US Army Corps of Engineers
Walla Walla District

Paradise Creek Ecosystem Restoration Moscow, Idaho

Detailed Project Report and Environmental Assessment

FINAL

Authority: Section 206, 1996 Water Resources Development Act Corps Project for Aquatic Ecosystem Restoration

January 2007

U.S. Army Corps of Engineers, Walla Walla District
Paradise Creek
Ecosystem Restoration
Moscow, Idaho
Detailed Project Report

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EXECUTIVE SUMMARY

This Detailed Project Report presents the analysis and recommendations of the ecosystem restoration project for a section of Paradise Creek located in Moscow, Idaho. This project encompasses the restoration and rehabilitation of certain reaches of Paradise Creek located on the campus of the University of Idaho in Moscow, Idaho. This ecosystem restoration project is proposed in cooperation with the University of Idaho (non-Federal sponsor).

The purpose of the Paradise Creek Ecosystem Restoration Project is to restore a highly degraded section of Paradise Creek as well as adjacent creek sections in Moscow, Idaho. Restoration would be accomplished by creating a healthy, diverse, and sustainable stream condition in Paradise Creek around the University of Idaho campus. Restoration would improve in-stream habitat, rebuild a continuous habitat corridor and improve wildlife habitat along the identified sections of Paradise Creek. Some of the other benefits of this project include enhanced environmental sustainability, storm water quality improvements, and improved flood damage reduction.

Several alternatives to repair/restore the creeks ecosystem were evaluated. These include:

- No-action.
- Relocate the channel
- Relocate the channel including downstream restoration
- Relocate the channel including upstream and downstream restoration

The alternative that reasonably maximizes the benefits in relation to cost and meets the planning objects is to relocate the channel including upstream and downstream restoration.

The preferred alternative includes three main elements: (1) Construct approximately 2,000 ft of new channel that would tie back into the existing channel, (2) channel reshaping and revegetation in the downstream section, and (3) channel reshaping and revegetation in the upstream section. The new channel and floodplain would be constructed as large as possible within the property constraints to maximize environmental benefits and flood capacity.

For the recommended plan, 15.36 acres of land (LERRD) will be required for initial construction of the three main elements. The majority of this land is owned in fee by the sponsor (14.56 acres) with the remaining 0.8 acres owned by Palouse River and Coulee City Railroad, Inc. The University of Idaho currently has a license agreement with Palouse River and Coulee City Railroad, Inc. allowing for restoration activities to occur in their portion of the footprint. The total estimated cost for the LERRD is $2,173,000 based on a gross appraisal completed in December of 2006. The cost includes the non-Federal sponsor's estimated administrative costs (costs incidental;

e.g. title survey, appraisal costs, negotiations, recording fees, legal fee, etc), escalation, and contingency.

The fully funded cost estimate for the recommended plan is $6,691,000, based on October 1, 2006, price levels indexed to the midpoint of construction. This cost includes engineering and design, supervision and administration, and construction costs. The schedule for project completion is as follows.

Action	Date
PCA Approval	March 2008
Plans and Specifications Completion	June 2009
Commitment of Construction Funds	September 2009
Advertise & Award	December 2009
Construction	December 2009 – February 2011

In conjunction with the Water Resources Development Act of 1996, Section 206 Aquatic Ecosystem Restoration, cost sharing for the recommended plan is 65-percent Federal and 35-percent from the non-Federal sponsor. Based on a the fully-funded cost estimate, which includes all funds anticipated to be necessary up to and through the construction of the project, the Federal portion of the estimated cost is $4,349,000.

1.0 - INTRODUCTION

The U.S. Army Corps of Engineers (Corps) and the University of Idaho are conducting a feasibility study of aquatic ecosystem restoration and environmental enhancements on a section of Paradise Creek in Moscow, Idaho. The feasibility study is being conducted in accordance with Section 206 of the Water Resource Development Act (WRDA) of 1996, which authorizes the Corps to undertake aquatic ecosystem restoration projects in the public interest. The University of Idaho is the non-federal sponsor (NFS) for this ecosystem restoration project. The City of Moscow is also very supportive of this effort. The city has signed a letter of understanding with the University of Idaho verifying the commitments between the two parties.

1.1 Study Authority

This report was prepared as a response to the following authority:

The WRDA 1996, Section 206, Aquatic Ecosystem Restoration, which reads:

1.1.1 General Authority

The Secretary may carry out an aquatic ecosystem restoration and protection project if the Secretary determines that the project - (1) will improve the quality of the environment and is in the public interest; and (2) is cost-effective.

