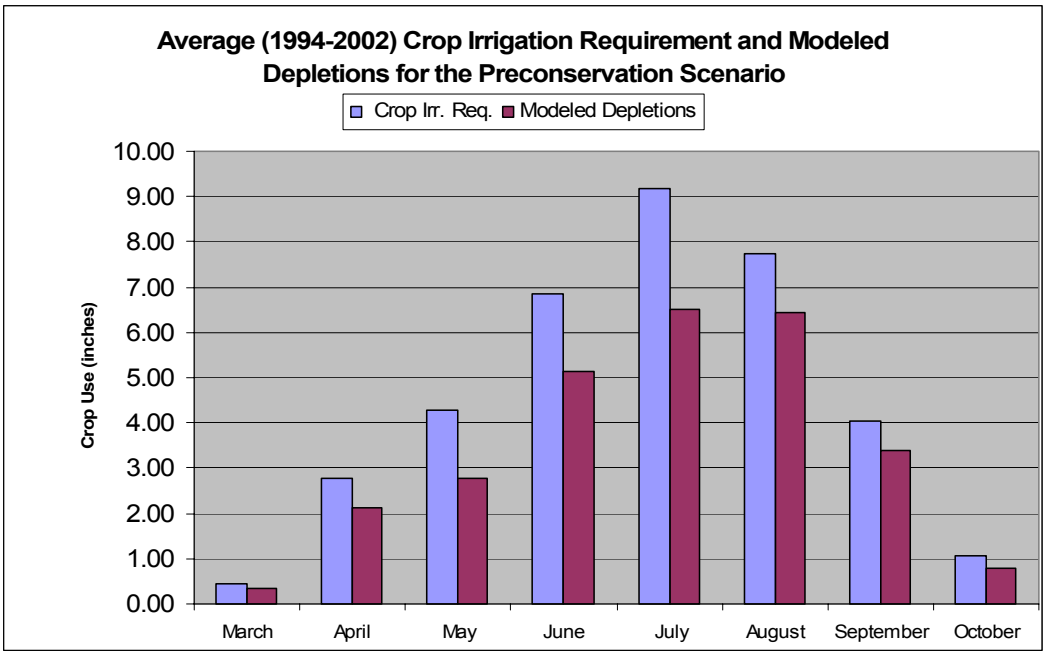


Figure 1: Average (1994-2002) monthly potential crop irrigation requirements and average monthly modeled depletions for in-boundary lands for the Preconservation Scenario.

The modeled results of the Preconservation Scenario were compared to the modeled results of the No Action Alternative to estimate the magnitude and timing of any impacts to the Umatilla River and to McKay Creek. Impacts to the Umatilla River were realized in the following locations.

> **Upstream of the Westland diversion:** Impacts 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 alternative and scenario.
>
> **Downstream of Dillon diversion:** Impacts are a result of differences in the timing and magnitude of return flows from Westland.

It is important to note that the projected downstream and upstream impacts are generated by a single action, boundary adjustment, and are not independent effects of separate actions.

Impacts Upstream of Westland Diversion

Impacts to the Umatilla River upstream of the Westland Diversion, as a result of conservation practices, are due to the differences in the magnitude and timing of storage water releases from McKay Reservoir. Table 1 shows the modeled average monthly differences in diversions (1994-2002) at Westland Diversion for the Preconservation Scenario when compared to the No Action Alternative. There are relatively minor differences in monthly diversions, and the annual diversion volumes are equivalent for both the Preconservation Scenario and the No Action Alternative. These differences in diversions are realized upstream of the Westland Diversion in the Umatilla River and in McKay Creek.

Table 1.—Modeled average monthly (1994-2002) flow and volume diversion differences between the Preconservation Scenario and the No Action Alternative at the Westland Diversion

Average of all years	Pre-conservation Scenario	
	Flow difference (average daily, cfs)	Volume difference (acre-feet)
January	0.0	0
February	0.0	0
March	0.0	0
April	0.0	0
May	0.0	0
June	-5.2	-309
July	-6.9	-423
August	10.8	662
September	1.8	105
October	-0.6	-35
November	0.0	0
December	0.0	0
Annual		**0**

Impacts Downstream of the Dillon Diversion

Impacts to the Umatilla River, downstream of the Dillon Diversion are due to differences in return flows from Westland. The differences in return flows are mainly attributed to differences in diversions and differences in canal seepage. Table 2 shows the modeled average monthly differences in return flows (1994-2002) from Westland, as measured in the Umatilla River upstream of the West Extension Irrigation District (West Extension) diversion for the Preconservation Scenario, when compared to the No Action Alternative. Return flows are higher for the Preconservation Scenario because of higher canal seepage returns.

Table 2.—Modeled average monthly (1994-2002) flow and volume return flow differences between the Preconservation Scenario and the No Action Alternative as measured in the Umatilla River upstream of the West Extension Diversion

Average of all years	Preconservation	
	Flow difference (average daily, cfs)	Volume difference (acre-ft)
January	3.5	212
February	2.9	160
March	2.3	141
April	2.5	149
May	3.7	225
June	4.6	276
July	6.2	381
August	7.7	475
September	9.3	553
October	8.0	495
November	6.0	354
December	4.4	269
Annual		**3,690**

Modeled Flows at Various Locations along the Umatilla River

Modeled impacts to the Umatilla River and McKay Creek were examined for years 1994 through 2002. The actual historical flows (1994-2002) at Umatilla River at Yoakum (YOKO), Umatilla River below Feed Diversion (UMUO), Umatilla River below Dillon Diversion (UMDO), Umatilla River at Umatilla (UMAO), and McKay Creek below McKay Reservoir (MCKO), adjusted to include 10 cfs minimum flow below McKay Reservoir, reflect operations that include deliveries to OB lands under TWSCs. This "current" operation includes conditions that would be similar to those that would occur under full boundary adjustment. Therefore, these historic flows will be used to estimate the flows that would occur under the Full Adjustment Alternative.

