Environmental Assessment

Agricultural Management Plan
Umatilla Indian Reservation
Umatilla County, Oregon

August 2015

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<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMP</td>
<td>Agriculture Management Plan</td>
</tr>
<tr>
<td>APE</td>
<td>Area of Potential Effects</td>
</tr>
<tr>
<td>AQP</td>
<td>Air Quality Program</td>
</tr>
<tr>
<td>ARPA</td>
<td>Archaeological Resources Protection Act</td>
</tr>
<tr>
<td>BIA</td>
<td>Bureau of Indian Affairs</td>
</tr>
<tr>
<td>BOT</td>
<td>Board of Trustees</td>
</tr>
<tr>
<td>BMP</td>
<td>Best Management Practice</td>
</tr>
<tr>
<td>BPA</td>
<td>Bonneville Power Administration</td>
</tr>
<tr>
<td>CEC</td>
<td>Cation Exchange Capacity</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CRP</td>
<td>Conservation Reserve Program</td>
</tr>
<tr>
<td>CCRP</td>
<td>Continuous Conservation Reserve Program</td>
</tr>
<tr>
<td>CRPP</td>
<td>Cultural Resources Protection Program</td>
</tr>
<tr>
<td>CTUIR</td>
<td>Confederated Tribes of the Umatilla Indian Reservation</td>
</tr>
<tr>
<td>DNR</td>
<td>Department of Natural Resources</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
</tr>
<tr>
<td>EIS</td>
<td>Environmental Impact Statement</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>EQIP</td>
<td>Environmental Quality Incentives Program</td>
</tr>
<tr>
<td>FMP</td>
<td>Forest Management Plan</td>
</tr>
<tr>
<td>ESA</td>
<td>Endangered Species Act</td>
</tr>
<tr>
<td>FSA</td>
<td>Farm Service Agency</td>
</tr>
<tr>
<td>FTE</td>
<td>Full Time Equivalent</td>
</tr>
<tr>
<td>HEL</td>
<td>Highly Erodible Lands</td>
</tr>
<tr>
<td>IDT</td>
<td>Inter-Disciplinary Team</td>
</tr>
<tr>
<td>IPM</td>
<td>Integrated Pest Management</td>
</tr>
<tr>
<td>IWMP</td>
<td>Integrated Weed Management Plan</td>
</tr>
<tr>
<td>LWD</td>
<td>Large Woody Debris</td>
</tr>
<tr>
<td>Msl</td>
<td>Mean sea level</td>
</tr>
<tr>
<td>NEPA</td>
<td>National Environmental Protect Act</td>
</tr>
<tr>
<td>NHEL</td>
<td>Non-Highly erodible lands</td>
</tr>
<tr>
<td>NAGPA</td>
<td>Native American Graves Protection and Repatriation Act</td>
</tr>
<tr>
<td>NHPA</td>
<td>National Historic Preservation Act</td>
</tr>
<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
</tr>
<tr>
<td>NRCS</td>
<td>Natural Resource Conservation Service</td>
</tr>
<tr>
<td>ODEQ</td>
<td>Oregon Department of Environmental Quality</td>
</tr>
<tr>
<td>OM</td>
<td>Organic Matter</td>
</tr>
<tr>
<td>OSU</td>
<td>Oregon State University</td>
</tr>
<tr>
<td>OWEB</td>
<td>Oregon Watershed Enhancement Board</td>
</tr>
<tr>
<td>PM</td>
<td>Particulate Matter</td>
</tr>
<tr>
<td>ROW</td>
<td>Right-of-Way</td>
</tr>
<tr>
<td>RUSLE</td>
<td>Revised Universal Soil Loss Equation</td>
</tr>
<tr>
<td>RMZ</td>
<td>Riparian Management Zones</td>
</tr>
<tr>
<td>SCI</td>
<td>Soil Conditioning Index</td>
</tr>
<tr>
<td>THPO</td>
<td>Tribal Historic Preservation Officer</td>
</tr>
</tbody>
</table>
**ACRONYMS AND ABBREVIATIONS (CONTINUED)**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMDL</td>
<td>Total Maximum Daily Load</td>
</tr>
<tr>
<td>TWQS</td>
<td>Tribal Water Quality Standard</td>
</tr>
<tr>
<td>UIR</td>
<td>Umatilla Indian Reservation</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
<tr>
<td>USGS</td>
<td>United States Geological Survey</td>
</tr>
<tr>
<td>USDOI</td>
<td>United States Department of Interior</td>
</tr>
<tr>
<td>USFWS</td>
<td>United States Fish and Wildlife Service</td>
</tr>
</tbody>
</table>
Figure 1: Reservation Map
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Chapter One: Purpose and Need

Intent

Consistent with the provisions of the Indian Self-Determination and Education Assistance Act [25 U.S.C. 450 et seq.], the Secretary shall provide for the management of Indian agricultural lands to achieve the following objectives:

1. To protect, conserve, utilize, and maintain the highest productive potential on Indian agricultural lands through the application of sound conservation practices and techniques. These practices and techniques shall be applied to planning, development, inventorying, classification, and management of agricultural resources.

2. To increase production and expand the diversity and availability of agricultural products for subsistence, income, and employment of Indians and Alaska Natives, through the development of agricultural resources on Indian lands.

3. To manage agricultural resources consistent with integrated resource management plans in order to protect and maintain other values such as wildlife, fisheries, cultural resources, recreation and to regulate water runoff and minimize soil erosion.

4. To enable Indian farmers and ranchers to maximize the potential benefits available to them through their land by providing technical assistance, training, and education in conservation practices, management of economics of agribusiness, sources and use of credit and marketing of agricultural products, and other applicable subject areas.

5. To develop Indian agricultural lands and associated values added industries of Indians and Indian tribes to promote self-sustaining communities.

6. To assist trust and restricted Indian landowners in leasing their agricultural lands for a reasonable annual return, consistent with prudent management and conservation practices, and community goals as expressed in the Tribal management plans and appropriate tribal ordinances.

1.1 Background Information

The Umatilla Indian Reservation (UIR) established by the Treaty of June 9, 1855, 12 Statue 945, between the United States and the Cayuse, Umatilla, and Walla Walla Tribes lies along the foothills of the Blue Mountains in northeastern Oregon immediately east of Pendleton. (Figure 1) The UIR covers a variety of terrain and land uses including rough uneven forest and rangelands, gently sloping agricultural fields, and long narrow floodplains supporting riparian vegetation.

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) depend on natural resources to assist in the development of a strong, diversified economy while preserving cultural, subsistence, and aesthetic values. Fishing and hunting as well as the gathering of roots and berries are deeply ingrained within the Tribal social structure. The harvesting, processing, manufacturing, and marketing of farm, forest, livestock, and mineral products provide income to landowners and the Tribes. Together with the Wildhorse Resort and Casino, use of natural resources form the foundation of the economy of the UIR.
Agriculture provides some income to over 4500 Indian landowners of trust land on the UIR. Much of this ownership is held by members enrolled in other tribes. Due to the United States settlement of the Cobel class action lawsuit and the CTUIR inheritance code the trend of land passing to non-tribal members has reversed. Agriculture trust land encompasses approximately 27,000 acres within the present boundaries of the Reservation representing some 510 allotments. The CTUIR, under self-governance compact manages this property in consultation with Indian beneficiaries that hold beneficial title to the land. The Agency Superintendent fulfills BIA’s trust obligations through mandated inherent federal functions, including approval of leases, permits, right of ways, etc.

### 1.1.1 Allotment Period

In 1885, the Slater Allotment Act provided for the assignment of land to individual Tribal members. The intention of the Slater Act and the General Allotment Act (Dawes Act) of 1887 was to make the Indians into farmer-citizens. Stipulations of this act required each allottee to retain and utilize at least 40 acres. Any parcel over 40 acres was available to be leased until the landowners were able to use it. The modification of the act by an Executive Order in 1902, allowed only grazing allotments to be leased in their entirety.

Despite all legislation designed to inhibit leasing, two years after completion of the initial allotments, a Secretary of Interior report stated, “fully 90% of all agricultural lands were farmed by white men for terms of one to five years.” Thus, the leasing relationships existing today were established early.

### 1.1.2 Reservation Setting and Land Ownership Profile

The UIR encompasses 236 square miles. The Blue Mountains bound the Reservation and drains into the Columbia Basin to the west. Rolling farm and pasture land at the lower elevations, scored by the Umatilla River, rise to the foothills and then to steep canyons and timbered mountains. Soil types and terrain vary widely.

The Slater Allotment Act of 1885 reduced the original 245,699 acres of the UIR to 157,982 acres. The present boundary is termed the diminished reservation boundary. In addition to the lands within the diminished reservation, the CTUIR own 17,152 acres outside the diminished reservation but within the original 1855 reservation boundary. The acquisition of this land, referred to as the Johnson Creek Restoration Area, through a special act of Congress in 1939 restored unclaimed land to Tribal. The Tribe also maintains land in SE Washington (Rainwater) and along the Columbia River in NE Oregon (Wanaket) through purchases with Bonneville Power Administration mitigation funds.

Today, the land ownership pattern on the UIR is a checkerboard of parcels falling into three main classes:

1. Deeded land held in fee simple estate by non-Indians, Indians or the CTUIR
2. Tribal Trust land with legal title held by the United States, and the beneficial or equitable title held by the CTUIR as a unit
3. Allotted Trust land with legal title held by the United States and the beneficial or equitable title held by an individual Indian landowner(s) or his or her heirs (Table 1).

Leasing of agricultural land on the Reservation has been a common arrangement between non-Indian farmers and ranchers and Indian landowners for over 100 years. The 1891 Amendment to the General Allotment Act officially sanctioned leasing of farming and grazing lands “Subject to the Approval of the Secretary of Interior.” To this day, leasing is an acceptable arrangement for the majority of Indian landowners and operators. As discussed, the responsibility for this function lies with the CTUIR-Department of Economic and Community Development (DECD) Land Program. The CTUIR-DECD Land Program initiates the leasing process between all parties after they receive a negotiation form containing the terms agreed upon by the prospective lessee and the Indian landowners. The leasing staff then generates a farming lease. This branch, in essence, serves as an intermediary between lessor and lessee. The above describes a negotiated lease, but there are circumstances that require the agency to solicit bids by advertising farm tracts for lease. Advertised bidding for leases has increased due to the obstacles associated with the highly fractioned heir ship. Highly fractionated allotments has resulted in the inability to locate owners and the inability of owners to agree on the terms of a lease within a specified period.

Table 1: Acreage by Ownership Class on the Umatilla Indian Reservation

<table>
<thead>
<tr>
<th>Land Within The Diminished Boundary</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tribal Trust Land</td>
<td>21,561</td>
</tr>
<tr>
<td>Tribal Fee Land</td>
<td>24,274</td>
</tr>
<tr>
<td>Allotted Trust Land</td>
<td>64,112</td>
</tr>
<tr>
<td>Deeded to Non-Indians</td>
<td>66,098</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>176,045</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Land Outside The Diminished Boundary</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tribal Trust Land (Johnson Creek Restoration &amp; Wánaket)</td>
<td>17,152</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>190,185</td>
</tr>
</tbody>
</table>

1.1.3 The Agriculture Resource

Agriculture plays a significant role in the regional economy and more specifically the UIR. The majority of land on the Reservation is in agricultural or livestock production. The City of Pendleton, Umatilla County, and the UIR have historically relied heavily on natural resources and agriculture. Agricultural land on the Reservation is tremendously diverse in both physical attributes and type of use. The following table represents the breakdown in crops grown on trust land on the Reservation for the 2011 crop year.

Table 2: 2011 Trust Acreage by Crop and Land Use

<table>
<thead>
<tr>
<th>Crop / Use</th>
<th>Acreage</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>844.13</td>
<td>3%</td>
</tr>
<tr>
<td>CRP</td>
<td>4163.53</td>
<td>16%</td>
</tr>
<tr>
<td>Fallow</td>
<td>8183.20</td>
<td>31%</td>
</tr>
<tr>
<td>Land Use</td>
<td>Acreage</td>
<td>Percent of Total</td>
</tr>
<tr>
<td>---------------</td>
<td>---------</td>
<td>------------------</td>
</tr>
<tr>
<td>Cropped HEL*</td>
<td>16,896.40</td>
<td>63%</td>
</tr>
<tr>
<td>Cropped NHEL**</td>
<td>7244.18</td>
<td>27%</td>
</tr>
<tr>
<td>Idle HEL</td>
<td>1356.00</td>
<td>5%</td>
</tr>
<tr>
<td>Idle NHEL</td>
<td>1479.68</td>
<td>5%</td>
</tr>
<tr>
<td>Total:</td>
<td>26,976.30</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

* Highly Erodible Land
** Non-Highly Erodible Land
*** Conservation Reserve Program

Diverse land use is the result of a number of variables, most important of which include topography, current use, climate, soils, potential for irrigation, productivity, and location.

The Reservation can be broken out into four broad physiographic subdivisions: the Pendleton Plains, the Blue Mountain Slope, the Blue Mountain Uplands, and the Stream Bottomlands. These subdivisions or landforms display distinct variations in slope, soils, and vegetation and have a strong influence on agricultural use. The Reservations’ most productive farmland is located on the Pendleton Plains. The majority of the grazing subsequently occurs on the grassy Blue Mountain Slope and in the Blue Mountain Uplands with some grazing on the Pendleton Plains. (Gonthier and Harris, 1977)

1.1.4 Climate
The climate of the Reservation is semi-arid, but partially influenced by maritime winds from the Pacific Ocean. The frost-free season varies from 185 days on the western edge of the Reservation to 120 days in the northeast corner. Most of the precipitation occurs during the winter months as rain and a limited duration of snow cover in most years. The region is best suited for winter cereal production because of the lack of adequate precipitation from June to August. Water erosion can be substantial due to the sloping topography and lack of adequate crop cover during winter months. Rain or snow on frozen soil occasionally causes severe erosion events. The precipitation that occurs during the summer months comes in the form of violent, summer downpours. Because less of the precipitation occurs during the growing season, it must be stored in the soil to benefit crop production. This condition is the basis for the wheat/fallow systems widely used in the arid areas in Eastern Oregon. On the south Reservation, where soils are shallow, the yields are significantly lower because of the low amount of soil moisture that can be stored.

Overall, the climate and other natural influences of this region provide an environment with the potential for high crop production. The area generally receives adequate winter precipitation and has a near optimum growing season for winter crops. Approximately 80-90% of the lower landscapes of the Reservation are farmed. Winter temperatures, at the lower elevations, are not generally detrimental, as snow cover does not exist for extended periods. Precipitation is the main variable when considering crop rotations.

1.1.5 Topography

Landscapes are readily discernible because each displays marked differences in slope, soils, and vegetation that have a direct relationship with land uses. As stated above, the Pendleton Plains, the Blue Mountain Slope, the Blue Mountain Uplands, and the Stream Bottomlands make up the four broad physiographic subdivisions on the reservation. The Pendleton Plains are a slightly dissected plateau characterized by gently rolling slopes favorable to crop production and found between 1,200-2,000 feet above Mean sea level (Msl). The Blue Mountain Slope, located between 2,000-3,000 feet Msl, is a series of steep walled canyons ascending to the more plateau-like Blue Mountain Uplands. The Blue Mountain Uplands are a region of meadows and forested land. Approximately one-third of the UIR is within this subdivision with elevations ranging from 3,000 feet Msl to approximately 4,100 feet Msl. The Stream Bottomlands are principally those of the Umatilla River, McKay Creek, and Patawa Creek that dissect other topographic units. Very flat flood plains edged by moderate to steep slopes up to the surrounding land distinguish them from surrounding areas (BIA Weed EA, 2000).

1.1.6 Soils

Characteristics of the soils on the Reservation vary with climatic, topographic, and geologic features of the region. Soils on the UIR grouped into four categories corresponding to the landforms are as follows: The stream bottomlands exhibit mainly the Hermiston, Onyx, Snow, and Yakima series. The Hermiston, Onyx, and Snow series are excellent deep agricultural soils. The Yakima soils, on the other hand, are excessively drained and too gravelly to cultivate and are best suited to irrigated pasture or alfalfa. About one-half of the bottomlands have Yakima soils. There are also some wet and poorly drained soils of the Pedigo and Stanfield series. The Stanfield soils are salt affected and have a hardpan.
The Pendleton Plains soils, considered the best agricultural soils on the Reservation, formed from windborne loess deposited on top of Columbia River basalt. The Pendleton Plains soil are typically deeper on the North Reservation, than, when they occur, on the South Reservation. The best of these soils are the thick loess of the North Reservation, the Walla Walla, Athena, and Palouse soils that form bands of increased darkness and fertility from west to east with increased precipitation. The Pilot Rock and McKay series of the south Reservation are less productive because they are both shallower and the McKay series exhibits poor drainage.

The Blue Mountain Slope, the ramp-like landform increasing in elevation from the Pendleton Plains to the Blue Mountain uplands, has soils Waha and Palouse, that are the dark and fine textured. Farming occurs on the Waha and Palouse soils where depth and slope are not limiting.

The Blue Mountain Uplands, at elevations from 3,000-4,100 ft. Msl, have predominately non-arable soils. The arable soils that are present are of the Thatuna and Cowsly series. These soils are deep and fine textured, with the Cowsly soils under the majority of the forest and rangeland. The restrictive element associated with this area is the short growing season.

1.1.7 Slope

Slope is the incline of the land surface from the horizontal, which determines to a large degree the land use for a particular area. If the slope is great enough, special practices are required to ensure satisfactory performance of the soil for specific use. Slope falls into four classes: 0-3%, 3-12%, 12-20%, and greater than 20%. The 3-12% category encompasses the majority of farming acreage on the Reservation.

1.1.8 First Foods

The Confederated Tribes of the Umatilla Indian Reservation’s (CTUIR) Department of Natural Resources (DNR) has adopted a mission based on “First Foods” ritualistically served in a Tribal meal. DNR seeks to utilize the First Foods to bring attention to ecological processes that may be devalued outside of Tribal culture and to prioritize efforts to re-naturalize those processes that sustain First Foods.

The agricultural land base includes resources that are heavily dependent on production of First Foods. Water flows throughout agricultural lands and highly productive soils produce vegetation that the Confederated Tribes rely on for First Foods. Herbaceous vegetation produces nutrients important to resident and wintering herds of elk and deer as well as a variety of birds and insects that make up the food chain in the region. The CTUIR’s iconic salmon is dependent on quality and quantity of water originating in the Blue Mountain uplands.

A variety of chemicals annually applied to commercially produced crops and naturalized plantings to enhance production and planting success throughout the agricultural lands have demonstrated negative impacts to water, and consumed crops. Landowners are dependent on crop production and subsidies for foregoing crop production by applying conservation measures (CRP) paid for by the United States Department of Agriculture (USDA). Better information is needed about chemical inputs to land and their impacts to food production, water quality, and
water quantity. Therefore, each farming lease now contains requirements for reporting chemical inputs and tillage and seeding operations. Proper management is dependent on understanding of land use and impacts associated with application of land management inputs for the desired results.

1.2 Purpose and Need

The American Indian Agricultural Resources Management Act of 1993 (107 Statute 2011, Title 25 United States Code 3701 et seq.) mandates the development of an Agricultural Resource Management Plan (AMP) for the development and administration of Indian agricultural lands. The AMP specifies actions to protect, conserve, utilize, and maintain the sustained productivity of Indian agricultural land consistent with other cultural and natural resource values. The AMP will chart a course towards the compatible co-existence of a healthy environment and a prosperous agricultural sector.

The AMP will provide an improved set of processes and procedures promoting wise stewardship through:

- Assessment of physical and biological conditions
- Correlation of physical and biological conditions with desirable future conditions
- Assessment of lease compliance and mitigation of non-compliance issues.
- Use of adaptive management

1.3 Nature of Decision

This Environmental Assessment (EA) documents the results of the environmental analysis conducted for the proposed Agriculture Management Program and provides the decision-maker with a basis to make an informed decision. The Superintendent of the Umatilla Agency, Bureau of Indian Affairs and the Board of Trustees are the officials responsible for deciding whether to:

- Take no action at this time (defer activities).
- Approve specific management activities or combination of activities presented in this EA to accomplish the stated purposes with the least adverse impacts.
- Require the development of an Environmental Impact Statement (EIS). This decision is based on a review of the environmental consequences of this document and a determination of whether or not the proposed project has a significant impact on the environment.

1.4 Primary Issues and Concerns

The BIA, CTUIR, Department of Natural Resources, Board of Trustees, and other interested entities identified the issues and concerns at the landscape level. Landscape level issues will be addressed at the watershed level rather than the allotment level. Management actions applied at the watershed level are more appropriate for multiple use improvement.
Important to the proposed action are seven significant issues and concerns along with the associated evaluation criteria:

1.4.1 Soil Quality and Erosion

1.4.1.1 How do we protect soil quality and reduce erosion from agricultural fields?

Soil quality is the suitability of the soil for the planned use. Good quality agricultural soil provides; nutrients for plant growth; a medium for recycling and detoxifying organic materials; and a link to plant, animal, and human health. (Brady and Weil, 1999)

Studies are finding that intensive cultivation practices negatively affect soil quality by depleting organic carbon (decreasing organic matter), increasing chemical inputs, and amplifying wind and water erosion. Common practices include deep fine tillage, intensive cropping schedules, irrigation induced salinization, increased pesticide usage, and over fertilization.

Erosion is the removal of soil by water and wind. A major concern for sustainable farming is that the rate of soil loss exceeds the rate of replacement. Erosion is a major cause of reduced fertility, weed infestations, decreased soil structure, sedimentation and water quality degradation.

The most severe soil erosion on Pacific Northwest cropland is from winter wheat seeded in a fine, conventionally tilled seedbed with little or no residue on the soil surface. Because of the late seeding, wheat plants are small and provide little erosion protection over winter. Fall tillage operations in preparation for spring crops can also cause runoff and erosion problems if most of the crop residue is incorporated, leaving a relatively fine, smooth surface. (PNW 275) Reduced/No Till systems on the UIR increase residue and surface roughness. Surface residue and a rough soil surface, slows down water movement and reduces runoff by 60 percent or more compared to low-residue conventional tillage.

Farming practices on the UIR traditionally consist of a 2-year rotation, either wheat/fallow or wheat/legumes, under conventional and reduced tillage systems. Currently there are 18,253 farmable acres on the reservation classified as Highly Erodible Land (HEL), and 8,724 acres classified as Non Highly Erodible Land (NHEL). Highly Erodible Land within the reservation accounts for 70% of cropped land held in trust.

For land to be considered highly erodible, potential erosion must be equal to or greater than eight (8) times the rate at which the soil can sustain productivity. (NRCS Farm Bill 2002). The soil loss tolerance (T) is the amount of erosion (tons per acre per year) that can take place without “significant long-term productivity loss”. (Claassen, 2004)

The implementation of an Agricultural Management Plan, designed to integrate sustainable agricultural practices into existing crop production, will ease soil erosion, manage organic and inorganic inputs, and maintain or even improve soil health in the long term.
1.4.2 Water Quality

1.4.2.1 How do we protect water quality and riparian habitat?

According to the CTUIR List of Water Quality Limited Streams (Table 3), many streams traversing agriculture lands on the UIR are water quality limited due to elevated temperatures, excessive sedimentation and habitat modifications or combination thereof (Appendix A). Cultural water use, fish and other aquatic habitat, and water contact recreation are beneficial uses adversely impacted by these water quality deficiencies.

<table>
<thead>
<tr>
<th>Water Name and Description</th>
<th>Water Quality Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buckaroo Creek – Mouth to River Mile (RM) 4.75</td>
<td>Temperature</td>
</tr>
<tr>
<td>Iskuulpa Creek – Mouth to headwaters</td>
<td>Temperature</td>
</tr>
<tr>
<td>Meacham Creek – Mouth to RM 13.0 at Reservation</td>
<td>Temperature</td>
</tr>
<tr>
<td>Boundary</td>
<td></td>
</tr>
<tr>
<td>Mission Creek – Mouth to headwaters</td>
<td>Turbidity</td>
</tr>
<tr>
<td>North Fork McKay Creek – Mouth to headwaters</td>
<td>Temperature</td>
</tr>
<tr>
<td>Spring Hollow Creek (tributary to Wildhorse Creek)</td>
<td>Temperature</td>
</tr>
<tr>
<td>– Mouth to headwaters</td>
<td></td>
</tr>
<tr>
<td>Umatilla River – West Reservation boundary to east</td>
<td>Temperature</td>
</tr>
<tr>
<td>Reservation boundary</td>
<td></td>
</tr>
<tr>
<td>Umatilla River – West Reservation boundary to</td>
<td>Turbidity</td>
</tr>
<tr>
<td>Mission Creek</td>
<td></td>
</tr>
<tr>
<td>Wildhorse Creek – Mouth to RM 26</td>
<td>Temperature</td>
</tr>
</tbody>
</table>

(CTUIR Integrated Report 303(d) list.