1.1.2 Cost Sharing

Non-Federal interests shall provide 35 percent of the cost of construction of any project carried out under this section, including provision of all lands, easements, rights of way, and necessary relocations.

1.1.3 Agreements

Construction of a project under this section shall be initiated only after a non-Federal interest has entered into a binding agreement with the Secretary to pay the non-Federal share of the costs of construction required by this section. The non-Federal interest shall pay 100 percent of any operation, maintenance, and replacement and rehabilitation costs with respect to the project in accordance with regulations prescribed by the Secretary.

1.1.4 Cost Limitation

Not more than $5,000,000 in Federal funds may be allotted under this section for a project at any single locality.

In response to the study authority, the reconnaissance phase of the study was initiated in April 2002. This phase of the study resulted in the finding that there was a Federal interest in continuing the study into the feasibility phase. The University of Idaho, as the non-Federal sponsor, and the Corps initiated the feasibility phase of the study on January 8, 2003. The feasibility phase study cost was shared between the Corps and the sponsor. This report presents the results of both phases of study.

1.2 Location

Moscow is located in the Idaho panhandle along the border with Washington State. The project study area includes a corridor along Paradise Creek from Highway 95 to Perimeter Drive. The potential channel relocation area just south of State Route 8 is also included. The proposed project is located in Township 39 North, Range 5 West, Sections 7 and 18 and Township 39 North, Range 6 West, Section 12, Latah County, Idaho.