The period 1994-2002 contains a range of water supply conditions that can be used to review a typical dry, average, or wet year scenario. The years 1995, 1996, and 1997 were wet years; 1999, 2000, 2002 were average years; and 1994, 1998, and 2001 were dry years. Years of a similar category were averaged together to obtain mean monthly flows for wet, average, and dry years To estimate the flows at these points along the river for the No Action Alternative, subtract the full impact from the historic flows. To estimate the flows at these points along the river for the Preconservation Scenario, add the preconservation impact to the No Action flows.

YOKO (Umatilla River at Yoakum)

Estimated flows at YOKO, which is upstream of the Westland Diversion, are shown in table 3 for the No Action Alternative and the Preconservation Scenario and for wet, average, and dry years. Table 4 shows mean volume differences between the scenarios. The differences in flows at YOKO are due to differences in the magnitude and timing of McKay storage water releases. This explanation of flows at YOKO is true for any point on the Umatilla River from McKay Creek to the Westland Diversion and for McKay Creek downstream of McKay Reservoir.

Table 3: Estimated mean flows at Yoakum for wet, average, and dry years for the No Action Alternative and the Preconservation Scenario.

	YOKO, Umatilla River at Yoakum (RM 38), average daily flows (cfs)					
	Wet year		Average year		Dry year	
Month	NA	Preconserv	NA	Preconserv	NA	Preconserv
Jan	1361.7	1361.7	744.2	744.2	619.6	619.6
Feb	2513.4	2513.4	834.4	834.4	433.5	433.5
Mar	1977.0	1977.0	1415.7	1415.7	1095.3	1095.3
Apr	1843.3	1843.3	1625.4	1625.4	1044.6	1044.6
May	1558.0	1558.0	801.1	801.1	870.0	870.0
Jun	458.1	452.4	476.4	470.2	434.1	428.7
Jul	280.8	273.2	253.5	247.4	256.3	247.1
Aug	245.3	257.0	201.5	211.2	208.7	223.2
Sep	210.3	214.0	185.0	186.9	179.8	180.0
Oct	237.1	234.8	226.2	226.8	201.5	201.3
Nov	445.4	445.4	240.1	240.1	347.6	347.6
Dec	902.6	902.6	345.7	345.7	765.9	765.9
Annual difference (acre-ft)		**0**		**0**		**0**

Table 4: Mean volume differences at YOKO for wet, average, and dry years for the Preconservation Scenario when compared to the No Action Alternative

Month	YOKO , Umatilla River at Yoakum (RM38), volume differences (acre-ft)					
	Wet year		Average year		Dry year	
		Preconserv		Preconserv		Preconserv
Jan		0		0		0
Feb		0		0		0
Mar		0		0		0
Apr		0		0		0
May		0		0		0
Jun		-340		-370		-320
Jul		-466		-374		-570
Aug		723		594		891
Sep		223		113		13
Oct		-140		37		-14
Nov		0		0		0
Dec		0		0		0
Annual difference (acre-ft)		**0**		**0**		**0**

UMUO (Umatilla River downstream of Feed Diversion)

Estimated flows at UMUO, which is upstream of the Westland Diversion and downstream of the Feed Diversion, are shown in table 5 for the No Action Alternative and the Preconservation Scenario and for wet, average, and dry years. Table 6 shows mean volume differences between the scenarios. The differences in flows at UMUO are due to differences in the magnitude and timing of McKay storage water releases.

Table 5: Estimated mean flows at UMUO for wet, average, and dry years for the No Action Alternative and the Preconservation scenario.

Month	UMUO, Umatilla River downstream of Feed Diversion (RM 28), average daily flows (cfs)					
	Wet year		Average year		Dry year	
	NA	Preconserv	NA	Preconserv	NA	Preconserv
Jan	1226.3	1226.3	681.5	681.5	568.8	568.8
Feb	2363.1	2363.1	721.5	721.5	292.9	292.9
Mar	1547.6	1547.6	1250.7	1250.7	841.9	841.9
Apr	1412.8	1412.8	1486.3	1486.3	790.8	790.8
May	1138.9	1138.9	759.5	759.5	700.2	700.2
Jun	334.3	328.6	465.3	459.0	362.4	357.0
Jul	196.2	188.6	236.0	229.9	200.8	191.6
Aug	172.8	184.5	189.6	199.2	169.0	183.5
Sep	153.0	156.7	175.0	176.9	158.8	159.0
Oct	241.8	239.6	221.7	222.3	195.1	194.9
Nov	476.8	476.8	248.3	248.3	307.4	307.4
Dec	851.6	851.6	358.0	358.0	659.4	659.4
Annual difference (acre-ft)		**0**		**0**		**0**

Table 6: Mean volume differences at UMUO for wet, average, and dry years for the Preconservation Scenario when compared to the No Action Alternative

Month	UMUO, Umatilla River downstream of Feed Diversion (RM 28), volume differences (acre-ft)					
	Wet year		Average year		Dry year	
		Preconserv		Preconserv		Preconserv
Jan		0		0		0
Feb		0		0		0
Mar		0		0		0
Apr		0		0		0
May		0		0		0
Jun		-340		-370		-320
Jul		-466		-374		-570
Aug		723		594		891
Sep		223		113		13
Oct		-140		37		-14
Nov		0		0		0
Dec		0		0		0
Annual difference (acre-ft)		**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 for both the Preconservation Scenario and the No Action 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 both scenarios. Estimated flows at UMDO are shown in Table 7 for the No Action Alternative and the Preconservation Scenario and for wet, average, and dry years.