Cultivation exposes top soil and increases runoff rates into streams, alters stream channel morphology and flows, facilitates erosion, reduces riparian cover, and generates organic and inorganic inputs in surface and ground water. Intensive tillage practices escalate soil sedimentation into the air and water and reduce field buffers along streams and tributaries, limiting the filtration of sediments, chemicals, or nutrients. Generally, fertilizer applications increase with the loss of nutrient rich topsoil, risking runoff and leaching into surface or
groundwater, causing nitrate and phosphate contamination, eutrophication of ponds, lakes, and even slow moving rivers and death of non-target plants and wildlife.

These impacts along with road and railroad construction and maintenance, stream manipulation (channelization, diking, rip-rapping, etc.), and intensive grazing have significantly affected aquatic resources on the UIR.

1.4.2.2 How will this issue be addressed?

- Promote the utilization of Best Management Practices (BMP) to improve stream temperatures, stream bank stability, turbidity, and fine sediment loads.
- Promote the utilization of farming BMP to decrease the amount of organic/inorganic input into streams.

1.4.3 Wildlife and Fish Habitat

1.4.3.1 How will agriculture practices affect fish, wildlife, and their habitat?

The impact of agriculture on wildlife and fisheries includes stream channelization, loss of riparian vegetation, increased sediment input, the loss of wildlife habitat, and changes in hydrology associated with land conservation (Umatilla/Willow, 2004). Agricultural practices and human development continue to affect many habitat types.

In July 2005, the UIR completed the CTUIR Total Maximum Daily Load (TMDL) for Temperature and Turbidity in compliance with the Clean Water Act, 1972. The TMDL and associated Water Quality Management Plan notes implications from the over use of riparian areas on stream morphology and wildlife habitat.

Cultivation and reduced plant/residue cover has consequences to streams on the UIR. These include stream channelization to prevent flooding, natural channel movements into fields, excessive fine sedimentation from runoff, and increased water temperatures.

Channelization can:
1. Compress the period of water conveyance making streams flashier and increasing and concentrating the energy of the water within the channel itself
2. Create higher flood peaks
3. Deliver greater loads of sediment and nutrients
4. Destroy riparian areas
5. Decrease the recharge to shallow groundwater aquifers thus creating higher summer temperatures and lower winter temperatures
6. Channelization greatly decreases winter habitat for juvenile salmon and steelhead. (Umatilla/Willow, 2004)

Excessive fine sedimentation in fish habitat limits respiration and feeding, social organization, oxygen availability, removal of metabolic toxins near eggs, and renders spawning sites less suitable. Increased temperatures cause decreased or lack of metabolic energy for feeding, growth or reproductive behavior, increased exposure to pathogens,
decreased food supply, and increased competition from warm water tolerant species. (CTUIR TMDL, 2005)

The availability of food, water, and cover regulates wildlife populations, with shrub-steppe and grassland habitats being the most heavily affected. Diversity in both plant species and plant communities over short distances is the key to healthy wildlife populations (Holechek et al., 1989). The closer these basic components of wildlife habitat occur together, typically the greater diversity and total numbers of wildlife species. The conversion of large areas of native vegetation to croplands has resulted in a significant loss of wildlife habitat forcing deer, elk, and other wildlife to move onto private agricultural land resulting in economic loss.

The impacts of agriculture on wildlife habitat have not been all negative. Wildlife populations inhabiting cropland can be quite high with many small birds and mammals, coyotes and red-tailed hawks, and game species such as ring-necked pheasants and wild turkey supported. (Umatilla/Willow, 2004) Agricultural lands enrolled in the United States Department of Agriculture (USDA)-Conservation Reserve Program (CRP) provide long-term grass and shrub habitat without the annual disruption of crop production practices. As these habitats age, there is a need to refresh the stands as they become monocultures of the most dominate grasses. As the Farm Service Agency (FSA) offers re-enrollment or new enrollment, they have implemented measures to improve the existing stands and new enrollments to be more wildlife friendly.

1.4.3.2 How will this issue be addressed?

➢ Identify processes for responding to damage of crops by wildlife.
➢ Identify, enhance existing, and create new wildlife/fisheries habitat.
➢ Encourage operators and landowners to consider CRP on marginal farm land.

1.4.4 Air Quality

1.4.4.1 How do we protect air quality?

The air quality on a reservation has important implications for quality of life, culture and religion, economic development and other significant areas of concern to the Tribe. Air pollution can make people sick, harm the environment, damage property, and reduce visibility. It originates from the build-up of harmful gases and particles in the air, which is the function of two things: 1) the amount of pollution emitted into the air, and 2) the degree of pollutant dispersal. (Tribal Clean Air Handbook) Particulate Matter (PM) is a common pollutant found on the UIR, caused by prescribed burning and conventional tillage practices.

Farmers use prescribed agricultural burning to remove stubble after harvest, control weeds/plant diseases, facilitate no or minimum tillage farming and improve the yield of certain crops. Smoke from these fires contains a complex mixture of gases and fine particles, which cause problems such as burning eyes, runny nose, and illnesses such as bronchitis (Environmental Protection Agency (EPA), 2003).
Currently through the Federal Air rules for Indian Reservations (FARR), a permit program exists for the CTUIR to regulate agricultural burning. Landowners or operators who want to perform agricultural burning on the UIR are required to get a permit through the CTUIR Air Quality Program (AQP). All potential prescribed burns on agricultural trust land will also need approval from both the BIA and CTUIR prior to burning. Agricultural burning includes windrow burning, ditch burning, stubble burning, and field sanitation. Currently there are no federal standards on PM as it relates to tillage on the UIR.


1.4.4.2 How will this issue be addressed?

- Anticipate regulatory changes to farming methods and encourage utilization of incentive programs.
- Anticipate future federal regulations for Particulate Matter as it relates to tillage.
- Continue UIR regulatory practice of determining allowable open burn day based on air dispersal conditions.

1.4.5 Monitoring and Evaluation

1.4.5.1 How do we effectively monitor whether management actions are leading to the desired future conditions?

Monitoring is an evaluation process usually conducted to determine the response to some management program (Holechek, 1989). To accomplish an adaptive management cycle, monitoring is critical to determine whether or not prescribed management actions are achieving the stated goals and objectives, and moving the landscape area towards the desired conditions. Landscape level evaluations of the results obtained from monitoring efforts will generate recommendations to continue current management or determine changes in management practices to meet the goals and objectives. The outcome could be modifications in mitigation measures, future actions, monitoring schemes, objectives, standards, guidelines, or some combination of these. The outcome of monitoring may lead to changes in management within the landscape area.

1.4.5.2 How will this issue be addressed?

- Utilize monitoring protocols that measure relevant biological and physical parameters, accepted by the scientific community and consistent with the TMDL.
- Identify responsibility along with the funds for monitoring the agriculture resource.

1.4.6 Weed Control

1.4.6.1 How will weeds be managed in agriculture lands?
Humans facilitate the spread of weeds, either intentionally or unintentionally. Regardless of the method of introduction weed problems on the UIR are as prevalent and troublesome as elsewhere in Oregon and the United States. Many weed species take advantage of disturbed agricultural or riparian areas to establish and spread. The CTUIR utilizes the Umatilla County Noxious Weed List for updated area problem weeds and their severity. (Appendix B)

All agricultural leases on trust land have specific language in the Soil Conservation and Crop Rotation Plan, attached to and made part of the lease addressing weed control on leased land. Section 3 General Management, in 3.04 Weed Control, lists specific monetary damages for non-compliance.

County noxious weed funding on Right of Ways (ROW) is not sufficient and the ROWs on the UIR are not a priority because of the expansive road system the county is responsible for outside of the boundary.

Limited resources are available to undertake this massive problem, for example jurisdiction of weed control on fee land is limited, there is little funding for weed control on trust lands, and the Umatilla County Weed Ordinance is minimally enforced throughout the UIR. Promotion of the Umatilla County Weed Ordinance has been one of the ideas to begin to address the problem.

1.4.6.2 How will this issue be addressed?

- Anticipate implementation of a MOU with Umatilla County Weed Control to implement noxious weed ordinance on all lands within the reservation.
- Continue treatment of noxious weeds on all idle trust land, as funding allows, preventing further spread.
- Obtain additional funding for staff and projects that address noxious weed infestations and spread.
- Develop community support by creating educational outreach materials.
- Continue implementation of the BIA Weed Management Plan on trust land.

1.4.7 Idle lands

1.4.7.1 How will idle lands be addressed? How are Trust lands kept in production and how are current idle lands returned to productive status?

Idle or abandoned agricultural lands result in lower land values, reduced income to landowners, and decreased natural resource values. The Agricultural Management Plan must address this problem to prevent more agricultural lands from becoming idle and to develop a strategy to return idle lands to suitable land uses. Currently there are an estimated 2700 acres or about 86 farmable allotments that appear to be idle with decreased natural resource, economic, and social values.

The goal of the Tribe is to keep all trust lands in suitable land uses for the benefit of the landowners and the Tribe. The objective is to provide measures to assist landowners or
operators to keep land in or return land to suitable, productive land uses and to provide access to assistance and programs that help landowners manage their agricultural land. The idling or abandonment of agricultural lands, with resulting undesirable plant communities, is not an acceptable option to the Tribe.

Problems associated with idle lands include undesirable vegetation/weed infestations that decrease land productivity for raising crops, forage, and wildlife habitat, decreased water quality, increased soil erosion causing damage to roads and home sites, decreased income for landowners, and decreased return on Tribal investments to the community.

Solutions to the problem include:

- Annually develop an inventory and assessment of all idle lands.
- Adjust lease programs to provide incentives to operators to continue to farm the land.
- Assist landowners to determine the proper or most beneficial use for any tract of land.
- Provide education to landowners to help them understand the range of land uses and importance of keeping land in suitable uses.
- Develop the capacity of the Tribal Farming Enterprise or custom farmers to farm more land or manage conservation programs on idle land.
- Make absentee landowners aware of the problems with allowing land to go idle.
- Assist landowners to consolidate or reorganize allotments to eliminate size or location impediments.
- Provide to landowners information concerning technical and financial assistance programs available for conservation, land retirement, wildlife habitat, wetland enhancement, etc.

1.4.7.2 How will this issue be addressed?

- Treat all idle abandoned lands for weeds through the BIA and CTUIR as funding allows.
- Educate farm operators and landowners concerning regulations and requirements of Department of Agriculture Incentive Programs.
- Establish time limits that agriculture lands will remain idle before shifting to pasture or rangelands.
- Address and implement the above solutions to prevent the addition of more idle land or return listed idle lands back into production.

1.5 Other Issues and Concerns

In addition to the primary issues and concerns, actions taken regarding agricultural management on the UIR must consider a number of other issues and concerns. These issues and concerns are either mandatory considerations in any environmental analysis process or matters for which treatment does not vary between alternatives.

1.5.1 Threatened and Endangered Species

1.5.1.1 How will critical habitat for threatened and endangered species be protected?
As part of the decision-making process, federal agencies must consider the effects of their action on listed or proposed to be listed threatened and endangered plant and animal species. The Endangered Species Act (ESA) of 1973 as amended requires federal agencies to ensure that actions taken will not likely affect the continued existence of any threatened or endangered species. The BIA is required to consult with National Oceanic and Atmospheric Administration (NOAA) Fisheries and United States Fish and Wildlife Service (USFWS) for those actions, which may or will, adversely affect listed species prior to implementing the actions.

The BIA has not developed policy regarding the designation of sensitive plant and animal species. The definition of a sensitive species as it relates to this plan is, those plant and animal species for which population viability is a concern as evidenced by:

1. Significant current or predicted downward trends in population numbers or density
2. Significant current or predicted downward trends in habitat capability that would reduce existing species distribution (BIA Weed EA, 2000)

1.5.1.2 How will this issue be addressed?

- Maintain close coordination and consultation between the CTUIR, USFWS, NOAA, and the BIA.

1.5.2 Implementation Costs

1.5.2.1 What resources are required to implement the AMP?

Funding and/or staffing levels will vary for each alternative. Agriculture and infrastructure maintenance, and lease compliance monitoring are the major costs associated with managing the Reservation’s agriculture program. Without the appropriate funding and staffing levels to accomplish such activities, needed actions go undone, compounding future issues.

Staffing resources will be necessary to educate owners and operators regarding compliance issues, penalties for non-compliance and incentives for compliance. Enforcement and compliance needs to be coordinated and consistent between all Tribal departments.

1.5.2.2 How will this issue be addressed?

- Identify staff and funding levels to implement the agriculture management program.
- Identify staff and funding levels for a monitoring program.
- Create and maintain communication between Tribal and BIA enforcement programs.

1.5.3 Cost/Benefit Analysis

1.5.3.1 What are the costs versus the benefits?
Successfully producing crops in an economical and sustainable manner requires an accurate assessment of the resources’ (soil, water, air, plants, animals, and human) capabilities and limitations. The core practices of crop rotation, tillage, residue management, nutrient management, and pest management are involved to address the capabilities and limitations of any cropland management system. (National Agronomy Manual, 2002)

Several parameters will determine whether currently farmed land is best suited in agriculture. Likewise, lands that have gone idle or abandoned may be able to regain cropping history and be eligible for federal assistance through conservation programs or crop insurance. Determining the viability of traditional farming versus sustainable farming methods may provide further insight to the environmental capability and sustainability of agricultural management on a tract-by-tract basis. Fluctuating commodity prices play key roles in determining the economic feasibility of land use.

1.5.3.2 How will this issue be addressed?

- Determine land suitability for crops based on environmental impacts vs. monetary gains.
- Ensure long-term sustainable agriculture through appropriate techniques.
- Effectively address sustainability by utilizing United States Department of Agriculture (USDA) incentive programs.
- Prepare a sample economic analysis for individual farms and allotments.

1.5.4 Cultural Resources and Traditional Uses

How will the need to protect cultural sites and to provide the opportunity for traditional uses such as root and berry gathering be met?

There are approximately 157,982 acres of Tribal fee and Indian trust land within the boundaries of the CTUIR. These lands contain sensitive cultural resources significant to the CTUIR. Agricultural practices such as plowing, burning, exposure to pesticides and fertilizers and installation of improvements such as fences, ponds, and buildings may negatively affect the integrity of cultural resources.

All undertakings conducted, funded, or permitted by a federal agency are subject to the National Historic Preservation Act (NHPA), 16 U.S.C. § 470 - 470x-6. The NHPA requires that for all undertakings, whether conducted by a federal agency or by a private party with federal involvement, the lead federal agency evaluate the effects of the undertaking on sites listed in or eligible for inclusion in the National Register of Historic Places (National Register), 16 U.S.C. § 470f.

Under 101(d) 2 of the NHPA, the CTUIR assumed Tribal Historic Preservation Office (THPO) responsibilities from the State Historic Preservation Office (SHPO) in 1996 in an agreement with the United States Department of the Interior, National Park Service. The THPO oversees compliance with the NHPA for those lands within the exterior boundaries of the UIR and other Tribal lands.
Additionally, the NHPA requires a lead federal agency to consult with the Tribes involved regarding each undertaking. Within the UIR, the lead federal agency shall consult with the Cultural Resources Protection Program, Department of Natural Resources (DNR), of the CTUIR.

1.5.4.1 **How will this issue be addressed?**

- Work with Cultural Resources Protection Program representatives to protect cultural resources.
- Work with the Tribal Historic Preservation Office to ensure compliance with the NHPA and to receive concurrence for proposed projects.

1.5.5 **Transportation**

1.5.5.1 **How will transportation be managed for effective and efficient access to farming tracts?**

The increase in roads, trails and other routes of transportation has degraded resource values and introduced weeds onto the UIR. The Inter-Disciplinary Team (IDT) recommends the development of a transportation plan, in cooperation with CTUIR Public Works through further analysis documents.

1.5.5.2 **How will this issue be addressed?**

- Identify, limit, enhance, and/or redirect existing roads on and off Agricultural lands to enhance water quality, plant health and diversity, and wildlife habitat.
- Create a transportation system infrastructure focused on reducing impacts on water quality, plant community, and wildlife habitat.
- Identify problem Right of Ways (ROW) and obtain funding needed to accomplish legal ROW access to fields.
- Identify and address needed and non-needed roads across agricultural lands.

1.5.6 **Tribal, Public, and Inter-Governmental Relationships**

1.5.6.1 **How will relationships and communications improve between Tribal, public, and governments?**

Implementation of the AMP and the utilization of local and national incentive programs require constructive relationships between the Tribe and governmental agencies. Strained relationships have developed from management impacts between trust and non-trust land. Cooperation between agencies, the BIA, and the Tribe will bridge communication barriers and aid in solving challenges within the reservation.
Management of a large resource base such as the reservation without consistency will result in yearly compounding problems and mismanagement of vital resources. Without good communication, consistency across the reservation will be difficult to accomplish.

1.5.6.2 How will this issue be addressed?

- Develop and maintain communications between fee and Indian landowners to coordinate farming/management practices on agricultural land.
- Improve coordination and communications between Tribes and governmental agencies to achieve goals and objectives.
- Streamline methods to aid owners and operators in utilizing United States Department of Agriculture (USDA) Incentive Programs.
- Establish regular lease conferences for landowners and farmers to answer questions and gain compliance with applicable laws, codes, and regulations.

1.5.7 Lease Compliance

1.5.7.1 What is necessary to ensure that leases are consummated at the appropriate time? What is necessary to ensure that lessees comply with the terms of leases?

Lease compliance occurs collaterally by several individuals within the CTUIR DECD Land Program and Department of Natural Resources, Range, Agriculture and Forestry Program, taking away from other activities occurring within each department. The addition of a full-time lease compliance officer, focused on implementing trespass and lease violation procedures and ensuring the execution of leasing and permitting procedures according to federal and Tribal laws and policies will be beneficial.

1.5.7.2 How will this issue be addressed?

- Define the lease process based on regulations 25 CFR 162.
- Identify staffing needs required to process and enforce leases in a timely manner.
- Provide increased flexibility to the negotiation process.
- Anticipate personnel levels needed to inspect the harvest of Indian Allotments.
Chapter Two: Alternatives Including Proposed Action

2.1 Permits Required to Implement Alternatives

Only licensed personnel may apply pesticides. Any land modifications must have clearance from the Tribal Cultural Resources Department. All water developments must acquire appropriate permits from the Tribal Water Resources Department.

2.2 Goals and Objectives

2.2.1 Element 1 Soil Quality and Erosion

*Goal:* Implement practices that improve soil quality and decrease erosion.

*Objective:* Adopt BMP to increase water infiltration and decrease surface runoff.

*Objective:* Identify and implement current and/or new soil conservation technology to improve the sustainability of agriculture.

2.2.2 Element 2 Water Quality

*Goal:* Meet or exceed Tribal Water Quality Standards for surface and ground water to protect all beneficial uses.

*Objective:* Reduce anthropogenic heating by shading streams where environmental conditions will allow (soils, depth of soils, flood plain connectivity, and vegetation community association).

*Objective:* Reduce anthropogenic fine sediment yield and increase bank stability by maintaining or increasing riparian vegetation.

*Objective:* Reduce anthropogenic organic and inorganic inputs to surface waters.

*Objective:* Provide for the biological and physical needs of fish and other aquatic organisms by enhancing and protecting native vegetation, floodplain function, stream channel form and function, and in-stream habitat diversity within riparian management areas.

2.2.3 Element 3 Wildlife and Fish Habitat

*Goal:* Develop and protect essential fish and wildlife habitat as defined by DNR, NOAA, and USFWS

*Objective:* Provide for the biological needs of fish in riparian management areas by maintaining adequate riparian vegetation and in stream habitat diversity.
Objective: Develop and maintain riparian management areas in agriculture zones.

Objective: Provide for biological needs of upland game birds in riparian management areas and USDA-Conservation Reserve Program (CRP) fields.

Objective: Promote cropping systems that reduce conflicts between big game and agriculture.

Objective: Utilize federal incentive programs to provide winter foraging for big game and minimize agriculture/wildlife conflicts.

2.2.4 Element 4 Air Quality

Goal: Meet or exceed Tribal/Federal Air Quality standards while allowing sustainable Agriculture.

Objective: Implement Tribal Burn regulations.

2.2.5 Element 5 Monitoring and Evaluation

Goal: Establish monitoring standards to provide sound data to measure and regulate impacts of the chosen management alternative.

Objective: Utilize monitoring protocols consistent with the Tribes TMDL and accepted by the Tribal community to measure relevant biological/physical parameters.

Objective: Develop and implement fish and wildlife habitat monitoring protocols.

Objective: Summarize and utilize existing data concerning all agriculture lands.

Objective: Develop protocol for monitoring big game use and the damage caused to agriculture crops as well as identify thresholds for responding to damage complaints.

2.2.6 Element 6 Weed Control

Goal: Utilize Integrated Pest Management (IPM) to control noxious and invasive species on agricultural land.

Objective: Expand treatments on all idle trust land as funding becomes available to prevent further spread of noxious weeds.
**Objective:** Develop communication with fee landowners to coordinate weed control actions and achieve consistent control of noxious and invasive species.

**Objective:** Provide educational opportunities addressing weed identification and control for Tribal members, lessees, and fee landowners.

### 2.2.7 Element 7 Idle Lands

**Goal:** Establish management strategies for idle lands, incorporating the most appropriate land uses.

**Objective:** Determine a time line that agriculture lands will remain idle before the land use classification changes

**Objective:** Promote incentives to utilize idle lands

**Objective:** Provide flexibility to the negotiation process

**Objective:** Schedule advertised bids at minimum two times per year and include idle lands

### 2.2.8 Element 8 Threatened and Endangered Species

**Goal:** Protect threatened and endangered species and their habitats as mandated in the ESA.

**Objective:** Up-date threatened and endangered species records for the UIR

**Objective:** Insure that all actions consider impacts to threatened and endangered species

**Objective:** Identify opportunities to improve critical habitat for listed species

### 2.2.9 Element 9 Implementation Costs

**Goal:** Funding and staffing levels adequate to implement the desired alternative and subsequent monitoring program.

**Objective:** Maintain required funding and staffing levels to carry out management activities

**Objective:** Pursue funding and cost sharing sources to carry out the chosen management alternative and monitoring program

**Objective:** Maintain program flexibility so that management emphasis and strategies remain the same to the extent possible
Objective: Identify the responsibility and funds for monitoring the biological and physical parameters of agriculture

2.2.10 Element 10 Cost/Benefit Analysis

Goal: Optimize land use practices through accurate analysis of environmental, economic, and social conditions

Objective: Determine land suitability based on soil types, precipitation, wildlife use, and crop revenues

Objective: Promote appropriate technologies to ensure long-term agricultural sustainability

Objective: Encourage utilization of all incentive programs to promote and encourage sustainability

2.2.11 Element 11 Cultural Resources and Traditional Uses

Goal: Maintain and improve the integrity of cultural resource sites

Objective: Protect the frequency, size, and integrity of cultural resource sites within agricultural areas

Objective: Prevent degradation to or removal of cultural resource artifacts and sites including traditional use areas, as identified by cultural resource staff, within agricultural areas

Objective: Consult with THPO prior to disturbing previously undisturbed lands to ensure that no cultural resources are harmed

2.2.12 Element 12 Transportation

Goal: Ensure legal access to all Tribal Allotments

Objective: Encourage a transportation analysis to address needs

Objective: Close roads not needed for resource management purposes or access by Tribal members

Objective: Establish construction and maintenance standards for both permanent and temporary roads

2.2.13 Element 13 Tribal, Public, and Inter-Governmental Relationships
Goal: Ensure regular communications with all agencies and institute open door policies

Goal: Improve coordination with BIA, Tribes, and USDA and streamline methods to assist owners and operators in utilizing Department of Agriculture incentive programs

Goal: Improve communication between fee and trust land managers to coordinate consistent land management across the reservation

Objective: Establish regular lease conferences for landowners and farmers

Objective: Establish a system to aid operators in gaining compliance with applicable laws, codes, and regulations

Objective: Communicate compliance/enforcement issues with all entities

Objective: Communicate resource management changes using the Tribal and local newspapers and meetings

Objective: Notify and request the participation of Tribal and fee landowners prior to the implementation of management practices

2.2.14 Element 14 Lease Compliance

Goal: Leases will be completed in a timely manner and will provide effective means to ensure compliance with Tribal and Federal laws pertaining to land use

Objective: Identify a lease compliance officer

Objective: Communicate all compliance/enforcement issues with all entities

Objective: Develop an education program to educate owners and operators of management and compliance issues

2.3 Standards and Guidelines

This agricultural management planning cycle will be 10 years from the date of signature by the CTUIR Board of Trustees (BOT) and BIA Umatilla Agency Superintendent, and completion of legal obligations with USFWS and NOAA for threatened and endangered species. Implementation Costs and Cost/Benefit Analysis shall be omitted from Standards and Guidelines since they will be performance based and will not require either Standards or Guidelines.