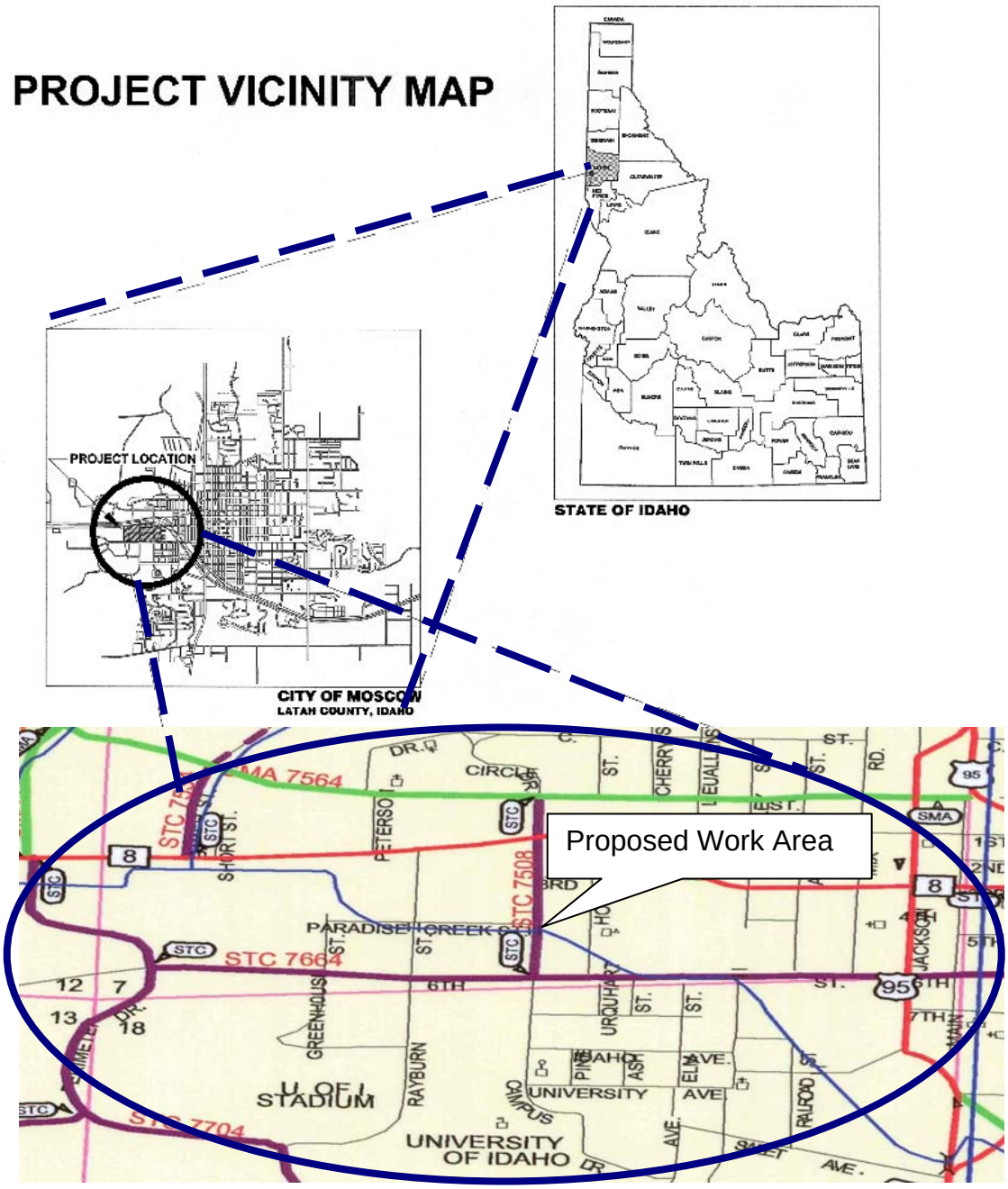


Figure 1-1. Project Vicinity Map

The topography in the Paradise Creek watershed ranges from steep mountains in the headwaters to broad, rounded, rolling, high prairies in the lower parts of the basin. Elevations range from 2,360 feet (ft) at Pullman, Washington to 4,500 ft at the headwaters of Paradise Creek. Paradise Creek originates on Moscow Mountain (elevation 4,356 ft.), then flows in a southwesterly direction for 20 miles, through Moscow, Idaho (elevation 2,520 ft.), ultimately to enter the South Fork of the Palouse River in Pullman, Washington. Paradise Creek drains a basin of 17.70

square miles above the University of Idaho at Moscow. Much of the stream flows through agricultural fields.

Within the City of Moscow Idaho, Paradise Creek has had a history of channel alignment modifications and covering. Within the study area, Paradise Creek was aligned under Paradise Creek Street in a 1,070 foot long culvert south of its original location. The culvert was undersized for the one percent chance flood. In recent times, an over flow swale was constructed paralleling Paradise Creek Street and the underground culvert. This swale is intended to capture the one percent flood that is not contained in the culvert.

1.3 Purpose

The purpose of this report is to present the findings of a feasibility investigation which was conducted to determine if there is a Federal interest in providing aquatic ecosystem improvements in the Moscow, Idaho area. The purpose of the Paradise Creek Ecosystem Restoration Project is to restore the habitat and ecological resource values of Paradise Creek in the Moscow, Idaho area. The goal of this project is to improve fish and wildlife habitat along a section of Paradise Creek.

1.4 Scope of Work

This report analyzes the problems and opportunities and expresses desired outcomes as planning objectives. Alternatives are then developed to address these objectives. These alternatives include a plan of no action and various action alternatives. The economic and environmental impacts of the alternatives are then evaluated and a feasible plan is selected. The report also presents details on Corps and sponsor participation needed to implement the plan. The report concludes with a recommendation for authorization.

1.5 Prior Studies, Reports, and Existing Water Projects

The following reports are being reviewed as directed in the study authorization:

* Reconnaissance Report: Palouse River Basin, Idaho and Washington, March 1989. This report mainly provided background information.

* Flood Insurance Study, City of Moscow, Idaho, Latah County. April 2002. This report provides relatively current flood level information that is important to the feasibility of various alternatives.

2.0 - PLANNING OBJECTIVES AND CRITERIA

2.1 National Objectives

The national or Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. Contributions to national economic development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the nation.

The Corps has added a second national objective for National Ecosystem Restoration (NER) in response to legislation and administration policy. This objective is to contribute to the nation's ecosystems through ecosystem restoration, with contributions measured by changes in the amounts and values of habitat.

2.2 Public Concerns

Two public concerns have been identified during the course of the study. Initial concerns were expressed in the study authorization. Additional input was received through coordination with the sponsor, other agencies, and a public meeting. A discussion of pubic involvement is included in Chapter 8, *Public Involvement and Review*. The public concerns that are related to the establishment of planning objectives and constraints are:

- Restoring a covered section of Paradise Creek
- Maintaining adequate flood capacity of the creek

2.3 Existing And Future Without Project Conditions

The major characteristics of the study area's natural and human resources are provided to promote a general understanding of the area. Paradise Creek, in the proposed project area was rerouted in the early 1900s or earlier and partially covered in the 1960s. The existing creek alignment enters a trapezoidal, riprap-lined, concrete covered channel at Line Street and continues in a fully enclosed channel for approximately 1,100 ft before day-lighting west of Rayburn Street. During high flows, the creek typically carries a large suspended sediment load and woody debris. Photo 2-1 shows Paradise Creek Street. Paradise Creek flows directly under the street. Photo 2-2 shows the covered creek.