Table 7: Estimated mean flows at UMDO for wet, average, and dry years for the No Action Alternative and the Preconservation scenario.

	UMDO, Umatilla River downstream of Dillon Diversion (RM 24), average daily flows (cfs)					
	Wet year		Average year		Dry year	
Month	NA	Preconserv	NA	Preconserv	NA	Preconserv
Jan	1184.1	1184.1	596.1	596.1	597.9	597.9
Feb	2326.4	2326.4	651.3	651.3	289.4	289.4
Mar	1757.9	1757.9	1282.3	1282.3	879.7	879.7
Apr	1496.4	1496.4	1354.9	1354.9	760.8	760.8
May	772.6	772.6	515.7	515.7	512.4	512.4
Jun	138.7	138.7	227.5	227.5	157.4	157.4
Jul	5.8	5.8	55.9	55.9	22.2	22.2
Aug	4.1	4.1	26.7	26.7	7.2	7.2
Sep	36.7	36.7	76.1	76.1	43.1	43.1
Oct	182.5	182.5	194.0	194.0	156.4	156.4
Nov	408.0	408.0	250.3	250.3	298.4	298.4
Dec	694.9	694.9	323.4	323.4	667.4	667.4
Annual difference (acre-ft)		**0**		**0**		**0**

UMAO (Umatilla River at Umatilla)

Flows at UMAO could be affected by return flows from irrigated acreage and canal seepage losses from Westland, which will vary, depending on which scenario is in place. Generally, flows will be more at UMAO under the Preconservation Scenario when compared to the No Action Alternative, due to the returns from increased canal seepage. Most of the return flows return to the Umatilla River downstream of UMDO; therefore, any impacts to the river due to changes in return flows will potentially affect only the reach from UMDO to the mouth of the Umatilla River. Estimated flows at UMAO are shown in table 8 for

the No Action Alternative and the Preconservation Scenario and for wet, average, and dry years. Table 9 shows mean volume differences between the scenarios.

Table 8: Estimated mean flows at UMAO for wet, average, and dry years for the No Action Alternative and the Preconservation scenario.

	UMAO, Umatilla River at Umatilla (RM 2.2), average daily flows (cfs)					
	Wet year		Average year		Dry year	
Month	NA	Preconserv	NA	Preconserv	NA	Preconserv
Jan	1368.5	1371.9	667.1	670.7	530.9	534.3
Feb	2695.2	2698.0	688.4	691.4	341.6	344.4
Mar	1942.1	1944.4	1285.5	1287.9	917.4	919.5
Apr	1496.7	1499.1	1288.9	1291.4	702.9	705.5
May	1224.6	1227.8	451.1	455.1	605.8	609.5
Jun	201.1	205.3	240.2	245.4	219.0	223.6
Jul	15.5	21.5	65.7	72.3	28.6	34.7
Aug	40.6	48.2	54.6	62.5	33.0	40.6
Sep	123.0	132.4	136.1	145.2	107.4	116.9
Oct	275.9	284.4	243.7	251.3	233.0	241.0
Nov	496.2	502.3	297.6	303.4	366.0	371.9
Dec	870.4	874.9	365.2	369.5	678.8	683.1
Annual Difference (acre-ft)		**3654**		**3752**		**3665**

Table 9: Mean volume differences at UMAO for wet, average, and dry years for the Preconservation Scenario when compared to the No Action Alternative

	UMAO, Umatilla River at Umatilla (RM 2.2), volume differences (acre-ft)					
	Wet year		Average year		Dry year	
Month		Preconserv		Preconserv		Preconserv
Jan		208		224		205
Feb		156		168		155
Mar		139		149		134
Apr		142		154		150
May		199		246		231
Jun		251		307		270
Jul		368		404		372
Aug		471		486		469
Sep		557		542		561
Oct		523		467		494
Nov		364		343		355
Dec		276		262		269
Annual difference (acre-ft)		**3654**		**3752**		**3665**

MCKO (McKay Creek below McKay Reservoir)

Estimated flows at MCKO, which is downstream of McKay Reservoir, are shown in table 10 for the No Action Alternative and the Preconservation Scenario and for wet, average, and dry years. Table 11 shows mean volume differences between the scenarios. The differences in flows at MCKO are due to differences in the magnitude and timing of McKay storage water releases.

Table 10: Estimated mean flows at MCKO for wet, average, and dry years for the No Action Alternative and the Preconservation scenario.

	MCKO, McKay Creek below McKay Reservoir, average daily flows (cfs)					
	Wet year		Average year		Dry year	
Month	NA	Preconserv	NA	Preconserv	NA	Preconserv
Jan	45.7	45.7	10.1	10.1	10.1	10.1
Feb	186.7	186.7	10.0	10.0	10.0	10.0
Mar	246.6	246.6	10.1	10.1	10.1	10.1
Apr	230.7	230.7	118.4	118.4	23.3	23.3
May	260.4	260.4	58.1	58.1	66.4	66.4
Jun	179.3	173.6	175.4	169.2	214.2	208.8
Jul	191.9	184.3	197.9	191.8	209.1	199.8
Aug	203.5	215.3	171.5	181.1	180.4	194.9
Sep	155.3	159.1	140.8	142.7	146.2	146.4
Oct	149.4	147.1	145.3	145.9	144.3	144.1
Nov	24.2	24.2	87.5	87.5	51.9	51.9
Dec	10.1	10.1	10.4	10.4	10.1	10.1
Annual Difference (acre-ft)		**0**		**0**		**0**