G = Guidelines: Strongly encouraged Recommendations for the implementation of a practice or project within the resource area.
S = Standards: Requirements for the implementation of a practice or project within the resource area.

2.3.1 Soil Quality and Erosion

Soil erosion is the physical wearing the earth’s surface caused by wind, running water, or other geological events, including such processes as gravitational creep. These processes create a less favorable environment for plant growth by stripping away topsoil, organic matter and natural soil fertility. Topsoil, in cultivated cropping systems, contains the majority of the root system and is important for its water holding capacity.

Soil erosion causes turbidly by allowing eroded sediments to enter streams and rivers and is deemed one of the most serious forms of water pollution.

2.3.1.1 Soil Quality

Soil quality indicators are highly interrelated. For example, the activities of earthworms, other soil organisms, and the conditions of soil structure such as aggregate stability, compaction, and pore size influence each other. Surface and subsurface soil structure which, controls water infiltration and availability, affects plant root growth and plant health. Organic residue and root biomass from plants feed soil organisms and contribute to soil organic matter, which in turn enhances soil structure. These interrelationships begin to show the complexity of soil systems. (Palouse and Nezperce Prairies Soil Quality Card Guide)

Because soil quality is an indication of soil management, it is essential that the soil meet a minimum standard of productivity. Soil quality is the ability of a specific type of soil to function within its surroundings, supporting plant and animal productivity, maintain or enhancing water and air quality and support human health and habitation. To meet soil quality and productivity standards, any soil must, given natural ecological conditions:

- Sustain plant and animal diversity and productivity.
- Regulate and partition water and solute flow
- Filter and buffer potential pollutants
- Store and cycle nutrients
- Support human health and habitation

Organic and inorganic fertilizer applications replace nutrients removed by cropping systems, maintain naturally depleted nutrients, or enhance other nutrients essential for plant growth. Successful nutrient management programs maintain adequate nutrient levels for optimum crop production while minimizing the impact of nutrient applications on the environment. Soil sampling and utilizing fertilizer guides will provide the necessary nutrient recommendations to minimize potential economic and environmental impacts and improve soil quality.

Several soil series are present on the reservation. The Soil Survey of Umatilla County Area, Oregon (USDA Soil Survey Service) defines the capabilities of each soil present. Each
series across the reservation will present different qualities that are adapted to local conditions. There is no one standard or group of standards that will allow each soil to meet productivity criteria.

2.3.1.1.1 **G1**: Soil test prior to fertilizer applications

2.3.1.1.2 **G2**: Use appropriate Oregon State University Extension Service fertilizer guides to optimize crop production and minimize environmental impacts.

2.3.1.2 **Soil Erosion**

Erosion by wind and water is the most destructive force on soil worldwide. Erosion removes topsoil, reduces levels of soil organic matter, and contributes to the breakdown of soil structure. Erosion not only causes loss of production, but also affects water and air quality, fish and wildlife habitat, and increases costs of maintaining roads and providing water for human consumption.

Controlling erosion to acceptable levels will maintain the productivity of agricultural land. The USDA has developed prediction models to estimate the impact of agricultural practices on soil quality and erosion. Management practices affect soil organic matter, a component of soil quality, affecting several critical soil functions. Enhancing soil organic matter can improve a soil’s capacity for productivity, nutrient cycling, filtering and buffering of potential pollutants, and partitioning water. Organic matter can improve the soil’s resistance to compaction and erosion. (Natural Resource Conservation Service (NRCS) Agronomy Technical Note No. 16, 2003)

If land is classified as Highly Erodible Land (HEL), it would contain soils that have an erodibility index of eight (8) or more. The potential erosion must be equal to or greater than eight (8) times the rate at which the soil can sustain productivity. (USDA/FSA NRCS Fact sheet, Highly Erodible Land Conservation and Wetland Conservation Compliance 2012). Producers participating in USDA-NRCS programs must comply with NRCS conservation plans to receive incentive or subsidy payments. These conservation plans contain the participants’ decisions regarding the conservation systems (location, land use, tillage systems, and conservation treatment measures and schedules) used when producing agricultural commodity crops. Each conservation plan documents the required treatments to reduce soil erosion.

Residue management is an essential component observed and monitored on the UIR. Residue is the material remaining from the previous crop that is measured after the next crop is seeded. In a wheat-fallow system, the measurements are taken two years apart in the crop year, after seeding and before December 1st, the beginning of the critical erosion period. Additional measurements of soil cover are measuring the crop canopy for “green cover” and soil clods > (greater than) two (2) inches in diameter. NRCS conservation plans require a minimum percentage of soil cover by residue and in some cases, green cover and/or soil clods > 2” in diameter may be used in combination of the preceding parameters, to maintain compliance as part of the conservation systems.
Leased HEL cropland has annual inspections following seeding in the fall, by CTUIR DNR Range, Agriculture and Forestry staff, to ensure compliance with NRCS conservation plans. Residue percentages must meet or exceed the requirements outlined in the applicable conservation plan to remain in compliance with the BIA lease agreements. CTUIR and BIA have the sole authority to enforce compliance on Indian Trust land. The decision(s) are not to be overruled by NRCS determinations.

The NRCS adopted Revised Universal Soil Loss Equation (RUSLE) in 1995 as the official tool for predicting long-term average annual soil loss. The current version of the RUSLE is, Revised Universal Soil Loss Equation 2 (RUSLE2), that calculates a Soil Conditioning Index (SCI). RUSLE2 guides conservation planning, inventory erosion rates over large areas, and estimates sediment production on upland areas that might become sediment yield in watersheds. (USDA-Ag Research Service, 2003)

The Soil Conditioning Index (SCI) is a prediction tool used by the NRCS in conservation planning to estimate if applied conservation practices will result in maintained or increased levels of soil organic matter. The SCI estimates trends in soil organic matter, which are indicative of soil quality trends. It combines the effect of three determinants of soil organic matter: organic matter, field operations, and soil type. If the calculated index is a negative value, the SCI predicts a decline in the level of soil organic matter under the production system. A positive SCI predicts an increase in the level of soil organic matter under the production system. Values near zero (i.e., 0 +/- 0.05) suggest that organic matter will be maintained near the current level. (NRCS Agronomy Technical Note No. 16, 2003)

2.3.1.2.1 S1: SCI values, determined when producing cropping plans, must predict favorable trends depending on the alternative selected.

2.3.1.2.2 S2: The lessee must farm according to an approved HEL conservation plan, developed to comply with the current USDA farm program legislation. Lessees shall furnish to the CTUIR a copy of the approved NRCS conservation plan fifteen (15) days prior to disturbing any vegetation or soil on the leased premises. By signing a lease, the lessee agrees to comply with the conservation plan.

2.3.1.2.3 S3: Operators must control active channel (gully) erosion to eliminate sediment delivery to streams. Active channel erosion consists of gullies or channels, which, at the largest dimension, have a cross sectional area of at least one square foot and which occur at the same location for two or more consecutive years.

2.3.1.2.4 S4: If allowed in NRCS conservation plans, the lessee will perform April through October tillage and seeding operations across slope or as close to the contour as possible. Tillage and seeding operations must run parallel to terraces or diversions if such structures exist. Fields will be tilled and furrowed on the contour and remain in said condition during the months of November through
April. All tillage operations will be such as to maintain the soil surface in a rough, cloddy condition.

Crop residue that remains after harvest is sometimes too excessive to cultivate and break down in the soil; it may be necessary to swath and bale residue, especially after harvesting with Stripper-Header combines. Operators may utilize a mower or chopper in conjunction with ordinary cultivation. If baling, chisel chopping, or mowing is not a feasible option then burning may be an alternative but only under specific approved circumstances.

2.3.1.2.5 S5: Residue must remain on light/ashy soils to assist in increasing organic matter and to provide an erosion control.

2.3.1.2.6 S6: No residue will be baled for hay or straw unless specified and agreed to in the lease agreement. When the lease does not have a residue removal agreement and under certain circumstances, a request in writing, must be filed with the Umatilla Agency Superintendent to remove residue from any trust land.

2.3.1.2.7 S7: Crop residues will only be burned with written authorization from the Umatilla Agency Superintendent, NRCS and CTUIR Air Quality. The NRCS must approve a “clean-till” request. A clean-till consists of either burning or tillage to remove excess residue or clean up weed problems. These operations are only allowed but once every five years. Also see (Air Quality for burn permit requirements)

2.3.1.2.8 S8: Operations on HEL ground must follow NRCS guidelines. A farmer may initiate a clean-till operation only with approval from NRCS, CTUIR and the Umatilla Agency Superintendent.

2.3.2 Water Quality

The Tribal Water Resources Program (WRP) establishes and enforces water quality standards on the Reservation through the 2004 CTUIR Administrative Rules and Standards to the Water Code. Lands bordering and/or having the potential to impact surface waters must meet these desired water quality standards. Land managers must also employ methods to reach these desired standards during maintenance and management procedures. The establishment of Riparian Management Zones (RMZ) will be required on streams meeting specific size/flow requirements.

2.3.2.1 Riparian Management Zones (RMZ)

RMZs are diverse areas of vegetation bordering surface water bodies where management practices focus on protecting water quality, fish, and other aquatic resources. Riparian Management Zones filter pollutants and minimize non-point source pollution as well as provide necessary habitat and safety corridors for wildlife. RMZ consist of the upslope area for a distance of 75 feet times the stream order (to a maximum of 300 feet) applied to each side
of the stream channel, measured from the outside edge of the active floodplain. (Draft WQ BMP, CTUIR Forestry Management Plan (FMP) 2010)

Sustainable agricultural management requires the protection of natural resources. Protection for riparian areas and floodplains will be provided for through the development and identification of Best Management Practice (BMP) that are identified for RMZ based on a modification of the standards described in the modified Strahler Riparian Standards outlined in the CTUIR FMP. RMZ will provide for opportunities to address agricultural needs while meeting fish, wildlife, and water quality objectives.

The RMZ widths include two separate zones, an inner and outer zone, allowing separate management standards in each. Below is a description of standards applied to the inner and outer zones. (Draft WQ BMP, CTUIR Forest Management Plan 2010) The RMZ widths will be determined by the “modified” Strahler (1964) stream ordering classification. The Strahler classification system is a general way of describing the size of a stream or river. (Strahler, A.N. 1964) The smallest permanent streams are "first order”. Two first order streams join to form a larger, “second order” stream; two second order streams join to form a “third order”, and so on. Smaller streams entering a higher-ordered stream do not change its order number. (Allan, J.D. 1995)

The “modified” Strahler, defined and adopted for the UIR, classification assigns an order number to each stream length starting with stream order 0 applied to the upper most headwater streams as mapped from a 1:24,000 stream layer (Appendix C). As two streams of the same order merge, the stream order increases to the next higher order in a downstream direction (the merging of a lesser order does not increase the order). It assumes that increasing stream order correlates with increases in channel dimensions and stream discharge. (Draft WQ BMP, CTUIR Forest Management Plan 2010) Consistent with management outlined in the CTUIR FMP all stream orders, as mapped by CTUIR GIS will be reduced by one when addressing crop production activities near streams.

A riparian area is a zone with distinctive soils and vegetation is a transitional area between a stream or other body of water and the adjacent uplands. This area includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation as well as vegetation that provide stability to the floodplain or surrounding fluvial surface during high flow events. This area is located next to perennial and intermittent streams on 1:24000 United States Geological Survey (USGS) quad maps. The RMZ is usually within the 100-year floodplain of a stream or, if a floodplain is absent, the zone hydrologically influenced by the stream.

The active floodplain is that area immediately adjacent to the channel that might receive overland flow during a high flow event. For the purposes of this plan it also includes the area that is immediately adjacent to highly entrenched stream channels that historically may have been active floodplain or may be active in the future (assuming that the existing channel formation is not at equilibrium with the valley setting). Active floodplain widths will vary by stream size and stream type. (Draft WQ BMP, CTUIR Forest Management Plan 2010)

2.3.2.2 Water Quality Standards and Guidelines
2.3.2.1 S1: Agricultural management activities have a high potential to affect select water quality parameters, temperature, turbidity, dissolved oxygen and contaminants. Agricultural production will be planned and implemented to meet Tribal Water Quality Standards (TWQS). Modification of agricultural practices will promote measurable improvements in stream reaches where water quality does not meet Tribal Standards.

When the distinction between the classifications of surface water, wetlands, or groundwater is undecipherable, the applicable standards will depend on the existing and designated beneficial use that may be adversely affected. At the boundary between waters of different classifications, the more stringent water quality criteria shall prevail. If the designated beneficial uses of more than one resource are affected, the most protective criteria shall apply.

2.3.2.2 S2: Mechanized equipment is prohibited in stream channels except at designated crossing areas. The CTUIR WRP must grant authorization for in-stream work. If any part of an allotment is limited due to the implementation of buffers, a Stream Zone Alteration Permit and approval of the superintendent is required to construct stream crossings. Stream crossing construction must follow standards listed in the CTUIR Standards to the Water Code.

2.3.2.3 S3: Riparian Management Zones consist of the upslope areas for a distance of 75 feet times the stream order (to a maximum of fourth order) applied to each side of the stream channel, outside the active floodplain, to a maximum of 300 feet.

2.3.2.4 S4: RMZ will be enforced on applicable streams within the agricultural area

2.3.2.5 G1: The RMZ inner zone width will vary depending on selected the Management Alternative.

2.3.2.6 G2: Ground disturbance within the RMZ inner zone buffer will be limited to provisions of this Environmental Assessment and outlined in conservation and crop rotation plans made part of farm leases on the Umatilla Indian Reservation unless it is to establish healthy riparian vegetation or is otherwise deemed appropriate by the conservationist.

2.3.2.7 S5: All active floodplains, riparian areas, and wetlands must be restored and protected through appropriate land use practices.

Applying BMP does not create a situation where any or group of practices will remedy all environmental degradation. Each environmental condition may result in the use of a different BMP to remedy any ecological deficiency.

2.3.2.8 S6: Large woody debris has been removed from many streams in the area and this can have a detrimental effect on pool frequency and quality. Incorporation of
large woody debris will be encouraged as site potential allows. Large woody debris consist of large pieces of wood placed systematically within the stream channel and used to slow water flow, diversify available habitats, and minimize stream channelization. The Oregon 1998 303(d) List: states Oregon Department of Fish and Wildlife (ODFW) Habitat Benchmark for Wood pieces per 100 meters; Desirable >20, and Undesirable <10. Much of the riparian vegetation has been removed from the streamside, reducing the future recruitment of large woody debris.

2.3.2.9 G3: Contour cultivation, conservation tillage, and cover crops will be encouraged within the outer zone to minimize water erosion and enhance RMZ performance.

2.3.2.3 Geomorphic Stability

The stability and integrity of natural systems have seen profoundly negative effects from the straightening, deepening, widening, lining, reshaping, relocating, and routing of channels through pipes (Rosgen, 1996). Negative implications from stream channel modifications include sedimentation, artificial velocity of flow, depleted vegetation, increased water temperatures, reduced fisheries and riparian habitat, and increased channel and stream bank erosion.

2.3.2.3.1 S7: Management activities must support a stable floodplain and channel condition or promote floodplain development at an elevation that is accessible to stream flow during high flow events. Repeatable channel morphology measures such as channel dimension, pattern, and profile used in trend analysis identify a stable condition. A stable floodplain and channel efficiently routes sediment without aggrading or degrading and maintains consistent channel features through time.

2.3.3 Wildlife and Fish Habitat

Other than irrigation diversions, two factors have negatively influenced wildlife and fisheries habitats on the UIR. The conversion of native grasslands and shrub-steppe communities to croplands reduced terrestrial habitat and increased erosion and sediment input into streams, negatively affecting fisheries habitat.

2.3.3.1 Habitat requirements for grassland species

Agricultural lands placed into CRP or idle lands that provide grassland cover will follow standards described in the USFWS Western Meadowlark Habitat Evaluation Procedures model (Shroeder and Sousa 1982). Based on its habitat requirements, the western meadowlark serves as an indicator for other grassland nesting species and literature is available to support habitat standards to meet its life history requirements. Localized site potential must be understood prior to establishment of conservation programs. Standards and guidelines are as follows:
2.3.3.1 **S1:** Canopy cover will consist of sixty percent (60%) herbaceous cover and up to ten percent (10%) shrub cover, as site potential allows.

2.3.3.2 **S2:** Sixty percent (60%) of the herbaceous material will consist of grasses 7 – 19” tall, as site potential allows.

2.3.3.3 **S3:** To provide cover for nesting birds, USDA-CRP or idle lands should not receive mechanical treatment (mowing) or pesticide treatment from May 15 to July 1 unless restoration of the plant community is being implemented.

2.3.3.2 Fish screening and water diversions

2.3.3.2.1 **S4:** Fish screening of water diversions must be subject to NOAA Fisheries, Standards for Fish Screening of Water Diversions.

The implementation of an ongoing inspection, maintenance, and repair program will assure the facilities are free of debris, and that screen material seals, drive units, bypass entrances, conduits, and other components are functioning.

In-stream standards and guidelines as they relate to water quality are located in the Water Quality Standards and Guidelines on page 27.

2.3.3.3 Native Plant Communities

As stated within the Water Quality Standards and Guidelines, RMZ standard widths will be established for streams of applicable order classification. The following standards work in cooperation with those already stated.

2.3.3.3.1 **S1:** Riparian areas or reserve lands within agriculture lands must support or make measurable progress (as measured by plant composition and ground cover) toward supporting the appropriate native plant community for the site or an appropriate plant community defined as the desired plant community.

2.3.3.3.2 **S2:** Active floodplains, riparian areas, and wetlands with shrubs including areas having potential for shrubs, or where shrubs have been removed in the past, management activities should achieve 80% coverage of each bank with at least 50% of that cover at full height typical for the shrub species involved.

2.3.3.3.3 **S3:** Riparian areas that cannot support shrub vegetation (e.g., rocky or thin soils), springs, and isolated or seasonal wetlands, must support or have measurable progress, as measured by plant composition and ground cover, toward supporting undisturbed riparian plant communities or wetland plant communities typical to the site.

Through vegetation treatments, restoration of native plant communities on the UIR is of vital importance.
2.3.3.4 **S2:** A prioritized seed preference list for any seeding operation is as follows:

A. Locally adapted native seed
B. Native cultivars
C. Non-invasive introduced species

Projects with known, pre-determined species and quantities will use a native seed source. Cultivars will only be used in the absence of adequate true native seed sources, when environmental and economic thresholds for native perennial grasses have passed, when threats of noxious weed infestations, or when accelerated soil erosion is immediate and cannot be addressed in a timely manner with true native seeds. In such cases, landowners or operators will use non-native species with non-persistent characteristics as approved by the Tribal Restoration Ecologist.

2.3.3.5 **S3:** Native shrub and tree selection for any re-vegetation project should be locally adapted to the area. It is preferable to have local native stock that originates at or as near project area as possible.

2.3.3.6 **G1:** Planting (by seeding or transplanting) grasses, forbs, shrubs, and trees in deteriorated riparian areas, bottomland forests, and reserve lands is appropriate if:

A. Natural regeneration of plants will not establish sufficient cover;
B. The vegetation that will establish or has established on the site is not an acceptable plant community;
C. Land use or activity plans require certain plant communities to meet objectives.

2.3.3.7 **S4:** The Tribal Restoration Ecologist will provide plant lists for native and non-invasive plants.

2.3.4 **Air Quality**

Standards and guidelines for air quality will encompass all anthropogenic degradation of air quality from agricultural trust land within the UIR. These rules limit the period and types of materials burned to control emissions of PM, and other noxious fumes to atmosphere and ground level concentrations of PM 10 and PM 2.5.

On April 8, 2005, the final EPA standards for agricultural burning were approved and the Tribe received final partial authority on August 21, 2006. All burning on the reservation must meet CTUIR Office of Air Quality (OAQ) standards and guidelines.

2.3.4.1 **Agricultural Burning**

Agricultural burning is a form of open burning, including but not limited to; windrow burning, ditch burning, stubble burning, and field sanitation. Agricultural burning may be performed to prevent disease, control pests, rotate crops, or for crop reproduction.
2.3.4.1.1 General Standards for Burning on Trust Agricultural Lands

2.3.4.1.2 S1: A completed NRCS Conservation Clean-Till Request is required for all HEL ground prior to issuing a burn permit. A farmer may clean-till every 3 years in an annual crop system and every 5 years on a wheat/fallow rotation. The Agency Superintendent must also approve all clean-till permits.

2.3.4.1.3 S2: Applicants must obtain, complete, and submit permit forms (Appendix D) to the CTUIR OAQ at least three business days prior to the desired burn date. Approval is also required from the Agency Superintendent.

2.3.4.1.4 S3: After submitting a completed application, the applicants must call CTUIR OAQ no later than 12:00 pm prior to the day of the desired burn.

2.3.4.1.5 S4: The CTUIR burn managers review requests between 12:00 pm and 2:00 pm to determine the preliminary recommendation for the burn area(s). Pre-approved applicants will receive notice of a preliminary decision by telephone by 6:00 pm.

2.3.4.1.6 S5: The pre-approved applicant must call the CTUIR OAQ by 9:00 am to determine whether the burning is allowed the day of the planned burn.

2.3.4.1.7 S6: Prior to field ignition, the applicant must call the CTUIR OAQ to find out if any changes have occurred in conditions for that day.

2.3.4.1.8 S7: Within 24 hours after the burn, the applicant must contact the CTUIR OAQ with post burn information.

2.3.4.1.9 S8: Applicants are responsible for compliance with any applicable burn safety requirements and must obtain applicable fire safety permits.

2.3.4.1.10 S9: Applicants are responsible for shutting down burns when necessary and/or requested to do so by the CTUIR OAQ or US EPA.

2.3.4.1.11 S10: Operators may burn diseased stubble if it is the only alternative or is a recommended treatment. Burning for weed infestations is not a replacement of proper weed management practices. Stubble may be burned if the field is heavily infested with cheat (Bromus secalinus), ripgut brome (Bromus rigidus) downy brome (Bromus tectorum) jointed goatgrass (Aegilops cylindrica), etc., during the optimum time to burn. In general, immediately following harvest for a month is the best time to burn. Fall burning will result in a fire hot enough to be effective in killing the seed source and sterilizing the seed.

2.3.5 Monitoring and Evaluation
Different levels of monitoring or accelerating regular monitoring cycles may be required due to unforeseen events, such as wild land fire, floods, drought or other climatic conditions, administration actions or corrections related to land status, management or trespass. Assessment will include watershed function in the uplands and riparian/wetland areas, ecological processes, habitat for native, threatened and endangered species, and locally important species.

2.3.5.1 **S1:** Monitoring and evaluation must be provided to insure that the standards provided in Elements, 1-13 be met or that there is an upward trend towards meeting those standards.

2.3.5.3 **G2:** Monitoring methodologies, schedules, costs, and responsibilities are displayed in Table 8. managers must allocate time and funding as needed to meet monitoring needs.

2.3.6 **Weed Control**

Weed populations on the UIR negatively affect agricultural production, wildlife and fisheries habitats, access roads, and cultural subsistence use. A successful weed control program will include cooperation and participation from owners and lessees of trust allotments, as well as implementation of the Integrated Weed Management Plan (IWMP).