Table 11.—Mean volume differences at MCKO for wet, average, and dry years for the Preconservation Scenario when compared to the No Action Alternative

Month	MCKO, McKay Creek below McKay Reservoir , volume differences (acre-ft)					
	Wet year		Average year		Dry year	
		Preconserv		Preconserv		Preconserv
Jan		0		0		0
Feb		0		0		0
Mar		0		0		0
Apr		0		0		0
May		0		0		0
Jun		-340		-370		-320
Jul		-466		-374		-570
Aug		723		594		891
Sep		223		113		13
Oct		-140		37		-14
Nov		0		0		0
Dec		0		0		0
Annual difference (acre-ft)		**0**		**0**		**0**

Summary

The results of modeling the Preconservation Scenario have shown that conservation activities, which occurred in Westland, have reduced return flows to the Umatilla River. Comparison of the Preconservation Scenario to the No Action Alternative also shows that there are other minor differences in the magnitude and timing of flows. These differences are shown in the following locations along the Umatilla River and in McKay Creek below McKay Reservoir:

Upstream of the Westland diversion: Impacts in 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 scenarios. The impacts are monthly variations that occur during the irrigation season. Annually, there are no differences between the scenarios.

Downstream of Dillon diversion: Impacts in the Umatilla River are a result of differences in the timing and magnitude of return flows from Westland. Average annual modeled return flows were around 3,690 acre-feet higher for the Preconservation Scenario.

Attachment B

Comments and Responses

Comments and Responses

The Draft Environmental Assessment (EA) was distributed to the public on January 22, 2004. Comments were scheduled to be received for 30 days until February 23, 2004.

Approximately 75 copies of the Draft EA were distributed to Federal, State, and local agencies, native American tribes, irrigation districts, and interested members of organizations and the general public. A total of 6 comment letters were received during the public review. Reclamation's responses to the significant comments and these documents are included in this attachment B (Comments and Responses).

The comment letters are presented in the order shown in the distribution list and in the table below. The responses precede the comment documents. The first page of each comment document is identified in the table below.

Some comments are repeated in several of the letters received. A summary of the comments and responses follow the table.

Commenters are from the state of Oregon unless otherwise indicated.

Written Comments

The following table provides the list of those commenting in distribution list order, with the page number of the comment document.

		Letter (page)
01	Confederated Tribes of the Umatilla Indian Reservation, Pendleton	B-5
02	Bureau of Indian Affairs, Portland	B-9
03	Morrow County Court, Heppner	B-13
04	West Extension Irrigation District, Irrigon	B-14
05	Westland Irrigation District, Hermiston	B-16
06	Strebin Farms, Inc. Irrigon	B-17

Summary of Significant Comments and Reclamation Responses

The significant review comments are summarized below along with Reclamation's responses. Some changes have been made in the text, where appropriate, in response to the comments.

Comment:

What effect does the irrigation of these additional lands have on the West Extension Irrigation District?

Response:

The RiverWare model identified an effect on the West Extension Irrigation District (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 Extention 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.

Comment:

The proposed mitigation/enhancement allows for water to stay in McKay Reservoir and be available for fisheries. Why isn't this water available to West Extension Irrigation District?

Response:

Based on RiverWare model results, 895 acre-feet of water is being provided as mitigation to instream flow impacts. Westland has also committed to the CTUIR that they will provide an additional 605 acre-feet of water from their McKay allocation as a fishery enhancement measure. Both quantities of water 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.

Comment:

With projected lower flows in September above Westland's diversion dam, the amount of suitable habitat area would be reduced from both a temperature and wetted-area perspective.

Response:

Irrigation releases under the Full Boundary Adjustment alternative would cease in the last week of September, potentially reducing flows above Westland's diversion dam compared to the No Action alternative, under which releases for irrigation continue until early October. Storage releases from McKay for instream flow purposes, however, are already underway by the last week of September. Consequently, releases for irrigation and releases for instream flows overlap by several days which ensures that the cessation of irrigation releases doesn't result in changes to suitable habitat. In 2003, when this overlap occurred, releases from McKay Reservoir rose in the period of overlap from about 80- 130 cfs to around 200 cfs and then fell to around 150 cfs when irrigation releases ceased. The instream flow releases are made in September to augment flows all the way to the mouth of the river.

Comment:

Since fish augmentation water must be released during this period to maintain rearing habitat, this water is unavailable to fish when they need it during passage periods, which causes lower flows during spring and/or fall fish migration.

Response:

The fish augmentation water, to maintain rearing habitat, would not need to be released until after McKay Reservoir releases for Westland end. In the past Westland has foregone use of up to about 6,300 acre-feet of McKay storage water as mitigation under the Temporary Water Service Contracts (TWSC). Because of that mitigation commitment, Westland has not had enough water to irrigate past the middle of September. The fish augmentation water has been used by fisheries managers after Westland had stopped irrigating but before McKay releases were needed to augment flows for fish migration. With Westland providing 1,500 acre-feet of water for instream flow augmentation, 895 acre-feet as mitigation for the boundary adjustment and, as an additional commitment to the CTUIR, 605 acre-feet as a fishery enhancement measure, instead of 6,300 acre-feet, they can continue to divert water into the latter part of September. Consequently, storage releases to augment flows for fish migration will already be underway before Westland stops irrigating, so releases to maintain habitat conditions above Westland's diversion dam wouldn't be needed.

Comment:

Page 8 – Provides that "[c]ategory III are lands that lie outside Westland's boundaries and consist of 8,855.5 acres of which 5,759 would be irrigated in any given year." The Draft EA, however, does not provide any discussion of how the BOR intends to monitor this and similar limitations on water use provided in the document, how will the agency assure that these limitations are carried out?

Response:

Since 2001, Reclamation has implemented an effort to identify unauthorized use by implementing a district review process. In implementing this review process, Reclamation has committed to periodic on-site reviews to determine whether the annual use of water is in accordance with existing contract terms. During these reviews, Reclamation staff will travel to the irrigation district office to make an onsite review of a number of items related to the use of project water, including the acres of lands served, water delivery records and water-master records. If it is found that the district is not complying with the contract terms, then Reclamation will advise the district of the actions required to bring them into compliance.

GENERAL COUNCIL
and
BOARD OF TRUSTEES

Water Committee

CONFEDERATED TRIBES
of the
Umatilla Indian Reservation
P.O. Box 638
PENDLETON, OREGON 97801
Area code 541 Phone 276-3165 FAX 276-3095

February 23, 2004

Ronald Eggers, Area Manager
U.S. Bureau of Reclamation Pacific Northwest Region
Lower Columbia Area Office
825 NE Multnomah St., Suite 1110
Portland, OR 98907

RE: WID Draft EA – Comments

Dear Ron:

Thank you for the opportunity to comment on the Bureau of Reclamation's (Reclamation) Draft Environmental Assessment for the Westland Irrigation District Boundary Adjustment dated December 2001 (DEA). The Tribal Water Commission for the Confederated Tribes of the Umatilla Reservation (the Commission) believes a significant amount of progress has been made over the last decade or so that Westland's boundary adjustment proposal has been on the table. This is primarily a result of the 2003 MOA between the Westland and the Tribes as well as several joint efforts the two entities have engaged in to benefit the salmon fishery in the Umatilla Basin and to maintain the farming economy.

In addition to the comments provided below, the Commission intends to abide by its commitment to Westland Irrigation District provided under the Memorandum of Agreement dated April 25, 2003. One of the Commission's principal concerns is the further reduction in water available for fish, which decreased from about 6500 ac-ft (1993 MOA) to about 1900 ac-ft in Westland's 2003 Temporary Water Service Contract in 2003 to 895 ac-ft as provided in the DEA. This is a setback for fish restoration in the Umatilla Basin, and a solution to the problem may need to be found outside the NEPA process.

The Commission has the following specific comments:

I. Appendix A

The Commission is encouraged by the analysis of the Pre-conservation Scenario provided in Appendix A-1. This is in keeping with Reclamation's commitment, made in

fall of 2000, to draft a separate no action alternative that identifies the specific impacts of WID's conservation activities and to conduct an historic overview to look at development of both the Umatilla Project and the Umatilla Basin Project and their environmental effects.

At the same time, Reclamation's preferred action will result in a decrease of 1,000 ac-ft (below the 2003 mitigation requirement) of water available for fish augmentation flows on an annual basis. In addition to those listed by Reclamation in the DEA on Page 47, lower water releases for irrigation in September have two potential impacts on fish: 1) at lower flow levels the amount of suitable habitat area is reduced from both a temperature and wetted-area perspective – this is not captured adequately in the text as the DEA uses the generic term to "a short reach of the Umatilla River" without any reference to actual size of the area, and 2) since fish augmentation water must be released during this period to maintain rearing habitat, this water is unavailable to fish when they need it during passage periods, which causes lower flows during spring and/or fall fish migration. These impacts negatively affect fish and are inconsistent with the Umatilla Basin Project Act of 1988. As a result, the Commission shall consult with Reclamation and meet with Westland to discuss measures to increase flows in the river to meet fundamental fish needs.

II. Miscellaneous

a) The frontpiece figure: This figure shows the County Line Irrigation District in with WID. Figures 2 and 3 also include CLWID but not in Figure 1.

b) Page 8 – Provides that "[c]ategory III lands are lands that lie outside Westland's boundaries, and consist of 8,855.5 acres of which 5,759 would be irrigated in any given year." The DEA, however, does not provide any discussion of how the BOR intends to monitor this and similar limitations on water use provided in the document. How will the agency insure that these limitations are carried out?

c) Page 30 – Mitigation: the DEA should explain why impacts occurring in the River above WID's diversion in June, September, and October do not need to be mitigated. Refer to Tables 10, 13, 15, and 20, under normal conditions, impacts during the migration periods sum to 2,889 ac-ft. The increased streamflow in July and August does not compensate for the reduced flow during the spring and fall salmonid migration periods.

d) Page 40 – Salmon: Here are more accurate numbers and years; CHF 85 - 6,028 (1985-2002), CHS 13 - 5,246 (1988-2003), and
Coho 29 - 22,872 (1987-2002).

e) Page 41 – Streamflow: The statement in the 2nd paragraph that the Umatilla River downstream from McKay Creek is only used seasonally for migration and over-wintering is contradictory to the discussion and citations on pages 43 and 50 (Germond 2000) that

identifies this reach as summer rearing habitat for steelhead. This use should also be included in Table 24. Also, the spring chinook adult migration season of use is incorrect – it should be April – July.

f) Page 44 – Salmonid Juvenile Rearing: 1) the discussion of summer rearing is related to coho spawning areas but back in the Salmonid Spawning section there is no description of coho spawning distribution and magnitude in relationship to the affected project area below McKay Creek and 2) this discussion is specific to the late summer period when WID discontinues McKay irrigation releases.