2.3.6.1 **S1:** The lessee shall control all weeds on all lands stated under the lease. The Lessee shall be responsible for, or shall immediately reimburse the designated weed program, any weed control cost incurred because of the Lessee’s failure to control weeds on said premises. (BIA, Soil Conservation and Crop Rotation Plan)

2.3.6.2 **S2:** Noxious weeds shall be intensively controlled or eradicated. Noxious weeds for the purpose of this plan are those weeds determined to be noxious by the Umatilla County Weed Board and so declared by the Umatilla County Board of Commissioners. (BIA, Soil Conservation and Crop Rotation Plan)

2.3.6.3 **S3:** All other weeds shall be controlled and not allowed to set viable seed. (BIA, Soil Conservation and Crop Rotation Plan)

2.3.6.4 **G1:** Weed management and control will follow the provisions listed and explained in the BIA Integrated Weed Management Plan (IWMP) for the UIR. Any noxious and/or pervasive weed control projects must follow approved standards and guidelines for weed control listed in the IWMP. Identification of species control needs will reference the Umatilla County Noxious Weed List.

2.3.6.5 **S4:** Operators will be subject to EPA laws and restrictions on the product label of any chemical used.

2.3.7 **Idle Lands**
The transition of productive farmland to idle ground has been a serious problem on the UIR in recent years. As commodity prices fall, and/or production costs increase, the feasibility of crop production decreases and once productive, farmland becomes undesirable for crop production. The landowners must be aware of and have the opportunity to comment on any changes made to the management of trust land.

2.3.7.1 S1:  Idle farmlands that have not been farmed within the previous five years and are located adjacent to a range unit will be considered for incorporation into the unit (as fencing is constructed) and grazed under the range management strategy for the reservation and the particular unit plan.

2.3.7.2 S2:  Tracts where the vegetation is suitable for grazing will be converted to pasture and leased as such if economic and environmental conditions allow.

2.3.7.3 S3:  Lands that meet specifications for re-forestation or forestation may be converted to a forest type.

2.3.7.4 S4:  Annually an inventory of trust lands and their status will be available. The inventory should include:
- Location
- Acreage
- Length of time since last farmed
- Soils
- Average Yield
- Reason for the tract to be idle

2.3.7.5 G1:  An idle tract of Indian Trust land may be considered for a lower rate rental rate or cost share to decrease the risk a farmer must take to regain agricultural production. The landowners and Superintendent must approve these rental rates and cost share opportunities. Using reports from the Soil Conservationist, the Superintendent will determine the condition of the tract in reaching a decision.

2.3.7.6 G2:  Reserve and idle lands must be seeded immediately prior to the period of longest favorable growing conditions. A favorable growing period of forty to sixty days will generally assure successful stand establishment. Any fall seeding must occur late enough that no germination occurs until early spring.

2.3.7.7 S5:  Leasing protocols for Negotiated Leases:
- Upon presentation to the CTUIR of a negotiated lease with a majority of shareholder signatures, the BIA will provide a written lease with negotiated terms to the tenant within 45 working days.
- Upon receipt of the lease to the tenant, he/she will have 35 working days to provide a bond, proof of acceptance of lessor forms, and landowner
signatures and if necessary, proof that an attempt was made to contact all of
the landowners, including those residing out of the immediate area.

- Should a lease be negotiated due to the lack of a majority interest of owners
  who are not non compos mentis, orphaned minors, undetermined heirs of an
  estate, whereabouts unknown, and/or persons who have given the
  Superintendent written authority to sign on their behalf, the Superintendent
  will commit their respective interests when all other owners have agreed and
  signed a new lease.

2.3.7.8 **G3:** Leasing protocols for Lease Advertisements:

A year prior to the expiration of a farming lease, the Realty Program mails 90-day notices to
all landowners of the allotment. Upon receipt of the letter, landowners have 90 days to
negotiate with any prospective tenant for the renewal of a lease. After the 90 days expires,
the Superintendent has full authority to grant leases on advertised tracts without further
involvement by landowners.

- When owners of a tract are not successful in negotiating a lease within the
  90-day notice period the lease will be advertised under the BIA Lease
  Advertisement Guidelines.
- The Realty Program will attempt to lease trust tracts in a second Lease Bid
  Advertisement if the first attempt is unsuccessful.
- The BIA will attempt to negotiate leases on tracts that remain un-leased after
  two lease advertisements with the Tribal Farming Enterprise, or if possible
  enter the trust tracts into a USDA Conservation program.
- For tracts where the Realty Program is not able to secure a lease, the
  landowner(s) will be encouraged to control noxious weeds and promote a
  healthy plant community. Federal assistance may be available to control
  infestation and spread of noxious weeds from idle lands.

2.3.7.9 **S5:** Where situations exist in 2.3.7, the CTUIR will begin the process of incorporating
the tracts into a range unit, pasture, or permanent cover crop as mandated by
2.3.7.1 **S1,** 2.3.7.2 **S2** and 2.3.7.6 **G2.** Landowner consent must be obtained prior
to changes in land use.

2.3.7.10 **S6:** A list of tracts that are idle or in danger of becoming idle will be generated and
advertised on a yearly basis.

2.3.8 **Threatened and Endangered Species**

The CTUIR must meet all necessary requirements prior to the implementation of any action
that may affect threatened and/or endangered species on the Reservation.

2.3.8.1 **S1:** Legal and biological requirements for the protection of endangered, threatened,
and sensitive plants and animals will be met.
2.3.8.2 S2: The required biological review will be carried out according to the requirements of the Endangered Species Act as amended. Consultation requirements of the US Fish and Wildlife Service and NOAA Fisheries will be met.

2.3.9 Cultural Resources and Traditional Uses

2.3.9.1 S1: In order to evaluate the effects of the undertaking on historic properties, the CTUIR must follow the process outlined in the NHPA’s implementing regulations (36CFR800). The CTUIR Tribal Historic Preservation Office (THPO) must be consulted for each undertaking that has the potential to affect historic properties, including sites of cultural significance to the CTUIR. (Appendix E)

2.3.9.2 S2: The lead federal agency must define the Area of Potential Effects (APE) of the undertaking in consultation with the THPO. The THPO has 30 days to respond.

2.3.9.3 S3: Cultural resource assessments will be conducted prior to each undertaking. The cultural resource assessment may use historic documents, oral histories, and/or archaeological field investigations to determine the nature and extent of such resources within the affected environment.

2.3.9.4 S4: If the archaeological fieldwork or oral history assessment locates cultural resources, avoidance or mitigation measures may be necessary.

2.3.9.5 S5: The THPO and the Cultural Resources Protection Program (CRPP) require that professionals meeting the Secretary of Interior’s Standards for the type of work to be performed oversee the cultural resource reports. All documentation regarding location, use, and character of historic properties is confidential and exempt from release under the Freedom of Information Act.

2.3.9.6 S6: The lead federal agency must submit the cultural resources report to the THPO and the CRPP.

2.3.9.7 S7: The lead federal agency will make their finding of effect and this finding must be sent to the THPO for review and concurrence. The THPO has 30 days to concur with the finding of effect.

2.3.9.8 S8: All projects will be designed to avoid disturbance to cultural resource sites. If this is not feasible, a mitigation plan will be developed in consultation with the Cultural Resources Protection Program and the Tribal Historic Preservation Office.

2.3.9.9 S9: In the event that cultural resources are exposed during project activities, those activities will cease until the discovery can be assessed. The undertaking may need to be modified so that the resources are left undisturbed.

2.3.9.10 S10: Plantings should include or enhance culturally important plants when feasible.
2.3.9.11 **S11**: Other laws and regulations governing federal action include the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001 et seq., the Archaeological Resources Protection Act (ARPA), 16 U.S.C. 470aa et seq., Executive Order 13007 regarding the protection of sacred sites, and other federal and Tribal laws, policies, regulations and guidelines.

2.3.10 **Transportation**

The AMP cannot fully address many of the issues and concerns raised during the planning process without consideration of the transportation system needed for administrative subsistence, and economic use. However, CTUIR believe that the political and social complexity of access for these uses warrants the development and implementation of a separate transportation management plan encompassing the UIR. The plan will identify needed access roads and the standards for road construction and maintenance, consistent with the natural resources and cultural/social values. (BIA, Draft Range Management Plan)

The following are guidelines to follow when dealing with transportation issues in the agricultural area. No actions will be taken to enforce or manage environmental limitations on the existing transportation system other than the activities already agreed to.

2.3.10.1 **G1**: Stream road crossings must follow standards listed in the CTUIR Standards to the Water Code.

2.3.10.2 **G2**: Road access will be adequate to accomplish commercial, resource, and protection management activities as well as subsistence use.

2.3.10.3 **G3**: Roads will be operated and maintained according to management emphasis and maintenance levels appropriate to planned uses and activities, safety, economics and impacts on land and resources.

2.3.11 **Tribal, Public, and Inter-Governmental Relationships**

With ever changing government programs, farming practices and commodity prices it is necessary to maintain open communication between Tribal staff, government agencies, landowners, and farmers. While the authority to mandate management regimes on non-Indian land is not understood, steps to implement conservation measures that respond to associated issues and concerns shall be carried out through several means including but not limited to the CTUIR Land Development Code and CTUIR Water Code.

2.3.11.1 **S1**: Lease conferences will be available for landowners and farmers once every two years informing them of changes, guidelines, and updates. Lease conferences will consist of the following: Appraisals/Negotiations, new farming techniques, new farm programs, updates to the leasing procedures, money distribution, CFR codes and regulations, laws, regulations and policies of leases, range practices, leasing, acquisition and disposals, probates and right-of-ways, and policy of operations.
2.3.11.2 S2: Since regulations and updates will occur regularly between lease conferences, updates will be printed in the Confederated Umatilla Journal, East Oregonian, letters and any other possible means to communicate updates to leasing protocols and changes to, or listing new farming programs, methods etc.

2.3.11.3 S3: Tribal staff and governmental agencies will establish biennial meetings to discuss changes, concerns, or problems on the Reservation.

2.3.11.4 S4: Regular communication between Tribal Farming Enterprise (TFE) and the CTUIR DECD Land Program shall occur to alleviate extended periods between the lease going under advisement and the final decision.

2.3.12 Lease Compliance

Evaluating the production practices and potential trespass issues on a consistent basis will ensure compliance with agricultural leases.

2.3.12.1 G1: Funds are needed to maintain each of the developed alternatives.

2.3.12.2 S1: Enforcement, trespass issues, and lease compliance will follow CFR code 25. Standards for compliance listed on each lease will contain the attributes of CFR code 25 and are the responsibility of the Range, Agriculture and Forestry (RAF) and DECD Land Program staff.

2.4 Management Alternatives

2.4.1 Alternative Development

The Inter-Disciplinary Team (IDT) used a three-step process to identify a reasonable range of alternatives that respond to the issues and concerns listed in Chapter 1. The IDT first established goals and objectives for management of agricultural resources on the UIR and then identified the standards and guidelines, or the physical, biological, and social conditions necessary for any of the alternatives to meet the goals and objectives. Finally, the IDT formulated three alternative management options, (Alternatives A, B, and C) expected to meet the goals and objectives if fully funded and implemented. In formulating these management alternatives, the IDT considered the effects that cropping system manipulation may have on natural resource values.

Any management program must utilize the best methods available to manage cropland depending on their soil resources, rainfall, topography, farming history, crop potential, geographic location, presence of or the need to protect culturally significant sites, sensitive plants or animals, fish and wildlife habitat requirements, watershed values, and legal, policy, and budget constraints.

The management program should ensure continuous public involvement in all phases of development and implementation of activities.
The management program must follow established procedures for site analysis of area resources, including inventory of soil, water, plant and animal status, and economic conditions for land utilization. This information is used to document successes and failures, monitoring of improvements or degradation in resource conditions, long-term viability of management practices, and changes are necessary.

The management program must include a process for modifications in response to the changing ecosystem, economic and social conditions as identified by the monitoring process.

The IDT formed alternatives with the idea in mind that incentive programs have the potential to generate partial compensation for lands removed from production due to the elevated conservation measures. These programs will also provide incentives for landowners and lessees to implement practices that provide environmental benefits. In some cases, other mitigation funds may be necessary to compensate landowners for loss of revenue on lands taken out of production due to conservation measures mandated by each alternative. On trust property, the Superintendent will consider options if incentive programs are not available to provide income within conservation areas.

The first management alternative (Alternative A, No Action) continues with existing management practices including any agricultural requirements and actions committed to by the BIA and/or CTUIR prior to initiation of the planning effort, or when the EA is approved. The No Action Alternative will not require enforcement of additional standards and guidelines. Analysis of a No Action Alternative is a requirement of the NEPA and BIA planning procedures. This alternative displays the likely outcome of existing cropping schemes to manage lands and resources into the future if fully funded.

The implementation of the chosen management alternative will continue for ten years from the date of signature. Updates and/or alterations to the plan may occur upon review after ten years. In the event that land management practices cannot meet any one or combinations of standards, the practices of the specific conservation systems will change to achieve favorable trends of the given standards. All Federal and Tribal laws, resolutions, codes, and mandates pertaining to actual resource protection and/or agricultural management will be complied with regardless of the alternative chosen.

**Items consistent with all alternatives:**

Inner riparian zone management will not vary between alternatives B, and C.

Pesticide and fertilizer inputs may increase when implementing reduced tillage or direct seed cropping systems. Each farming lease, on trust land, contains requirements for reporting land inputs and operations such as pesticide and fertilizer applications as stated in the lease:

**“SECTION 3 GENERAL MANAGEMENT**

3.01 Maintenance Records. The Lessee shall keep clear, complete, and detailed records of all operations. This includes dates of tillage operations and seeding dates as well as repairs and replacement of improvements on said premises. The Lessee shall also keep a clear, complete,
and detailed record of all chemicals applied. These records will be turned into the Division of Natural Resource Management at the end of each year.” Reports are submitted to CTUIR DNR Agriculture staff. This information is to facilitate future land use decisions.”

With discretion, the Superintendent may waive certain requirements of the standards and guidelines as they relate to residue, farming methods, and buffer widths. Variances will require justification and/or obvious need. Landowners will be notified and have the opportunity to comment on operational changes to their respective allotment(s).

As erosion measurement and farm systems analysis technology becomes available, staff will utilize the most current accepted version.

SCI values, derived from RUSLE2, are required with Alternatives B and C. These two alternatives require a predicted positive or zero impact with the proposed agricultural practices in each new crop plan (Appendix F). Despite the alternative chosen, Compliance with NRCS Conservation plans remains the same on all farmed HEL ground.

The Lessee will not alter or remove riparian vegetation and/or wetlands without prior authorization from the Superintendent and an approved Stream Zone Alteration permit from the CTUIR Department of Natural Resources, WRP.

With exception of Alternative A, each alternative will be associated with changes in production acres on land with streams, rivers and other affected water bodies DNR Natural Resource staff will encourage conservation incentive programs to offset some costs of lost production if alternative B or C is chosen.

Leasing idle lands and reducing the amount of land becoming idle will remain a priority despite the alternative chosen.

2.4.2 **ALTERNATIVE A – NO ACTION, MAINTAIN CURRENT MANAGMENT PRACTICES**

The CTUIR will not require changes in farming management and cropping operations for ten years from the signature of the Agricultural Management Plan except to meet current Tribal codes and regulations, and federal program standards and guidelines (25 CFR Part 162 and USDA Programs). This alternative will not require the standards and guidelines formulated during this planning process to be re-evaluated.

Standards and guidelines exist to maintain the minimum standards that reduce negative impacts upon agricultural lands on the UIR. Each particular agriculturally related action on must meet specifications of the federal, state and local standards and guidelines for agricultural management.

The enforcement procedures for federal agricultural management standards and guidelines will be similar to current compliance procedures. Currently residue management is only required on
HEL lands. Operators may continue to farm NHEL lands at the current residue levels. The SCI trend will not be considered.

There will be no change of current management activities. The CTUIR will attempt to meet water quality standards through public education and promotion of incentive programs. This planning cycle will not incorporate any additional requirements upon farming and cropping systems to enhance or maintain elevated agricultural or environmental conditions for the benefit of the above listed issues and concerns (Chapter 1).

2.4.2.1 **Personnel required to facilitate this alternative include:**

2.4.2.2 One (1.0) Full Time Equivalent (FTE) Soil Conservationist to write crop plans, respond to complaints, conduct field inspections for lease compliance, optimized production, identify tracts likely to fall idle, and otherwise assist in the implementation of conservation efforts.

2.4.2.3 An Additional one-half (0.5 FTE) Soil Conservation Technician to write crop plans, respond to complaints, conduct field inspections for lease compliance, optimized production, identify tracts likely fall idle, and otherwise assist in the implementation of conservation efforts. The Agency superintendent and the CTUIR BOT will consider any additional requirements applied to cropping and farming actions on a site-specific basis. Leasing of trust lands will continue in the same manner for crop production as in the past on UIR trust lands.

These two positions will work together to ensure that lease implementation and compliance occur in a timely and efficient manner and to inform landowners and tenants of the requirements of this Management Plan/EA and the conservation practices to be applied

2.4.3 **ALTERNATIVE B—ZERO OR POSITIVE SCI TRENDS AND A VOLUNTARY ONE-QUARTER (1/4) OF THE RMZ USED FOR THE INNER ZONE FOR 10 YEARS, WITH MANDATORY ONE-QUARTER (¼) OF THE RMZ USED FOR THE INNER ZONE THEREAFTER**

The CTUIR propose to require each new lease beginning after the approval of this plan to include a RUSLE2 analysis in the crop plan. Cropping practices meeting a predicted zero or positive (± 0.05) SCI will be required on all agricultural lands regardless of HEL status. Residue levels required by CTUIR and NRCS Conservation Plans are enforced on all HEL land. The BIA and CTUIR have the sole authority through crop plan provisions to enforce conservation compliance on Indian Trust land and through relationship with the Oregon Department of Agriculture may enforce requirements on fee land.

Riparian management zones (RMZ) with inner zones at minimum one-quarter (1/4) of the total RMZ width on Strahler Modified Stream Orders 1-4 will be voluntary for the first ten years from the final approval of this plan. **Following the ten-year voluntary period, RMZ inner zone buffer requirements will be mandatory at the beginning of each new lease.**
The CTUIR will establish an educational outreach program focused on promoting the voluntary adoption of inner zones consisting of one-quarter (1/4) of the RMZ width on agricultural land prior to the requirements after ten years. The educational program will utilize promotional materials and activities targeting landowners and operators and encouraging the adoption of voluntarily establishing permanent streamside vegetation. CTUIR have dedicated staff to develop and implement projects that provide adequate riparian vegetation while minimizing the economic impacts of lost production within riparian management zones.

For the first ten years, entry into the established inner zone will be discouraged except in designated crossing areas and for the purposes of improving the function and condition of the riparian area and stream channel. After the voluntary ten-year period has lapsed, entry into the established inner zones will be prohibited except in designated crossing areas and for the purposes of improving the function and condition of the riparian area and stream channel. Any stream channel modifications require a permit from the CTUIR WRP. Throughout plan implementation, the Soil Conservationist will define and promote the appropriate buffer standards relating to equipment usage, plant densities, and types within the conservation plan using available technical guides.

<table>
<thead>
<tr>
<th>Stream Order</th>
<th>Total Buffer Width</th>
<th>1/4 RMZ Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Order</td>
<td>0 feet</td>
<td>0 feet</td>
</tr>
<tr>
<td>1st Order</td>
<td>72 feet</td>
<td>18 feet</td>
</tr>
<tr>
<td>2nd Order</td>
<td>150 feet</td>
<td>38 feet</td>
</tr>
<tr>
<td>3rd Order</td>
<td>224 feet</td>
<td>56 feet</td>
</tr>
<tr>
<td>4th Order</td>
<td>300 feet</td>
<td>75 feet</td>
</tr>
</tbody>
</table>

This alternative requires all farming operations to protect the soil during critical erosion periods, defined as December 1 thru March 1. Utilization of Federal and Tribal conservation programs will optimize productivity of the resources and offset the costs while implementing the requirements of this alternative.

Additional personnel may be necessary to ensure compliance with this Alternative and promote participation in federal, state, and local conservation projects and programs.

2.4.3.1 Personnel required to facilitate this alternative include:

2.4.3.2 One (1.0 FTE) Soil Conservationist II to analyze field data, develop cropping plans, respond to complaints, monitor for lease compliance, optimize production, assist other land managers (Tribal and other organizational natural resource entities), and identify and promote use of tracts that have or may fall idle.

2.4.3.3 One (1.0 FTE) Watershed Coordinator to develop buffer plans, assist in the implementation of conservation efforts, solicit and facilitate incentive programs,
provide technical assistance and educational outreach to landowners and operators, monitor stream conditions, and monitor buffer compliance.

2.4.3.4 One (0.5 FTE) Soil Conservation Technician II to assist in the implementation of conservation efforts, solicit and facilitate incentive programs, provide technical assistance and educational outreach to landowners and operators, monitor stream conditions, and monitor buffer compliance.

These three positions will work together to ensure lease implementation and compliance occur in a timely and efficient manner and to inform landowners and tenants of the requirements of this Management Plan/EA and the conservation practices to be applied.

2.4.4 ALTERNATIVE C—ZERO OR POSITIVE SCI TRENDS AND A VOLUNTARY ONE-QUARTER (1/4) OF THE RMZ USED FOR THE INNER ZONE WITH RE-EVALUATION OF BUFFER TARGET AT END OF 10 YEAR PERIOD.

The CTUIR propose to require each new lease beginning after the approval of this plan to include a RUSLE2 analysis in the crop plan. Cropping practices meeting a predicted zero or positive (± 0.05) SCI will be required on all agricultural lands regardless of HEL status. The required residue levels in NRCS Conservation Plans are enforced on all HEL ground. The CTUIR has the sole authority through crop plan provisions to enforce conservation compliance on Indian Trust land and through relationship with the Oregon Department of Agriculture may enforce requirements on fee land.

Riparian management zones (RMZ) with inner zones at minimum one-quarter (¼) of the total RMZ width on Strahler Modified Stream Orders 1-4 will be voluntary for the first ten years from the final approval of this plan. At the conclusion of the ten-year voluntary period, the plan will be re-evaluated and updated to reflect changes in farming practices, changes in agricultural economic conditions and progress toward meeting water quality standards. At such time, the BOT will choose to continue with the voluntary buffer adoption, modify the existing buffer implementation program, begin mandatory buffer implementation, or cease the buffer implementation program.

The CTUIR will establish an educational outreach program with the goal of creating at minimum buffers one-quarter (¼) of the RMZ width on trust land. The educational program will utilize promotional materials and activities targeting landowners and operators and encouraging the adoption of the voluntary buffer zones. CTUIR have dedicated staff to develop and implement projects that provide adequate riparian vegetation while minimizing the economic impacts of lost production within riparian management zones. **Farm contracts will be limited in duration in the event that lessees or permittees cannot or will not establish and maintain voluntary one-quarter (¼) RMZ buffers.** Alternative C will utilize leasing regulations to promote incentives that reward proper application of upland and streamside conservation measures. The four-year contract limit will allow the Department of Natural Resources to plan and implement conservation practices that addresses the desire for stream zone buffers.
For the first ten years entry into the established inner zone will be discouraged except in designated crossing areas and for the purposes of improving the function and condition of the riparian area and stream channel. Mechanically improving stream channels must be planned and permitted in coordination with WRP. At the end of the ten-year voluntary period, this requirement will be re-evaluated. Throughout plan implementation, the Soil Conservationist will define and promote the appropriate buffer standards relating to equipment usage, plant densities, and types within the conservation plan using available technical guides.

Table 5: Alternative C Minimum Inner Zone Widths:

<table>
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<tr>
<th>Stream Order</th>
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This alternative requires all farming operations to protect the soil during critical erosion periods; defined as December 1 thru March 1. Utilization of Federal and Tribal conservation programs will optimize productivity of the resources and offset the costs while implementing the requirements of this alternative.

Additional personnel will be necessary to ensure compliance with this Alternative and promote participation in federal, state, and local conservation projects and programs.

2.4.4.1 Personnel required to facilitate this alternative include:

2.4.4.2 One (1.0 FTE) Soil Conservationist II to analyze field data, develop cropping plans, respond to complaints, monitor for lease compliance, optimize production, assist other land managers (Tribal and other organizational natural resource entities), and identify and promote use of tracts that have or may fall idle.