g) Page 46 – Lamprey: In the last sentence, they can't go behind the fish ladder. They can pass through diffusers inside the ladder without passing in front of the viewing window.

h) Page 50 – MCR Steelhead: Potentially, spawning does occur in lower McKay Creek.

i) Page 51 – Bull Trout: There have also been a few adults (5) captured at Three Mile Dam in May and June.

j) Page 52 - MCR Steelhead and Bull Trout: Steelhead "migrants" may be present…" – This statement is incorrect as stated, should probably use a different term than migrants here (juveniles?). Also, see comments above regarding lower flows in September.

k) Page 54 – Recreation (Affected Environment and Consequences): No mention at all of McKay Reservoir and associated recreational usage and potential impacts.

l) Page 65 – Exchange Program: Last paragraph, water exchange with WEID ends July 1. WEID doesn't "potentially" divert the entire flow they DO divert the entire flow.

m) For the reader, it would be easier to view a hydrograph of the wet, average, and dry years with a table of the flow differences for the different reaches. As it is with just tables, the reader is not able to easily examine the trends in flow differences between conditions and location.

This concludes the Commission's comments on the Draft Environmental Assessment for the proposed boundary adjustment for Westland Irrigation District. We assume that once this EA is finalized, it will go through the NOAA consultation process under Section 7.

The Commission intends to uphold the commitments in CTUIR's 2003 MOA with Westland. We may want to consult with Reclamation in mid-March, prior to the developments and issuance of a FONSI, to discuss how to resolve our concerns about the impacts of the reduction of water available for fish. If you have any questions regarding

these comments please contact the Tribal Water Resources Program Staff at (541) 966-2426. I look forward to continuing to work with you on the WID boundary expansion process.

Sincerely,

William Burke, Chairman
Tribal Water Commission

Cc: Tribal Water Commission
Antone Minthorn/BOT
Michael Farrow/DNR
Aaron Skirvin/WRP
Harold Shepherd/WRP
Kate Ely/WRP
Gary James/Fisheries
Brian Zimmerman/Fisheries
Dan Hester/Tribal Attorney
Bob Hamilton/BOR
Dave Kaumhiemer/BOR
Mike Wick/WID
Michael Tehan/NOAA Fisheries

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Northwest Regional Office
911 N.E. 11th Avenue
Portland, Oregon 97232-4169

IN REPLY REFER TO:

MEMORANDUM

FEB 2 6 2004

TO: Dave Kaumheimer, Bureau of Reclamation

FROM: Northwest Regional Director

SUBJECT: Review of Proposed Boundary Adjustment for the Westland Irrigation District, Umatilla Project, Oregon, Umatilla and Morrow Counties - Draft Environmental Assessment.

This office has reviewed the Draft Environmental Assessment and the attached comments prepared by the Bureau of Indian Affairs contractor - Natural Resource Consulting Engineers. Please accept these comments as the Bureau of Indian Affairs response to the request for review and comment.

Please contact Ms. Mary T. Manydeeds at 503-872-2886 if you have any questions regarding this memorandum.

Attachments

NRCE®

MEMORANDUM

Date: February 19, 2004

To: Mary Manydeeds, Bureau of Indian Affairs, Northwest Regional Office

From: Marijan Babic, Natural Resources Consulting Engineers, Inc.

Re: Comments on the Draft Environmental Assessment, ***Proposed Boundary Adjustment for the Westland Irrigation District, Umatilla Project, Oregon***

Natural Resources Consulting Engineers, Inc. (NRCE) has reviewed the January 2004 Draft Environmental Assessment, *Proposed Boundary Adjustment for the Westland Irrigation District, Umatilla Project, Oregon* (DEA), which was prepared by the U.S. Bureau of Reclamation (BOR). NRCE is the prime contractor to the Bureau of Indian Affairs (BIA), Northwest Regional Office (NWRO), regarding the National Environmental Policy Act (NEPA) proceedings concerning the proposed boundary adjustment for the Westland Irrigation District (WID).

Since May 2002, NRCE has participated in the work of the Umatilla Hydrologic Model Development Team in an oversight role for the BIA-NWRO. NRCE has performed review and assisted in the development of the calibration version of the *RiverWare* hydrologic model, which was used by the BOR as the basis for the hydrologic modeling and analysis presented in the DEA.

NRCE has previously reviewed and prepared comments on the August 2003 Administrative DEA (ADEA). Most of NRCE's comments on the ADEA have been addressed in the DEA. The modeling and analysis that were performed for the DEA represent improvements over those that have been performed for the ADEA. Following are NRCE's comments on the technical issues in the DEA.

Formulation of Alternatives

The fundamental assumption in the DEA is that the WID would use all water that is presently used on the out-of-boundary lands to extend irrigation season on the in-boundary lands in the event that the proposed boundary adjustment is not approved. The DEA presents an assumed cropping pattern and the corresponding crop water requirements. However, the DEA does not compare these requirements to the actual historical water deliveries to demonstrate that these historical deliveries were insufficient and that extending the irrigation season would be appropriate. The DEA does not demonstrate that the assumed use of all water within the WID boundaries under the No Action Alternative (NAA) would not exceed the crop water requirements. The DEA also does not explain how the irrigation season would be extended in practice to exactly compensate for discontinuance of the current project water use on out-of-boundary lands under the NAA.