2.4.4.3 A second (1.0 FTE) Watershed Coordinator to develop buffer plans, assist in the implementation of conservation efforts, solicit and facilitate incentive programs, provide technical assistance and educational outreach to landowners and operators, monitor stream conditions, and monitor buffer compliance.

2.4.4.4 One (0.5 FTE) Soil Conservation Technician II to assist in developing buffer plans, the implementation of conservation efforts, solicit and facilitate incentive programs, provide technical assistance and educational outreach to landowners and operators, monitor stream conditions, and monitor buffer compliance.

These three positions will work together to ensure lease implementation and compliance occur in a timely and efficient manner and to inform landowners and tenants of the requirements of this Management Plan/EA and the conservation practices to be applied.
2.5 Alternatives Analyzed But Not Considered

Mandatory buffer installation for each new farm lease was considered in additional alternatives. The alternatives were not pursued due to concerns that additional farming acreage would go idle. The concern is that local farmers would not tolerate additional requirements with expenses of converting riparian acres on each leased tract into permanent grass/shrub/tress stands. Consequences of additional idle acreage would put increased burden on soil conservation and realty staff to keep land in production. Additional idle land would also create further infestation of undesirable and noxious weeds.
Chapter Three: Affected Environment

Chapter 3 explains the relevant physical, biological, social, and economic resource components of the existing Umatilla Indian Reservation cultivated environment. Alternative implementation may cause changes in the resource component to occur. This chapter addresses the issues and concerns previously considered in accomplishing the Agricultural Management NEPA process.

3.1 Soil Quality and Erosion

There are 26,976 acres leased for agricultural crop production on the reservation. Approximately 85-90 percent of operators are practicing conservation tillage to reduce soil erosion and improve soil health. Conservation tillage is defined as any tillage system that leaves at least 30 percent of the surface covered by plant residues for control of erosion by water; for controlling erosion by wind, it means leaving at least 1120 kg/ha (1000 lb/ac) of small-grain-straw-equivalent during the critical wind erosion period. The NRCS has evaluated all of the HEL land and designed a “conservation plan” for the specific soils and slopes associated with an individual FSA Tract. The amount of residue needed varies depending on the type and structure of the residue.

Local research shows in a wheat fallow rotation with conventional tillage 35 to 40 percent of soil organic matter was lost in 60 years of cultivation. Residue management treatment plots having high levels of soil organic matter demonstrate water intake rates to be three (3) times greater than treatment plots with low levels of soil organic matter. Soil compaction was least under management practices that returned high levels of crop residue to the soil. Over time, soil organic matter continues to decline in a wheat/fallow rotation under conventional tillage. Greater amounts of added nitrogen are necessary to achieve optimum yield because soil nitrogen availability has correspondingly declined. Nitrogen fertilizers have led to a decrease in soil pH to as low as 5.2. Lime may be required within 15 years. (Pendleton Agricultural Research Center 1931-1989)

High quality agricultural soil can be directly associated with organic matter, in which the majority is found in the top soil. Organic matter consists of microorganisms, plant litter, and the remains of organisms, which once occupied the soil. As organic matter decomposes, its nutrients become available to growing plants. Organic matter provides many of the needed attributes of soil quality. Soil organic matter acts as a storehouse for nutrients, reduces the effects of compaction, builds soil structure, and increases the infiltration rate of water. Organics serve as a buffer against rapid changes in pH and serve as an energy source for soil micro-fauna.

The USDA Farm Service Agency has enrolled 4,699 acres of previously farmed agricultural land on the reservation into the Conservation Reserve Program (CRP). The CRP implements herbaceous plantings ideal for wildlife habitat, water quality, reduced erosion, and cleaner air on former cropland that was previously too difficult to farm (topography, soils, and location) or lying idle. Land eligible for CRP must have been planted to an agricultural commodity crop four of the previous six years. Upon completion of the 10-year cycle, the field may be renewed, at the discretion of the FSA, to CRP or returned to agricultural production. The operator and landowner(s) split the CRP payments.
Streamside soil loss is a concern addressed in this plan. Currently agricultural fields bordering streams increase the risk of sloughing soil into waterways, flooding, and reduced water quality. Implementation of conservation buffers will provide stable stream banks, cleaner water, enhanced wildlife populations, cropland protection, enhanced aesthetics and recreation, and sustainable landscapes. Currently the Conservation Reserve Enhancement Program (CREP), the Environmental Quality Incentives Program (EQIP), and Continuous Conservation Reserve Program (CCRP) are federal programs implemented on the Reservation to provide financial benefits for buffer implementation along waterways.

3.2 Water Quality

Water quality on the UIR is dependent upon both surface and groundwater sources. The Umatilla River and its tributaries drain the diminished reservation. The river rises in the Blue Mountains, flows westerly across the reservation, and joins the Columbia River at Umatilla, Oregon. The main stem of the Umatilla effectively divides the reservation into almost equal northern and southern halves. Demands on the Reservations’ surface water are not excessive. Wells are the principle source of domestic, commercial, and irrigation water. (USDOI BIA Weed EA, 2000)

The Federal Clean Water Act, 1972, has been the driving force in creating programs and laws to protect Tribal beneficial use of surface water on and off the reservation. The act mandated the development of the CTUIR TMDL to address pollutants entering surface water. In July 2005, the UIR developed a TMDL to address sediment and temperature on water bodies throughout the Reservation. These two pollutants, as stated by the TMDL, are supported by ample data showing that water quality parameters are not being met. The Umatilla River, Meacham Creek, Tutuilla Creek, and other tributaries are generally too warm in mid and late summer while the Umatilla River and Mission Creek exceed water quality standards for turbidity a result of too much fine sediment eroding from stream channels and moving off adjacent lands into the stream. (CTUIR TMDL, 2004) Table three lists the water quality limited streams in the Range Resource Areas as of 2003 and explains each streams listed parameter.

The Board of Trustees adopted water quality standards to provide a mechanism for managing and regulating the quality and uses of waters of the Reservation by establishing water quality goals for specific water bodies, and providing a legal basis for regulatory controls. The exercise of this governmental function is critical to the Tribes’ self-governing principles.

Purposes of the water quality standards are to maintain or restore the chemical, physical, biological conditions, and cultural integrity of the surface waters of the Reservation for the Tribes, its people and residents of the Reservation. The Tribes plan to achieve a level of water quality that provides for the protection and propagation of fish and wildlife, for recreation in and on the water, and for all existing and designated beneficial uses of the water. The Tribes will promote a holistic watershed approach to management of the surface waters of the Reservation and will protect cultural and spiritual uses of water and threatened and endangered species. (CTUIR WQS, 2004)
### 3.3 Wildlife and Fish Habitat

Agricultural, range, and forest ecosystems of the UIR support a wide variety of wildlife species. Three hundred and seventy nine species of vertebrate animals may be present in the Blue Mountains including 10 amphibians, 16 reptiles, 89 mammals, and 365 birds. Fifty-one of the birds are found during migration or are accidental in the area. More detailed species descriptions are found in Wildlife Habitats in Managed Forests – The Blue Mountains of Oregon and Washington (Thomas et al., 1979).

Numbers of large ungulates utilizing the UIR during the winter months depend on the severity of the winter. Rocky Mountain elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), and white-tailed deer (*Odocoileus virginianus*) are integral to the culture of the Tribes, providing subsistence for many Tribal members. The UIR provides winter range for one of the largest elk herds in the country. These elk use the forest and range habitats of the UIR and during severe winters can cause conflicts with agriculture as they forage on winter crops.

The agricultural zone of the UIR consists of a mosaic of cover and non-cover habitats. Non-cover habitats include annual cropping systems where little or no vegetative cover exists during summer fallow. These lands provide little or no benefit to wildlife while in this status. These areas typically exclude burrowing animals due to ground disturbance from tillage and the lack of cover increases the exposure of predation for other animals.

Riparian areas, untilled wetlands, fencerows, road and irrigation ditches, untilled right-of-ways, idle lands, pasturelands, and land enrolled in CRP provide cover habitats in the Ag zone. Food crops in areas under annual tillage can provide forage and cover for wildlife during the growing season. However, grazing by wild ungulates and Canada geese (*Branta Canadensis*) can impact crop production and is a source of conflict between agricultural and wildlife conservation interests.

Habitat types found in the agricultural zone of the UIR as defined by the Northwest Habitat Institutes’ Interactive Biodiversity Information System (2003), may include: interior grasslands; herbaceous wetlands; interior riparian-wetlands; open water (lakes, rivers, ponds and reservoirs); agricultural pasture and mixed environs; mixed conifer forest; Ponderosa pine dominate; and shrub-steppe.

The upper Umatilla River Watershed within UIR Boundaries supports numerous resident fish species, including portions of the Columbia River population of Bull Trout (*Salvelinus confluentus*), currently listed as threatened under the Federal Endangered Species Act (ESA). Other resident fish species present within UIR Boundaries include rainbow trout (*Oncorhynchus mykiss*), mountain whitefish (*Prosopium williamsoni*), Pacific Lamprey (*Lampetra tridentate*), and various non-game species (a more conclusive list can be viewed in the Umatilla Sub-basin/Willow Creek Sub-basin Summary). Anadromous salmonids that occur on the UIR include summer steelhead (*oncorhynchus mykiss*), Coho salmon (*Oncorhynchus kisutch*), and spring and fall Chinook salmon (*Oncorhynchus tshawytscha*). Hatchery reared wild endemic brood stock (prevents domestication) supplement populations of the mid-Columbia Evolutionary Significant Unit of wild summer steelhead, currently listed as threatened under the ESA. Coho and Chinook salmon were extirpated in the early 1900’s, shortly after construction of Three Mile
Dam, an irrigation diversion located in the lower Umatilla River. After an approximated 75-year absence, these species were re-introduced and supplementation has occurred in conjunction with actions designed to reconstruct irrigation diversions and augment in stream flows in the lower basin.

Several species of Pacific salmon are significant to the local area from the perspective of their use by humans. Chinook salmon, Coho salmon, and Steelhead trout provide opportunities for recreational and consumptive harvest that is important to the local area from both a cultural/social and economic standpoint. Agricultural activities threatened both Coho and Chinook salmon runs to the point of extinction in the Umatilla/Willow sub-basin; currently, reintroduction of both species is underway and runs are now adequate to support annual consumptive sport fisheries (Draft Umatilla/Willow Sub-basin Plan, 2004). Bull Trout fishing is open to Tribal members on the Reservation and ceded lands, but closed to non-Tribal members. Some Bull trout are taken, but most are caught and released (Draft Revised Bull Trout Recovery Plan, 2002).

Historically Bull Trout occurred throughout the Columbia Basin, today they are found primarily in upper tributary streams and several lake and reservoir systems within the US (USFWS, 1998). Threats to long-term Bull Trout persistence include dams, forest management practices, roads, agricultural practices, grazing and nonnative species. The north and south fork Umatilla River and Meacham Creek contain the most current and potential Bull Trout spawning and rearing habitat. (Draft Revised Bull Trout Recovery Plan, 2002)

The CTUIR Department of Natural Resources’ (DNR) Programs have enhanced approximately 10 river miles of anadromous salmonid habitat and one mile of resident fisheries habitat on the UIR since 1988. Approximately 1.4 river miles of these habitat improvements lie within the UIR Agricultural Management Zone. More specifically, these enhancements are located on Mission Creek, the upper McKay Creek, and lower Spring Hollow Creek, a tributary to Wildhorse Creek. Mission Creek supports populations of steelhead and Coho salmon. Both upper McKay creek and Spring Hollow Creek do not currently support anadromous fish, but contain resident fish populations. Enhancements in these three drainages have included treatment of noxious weeds, plantings of native riparian vegetation, in stream structural enhancements (check dams and passage improvements) and construction of riparian livestock exclusion fencing. The installation of passage improvements has occurred on the lower Mission Creek, Moonshine Creek, and Cottonweed Creek. There is currently development for watershed scale restoration and management plans occurring in the Patawa / Tutuilla Creek Drainages. Additional habitat recovery and protection efforts are necessary within the Agriculture Management Zone to increase fish survival and improve natural production capabilities.

Table 6-1. Estimated Adult And Jack Spring Chinook Returns To The Umatilla River Mouth And Spawning Data 1988-2007.

<table>
<thead>
<tr>
<th>Year</th>
<th>Spring Chinook Returns</th>
<th>Redds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>1989</td>
<td>164</td>
<td>14</td>
</tr>
<tr>
<td>1990</td>
<td>2,190</td>
<td>289</td>
</tr>
<tr>
<td>1991</td>
<td>1,330</td>
<td>144</td>
</tr>
<tr>
<td>1992</td>
<td>464</td>
<td>59</td>
</tr>
<tr>
<td>Year</td>
<td>Fall Chinook Returns</td>
<td>Redds(^1)</td>
</tr>
<tr>
<td>------</td>
<td>----------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>1988</td>
<td>258</td>
<td>NC</td>
</tr>
<tr>
<td>1989</td>
<td>526</td>
<td>92</td>
</tr>
<tr>
<td>1990</td>
<td>440</td>
<td>50</td>
</tr>
<tr>
<td>1991</td>
<td>990</td>
<td>18</td>
</tr>
<tr>
<td>1992</td>
<td>274</td>
<td>0</td>
</tr>
<tr>
<td>1993</td>
<td>407</td>
<td>0</td>
</tr>
<tr>
<td>1994</td>
<td>932</td>
<td>7</td>
</tr>
<tr>
<td>1995</td>
<td>906</td>
<td>1</td>
</tr>
<tr>
<td>1996</td>
<td>741</td>
<td>1</td>
</tr>
<tr>
<td>1997</td>
<td>655</td>
<td>22</td>
</tr>
<tr>
<td>1998</td>
<td>460</td>
<td>24</td>
</tr>
<tr>
<td>1999</td>
<td>886</td>
<td>25</td>
</tr>
<tr>
<td>2000</td>
<td>1,125</td>
<td>165</td>
</tr>
<tr>
<td>2001</td>
<td>2,365</td>
<td>NC</td>
</tr>
<tr>
<td>2002</td>
<td>2,382</td>
<td>NC</td>
</tr>
<tr>
<td>2003</td>
<td>2,181</td>
<td>NC</td>
</tr>
<tr>
<td>2004</td>
<td>4,127</td>
<td>NC</td>
</tr>
<tr>
<td>2005</td>
<td>3,132</td>
<td>NC</td>
</tr>
<tr>
<td>2006</td>
<td>2,696</td>
<td>NC</td>
</tr>
<tr>
<td>2007</td>
<td>3,553</td>
<td>NC</td>
</tr>
</tbody>
</table>

\(^1\) Fall Chinook And Coho Spawning Occurs At The Same Time; Redd Counts Are Partial And Are Unidentified As Per Species

NC = No Counts Made

Table 6-3. Estimated Adult and Jack Coho Salmon Returns to the Umatilla River Mouth and Spawning Data 1988-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Coho Returns</th>
<th>Redds(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>0</td>
<td>NC</td>
</tr>
<tr>
<td>1989</td>
<td>0</td>
<td>92</td>
</tr>
<tr>
<td>1990</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>1991</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>1992</td>
<td>334</td>
<td>0</td>
</tr>
</tbody>
</table>
Table 6-4. Estimated Adult And Jack Summer Steelhead Returns To The Umatilla River Mouth And Spawning Data 1988-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Summer Steelhead Returns/²</th>
<th>Redds/³</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>2,480</td>
<td>138</td>
</tr>
<tr>
<td>1989</td>
<td>2,474</td>
<td>77</td>
</tr>
<tr>
<td>1990</td>
<td>1,667</td>
<td>HW</td>
</tr>
<tr>
<td>1991</td>
<td>1,111</td>
<td>HW</td>
</tr>
<tr>
<td>1992</td>
<td>2,769</td>
<td>135</td>
</tr>
<tr>
<td>1993</td>
<td>1,914</td>
<td>HW</td>
</tr>
<tr>
<td>1994</td>
<td>1,304</td>
<td>64</td>
</tr>
<tr>
<td>1995</td>
<td>1,571</td>
<td>74</td>
</tr>
<tr>
<td>1996</td>
<td>2,116</td>
<td>119</td>
</tr>
<tr>
<td>1997</td>
<td>2,543</td>
<td>138</td>
</tr>
<tr>
<td>1998</td>
<td>1,854</td>
<td>126</td>
</tr>
<tr>
<td>1999</td>
<td>1,939</td>
<td>218</td>
</tr>
<tr>
<td>2000</td>
<td>2,966</td>
<td>238</td>
</tr>
<tr>
<td>2001</td>
<td>3,749</td>
<td>382</td>
</tr>
<tr>
<td>2002</td>
<td>5,663</td>
<td>347</td>
</tr>
<tr>
<td>2003</td>
<td>3,194</td>
<td>322</td>
</tr>
<tr>
<td>2004</td>
<td>3,455</td>
<td>208</td>
</tr>
<tr>
<td>2005</td>
<td>2,532</td>
<td>218</td>
</tr>
<tr>
<td>2006</td>
<td>1,977</td>
<td>50</td>
</tr>
<tr>
<td>2007</td>
<td>3,571</td>
<td>314</td>
</tr>
</tbody>
</table>

¹ Fall Chinook and Coho Spawning Occurs at the Same Time; Redd Counts Are Partial and Are Unidentified As Per Species
NC No Counts Made

² Second year of run-year is indicated (e.g. 2007 entry is for fish returning in the 2006-2007 run year)
³ HW = no counts conducted due to high water
Poor land use practices within the Riparian Management Zone have reduced riparian vegetation, degraded water quality, and have likely diminished water table elevations and in stream flows. Lack of conservation farming practices such as grassed waterways and failure to leave crop residue, maintain tilth and chisel stubble are common problems resulting in erosion of top soils into waterways during wet winter months. Field runoff of pesticides affects stream water quality and potentially fish and other aquatic organisms in some of these areas. Past and current agricultural practices have further affected fish habitat by altering natural stream channel form and function. Loss of stream channel meander from channelization and diking has accelerated runoff velocity due to increases in surface gradient. Limited portions of stream reaches within the Agricultural Management Zone sustain year-round flows and provide acceptable fish habitat. Lack of perennial stream flows, insufficient riparian cover, and low numbers of in stream woody debris are the primary factors limiting anadromous fisheries production in these systems. Habitat surveys conducted in conjunction with biological inventories by the CTUIR Umatilla Basin Natural Production Monitoring and Evaluation Project during the mid 1990’s specify habitat-limiting factors for each stream.

3.4 Air Quality

Pacific maritime air masses heavily influence the climate of the UIR, resulting in moist, mild winters, and dry, moderately warm summers. Topographical features modify microclimates especially during the winter months when temperature inversions result in low cloud and fog layers on the western and northern portions of the UIR. During periods of atmospheric stability, particulate levels can rise substantially with the use of wood stoves and field burning being the main contributors.

The Federal Clean Air Act of 1967, as amended, is the centerpiece of the present day system of air quality regulation at the local, state, and national levels. The act established National Ambient Air Quality Standards (NAAQS) that define specific levels of air quality necessary to protect public health and welfare. States and tribes as well as federal facilities and land managers are responsible for implementation of these regulations.

In August 2006, the UIR AQP received partial delegated authority to administer agricultural burn permits from the EPA. An operator within the reservation boundary wishing to perform an agricultural burn must apply for a permit through the Tribal Air Quality program. Following approval of the submitted application, the operator must notify the Tribal AQP of their intention to burn on the day of the burn to receive final permit approval to proceed.

Table 7. 2000 Air Emissions On The Umatilla Indian Reservation (Tons/Year).

<table>
<thead>
<tr>
<th>Source</th>
<th>Total Particulate Matter (PM10 and PM2.5)</th>
<th>NH3</th>
<th>NOx</th>
<th>CO</th>
<th>HC</th>
<th>VOC</th>
<th>SOx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Burning</td>
<td>166</td>
<td>56</td>
<td>98</td>
<td>2830</td>
<td>-</td>
<td>229</td>
<td>20</td>
</tr>
<tr>
<td>Residential Woodstoves</td>
<td>9</td>
<td>-</td>
<td>1</td>
<td>65</td>
<td>-</td>
<td>15</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Grain Elevator</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mobile Sources</td>
<td>56</td>
<td>-</td>
<td>1238</td>
<td>2203</td>
<td>309</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### 3.5 Monitoring Needs

The CTUIR has collected information on HEL ground, crop rotations, and weeds. Monitoring stubble residue provides an estimate of ground cover, in pounds per acre, which will help reduce wind and water erosion. This data has served as baseline information to be used to direct changes in farming practices and techniques. Residue level measurements taken on HEL ground every crop year demonstrate patterns of farming techniques and their impact on the land.

Annually the CTUIR-DNR Range, Agriculture and Forestry staff monitors crop rotations, crop health, and weed species present, ensuring compliance with leases put in place by the BIA for the landowners. The allotment files identify and document an inventory of noxious weeds present.

### 3.6 Weed Control

For this plan, there are three categories of weeds: potential, new, and established. Potential invaders are unidentified species within the UIR where invasion is imminent. New invaders are species in the early stages of invasion that have not yet spread to the point where resource and economic damage is occurring, but the potential for damage is high. Established species are species that have spread to the point that they have naturalized and are causing an unacceptable level of resource damage.

Lessees are responsible for managing weed control on their leased trust land. They may use herbicides to control weeds and non-native plants in fallow and cropped fields. Diverse populations of natives and minimal management in CRP plantings have reduced weed infestations. Outcroppings of noxious weeds are still present, and can cause potential problems for neighboring farmers.

Idle lands are a haven for weeds such as rush skeletonweed (Chondrilla juncea), knapweeds (Centaura species), cheatgrass (Bromus tectorum), medusahead (Taeniatherum caput-medusae), thistles (Cirsium, & Centaura), field bindweed (Convolvulus arvensis) cereal rye (Secale cereale) tumble mustard (Sisymbrium altissimum) kochia (Koshia scoparia) and other species. The absence of a lease, little monitoring, and no management allow the establishment and proliferation of these weeds.

A survey of the UIR during the summer of 1998 revealed an infestation of diffuse knapweed (Centuarea diffusa), Russian knapweed (Centaurea repens), and yellow starthistle (Centaurea solstitialis) was greater than previously thought. These three select weeds spread across 3,375 acres of which 1,881 acres are trust lands and other noxious weeds infested an additional 1,536

<table>
<thead>
<tr>
<th>Fugitive Dust</th>
<th>24,088</th>
<th>-</th>
<th>-</th>
<th>-</th>
<th>-</th>
<th>-</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railroad</td>
<td>50</td>
<td>-</td>
<td>2004</td>
<td>523</td>
<td>-</td>
<td>71</td>
<td>326</td>
</tr>
<tr>
<td>Fertilizer &amp; Pesticide Applications</td>
<td>33</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total Estimated Emissions Tons/Year</td>
<td>24,398</td>
<td>89</td>
<td>3380</td>
<td>5720</td>
<td>309</td>
<td>354</td>
<td>385</td>
</tr>
</tbody>
</table>
acres. Further surveys in 2001 and 2007 discovered garlic mustard (*Alliaria petiolata*) in the Tutuilla/Patawa drainages. Garlic mustard present challenges for control as plants tend to grow in the understory of shrub and tree species making detection and control difficult. With additional surveys, the CTUIR anticipates locating additional infestations of noxious weeds.

With an emphasis on identifying noxious weeds, CTUIR Staff have not yet completed a detailed survey for all weeds on the UIR. In terms of existing and/or potential vectors, the most obvious and well-understood examples are transportation networks (rail and road systems), recreational corridors, wildlife travel corridors and the introduction of invasive ornamental plants. While site-specific surveys are needed on the UIR, it seems reasonable to assume that the quality of agriculture production will likely be adversely affected by such infestations.

### 3.7 Idle Lands

Idle lands on the Reservation are causing a multitude of problems including lost income/revenues, loss of production acres, increasing weed concentrations, and degrading soil and water quality. In 2011, the UIR had 2607.80 total acres of idle farming allotments. These idle lands have increased due to cost of crop production and market volatility, increasing chemical and fertilizer costs and access.

Options for the utilization of idle lands include perennial grass plantings, inclusion into range units, and/or leasing the allotments as pasture. As stated in the standards and guidelines, a list of tracts that are in danger of falling idle or abandoned will be available on a yearly basis. The CTUIR can then begin the process of incorporating the tracts into one of the options for utilization.

### 3.8 Threatened & Endangered Species

**Listed Species (US Fish and Wildlife Services, Oregon Department of Fish and Wildlife and NOAA National Marine Fisheries found to be present on the UIR include:***

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Common Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Salvelinus confluentus</em></td>
<td>Bull Trout</td>
<td>Threatened</td>
</tr>
<tr>
<td><em>Oncorhynchus mykiss</em></td>
<td>Summer Steelhead</td>
<td>Threatened</td>
</tr>
<tr>
<td><em>Oncorhynchus tshawytscha</em></td>
<td>Spring Chinook</td>
<td>Threatened</td>
</tr>
<tr>
<td><em>Cottus marginatus</em></td>
<td>Margined sculpin</td>
<td>Species of Concern</td>
</tr>
<tr>
<td><em>Lampetra tridentate</em></td>
<td>Pacific lamprey</td>
<td>Species of Concern</td>
</tr>
<tr>
<td><em>Sceloporus graciosus graciosus</em></td>
<td>Northern sagebrush lizard</td>
<td>Species of Concern</td>
</tr>
<tr>
<td><em>Accipiter gentilis</em></td>
<td>Northern Goshawk</td>
<td>Species of Concern</td>
</tr>
<tr>
<td><em>Agelaius tricolor</em></td>
<td>Tricolored blackbird</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Species Name</td>
<td>Common Name</td>
<td>Status</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Dryocopus pileatus</td>
<td>Western burrowing owl</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Bartramia longicauda</td>
<td>Upland Sandpiper</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Bureo regalis</td>
<td>Ferruginous hawk</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Contopus cooperi</td>
<td>Olive-sided flycatcher</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Empidonax traillii adustus</td>
<td>Willow flycatcher</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Icteria virens</td>
<td>Yellow breasted chat</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Oreortyx pictus</td>
<td>Mountain quail</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Plcoides albolarvatus</td>
<td>White-headed woodpecker</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Melanerpes lewis</td>
<td>Lewis’ woodpecker</td>
<td>Species of Concern</td>
</tr>
</tbody>
</table>

**Mammals**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Common Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antrozous pallidus</td>
<td>Pallid bat</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Corynorhinus townsendii</td>
<td>Townsend’s western big-earred bat</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Lasionycteris noctivagans</td>
<td>Silver haired bat</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Myotis cilioabrum</td>
<td>Small footed myotis bat</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Myotis volans</td>
<td>Long legged myotis bat</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Myotis yumanensis</td>
<td>Yuma myotis bat</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Sorex prebei</td>
<td>Preble’s shrew</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Urocitellus washingtoni</td>
<td>Washington ground squirrel</td>
<td>Candidate Species</td>
</tr>
<tr>
<td>Myotis evotis</td>
<td>Long-eared myotis bat</td>
<td>Species of Concern</td>
</tr>
</tbody>
</table>

**Plants**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Common Name</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allium robinsonii</td>
<td>Robinson’s onion</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Astragalus collinus var. laurentii</td>
<td>Laurence’s milk vetch</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Camissonia pygmaea</td>
<td>Dwarf evening primrose</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Trifolium douglasii</td>
<td>Douglas clover</td>
<td>Species of Concern</td>
</tr>
<tr>
<td>Myosurus sessilis</td>
<td>Sessile mousetail</td>
<td>Species of Concern</td>
</tr>
</tbody>
</table>

**Status**

**Listed Species:** An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future.

**Candidate Species:** Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

**Species of Concern:** Taxa whose conservation status is of concern to the U.S. Fish and Wildlife Service (many previously known as Category 2 candidates), but for which further information is still needed. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing.

### 3.8.1 Endangered Species

#### 3.8.1.1 Steelhead (*Oncorhynchus mykiss*)

Steelhead enters the Umatilla River from fall through spring during the high flow period. Spawning and rearing habitat includes several tributaries to the Umatilla River on the UIR
particularly Meacham Creek, Squaw Creek, and Buckaroo Creek (Contor et al., 1996). High summer water temperatures, lack of vegetation canopy cover, insufficient quantity of pools, and lack of large woody debris, bank instability, and flashy stream flow characterize all of these streams. Land uses including timber harvest, roads, and livestock grazing have contributed to these habitat conditions.

3.8.1.2 Chinook salmon fall runs (Oncorhynchus tshawytscha)
Fall Chinook spend from two to six years in the ocean. Adults return to the Umatilla River from August through mid-December. Juveniles emerge from the gravel in April and sub-yearlings begin to out-migrate in May. Productivity of Fall Chinook in the sub-basin is very low, based on both female spawning escapement and the number of returning adults per spawner. Decreased productivity is attributed to increased sediment load, high water temperatures, and habitat loss mainly through loss of riparian vegetation. Occasionally, fall Chinook redds have been found farther upstream; in 1998 four redds were found in Buckaroo Creek and in 1999 fall Chinook redds were observed in the mainstem up to RM 67. (Draft Umatilla Willow Sub-basin Plan, 2004)

3.8.1.3 Chinook salmon spring/summer runs (Oncorhynchus tshawytscha)
In 1986, Spring Chinook salmon were re-introduced into the sub-basin. This stock enters the Columbia River from the ocean from February through April. Entry into the Umatilla River begins in late March, peaks in May, and is mostly complete by the end of June. Spawning begins in early to mid-August, peaks in late August /early September, and ends in late September. Juveniles emerge from the gravel in January and February. Smolt outmigration from the sub-basin begins in March, peaks in late March through late April, and is generally complete by late May. Current Spring Chinook distribution is limited to the upper mainstem, the North Fork Umatilla, and Meacham Creek. The current spawning distribution is much smaller than the estimated historic distribution. Causes of this include increased sediment load, high water temperatures, and habitat loss mainly through loss of riparian vegetation. (Draft Umatilla Willow Sub-basin Plan, 2004)

3.8.1.4 Bull Trout (Salvelinus confluentus)
Cold-water habitat is especially significant for this species, spawning occurs on gravel riffles in small streams with a long in-gravel development period. Juveniles are closely associated with streambed, adults range more widely. Warming and de-watering of habitats resulting from land and water use practices confine populations to small cold headwater streams. Poor habitat conditions for this species limit distribution on the UIR.

3.8.2 Candidate Species

3.8.2.1 Washington ground squirrel (Urocitellus washingtoni)
The Washington Ground Squirrel inhabits isolated grassland remnants of northern Gilliam, northern Morrow, and northwest Umatilla County. Areas occupied by the squirrels tend to have sandy and deep soils with a lower percentage of clay than found in unoccupied areas. All reported colonies are well west of the UIR (Marshall, 1996).
3.8.2.2 Columbia Spotted Frog (*Rana luteiventris*)
Columbia spotted frogs occur in marshy ponds or lake edges and algae-covered overflow pools of streams. Food consists of insects, mollusks, crustaceans, and arachnids. Scattered populations may occur where bullfrogs are scarce or absent. Bullfrogs are highly carnivorous and prey on spotted frog tadpoles and adults. Spotted frogs breed along the Umatilla River on the UIR above Homily (Kronner, 1999).

3.8.2.3 Yellow-billed Cuckoo (*Coccyzus americanus*)
Yellow-billed cuckoos are birds of thick, closed-canopy riparian forests with an understory of dense brush. These riparian forests are usually composed of various species of willows and cottonwoods, especially black cottonwoods along the rivers of eastern Oregon. Studies in California have suggested that patches of suitable habitat must be at least 37 acres in size and include over 7.5 acres of closed canopy riparian forest. Although their nests are in willows, yellow-billed cuckoos seem to feed among cottonwoods. They eat mainly caterpillars, including tent caterpillars, although they eat other insects (including grasshoppers and cicadas), fruit, and occasionally small lizards and frogs. While a few pairs of this species probably breed in eastern Oregon during most years, no documentation exists of regular habitation of any area. The decline of Oregon’s yellow-billed cuckoo population may be related to the loss of large stands of riparian forests along our major rivers. (Csuti, B. et al., 1997)

3.8.3 Species of Concern

3.8.3.1 Margined Sculpin (*Cottus marginatus*)
Margined Sculpins are fish typically less than three (3) inches in length and prefer deeper water of streams and rivers with low water velocity. These Sculpins are common in the Umatilla River System (Contor et al., 1996).

3.8.3.2 Pacific Lamprey (*Lampetra tridentata*)
Pacific Lamprey is typically anadromous. Adults spawn in sandy gravel at the upstream edge of riffles in small streams. Ammocoetes (larval phase) burrow in mud where they filter feed for five to six years before transforming to the adult parasitic form and migrating downstream to the ocean. A remnant population of Pacific lamprey (10-15 adults each year) are known to occur in the Umatilla River above Three-Mile Dam (Close, 1999).

3.8.3.3 Northern Goshawk (*Accipter gentilis*)
Northern goshawks typically inhabit mature forest types. Dense overhead foliage or a high degree of canopy cover created by tall trees is typical of nesting habitat. Goshawks forage beneath the forest canopy on a variety of birds and mammals. There are no known goshawk nests on the UIR.

3.8.3.4 Tri-colored Blackbird (*Agelaius tricolor*)
The Tri-colored Blackbird generally prefers to breed in freshwater marshes with emergent vegetation or in thickets of willows or other shrubs. In Oregon, it has bred in tangles of Himalayan blackberry growing in and around wetlands. The blackbird eats mostly animals’ food in the breeding season. It feed on a variety of seeds and waste grain following breeding. The location of colonies is unpredictable from year to year, making monitoring and conservation difficult. (Csuti, B. et al., 1997)
3.8.3.5 Western Burrowing Owl (*Athene cunicularia hypugaea*)
Western Burrowing Owls live in open deserts, grasslands, fields, and pastures. It will use roadsides and airports. In Oregon, it is most common in the sagebrush steppe of the southeastern part of the state, but also occurs in arid parts of the Columbia Basin. The owl feed on rodents, insects, bats, shrews, small birds, crayfish, reptiles, and amphibians. (Csuti et al., 1997)

3.8.3.6 Ferruginous Hawk (*Buteo regalis*)
The Ferruginous Hawk soars over open country (grassland, desert steppe, juniper woodland). It requires ledges on cliffs, isolated trees, or riparian woodland for nesting, although there are reports of ground nesting from Malheur County. This hawk preys on mammals found in its arid environment, including jack rabbits, ground squirrels, pocket gophers, and kangaroo rats. It will also eat birds and reptiles. This hawk was once common to Oregon, but it has declined with the conversion of grasslands to agriculture over much of its range (Csuti, B. et al., 1997).

3.8.3.7 Willow Flycatcher (*Empidonax traillii adastus*)
This flycatcher is found in willows at the edges of streams flowing through meadows and marshes, but also breeds in thickets along the edges of forest clearings and, generally, in tall, brushy vegetation near water. Normally it does not inhabit grasslands and desert valleys of eastern Oregon in the absence of these microhabitat elements, although it does use vegetation around springs and seeps in desert mountain ranges. They have a routine diet for their family, eating mostly flying insects, especially wasps, but including flies, mosquitoes, ants, beetles, bees, grasshoppers, and dragonflies. They glean some spiders, seeds, and berries from foliage. (Csuti, B. et al., 1997)

3.8.3.8 Yellow Breasted Chat (*Icteria virens*)
The Yellow-breasted Chat breeds in brushy areas and in riparian woodlands along streams. It will use tangles of brush in the open or occurring as understory in deciduous or mixed deciduous-coniferous woodlands. It is absent from high mountains, dense forests, and extremely arid areas. This species has a diet mostly composted of insects gleaned from vegetation. When they are available, it also eats some fruits and berries. Loss of riparian habitat has resulted in the decline of the Yellow-breasted Chat in many regions. (Csuti, B. et al., 1997)

3.8.3.9 Lewis’ Woodpecker (*Melanerpes lewis*)
The Lewis’ Woodpecker can excavate its own nest chamber, usually in a dead or decayed tree, but prefers to use an existing abandoned woodpecker hole. It begins breeding in late April and May. Both male and female incubate the clutch of 6 to 7 eggs for about 2 weeks. Young fledge about a month after hatching. The diet varies by season. In spring and summer, it mostly eats insects and spiders. The diet turns to acorns and berries in the fall. It stores acorns for winter consumption, usually under the bark or in crevices of trees, or in cracks of utility holes. This species has decline in numbers in Oregon, the result of loss of nesting and food storage trees, and increased competition for nest cavities from introduced European Starlings. (Csuti, B. et al., 1997)

3.8.3.10 Mountain Quail (*Oreortyx pictus*)
Mountain Quail, found at higher elevations, is not a bird of dense coniferous forests, but preferring open forests and woodlands with an ample undergrowth of brushy vegetation. It also
inhabits thickets of chaparral and riparian woodland, meadow edges in forests, and brushy regrowth following timber harvest. It winters at the lower edges of forests, sometimes traveling on foot 20-40 miles from its breeding habitat. During the spring and summer, leaves, buds, flower, and bulbs make up most of the diet. They also eat some berries and insects such as grasshoppers, beetles, and ants. In winter, seeds of a variety of plants, including acorns, make up most of the diet. This species has declined recently in the mountains of eastern Oregon. (Csuti, B. et al., 1997)

3.8.3.11 Pallid Bat (*Antrozous pallidus*)
The pallid bat inhabits arid regions and open forest types (ponderosa pine, oaks). It occurs in a variety of desert vegetation types (sagebrush, juniper, salt-desert shrub), and typically uses cliff-faces, caves, mines, or buildings for roosts. Food habits include flightless arthropods including Jerusalem crickets, beetles, grasshoppers, scorpions, moths, and some small vertebrates such as lizards and pocket mice. (Csuti, B. et al., 1997)

3.8.3.12 Silver-haired Bat (*Lasionycteris noctivagans*)
This is a bat of forested areas and is most abundant in older Douglas-fir/western hemlock forests, although it also occupies ponderosa pine forests. It forages over ponds and streams in the woods, and typically finds a day roost under a flap of loose bark. These bats prefer soft-bodied prey, with moths, termites, and flies being the most important food items. It also eats ants, beetles, true bugs, spittlebugs, and planthoppers. (Csuti, B. et al., 1997)

3.8.3.13 Olive-Sided Flycatcher (*Spermophilus washingtoni*)
Olive-sided flycatchers inhabit boreal spruce and fir forests usually near openings, burns, ponds, and bogs. This bird always perches on dead branches in an exposed position at or very near the top of the tallest trees. The species forages on winged insects. No Neotropical bird surveys have been conducted on the UIR.

3.8.3.14 Townsend’s Western Big-Eared Bat (*Corynorhinus townsendii townsendii*)
The Pacific big-eared bat occurs in numerous plant communities and appears to prefer caves, lava tubes, mines, bridge undersides, and abandoned buildings for nursery and hibernation purposes. These sites must meet exacting temperature, humidity, and physical requirements. These bats feed on insects that they capture in flight or glean from plants. No cave, lava tube, or mine habitat occurs on the UIR. A few abandoned buildings occur along the Umatilla River and its tributaries. There is a colony using a barn on the Bar M Ranch in the upper Umatilla River east of the UIR (Kronner, 1999).

Comprehensive surveys for this species and other bats have not been conducted on the UIR.

3.8.3.15 Small-Footed Myotis (*Myotis ciliolabrum*)
The small-footed myotis is mainly a bat of shrub-steppe but is also found in ponderosa pine and mixed conifer. This bat forages along cliffs and slopes in dry areas. Hibernation sites occur in caves and mines. Individuals roost in buildings, under bark, and in rock crevices.

3.8.3.16 Long- Eared Myotis (*Myotis evotis*)
The long-eared myotis is mainly in forested areas but also occurs in riparian, shrub-steppe, and agricultural areas. This bat often feeds over water and roots in forests. Maternity roots and
hibernation sites occur in buildings, caves, and mines. Individuals roost under bark and in rock crevices and snags.

3.8.3.17 Long-Legged Myotis (*Myotis volans*)
The long-legged myotis is mainly in coniferous forests. The bat often feeds over water and roosts in forests but also pursues prey through, over, under, and around the forest canopy. Maternity roosts occur in buildings, under bark, and in snags. Winter hibernation sites are in caves and mines. Individuals roost in buildings, under bridges, under bark, and in rock crevices.

3.8.3.18 Yuma Myotis (*Myotis yumanensis*)
The Yuma myotis inhabits urban, riparian, and coniferous habitats. Yuma bats are closely associated with water over which they feed. Maternity roosts occur in buildings, under bridges, and in caves and mines. Hibernation sites are in caves and mines. Individuals roost in buildings, under bridges, and rocky exposures. Use of buildings by this species is especially high.

3.8.3.19 Northern Sagebrush Lizard (*Sceloporus graciosus graciosus*)
These lizards are found in sagebrush habitats, but also occur in chaparral, juniper woodlands, and coniferous forests. They require well-illuminated open ground near cover and are primarily ground dwellers. They eat a variety of small invertebrates, including crickets, beetles, flies, ants, wasps, bees, mites, ticks, and spiders. In Oregon, this lizard is seldom above 1,700 meters elevation and is found along river bottoms in the coastal redwood forests of southwestern Oregon. (Csuti, B. et al., 1997)

3.8.3.20 Washington Ground Squirrel (*Spermophilus washingtoni*)
The Washington Ground Squirrel inhabits isolated grassland remnants of northern Gilliam, northern Morrow, and northwest Umatilla County. Areas occupied by the squirrels tend to have sandy and deep soils with a lower percentage of clay than found in unoccupied areas. All reported colonies are well west of the UIR (Marshall, 1996).

3.8.3.21 Preble’s Shrew (*Sorex prebei*)
Preble’s shrew range occupies a variety of habitats, including arid and semiarid shrub-grass associations, openings in montane coniferous forests dominated by sagebrush, willow-fringed creeks and marshes, bunchgrass associations, sagebrush-aspen associations, sagebrush-grassland, oak chaparral, open ponderosa pine-Gambel oak stands, and alkaline shrubland (Williams 1984, Ports and George 1990, Cornely et al. 1992, Long and Hoffmann 1992, Kirkland and Findley 1996, Verts and Carraway 1998). No known surveys for Preble’s shrew have been conducted on the Umatilla Indian Reservation.

3.8.4 Plant Species of Concern
A survey of approximately 250 sites during the 1980’s documented plant species and communities on the UIR, there were no plant species of concern identified. Professional botanists verified all plant identifications.

### Table 8: Occurrence of Plant Species of Concern

<table>
<thead>
<tr>
<th>Species</th>
<th>General Area of Nearest Documented</th>
</tr>
</thead>
</table>

9/21/2015, Draft Agricultural Management Environmental Assessment 9/21/2015
### Occurrence

<table>
<thead>
<tr>
<th>Species</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laurence’s Milk-Vetch (<em>Astragalus collins var. laurenti</em>)</td>
<td>This species is endemic to the Columbia Plateau of northern Oregon, within the Columbia Basin ecoregion. The majority of known occurrences are small and fragmented, with poor estimated viability.</td>
</tr>
<tr>
<td>Robinson’s onion (<em>Allium robinsonii</em>)</td>
<td><em>Allium robinsonii</em> has been found along the Columbia River from Ferry County, northeastern Washington, to about the mouth of the John Day River, north-central Oregon, and is now possibly extirpated from Oregon.</td>
</tr>
<tr>
<td>Dwarf evening primrose (<em>Camissonia pygmaea</em>)</td>
<td><em>Camissonia pygmaea</em> is found on unstable soil or gravel in steep talus, dry washes, banks and roadcuts. Regional endemic populations may exist in eastern Oregon (Gilliam, Grant, Harney, and Wheeler counties).</td>
</tr>
<tr>
<td>Douglas clover (<em>Trifolium douglasii</em>)</td>
<td>The historic range for this taxon was from Spokane County, Washington to Baker County, Oregon, east to adjacent Idaho. The species is currently known only from Garfield County, Washington, and Umatilla and Union counties in Oregon.</td>
</tr>
<tr>
<td>Sessile mousetail (<em>Myosurus sessilis</em>)</td>
<td>This species was found in hard, bare, desiccated clay, in sparsely vegetated areas of shallow vernal pools, from 275 to 2400 feet elevation. This species is only found in Washington, Oregon and California (in California only in hybrid swarms with both <em>Myosurus minimus</em> and <em>M. sessilis</em>).</td>
</tr>
</tbody>
</table>

### 3.9 Implementation Costs

The CTUIR currently funds one and one half staff positions, and as needed, may add additional funds to monitor and enforce violations for agriculture management on the UIR. Additional funding from the EPA promotes and implements conservation programs on the UIR.

### 3.10 Cost/Benefit Analysis

The CTUIR does not have exact costs incurred for production. Comparative studies conducted through Oregon State University and Washington State University has illustrated variable yields and net returns based on location, rainfall, crop rotations, soil types and individual farming methods. Yields vary from the North Reservation to the South Reservation and from field to field depending on location.

In 2007 there are approximately 4,962 acres farmed by reduced tillage or no-till operations, 4,782 acres enrolled in CRP, and 15,960 acres must meet HEL requirements. Conventionally farmed land, not in conservation programs, totals approximately 2,865 acres. Buffers have not been required along any of the streams.

### 3.11 Cultural and Traditional Uses

The Umatilla Indian Reservation lands contain sensitive cultural resources significant to the Tribes. These resources are subject to ongoing impacts such as weather, vandalism, farming, and exposure to pesticides and fertilizers. Examples of archaeological resources include:

- Lithic Scatters
• Lithic Tool Quarrying Sites
• Rock Features
• Rock Images
• Village/Habitation Sites
• Historic resources such as roads, canals, ditches, dams, homesteads, structures, dumps, and allotment markers

Other types of cultural resources include:
• Sacred Sites/Traditional Cultural Properties
• Vision Quest Sites/Ceremonial Locations
• Gathering, Hunting and Fishing Locations
• Cultural Landscapes

3.12 Transportation

Road miles within the agricultural zone are 276.8 with an additional 13.5 miles of Union Pacific Railroad lines. Currently road maintenance and construction responsibilities are between CTUIR and county road department. CTUIR has limited responsibility for the transportation system with the majority of road maintenance carried out by Umatilla County.

3.13 Tribal, Local, and Inter-Governmental Relationships

In early 2008, the CTUIR compacted the Range and Agriculture program. Shortly thereafter, the Niixyawi Governance Center was constructed and the Forestry Program was compacted. Staff maintain close working relationships with Umatilla Agency as the Superintendent maintains inherent federal responsibility to approve many of the activities accomplished by the Range, Ag. and Forestry program on Trust property.

Fisheries and Wildlife Programs, Cultural Resources, Air Quality, and the Tribal Farm Enterprise have been essential to improve wildlife habitat, managing prescribed burns, implementing projects, and reducing idle ground. Future cooperation between agencies will be necessary with the implementation of this Agricultural Management Plan.

The combination of deeded land interspersed with trust and Tribal fee land has produced a checkerboard pattern of ownership on the Reservation causing jurisdictional problems for agencies, resulting in isolated or land-locked tracts. Land locked tracts benefit only those operators who currently own adjacent land or lease surrounding tracts. Lack of cooperation and communication between fee, Tribal, and trust land has caused inconsistent land management across the reservation. Fractionated ownership has made the management and administration of the allotted lands extremely difficult and time consuming.

3.14 Monitoring Lease Compliance
A non-compliance of the crop plan by the lessee is a lease violation. Violations of the crop plan includes but are not limited to incorrect crop rotations, poor weed control, improper use of fire management, and lack of necessary conservation measures.

Trespass is defined by CFR as, “any unauthorized use of, or action on Indian Agricultural Lands”. The most common trespass violations on the UIR fall into two broad categories: Utilization of Indian land without a valid lease and illegal livestock grazing on croplands.

The CTUIR does not currently have a lease compliance officer to enforce every non-compliance issue. Staff from the CTUIR-DNR Range, Agriculture and Forestry program monitor all allotments and notify the Realty Program of any non-compliance on farm land. All grazing violations, including permit violations and trespass are investigated and resolved by following procedures within 25 CFR §166.800
Chapter Four: Environmental Consequences

This chapter explains the scientific and analytical basis for comparisons between the alternatives in Chapter two. This section describes the probable consequences, impacts, and effects of each alternative on rangeland resources and grazing woodlands across the UIR. The chapter addresses the resources listed in Chapter three and the affect each alternative will have on them.

Basic assumptions of the analysis are:

- The BIA and CTUIR will have the funding and personnel to implement the final decision.
- All treatments including management requirements and constraints will be applied as stated.