131 Lincoln Avenue • Suite 300 • Fort Collins, Colorado • 80524
Phone (970) 224-1851 • Fax (970) 224-1885

Mitigation

The DEA provides for mitigation of 895 ac-ft for impacts due to differences in the return flows below the Dillon Diversion. However, the DIA does not specify the manner in which the mitigation water would be applied. The application of the mitigation water should match the timing of the impacts. Furthermore, 895 ac-ft represents the average annual impact for years 1994-2002 (Table 11). The impacts in different years are different and in some years the impacts will be greater than 895 ac-ft. For example, Table 17 shows that the average impacts in wet years are 948 ac-ft. The impacts in the worst year would be even higher.

Furthermore, there is no mitigation specified for impacts above Westland Diversion. These impacts are approximately 13 cfs in September and approximately 8 cfs in October, relative to baseline flows of the order of 150 cfs. On page 47, the DEA argues that fish releases from McKay Reservoir in September and October would provide adequate conditions for rearing under all alternatives. However, the DEA does not present background information on the operational policy concerning these releases and it is not clear that these releases would guarantee adequate conditions. It is furthermore not clear that sufficient water would be available in McKay Reservoir at all times to provide adequate releases. The impacts shown in Table 10 can be interpreted as differences in the releases under the NAA relative to the Full Boundary Adjustment Alternative (FBAA). Having to release less water under the NAA would result in more water in McKay Reservoir to be used later. Hence, the FBAA results in impacts on the amount of storage water available for fish releases, and these impacts should be mitigated. The sum of the average impacts for September and October is 1,266 ac-ft, and the impacts in the worst year would be higher.

Period for Analysis

The results presented in the ADEA are based on the period 1994-2002 (9 years), while the full modeling period includes 1947-2002 (46 years). Although the model is being run for 46 years, it appears that the period 1947-1993 is not used for anything. Given the structure of the model, it is probably more appropriate to report the results based on the more recent period during which the Umatilla Basin Project facilities were in place. However, nine years is generally not sufficiently long to extract accurate averages. Furthermore, the results for wet, average, and dry years are based on samples of three years each, which leads to an even greater uncertainty in the averages.

This problem is caused by developing a model based on the direct input of the historical gage flow and diversion data. If this data exhibits significant changes over time due to changes in system configuration, the resulting model is only appropriate for the period during which the system configuration was the same as the configuration of the system under consideration. This problem is generally avoided by developing a model which is not based on the historical gage flow and diversion data but on the historical natural flows and operating rules appropriate for the scenario under consideration. Such a model would be demand-driven, would allocate natural flows according to live flow water rights, would include McKay Reservoir and possibly various storage accounts in it, and would determine McKay Reservoir releases based on the appropriate operating rules. Such a model would be able to simulate the system over the entire period of record and would produce significantly more accurate averages of results of interest. Short of developing, validating, and applying such a model, the BOR should acknowledge the uncertainty in the average results obtained for the nine-year period.

Discrepancies with Respect to the Calibration Model

The acreages for the Full Boundary Adjustment Alternative (as presented in Table 7), particularly for the Westland Out-of-Boundary, are very different from the acreages at the last time step in the calibration model. In particular, the acreage for the Westland Out-of-Boundary Flood-storage for 1991 (and all other years) in the calibration model is zero, whereas the Full Boundary Adjustment Alternative has 7,241.3 acres. It appears that the calibration model may not have properly reflected the actual acreages and water use in the district.

NRCE has previously raised this comment on the ADEA. The BOR has investigated the effect of changing acreages in the calibration model but concluded that calibrated parameters are not sensitive to these changes (personal communication with J. Roache, BOR, on February 17, 2004). Based on this analysis it can be assumed that the parameters used in the model were valid for the applications presented in the DEA.

Pre-Conservation Scenario

The impacts of the pre-conservation scenario are being determined by comparison with the NAA, which again assumes that all conserved water would be used within the WID boundaries. As discussed above, this fundamental assumption for the NAA has not been justified. It would be more appropriate to determine the impacts of the pre-conservation scenario relative to the case in which the conserved water would not have been used inside or outside of the WID at all.

COUNTY COURT

P.O. Box 788 • Heppner, Oregon 97836
(541) 676-5620 FAX (541) 676-5621

TERRY K. TALLMAN, Judge
email: ttallman@co.morrow.or.us
Boardman, Oregon
JOHN E. WENHOLZ, Commissioner
email: jwenholz@co.morrow.or.us
Irrigon, Oregon
RAY GRACE, Commissioner
email: rgrace@co.morrow.or.us
Heppner, Oregon

February 26, 2004

Dave Kaumheimer, UCA-1600
Bureau of Reclamation
Upper Columbia River Area Office
1917 Marsh Road
Yakima, WA 98901

TRUE COPY
OF ORIGINAL

Re: Proposed Boundary Adjustment, Westland Irrigation District
Umatilla Project, Oregon, Draft Environmental Assessment

Dear Mr. Kaumheimer:

Morrow County is concerned that the Boundary Adjustment for the Westland Irrigation District will have economic impact upon its patrons in the West Extension Irrigation District. This issue is related to the continuing decrease in return flows in the Umatilla River and West Extension's consequent increasing reliance upon its Columbia River pumps. As you are aware, when district pumps water, the cost increases.

Morrow County asks that you address these two issues in your Environmental Assessment:

1) What effect does the irrigation of these additional lnds have on the West Extension Irrigation District diversion? The time frame studied should be prior to the original expansion of the boundaries (pre-1983), in order to get an accurate assessment.

2) The mitigation proposed in the boundary adjustment seems to allow the water to stay in the McKay Reservoir and be available for fisheries. Why isn't the mitigation water available to West Extension?

The Board of Commissioners remains concerned about water issues in the County, and request that you revise your document to thoroughly address the concerns that we have. Thank you.