This chapter contains a description of the direct, indirect, and cumulative effects where:

- A direct effect of an action occurs at the same time and place as the action.
- An indirect effect of an action occurs later in time or further removed in location but is still reasonably foreseeable.
- The cumulative effects of a past, present, and future reasonable and foreseeable action must be considered.

4.1 Soil Quality and Erosion

Issue: How do we protect soil quality and reduce erosion from agricultural lands?

4.1.1 Alternative A

4.1.1.1 Direct Impacts

Alternative A does not require any changes to farming practices or the implementation of conservation measures on NHEL soils. Only land with HEL soils is required to maintain a minimum level of soil residue. The status and trend of soil quality and erosion will continue. Current farming practices will continue until operators voluntarily adopt conservation farming practices.

The major purposes for tillage are to prepare an adequate seedbed and to control weeds. Tillage also improves; aeration, increases water infiltration, makes furrows for irrigation, and incorporates crop residues or farm chemicals. (Miller and Gardiner, 1998)

This alternative will not change the established conservation tillage practices. Farming operations will continue their current conservation practices and will maintain currently required residue levels, thereby improving plant health, increase organic matter, and aggregate stability while minimizing erosion rates. Conservation tillage practices by definition maintain at least...
30% residue on the soil surface and include no-till, strip-till, mulch-till, and ridge-till practices. No-till and other reduced tillage practices protect the soil from wind and water erosion, increase aggregate stability, organic matter, microbial and invertebrates, infiltration, and available water holding capacity (USDA-NRCS, 1996).

Current farming practices on the UIR will continue. These farming practices may include residue removal and some tillage practices that bury crop residues to provide a fine seedbed prior to planting. Generally, conventional tillage begins with primary tillage, or the first and deepest operation, used to loosen the soil, often by way of a moldboard plow, large disk plow, or chisel plow. Following primary tillage, secondary tillage uses disks, cultivators, and harrows to kill weeds, incorporate pesticides and fertilizers, and prepare a well-pulverized seedbed. (Miller and Gardiner, 1998)

Operators seeking to adopt conservation tillage practices usually incur additional start-up costs, such as increased initial fertilizer and pesticide costs, increased disease occurrence and specialized equipment costs. With continued use and system adjustments, compaction, weeds, insect species, and disease populations are typically controlled.

4.1.1.2 Indirect Impacts

Reduced or buried soil residues expose the soil surface to the erosive forces of wind, water, and sunlight. The loss of organic matter from tillage and erosion is one of the primary causes for reduced crop yields. As organic matter decreases, soil aggregate stability, water holding capacity, and cation exchange capacity, decline. (USDA-NRCS, 1998)

Desirable aggregate stability resists the impact of water. Aggregates that break down with water release small particles that clog pores creating a crust on the surface and reducing water and air movement. Pore spaces between soil aggregates provide air and water movement, and space necessary for plant growth. (USDA-NRCS, 1996) Organic matter protects soil aggregates by breaking up and intercepting water and providing cementing agents, for aggregation, as organic matter breaks down. (Miller and Gardiner, 1998)

“The capacity of soils to store available water, determines to a great extent their usefulness for plant growth” (Brady and Weil, 1999). Soil water is necessary to form soil aggregates, release or tie up soil nutrients, alter soil chemistry, wear down nutrients, transport nutrients to plant roots, and for plant growth. A dry soil does not promote root extension and growth and since water is the vehicle for nutrient transport, the roots cannot obtain the necessary nutrients for plant growth. The greater the amount of organic matter the better water infiltrates into the soil.

Cation Exchange Capacity (CEC) is the sum total of exchangeable cations that a soil can adsorb. (Brady and Weil, 1999). The CEC is highly variable depending on the amount of mineral and organic colloids present. Organic matter can increase the cation exchange capacity of a soil from 20% to 70%. (Havlin et al., 1999)

Sedimentation affects neighboring fields, streams, and residential areas. Sediment by definition is a solid material transported from its site of origin by air, water, gravity, or ice to a field or low landscape position. Fine-grained soil particles deposited on sandy soils generally improve soil
quality whereas coarser material deposited on fine-textured soils creates a more delicate balance. The best method for addressing sedimentation is prevention, since soil quality generally decreases as the depth of sediment deposition increases. (USDA-NRCS, 1996) Sediment will also enter streams harming fish and wildlife, and will coat roadways and block ditches, requiring annual maintenance.

Typically, mulch-tillage or no-till systems leave larger amounts of surface residues on and near the soil surface. The resulting benefit of reduced tillage systems is that the soils probably do not crust over as much. With increased residue, surface pores are more likely to stay open and intense rainfalls result in less soil splash. Reduced soil splash limits soil movement, making it harder for soil to seal pores and cause crusting. (Mark Hanna, and Michael J. Tidman 2000)

4.1.2 Alternatives B and C

4.1.2.1 Direct Impacts

Alternatives B and C will require each new lease to include a RUSLE2 analysis with an SCI greater than zero (±0.05) regardless of HEL status. Residue requirements will be enforced on all HEL ground. In order to develop the SCI analysis, farmers will be required to estimate the crop production treatment activities on the ground for the term of the lease. Understanding that farmers must have latitude to make changes to farming practices, given annual, or seasonal shifts in conditions allow managers to adjust to economic, environmental, and social conditions on the ground.

Riparian Management Zone Alternatives B & C offer voluntary implementation of RMZ bordering stream orders 1-4 with inner zones one-quarter (¼) of the total RMZ width, for the first ten years. Following the initial ten years Alternative B requires implementation of RMZ bordering stream orders 1-4 with inner zones one-quarter (¼) of the total RMZ width. Alternative C will allow the CTUIR Board of Trustees to re-evaluate the implementation of RMZ bordering stream orders after the initial 10-year period. The combination of short lease terms and outreach and education will promote conservation of water quantity and quality over the plan’s duration.

The SCI combines the effects of three components, organic matter (OM), field operations (FO), and erosion (ER), (SCI=OM+FO+ER). SCI levels greater than zero (±0.05) predict the planned system will maintain or increase organic matter. Higher values indicate more confidence that a trend in soil organic matter will be significant. (USDA-NRCS, 2003) Increased organic matter reduces erosion, improves biological activity, supplies slow release natural fertilizers to plants, increases soil moisture, and secures pesticides and inorganics on site rather than eroding into waterways. All of these benefits will improve soil function, crop productivity, and soil sustainability.

Application of upland residue management and increasing permanent riparian vegetation would increase compliance with TMDL and the Umatilla Basin WQMP.

4.1.2.2 Indirect Impacts
In addition to a required zero or positive SCI, operators will be required to comply with NRCS residue requirements on HEL ground, as is the case now. Operations to meet HEL requirements will not be different from current practices.

Soil aggregates are more stable than in conventionally tilled soils. Material produced from the decomposition of organic matter and the presence of bacteria and fungal hyphae bind or tie smaller aggregates and soil particles. (USDA-NRCS, 1996) Soils protected by residue requirements will have a higher likelihood of staying in place, benefiting crop health, rather than eroding into surface waters and wildlife habitats.

Increased aggregation and aggregate stability has the following beneficial effects:

- Resistance of soil dispersion
- Less susceptibility to compaction
- Improved soil aeration
- Better soil drainage
- Improved Infiltration
- Less susceptibility to erosion
- Plant emergence

(USDA-NRCS, 1999)

NRCS residue requirements on HEL ground would maintain a minimum level of crop residue, green cover, and clods. HEL soil would benefit from the increased aggregate stability, reduced erosion, and the impact on neighboring resources. Residue retention will also maintain organic matter within the soil increasing biological activity, nutrient availability, water holding capacity, and cation exchange capacity. (USDA-NRCS, 1996) There would be no changes seen on HEL ground, originating from the implementation of residue requirements.

Crop residue retention increases organic matter, which has many benefits:

- Over 90% of soil nitrogen is associated with soil organic matter.
- Organic matter supplies directly or indirectly through microbial action, the major soil aggregate-forming cements.
- Organic matter contributes to the cation exchange capacity. The large available surfaces have many cation exchange sites that adsorb nutrients for eventual plant use.
- Organic matter increases water content and increases both air and water flow rates through fine textured soil (silts).
- Organic matter is a carbon source for many microbes that perform other beneficial functions in the soil (make available slow release fertilizers).
- Organic matter reduces erosion, shades the soil (preventing rapid moisture loss), and keeps the soil cooler in very hot weather and warmer in cold weather.

(Miller and Gardiner, 1998)

There will be no affect to soil quality on farmland from the implementation of RMZ.

4.2 Water Quality

**Issue:** How do we protect water quality and riparian habitat?
4.2.1 Alternative A

4.2.1.1 Direct Impacts

There will be no change to water quality from the implementation of Alternative A. Alternative A does not require any changes to farming practices or the implementation of additional conservation measures. Sediment delivery to streams from agricultural lands will remain the same, within natural variability. Conventional tillage practices leave the soil exposed and prone to surface erosion from wind and water. Nutrient and pesticide transport to streams will remain the same. Nutrients and pesticides are easily transported on soil particles through surface erosion. The percent of the streams shaded by riparian vegetation will not change. Agricultural crops provide little shade to streams as compared to mature riparian vegetation.

4.2.1.2 Indirect Impacts

Without an increase in riparian vegetation, stream bank erosion will continue at the same rate as in the past. Many streams on the UIR do not meet Tribal water quality standards for sediment and are listed as water quality limited, due to stream bank erosion and sediment delivery from upland erosion.

The lack of riparian vegetation to provide shade for streams from solar radiation and the lack of hyporheic exchange from floodplains and riparian management zones will contribute to elevated stream temperatures. Many of the streams on the UIR do not meet TWQS for temperature and are listed as water quality limited.

Crop and soil damage from flood events will remain a threat. With an established floodplain and buffer zone, floodwaters are better able to dissipate in these zones before damaging crops and causing erosion.

The potential for algae blooms and related decreases in dissolved oxygen will remain the same. Nutrient inputs from agricultural practices transported to the streams through erosion can increase algae growth. Excessive algae growth uses up available dissolved oxygen, lowering the availability for fish and other beneficial uses. Increases in stream temperature also reduce the available dissolved oxygen since warmer water has less capacity to hold dissolved oxygen.

4.2.1.3 Relationship to Other Policies

The Confederated Tribes of the Umatilla Indian Reservation Total Maximum Daily Load for Temperature and Turbidity (CTUIR TMDL 2004) states the following goals:

Priority recovery targets include the following goals:

- Re-vegetating floodplains and riparian zones
- Re-establishing more natural (e.g. less human-constrained) stream channel configurations and locations
• Stabilizing uplands, especially in agricultural lands to reduce overland delivery of sediment

• Attempting to restore hyporheic flows to the alluvial aquifer from the decommissioning of the City of Pendleton’s infiltration gallery municipal water system

• Working with our partners to reduce the mid- and late summer stream temperature and suspended sediment levels in the Umatilla River, Meacham Creek and other tributary waters that enter the Umatilla Indian Reservation.

The first three goals above directly relate to this Agricultural Management Plan. The goal of re-vegetating floodplains and riparian zones can be accomplished by establishing buffers in RMZ. The goal of re-establishing more natural stream channel configurations and locations can also be accomplished by establishing buffers and allowing the streams to meander within the established zones. Stabilizing uplands in agricultural areas to reduce the overland delivery of sediment can be achieved by requiring additional conservation measures on agricultural lands. The implementation of Alternative A does not work towards accomplishing any of these goals stated in the CTUIR TMDL.

The CTUIR TMDL sets target erosion reductions for watersheds. The McKay watershed has a target erosion reduction of 33 percent for the uplands and 39 percent for stream banks. The Tutuilla-Patawa Watershed has a target erosion reduction of 38 percent for the uplands and 58 percent for stream banks. The Wildhorse Watershed has a target erosion reduction of 22 percent for the uplands and 73 percent for stream banks. These target erosion reductions will not be met through agricultural reductions with the implementation of Alternative A.

4.2.2 Alternative B

4.2.2.1 Direct Impacts

SCI levels greater than zero (±0.05) predict the planned system will maintain or increase organic matter (USDA-NRCS, 2003). Increased organic matter reduces erosion and can decrease the transport of nutrients and pesticides to streams.

Various studies show buffer widths are effective at reducing sediment delivery to streams. At the extreme end, Belt et. al (1992), describes a buffer width of 200-300 ft. as effective to control non-channelized sediment flow. Karr and Schlosser (1977) determined a buffer width of 100-125 ft. will remove 75 percent of sediments, however they state that the size and type of vegetative buffer strip needed to remove a given fraction of the overland sediment load cannot be universally quantified. Johnson and Ryba (1992) state 90 percent of sediment is removed with a buffer of 100 ft. Barden et. al (2003) researched a “narrow” 40 ft. buffer to determine the effectiveness of various vegetation types on sediment and nutrient removal. Results ranged from under 40 percent to over 90 percent for various plots.

The establishment of inner buffer zones of one-quarter (¼) the total RMZ widths will have increased benefits observed with greater buffer zone widths. The increased buffer width with increased stream order will provide more area for riparian vegetation to trap sediment, nutrients,
and pesticides, provide stream shading and hyporheic exchange, allow the stream to meander and establish equilibrium, and stabilize the stream banks. Many studies suggest 100 ft. buffers are effective at controlling sediment, reducing nutrient inputs to streams, and controlling water temperature (Erman et al, 1977, Johnson and Ryba, 1992, Lynch et. al 1985). Macro invertebrate diversity is often used as an indicator of water quality. Gregory et. al (1987) determined that the Shannon-Wiener Diversity Index of macro invertebrate diversity is the same in a control stream and a stream with a 100 ft. buffer.

The Shannon-Weiner Diversity Index is a commonly used biotic index combining data on the number of species (richness) and the relative abundance of each species (evenness) in the sampled community. Higher index values are associated with communities that have high species richness (i.e., many taxa) and the abundance of each taxon is similar. Values for the index generally fall between zero and four with values less than one indicative of low richness and evenness that may be a result of environmental perturbations. Values greater than three are indicative of robust communities and a “healthy” stream (Krebs 1994). In Alternative C, inner buffer zones of one-quarter (¼) the total RMZ widths are less than 100 ft. for all steam orders and will not be as protective to water quality as buffers of 100 ft.

4.2.2.2 Indirect Impacts

For agricultural lands currently in conventional tillage, requiring SCI levels greater than or equal to zero (±0.05) will result in an increase in organic carbon in the soil. This increase in organic matter will result in a decrease in soil erosion and reduce the amount of sediment transported off the field.

With an increase in organic carbon, more nitrogen will be available for crops and chemical fertilizer inputs could potentially be reduced. This reduction will lead to less available nutrients to erode into streams. In addition, pesticide transport to streams will be reduced with a reduction in soil erosion off the fields. If vegetated buffers are too narrow and conservation measures are not in place to minimize sediment delivery to the buffer zone, risks are high of building up the stream banks with trapped sediment and concentrating or channelizing water flow through and around the buffer zones.

Stream temperatures may decrease from the effects of stream shading by riparian vegetation. Johnson and Ryba (1992) state stream temperatures are maintained within one (1) degree F of baseline with 100 ft. buffers.

Stream bank erosion will be minimally reduced long term by providing areas in the floodplain and buffer zone for the stream to meander and establish a healthy channel in equilibrium with natural erosion processes. Roots of riparian vegetation hold the stream bank soil together and reduce stream bank erosion, with trees and shrubs providing the most protection. In addition, riparian vegetation reduces the energy of the water flow, decreasing its erosive impact.

Buffer zones have the potential to reduce sediment, nutrient, and pesticide inputs to streams and reduce water temperatures through stream shading and increased hyporheic flow. This is a step towards meeting Tribal Water Quality Standards and CTUIR TMDL goals.
The establishment of inner buffer zones of one-quarter (¼) the total RMZ widths will have increased benefits observed with greater buffer zone widths.

Buffer zones used in conjunction with conservation measures have the greatest positive impact on water quality. Buffers function fully when conservation measures reduce the amount of sediment, nutrients, and pesticides transported from agricultural fields.

Voluntary inner buffer zones of one-quarter (¼) the total RMZ widths for 10 years, with mandatory buffer zones after 10 years, will delay the positive effects of implementing buffers for 10 years. Currently, buffers are voluntary, and any operators who are interested in receiving incentives to install riparian buffers are already doing so.

4.2.3 Alternative C

4.2.3.1 Direct and Indirect Impacts

Requiring SCI levels greater than or equal to zero (±0.05) will result in the same impacts as Alternative B (increased organic matter in the soil, and reduced sediment, nutrients, and pesticides transported to streams).

Voluntary inner buffer zones of one-quarter (¼) the total RMZ widths for 10 years, with a re-evaluation of the AMP after 10 years, will delay the positive effects of implementing buffers for at least 10 years. Currently, buffers are voluntary, and any operators who are interested in receiving incentives to install riparian buffers are already doing so. Impacts will be the same as Alternative A, with no buffer requirements.

4.3 Wildlife and Fish Habitat

Issue: How will agricultural practices affect fish, wildlife, and their habitat?

Other than irrigation diversions, two factors have negatively influenced wildlife and fisheries habitats on the UIR. The conversion of native grasslands and shrub-steppe communities to croplands reduces terrestrial habitat and increases erosion and sediment input into streams, negatively affecting fisheries habitat.

4.3.1 Alternative A

4.3.1.1 Direct and Indirect Impacts

Alternative A does not require any changes to farming practices or the implementation of conservation measures. If sediment has been a problem, it will continue to affect neighboring fields, streams, and residential areas, directly harming fish and wildlife, and indirectly impacting downstream habitats. Riparian and aquatic habitat availability and quality will remain at its current levels within the agriculture zone. Fish and wildlife use of these agriculture lands will remain unchanged unless ongoing conservation practices are discontinued.
4.3.2 Alternative B and C

4.3.2.1 Direct and Indirect Impacts

The direct and indirect benefits to fish and wildlife and their habitats will increase correspondingly as the total area of tilled land converted back to riparian and upland habitat increases. Alternatives B and C consist of approximately 385 acres depending on the level of voluntary action and actions taken after the first ten years of implementation. These benefits will include reduction of pesticide impacts to aquatic and terrestrial habitats and fish and wildlife species, reduced sedimentation, increased terrestrial and aquatic habitat diversity, and expanded suitable terrestrial habitats within agricultural areas. As suitable wildlife habitats increase in quality and scope and provide improved cover and security for big game and other wildlife, it is reasonable to expect a corresponding increase in wildlife use and therefore an increased potential for conflicts between wildlife and adjacent croplands.

4.4 Air Quality

Issue: How do we protect air quality?

4.4.1 Alternative A, B, C,

4.4.1.1 Prescribed Burning

4.4.1.1.1 Direct Impacts

The CTUIR Comprehensive Air Quality Program (CAQP), Office of Air Quality, is a program within the Department of Science and Engineering (DOSE). Recognizing that air is one of our most important natural resources, the goal of the CTUIR CAQP is to ensure clean air on the UIR by developing a program to assess, monitor, regulate and remedy both indoor and outdoor air quality.

In August 2006 the CTUIR Board of Trustees and the EPA Region 10 signed a Delegation of Authority agreement empowering the CTUIR to implement the Federal Air Rules on Reservation (FARR) on the Umatilla Indian Reservation. As of January 1, 2007 the CTUIR is administering smoke management rules on the reservation. (http://air.umatilla.nsn.us/aboutus.aspx)

The effects of air quality from prescribed burning as well as the requirements on prescribed burning will be independent of the Alternative chosen. All burning on the Reservation must meet CTUIR OAQ standards and guidelines.

4.4.1.1.2 Indirect Impacts

Applications for prescribed burning may increase depending on the alternative chosen and operational changes required. Field burning is dependent on air quality standards and the burn regulations enforced to maintain healthy air quality.
Open burning is prohibited whenever the EPA Regional Administrator declares a burn ban due to deteriorating air quality. The Regional Administrator may declare a burn ban when air quality levels have exceeded, or are expected to exceed, 75% of any national ambient air quality standard for particulate matter, and if these projected levels continue or reoccur over at least the next 24 hours. (40 CFR Part 49.131 d2) CTUIR OAQ has the discretion to reject a burn permit at no specific concentration.

4.4.1.2 Soil Particulates

The NRCS has not identified the Columbia Basin as a high wind erosion area; however, dust storms are common in the area. When combined, back-to-back drought years, light soils, wind and farming and dust storms can be deadly.

“In September of 1999, after a long dry summer, a farmer was plowing his wheat fields in Eastern Oregon on a blue-sky day. A freak wind whipped up and dust covered the roadway. Instantly, everything went black. Later, they found dead people in cars with the cruise controls still set as high as 75 miles an hour. One person involved in the accident tried to go back to warn others. He waved at them, but the passing drivers just waved back... The last sight the young man had of one trucker was the trucker driving full bore into the dust storm, both hands off the wheel as he waved at the young man.” (April Henry from Learning to Fly)

“We called the weather service about 9:30 saying that visibility was getting bad… I could see the dust coming in a big cloud from the southwest. There’s too much tillage to the west and southwest of us. You get a wind event like we had and that soil is loose, powdery and lifting, and I don’t think you can stop it… Farming by its very nature, particularly in this country on these soils, at some time is going to involve tillage, and when it does… you’re going to have exposure to winds… have wind and exposed soil, you’re going to have dust.”

(Pendleton area farmer and member of the Oregon Wheat Growers League, talking about the September 25, 1999 event)

Intensive tillage of soils in agricultural uses is also a significant condition releasing soil to make it easily transportable by high winds. Depending on the crop and region involved, tillage may be occurring in the spring and/or in the autumn. Research in north-central Oregon and south-central Washington (UO 2009) indicates that region's dust problem isn't simply a matter of soil being redistributed from one field to another by the wind. Fine particulate becomes suspended in the air and may travel thousands of miles. Scientists indicate that the region is truly losing soil. (WSU 2003)

The Palouse region soils, northeast of Pendleton and south of Spokane, WA, are referred to as “loess” soils. Loess soils are formed by the accumulation of wind-blown dust. The Columbia Plateau is believed to have contributed to the wind-blown soils of the Palouse region.

Conservation tillage and CRP have greatly reduced the problem of blowing dust in eastern Oregon as well as the UIR. Sixteen percent of the agricultural land on the UIR is in CRP and the majority of the HEL is cropped using minimum or no-till farming operations. These systems retain residue on the soil surface to reduce both wind and water erosion.

4.4.1.2.1 Alternative A
4.4.1.2.1.1 Direct Impacts

There will be no change to air quality from the implementation of Alternative A. Wind erosion will continue to persist within high tillage areas. “Wind erosion occurs whenever bare, loose, dry soil is exposed to wind of sufficient speed to cause movement” (WSU, 1998). Conventionally tilled NHEL ground would pulverize soil into small particles vulnerable to high wind events. Soil dust (PM$_{10}$ and greater) is a fine particulate that becomes suspended and is transported in the atmosphere. Minute soil particles (PM$_{10}$ and greater) are now considered to be a health concern because they are readily inhaled and collect in the lungs causing respiratory infections. (WSU, 1998)

HEL ground requiring a minimum residue level will reduce wind erosion by maintaining residue levels, clod size, and green cover. Surface roughness, vegetation, and crop residues are the most practical approaches for reducing the potential of wind erosion (WSU, 1998). Farming with the Wind II, a WSU Publication states, “… with 30% flat residue cover and soil with a smooth surface, the reduction in erosion is about 16% of that for the same soil with no residue cover”. Standing and undisturbed residue cover provides even further protection against wind erosion with near 0% being lost (WSU, 2004).

4.4.1.2.1.2 Indirect Impacts

In addition to air pollution, wind erosion contributes to a significant loss of topsoil (WSU, 2004). Without topsoil, infertile subsoil (the layer beneath topsoil) and bedrock layers lack moisture retention, nutrient availability, and biological activity necessary for plant growth.

4.4.1.2 Alternative B and C,  

4.4.1.2.2.1 Direct Impacts

The SCI and HEL requirements in Alternative B and C will provide the necessary residue/organic matter to protect the topsoil from wind erosion on Trust cropland on the Reservation. “Application of soil conservation practices that minimally disturb the soil, add organic matter to it, and provide cover from crop residues and vegetative growth is fundamental to achieving control of wind erosion and dust emissions, and improving soil quality in both dry and irrigated croplands…” (WSU, 2004)

4.4.1.2.2 Indirect Impacts

RMZ planted with trees and shrubs act as natural wind barriers reducing wind velocity, soil erosion, and protecting growing crops from wind-borne soil particles. Buffer vegetation can reduce wind velocity causing particulate matter to drop out of suspension trapping it and absorbing some of the attached chemicals. (NRCS, 2004)

4.5 Monitoring Needs
4.5.1 Issue: How do we effectively monitor progress within agricultural lands?

4.5.2 Alternative A, B, C

**Direct and Indirect Impacts**

Monitoring and evaluation ensure achievement or an upward trend toward achieving the Standards in Elements 1 – 14. The appropriate CTUIR-DNR program(s) will share monitoring responsibilities. Omitted from the following table are two un-measurable elements, Implementation Costs and Cost/Benefit Analysis.
### Table 9: Agricultural Monitoring – Elements, Standards, Monitoring Schedule, and Methodology

<table>
<thead>
<tr>
<th>Element</th>
<th>Standards</th>
<th>Monitoring Schedule</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soil Quality</strong></td>
<td>Residue levels on HEL ground must meet NRCS HEL requirements</td>
<td>Once per year, After fall planting before Dec 1.</td>
<td>line transect method</td>
</tr>
<tr>
<td></td>
<td>Crop yields and operation records must match planned SCI trends</td>
<td>Once per crop cycle</td>
<td>Crop yield and operations reporting</td>
</tr>
<tr>
<td><strong>Water Quality</strong></td>
<td>Bank stability &gt; 80%</td>
<td>Year 1, every 3rd year thereafter</td>
<td>EPA Greenline, 1993</td>
</tr>
<tr>
<td></td>
<td>No more than a 10% increase in natural stream turbidities as measured relative to a control point immediately upstream</td>
<td>Year 1, every 3rd year thereafter</td>
<td>In Situ ISCO monitoring</td>
</tr>
<tr>
<td><strong>Wildlife and Fish Habitat</strong></td>
<td>&lt;20% stream substrate surface area covered by fine sediments (dia. &lt; .25 in.) within fish spawning habitat.</td>
<td>Year 1, every 3rd year thereafter</td>
<td>Pebble count of representative reach.</td>
</tr>
<tr>
<td></td>
<td>The 7-day moving average of daily maximum stream temperatures is; &lt;50 degrees F in bull trout habitat; 55 degrees F in salmonid spawning habitat; 64 degrees F in salmonid rearing habitat.</td>
<td>Annually</td>
<td>In-stream temperature monitors</td>
</tr>
<tr>
<td></td>
<td>Active floodplain areas with shrubs or shrub potential &gt; 80% coverage of each bank with at least 50% of that cover at full height typical for the shrub species involved</td>
<td>Year 1, every 5th year thereafter</td>
<td>Line intercept, measuring stick</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>Air quality levels must stay below 75% any national ambient air quality standard for particulate matter</td>
<td>EPA</td>
<td>EPA</td>
</tr>
<tr>
<td></td>
<td>Discretionary - Tribal Air Quality Monitoring</td>
<td>CTUIR DOSE OAQ</td>
<td>CTUIR DOSE OAQ</td>
</tr>
<tr>
<td><strong>Weed Control</strong></td>
<td>The occurrence of noxious and other selected weeds will be documented.</td>
<td>RAF Annually upon reported problems.</td>
<td>Mapping through on the ground surveys, GPS, and aerial surveys</td>
</tr>
<tr>
<td><strong>Idle Lands</strong></td>
<td>Idle Land Inventory</td>
<td>Annually</td>
<td>Records search and historical data</td>
</tr>
<tr>
<td></td>
<td>Idle Land Advertisement</td>
<td>Annually</td>
<td>90-Day notices and Bid Advertisements</td>
</tr>
<tr>
<td><strong>Threatened and Endangered Species</strong></td>
<td>No measurable standard, comply with NEPA and ESA</td>
<td>Pre-implementation of Ag Management Plan</td>
<td>Pre-field review of literature, field surveys as needed</td>
</tr>
<tr>
<td><strong>Cultural Resource and Traditional Uses</strong></td>
<td>Survey prior to ground disturbing activities and avoid impacts</td>
<td>Throughout activities</td>
<td>Utilize monitors</td>
</tr>
</tbody>
</table>
Table 9: Continued

<table>
<thead>
<tr>
<th>Element</th>
<th>Standards</th>
<th>Monitoring Schedule</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>Road conditions will be noted and addressed, as they are made known.</td>
<td>Throughout the year</td>
<td>Observations from field work and surveys</td>
</tr>
<tr>
<td>Tribal, Public, and Inter-Governmental</td>
<td>Develop and maintain relationships with other agencies.</td>
<td>Annually</td>
<td>Informational meetings</td>
</tr>
<tr>
<td>Relationships</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lease Compliance</td>
<td>Operators must comply with lease requirements</td>
<td>Annually</td>
<td>Spring field checks and yield reporting</td>
</tr>
</tbody>
</table>

* Immeasurable Elements – Cost/Benefit Analysis and Implementation Costs - have been omitted from this table
4.6 Weed Control

4.6.1 Issue: How will weeds be managed in agricultural lands?

4.6.2 Alternative A

4.6.2.1 Direct and Indirect Impacts

There will be no change in current weed management with the implementation of Alternative A. The leases will maintain existing management for weed control, the new standards and guidelines will not be enforced.

4.6.3 Alternative B and C

4.6.3.1 Direct and Indirect Impacts

Alternative B and C require the implementation of Standards and Guidelines developed during this planning process. The latter 10 years of Alternative B require the creation of varying buffer widths along streams. If the operators or landowners choose not to implement streamside buffers, idle lands may increase, leading to weed invasions. Abandoned agricultural lands are prime areas for weed invasion. Operators and/or landowners may have the option to install buffers by enrolling in USDA Conservation Programs. Weed maintenance is a requirement of the USDA Conservation Programs.

Encroachment of noxious weeds on productive farmland will reduce yields of agricultural crops while at the same time increase cost of production.

4.7 Idle Lands

4.7.1 Issue: How will idle trust lands be addressed? How are Trust lands kept in production and how is current idle land returned to productive status?

4.7.2 Alternative A

4.7.2.1 Direct and Indirect Impacts

There will be no change to idle lands management with the implementation of Alternative A. There will be a continued effort to lease idle lands but the standards and guidelines developed during this planning effort will not be enforced. Procedures currently used for lease advertisement and development will continue. Idle lands are to be advertised annually, incentive programs will be encouraged, and weed infestations will fall under the applicable weed program.

4.7.3 Alternative B and C
4.7.3.1 Direct Impacts

Alternatives B and C require the implementation of Standards and Guidelines developed during this planning process. These alternatives require further attempts to lease idle lands. Farmland not at risk of losing agricultural status will be incorporated into rangeland, pasture, or timber, depending on location. Idle lands will be inventoried annually to determine location, acreage, past leasing status, soils, average yields, and reason for being idle.

Un-leased tracts will be offered to CTUIR-TFE through advertised bidding procedures for leasing and/or enrolled into USDA Conservation Programs, depending on program eligibility. The landowners of tracts that remain un-leased will be encouraged to control weed populations on the allotment. RAF will continued efforts to propose funding that controls or eradicates noxious weeds.

With the implementation of Alternatives B or C, additional tools will be available to lease idle lands. There will be no guarantee that idle land acreage will decrease but further efforts will increase the likelihood.

4.7.3.2 Indirect Impacts

Implementing Alternatives B or C will require operators to adopt conservation farming practices and buffer establishment (the latter part of B). Variable crop returns with the loss of cropland to buffers, and the initial willingness and/or cost of adopting conservation farming practices could have a potential negative affect on idle land acreage.

The cost/benefit analysis in this plan will approximate the financial benefits and losses resulting from the implementation of each alternative. Alternatives B and C require conservation practices that may demand less time and less fuel but may also necessitate increased weed control, insect control, and seedbed preparation. The impact these changes have on idle lands is dependent on the farmer and the affect these changes will have on their farming operations. There are 2,865 conventionally tilled, NHEL acres that are not enrolled in a conservation program and 23,753 acres of farmland that are HEL, planted to CRP, or farmed by operators practicing conservation tillage.

4.8 Threatened and Endangered Species

4.8.1 Issue: How will critical habitat for threatened and endangered species be protected?

4.8.2 Alternative A

4.8.2.1 Direct Impacts

Alternative A does not require any changes to farming practices or the implementation of conservation measures. If erosion has been a problem, it will continue to affect neighboring fields, residential areas, and streams, directly harming fish and wildlife, and indirectly
impacting downstream habitats. Riparian and aquatic habitat availability and quality will remain at its current levels within the agriculture zone. Fish and wildlife use of these agriculture lands will remain unchanged unless the few ongoing conventional farming practices are discontinued.

4.8.2.2 Indirect Impacts

As directed by the Endangered Species Act (ESA) of 1973, federal agencies are required to ensure that actions taken will not likely affect the continued existence of any threatened species. The actions undertaken in Alternative A will evaluate the potential impacts to threatened and endangered species. As there are no changes required by Alternative A there is little expected to result from consultation with the ESA.

4.8.3 Alternative B and C

4.8.3.1 Direct Impacts

Application of streamside vegetation strips within the agricultural zone will provide positive impacts to a whole host of terrestrial and aquatic species. Particularly, species such as elk, deer and upland birds will benefit. The addition of structure and complexity to vegetation within the riparian zones provides forage and cover as well nesting areas for most terrestrial species on the reservation. Aquatic species benefit from filtered cool water provided by the addition of shading and buffer filtering of the channel. While many of the streams are intermittent and run very few days of the year, ground water storage will enhance re-vegetation efforts within the RMZ.

Impacts to higher order streams shall be positive as well. Most of the water in the intermittent agricultural zone streams drains to higher order streams that have water quality limits due in part to water pollution from lower order streams. Removing impairments from lower order streams by applying conservation practices is a widely accepted best management practice to enhancing higher order stream water quality and aquatic habitat.

4.8.3.2 Indirect Impacts

Meeting the requirements for Alternatives B or C requires consultation with the ESA. This eliminates new threats to listed species with the implementation of buffers or other conservation practices.

4.9 Implementation Costs

4.9.1 Issue: What resources are required to implement the Agricultural Management Plan?

4.9.2 Alternative A

4.9.2.1 Direct Costs
As previously stated, the CTUIR funds one and a half staff positions. No new expenses will be incurred with Alternative A implementation.

**Table 10: Alternative A Program Implementation Costs Per Year**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td></td>
</tr>
<tr>
<td>Soil Conservationist</td>
<td>$50,000</td>
</tr>
<tr>
<td>Range &amp; Ag Technician (0.5)</td>
<td>$17,000</td>
</tr>
<tr>
<td>Fringe Benefits (39%)</td>
<td>$26,130</td>
</tr>
<tr>
<td>Travel and Training</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

**Table 9: Continued**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles</td>
<td>$4,500</td>
</tr>
<tr>
<td>Communications &amp; Office Expenses</td>
<td>$1,000</td>
</tr>
<tr>
<td>Supplies and Materials</td>
<td>$3,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>$3,000</td>
</tr>
<tr>
<td>Grand Total</td>
<td><strong>$107,630.00</strong></td>
</tr>
</tbody>
</table>

Total program costs of Alternative A will be **$107,630.00**.

4.9.2.2 **Indirect Costs**

Alternative A will not require indirect costs since there are not any additional requirements from the current operations.

4.9.3 **Alternative B**

4.9.3.1 **Direct Costs**

RAF attempts to implement all of the alternatives within current funding levels.

**Table 11: Alternative B Program Implementation Costs per Year**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td></td>
</tr>
<tr>
<td>Soil Conservationist FTE (Existing)</td>
<td>$50,000</td>
</tr>
<tr>
<td>Watershed Coordinator FTE (Existing)</td>
<td>$42,000</td>
</tr>
<tr>
<td>Soil Conservation Technician .5 FTE (Existing)</td>
<td>$17,000</td>
</tr>
<tr>
<td>Fringe Benefits (39%)</td>
<td>$42,510</td>
</tr>
</tbody>
</table>
Travel and Training | $6,000
Vehicles (Two) | $12,000
Communications & Office Expenses | $2,500
Supplies and Materials | $3,500
Equipment | $6,000
Grand Total | $181,510.00

Total estimated program costs of Alternative B will be $181,510.00.

4.9.3.2 Indirect Costs

Planned indirect costs as they relate to Alternative B implementation include weed control on idle lands and along riparian areas, monitoring and evaluation, lease compliance, educational outreach, and riparian plantings.

4.9.4 Alternative C

4.9.4.1 Direct Costs

RAF attempts to implement all of the alternatives within current funding levels.

**Table 12: Alternative C Program Implementation Costs per Year**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td></td>
</tr>
<tr>
<td>Soil Conservationist FTE (Existing)</td>
<td>$50,000</td>
</tr>
<tr>
<td>Watershed Coordinator (Existing)</td>
<td>$42,000</td>
</tr>
<tr>
<td>Soil Conservation Technician .5 FTE (Existing)</td>
<td>$17,000</td>
</tr>
<tr>
<td>Fringe Benefits (39%)</td>
<td>$42,510</td>
</tr>
<tr>
<td>Travel and Training</td>
<td>$6,000</td>
</tr>
<tr>
<td>Vehicles (Two)</td>
<td>$12,000</td>
</tr>
<tr>
<td>Communications &amp; Office Expenses</td>
<td>$2,500</td>
</tr>
<tr>
<td>Supplies and Materials</td>
<td>$3,500</td>
</tr>
<tr>
<td>Equipment</td>
<td>$6,000</td>
</tr>
<tr>
<td>Grand Total</td>
<td>$181,510.00</td>
</tr>
</tbody>
</table>

Total estimated program costs of Alternative C will be $181,510.00.

4.9.4.2 Indirect Costs

Planned indirect costs as they relate to Alternative C implementation include weed control on idle lands and along riparian areas, monitoring and evaluation, lease compliance, educational outreach, and planning riparian plantings.
4.10 Cost/Benefit Analysis

4.10.1 Issue: What are the costs versus the benefits?

4.10.2 Alternative A

4.10.2.1 Direct and Indirect Impacts

Implementation of Alternative A will not cause the operator to incur any additional costs and the owners will not lose any additional income from buffers or operational changes.

4.10.3 Alternative B and C

4.10.3.1 Residue Management

Alternatives B and C require appropriate residue management on Trust property throughout the Reservation regardless of HEL status. Residue management requires the adoption of conservation tillage or no-till practices. Currently there are approximately 4,962 acres farmed by traditionally reduced tillage or no-till operations, 4163.53 acres enrolled in CRP, and 13,826 acres must meet HEL requirements. Conventionally farmed land not protected by conservation programs totals approximately 2,865 acres.

Conventional tillage facilitates the translocation of soil, wind and water erosion, organic matter decomposition, soil acidification, and decreased biological activity thereby decreasing sustainability for future cropping systems. Sustainability is the balance between degradation processes and conservation and reclamation processes. (McCool et al., 1999) “Developing viable conservation tillage practices is a key element in achieving sustainable non-irrigated agriculture in this region (Northwestern Wheat and Range Region of the Pacific Northwest),” (McCool et al 1999). Non-sustaining farming practices, such as continuous conventional tillage, limits future crop productivity thereby risking future income. Once farmable and productive the land will lack the physical, biological, and chemical components necessary to grow crops.

Oregon State University and Washington State University have conducted comparison studies of conventional, minimum, and no-till operations that have produced variable yields and net returns depending on the location, crop rotation, and farming operation. The conclusion to a study conducted at the Columbia Basin Agricultural Research Center states: “It is important to recognize that there are other, non-economic factors that may be of great value but that are difficult to quantify, such as the value of time spent in the field or potential offsite costs due to soil erosion” (Petrie et al., 2006). Soil erosion produces an economic loss that is very difficult to measure, though the resulting effects to water and air quality are of a high importance to society (Petrie et al., 2006). The initial cost of conservation farming practices has proven to be an expensive venture to some farmers, but without it the cost to future agricultural production, due to soil erosion, will be much greater, and will take much longer to restore.
4.10.3.2 Alternative B

4.10.3.2.1 Buffer Establishment

Following the ten-year voluntary period, RMZ inner zone buffer requirements will be mandatory at the beginning of each new lease. Alternative B requires the implementation of buffers ranging from 18 feet to 75 feet bordering Strahler Stream Orders 1-4. Land that is being farmed too close to these stream orders will be taken out of production and available for sign-up in federal incentive programs. If incentive programs are not available, the BIA Superintendent may provide variances on a case-by-case basis.

Two federal incentive programs are available for buffer installation are the Conservation Reserve Enhancement Program (CREP) and the continuous Conservation Reserve Program (CCRP). In Oregon, additional funds are available, from the Commodity Credit Corporation (CCC) and the state, for the CREP program. This provides a total cost share of creating a CREP buffer is 115%. The USDA FSA office is the federal agency taking applications for these programs. The purpose of these programs is to establish buffer vegetation on agricultural land along streams, protecting water quality and restoring fish and wildlife habitat (ODA, 2003). Land bid into these programs is evaluated for meeting the basic eligibility requirements by NRCS. The NRCS also determines the buffer that is appropriate for the stream type. Depending upon they type of buffer, operators with enrolled land into CREP and CCRP will receive annual rental payments for the enrolled acreage including a base rental rate, bonus rate, and maintenance rate.

4.10.3.3 Alternative C

4.10.3.3.1 Buffer Establishment

Alternative C encourages voluntary adoption of buffers ranging from 18 feet to 75 feet with a re-evaluation after the initial 10 years. The potential effect of buffers along these water bodies may mirror Alternative B or it may be less. The effects will vary depending on the operator and landowners’ willingness to adopt the buffers and the incentives to enroll in conservation programs. Farm contracts will be limited to a 4-year duration in the event that lessees or permittees cannot or will not establish and maintain voluntary one-quarter(¼) RMZ buffers. The 4-year contract limit will allow the Department of Natural Resources to plan and implement conservation practices that address the desire for stream zone buffers.

Table 13: Total Buffer Miles/Acreage by Alternative

<table>
<thead>
<tr>
<th>Alternatives</th>
<th>Buffer Requirement</th>
<th>Total Buffer Miles</th>
<th>Total Buffer (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative A</td>
<td>None</td>
<td>198</td>
<td>391</td>
</tr>
<tr>
<td>Alternative B</td>
<td>1 Order = 18 feet</td>
<td>50.54</td>
<td>Variable for first 10 years and 2105 after</td>
</tr>
<tr>
<td></td>
<td>2 Order = 38 feet</td>
<td>64.61</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Order = 56 feet</td>
<td>5.36</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 Order = 75 feet</td>
<td>15.08</td>
<td></td>
</tr>
</tbody>
</table>
### 4.11 Cultural Resources and Traditional Uses

#### 4.11.1 Issue: How will the need to protect cultural sites and to provide the opportunity for traditional uses such as root and berry gathering be met?

Agricultural management activities may have an effect on traditional and cultural resources. The CTUIR seeks to implement agricultural management practices in such a way to avoid historic properties.

#### 4.11.2 Alternative A (No Action Required)

##### 4.11.2.1 Direct and Indirect Impacts

Existing resources will continue to be subject to ongoing impacts such as weather, vandalism, plowing, and exposure to pesticides and fertilizers.

#### 4.11.3 Alternative B

##### 4.11.3.1 Direct and Indirect Impacts

For the first ten years, the existing resources will continue to be subject to ongoing impacts such as weather, plowing, and exposure to pesticides and fertilizers. After ten years, buffers will be implemented increasing the likelihood that historic properties will be avoided by using a monitor on any ground disturbing activities and the quality of First Foods improved, especially if those species are included in the buffer plantings.

#### 4.11.4 Alternative C

##### 4.11.4.1 Direct and Indirect Impacts

For the first ten years, the existing resources will continue to be subject to ongoing impacts such as weather, vandalism, plowing, and exposure to pesticides and fertilizers. After ten years, either the impacts will be that same, or if buffers are implemented, the likelihood that historic properties will be avoided by using a monitor on any ground disturbing activities. The quality of First Foods may be improved if those species are included in the buffer plantings.

#### 4.12 Transportation

##### 4.12.1 Issue: How will transportation be managed for effective and efficient access to farming tracts?

<table>
<thead>
<tr>
<th>Alternative C</th>
<th>1 Order = 18 feet</th>
<th>2 Order = 38 feet</th>
<th>3 Order = 56 feet</th>
<th>4 Order = 75 feet</th>
<th>1 Order = 50.54</th>
<th>2 Order = 64.61</th>
<th>3 Order = 5.36</th>
<th>4 Order = 15.08</th>
<th>Variable depending on the amount of voluntary implementation</th>
</tr>
</thead>
</table>

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4.12.2 Alternative A, B, C

4.12.3 Direct and Indirect Impacts

Currently road maintenance and construction responsibilities belong to the CTUIR. The CTUIR carries limited responsibility for the transportation system with the majority of road maintenance carried out by Umatilla County. Implementation of a management plan will maintain transportation corridors in a manner that benefits natural resources and provides access to farming allotments.

4.13 Tribal, Local, and Inter-Governmental Relationships

4.13.1 Issue: How will Tribal, local, and government relationships / communications be managed?

4.13.2 Alternative A

4.13.2.1 Direct and Indirect Impacts

There will be no change to Tribal, Local, and Inter-Governmental Relationships with the Implementation of Alternative A.

4.13.3 Alternative B and C

4.13.3.1 Direct and Indirect Impacts

Implementation of Alternatives B or C will require compliance with the standards formulated in this plan. Those standards will establish lease conferences between landowners and farmers, printed notification of regulations and updates in local publications, biennial meetings between Tribal staff and governmental agencies, and regular communication between CTUIR-TFE and the division of CTUIR Land Program. Implementation of these actions will be beneficial to the inter-agency communication necessary to administer leases, and promote and utilize incentive programs.

4.14 Lease Compliance

4.14.1 Issue: What is necessary to ensure leases are consummated at the appropriate time?

4.14.2 Alternative A, B, C

Direct and Indirect Impacts

Lease compliance will not change between alternatives. Natural resource staff will continue to monitor lease requirements independent of the alternative chosen. Increased funding will
be necessary to enforce increased lease requirements under Alternatives B or C. See Implementation Costs.

Matrix

The following table (Table 15) assembles the three alternatives into a matrix that lists and evaluates the effects of each alternative on primary issues and concerns.
Table 15. Anticipated Effects of Implementation of Alternatives for the Agricultural Management Plan

<table>
<thead>
<tr>
<th></th>
<th>Alternative A</th>
<th>Alternative B</th>
<th>Alternative C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Soil Quality and Erosion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Estimated Soil Loss (tons)</td>
<td>maintain</td>
<td>decrease</td>
</tr>
<tr>
<td></td>
<td>Estimated Acres with Residue Management (acres)</td>
<td>maintain</td>
<td>Increase</td>
</tr>
<tr>
<td>2</td>
<td>Water Quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Suspended Solids</td>
<td>maintain</td>
<td>decrease</td>
</tr>
<tr>
<td></td>
<td>Turbidity</td>
<td>maintain</td>
<td>decrease</td>
</tr>
<tr>
<td>3</td>
<td>Wildlife and Fish Habitat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Estimated Aquatic Habitat Acres</td>
<td>maintain</td>
<td>Increase</td>
</tr>
<tr>
<td></td>
<td>Estimated Terrestrial Habitat Acres</td>
<td>maintain</td>
<td>Increase</td>
</tr>
<tr>
<td>4</td>
<td>Air Quality</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Estimated Soil Particulate matter</td>
<td>maintain</td>
<td>decrease</td>
</tr>
<tr>
<td></td>
<td>Estimated Soil Loss (tons)</td>
<td>maintain</td>
<td>decrease</td>
</tr>
<tr>
<td>5</td>
<td>Noxious Weed Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Estimated Infested Acres</td>
<td>maintain</td>
<td>maintain</td>
</tr>
<tr>
<td>6</td>
<td>Idle Lands</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Estimated idle acres</td>
<td>maintain</td>
<td>decrease</td>
</tr>
<tr>
<td>7</td>
<td>Implementation Costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Program Funding</td>
<td>maintain</td>
<td>maintain</td>
</tr>
<tr>
<td>8</td>
<td>Cultural Resources/Traditional Uses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acres accessible to cultural/traditional use</td>
<td>maintain</td>
<td>maintain</td>
</tr>
</tbody>
</table>
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