Sincerely,

Terry K. Tallman
Morrow County Judge

West Extension Irrigation District

P. O. Box 100 Irrigon, Oregon 97844
541-922-3814 541-922-9775 (fax)

February 26, 2004

Mr. Dave Kaumheimer, UCA-1600
Bureau of Reclamation
Upper Columbia Area Office
1917 Marsh Road
Yakima, WA 98901

Re: Draft Environmental Assessment, Proposed Boundary Adjustment
Westland Irrigation District, Umatilla Project, Oregon

Dear Dave:

First of all, thank you for extending the comment period three days to accommodate our needs.

West Extension Irrigation District is the West End of the Umatilla Basin project. The project is heavily reliant upon return flows. These return flows originate from the water use practices of upland irrigation districts, including Westland.

The West Extension Irrigation District has three areas of concern relative to the Draft Environmental Assessment.

1) The Draft Environmental Assessment does not completely or accurately address all of the hydrological impacts and potential consequences of the alternatives. Most significantly, impacts to downstream irrigators and irrigation districts as well as likely responses to those impacts on the environment are completely ignored. What are the residual effects of the action? It is evident that a more comprehensive hydrological study is needed that takes into account all the cumulative effects, which include likely district impacts and responses to the alternative. The results of such a study may well affect the conclusions that have been made in this draft document. Until these aspects of impact are analyzed, the conclusions of the Draft Environmental Assessment cannot generate confidence.

2) The federal project water that serves most of the West Extension Irrigation District is made up of return flows of which a significant amount is from McKay Reservoir. The mitigation proposed in the Draft Environmental Assessment does not mitigate for the reduction of these return flows to the West Extension Irrigation District diversion or for likely responses to such reduction. If any of the alternatives has a reasonable and likely probability of forcing fundamental changes in district operation and water use, which in turn could have potential impacts on the environment, and if such action causes other residual effects, then the Draft Environmental Assessment must come to grips with these facts and assess the significance of such impacts. There are clear economic and social impacts, as well, which are interrelated to natural or physical environmental impacts. The Draft Environmental Assessment completely ignores all these issues.

3) The baseline used for the Draft Environmental Assessment should logically be established before conservation era, that is, before 1983, when Westland's water spreading (the actions whose impacts are being assessed) actually began. It should likewise take into account the impacts of the action and mitigation needs that have arisen from that time, including impact to West Extension's diversion.

The West Extension Irrigation District requests the opportunity to review the modeling and offer comments. Please let us know when that can be done.

We request that the Final Environmental Assessment evaluate rather than ignore the impacts noted above, and that West Extension's issues be considered in any final decision. We are available for further discussion on these issues.

Sincerely,

Beverly J. Bridgewater

Beverly J. Bridgewater
Secretary/Manager

WESTLAND IRRIGATION DISTRICT

Phone (541) 667-2030
Fax (541) 667-2031

P.O. Box 944
Hermiston, OR 97838

February 20, 2004

Mr. Dave Kaumheimer
Upper Columbia Area Office
U.S. Bureau of Reclamation
1917 Marsh Road
Yakima, WA 98901

Dear Dave,

Thank you for the opportunity to comment on the draft environmental assessment (EA) describing the impacts associated with the action of adjusting Westland Irrigation District's (Westland) federally recognized boundaries. This has been a long and challenging process, and Westland appreciates the efforts of you and other Bureau of Reclamation officials in reaching this point.

Westland suggests the following edits to the draft EA:

1. The model-derived mitigation amount of 895 acre-feet is based on a full fill of McKay Reservoir. Consistent with past operations, it should be noted that if McKay Reservoir does not fill, the mitigation amount for that year would be reduced by the percentage the reservoir lacked in reaching one-hundred percent fill capacity. E.g., if the reservoir filled to 95 %, the mitigation amount would be reduced by 5 %.

2. The maps showing the category I & II lands seem to show some of these lands as inside the recognized federal boundary. This may be due to the category I & II lands being identified on the map in full forty-acre blocks rather than by quarter-quarter.

3. On page 79, the draft EA states the anticipated mitigation would come from Westland's contracted McKay storage. To be consistent with the rest of the document, the last sentence on the page should read, "Westland would use McKay storage water to fulfill the mitigation requirements."

Please contact me with questions you may have regarding these comments.

Sincerely,

Mike Wick
District Manager

Strebin Farms, Inc.
P. O. Box 724, Irrigon, OR 97844
541-922-2521

February 26, 2004

Dave Kaumheimer, UCA-1600
Bureau of Reclamation
Upper Columbia River Area Office
1917 Marsh Road
Yakima, WA 98901

Re: Comments – Westland Irrigation District - Proposed Boundary Adjustment
Draft Environmental Assessment

Dear Mr. Kaumheimer:

I represent Strebin Farms, which has landholdings in the West Extension Irrigation District (WEID) and receives water through the WEID. I have been irrigating in WEID for a number of years as well as serving on the Board of Directors for the past six years.

I have reviewed the Draft Environmental Assessment and find that the modeling and subsequent analysis presented in the document does not take into account the effect of the proposed action on the West Extension diversion. I am concerned that by ignoring this fact, and providing proper mitigation, the cost of water in the WEID will continue to escalate as they rely more and more on pumped water.

I also noted that on Page 67 of the document, you stated that WEID is requesting 6000 acres of land, which are currently irrigated. That is not the correct statement. The WEID is requesting 3000 acres of land that have been irrigated since 1968 and an additional 3000 acres for future irrigation. The rest of the statement concerning WEID's proposed adjustment on page 67 seems correct.

Thank you for this opportunity to provide comments.

Sincerely,

Douglas W. Strebin
Principal