Photo 2-1. Paradise Creek Street (looking west). The overflow swale is located on the right side of the sidewalk and street lights.

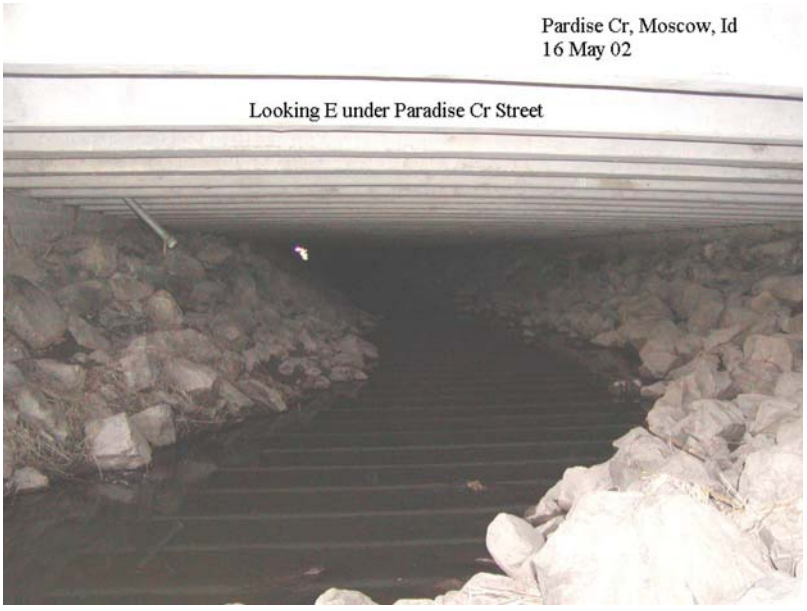


Photo 2-2. Paradise Creek under Paradise Creek Street (looking east, upstream)

2.3.1 Physical Environment - Sedimentation and Erosion

No significant sedimentation or erosion problems were observed during visits to the proposed project area. Sections of the channel have been hard armored with concrete and riprap. The amount of sedimentation and erosion is not likely to change in the future even without the proposed project.

2.3.2 Flooding

Paradise Creek drains a basin of 17.70 square miles above the University of Idaho at Moscow. Flows in Paradise Creek are extremely variable, averaging less than one cubic foot per second (cfs) from July through October, while peaking in excess of 400 cfs during spring runoff (U.S. Fish and Wildlife Service 1989). Flow frequencies are presented in Table 2-1. Stream flows and flooding levels are not likely to change noticeably in the future even without the proposed project.

Table 2-1. Approximate Flow Frequencies for Paradise Creek at the University of Idaho at Moscow, Idaho (below Hog Creek).

Percent Exceedance	Paradise Creek (drainage area 17.7 mi^2)
50	340 cfs
20	515 cfs
10	660 cfs
4	885 cfs
2	1,090 cfs
1	1,310 cfs

2.3.3 Water Quality

The Clean Water Act, Section 303(d), provides a framework to identify streams that are water quality limited and, as a result, do not meet their designated beneficial uses. The creek was identified as water quality limited from its headwaters to the Washington State line in 1994 for several pollutants. Beneficial uses for Paradise Creek in Idaho include cold water biota, secondary recreation, and agricultural water supply. The creek is currently not supporting its designated beneficial uses. Paradise Creek is listed on Idaho's 303(d) (1998) list for six pollutants: nutrients, sediment, thermal modification, flow modification*, habitat modification*, and pathogens. (* flow and habitat modification are not typical pollutants, but were designated as such for descriptive purposes.) The 1996 303(d) list also included ammonia as a pollutant of Paradise Creek. In the winter and spring, suspended solids from eroding agricultural fields typically affect Paradise Creek during high runoff. During the low flows of the late summer, phosphorus and nitrogen are present in high enough concentrations to stimulate algal and macrophyte populations. Nutrient and bacterial levels often exceed both Idaho and Washington standards. Discharge from Moscow's sewage treatment plant and the University of Idaho's aquaculture facility enter Paradise Creek downstream from the proposed work area. Water quality of these discharges is sometimes poor.

Within the covered portion of the channel, 20 storm water collection pipes discharge directly into the creek carrying untreated runoff and spring water from approximately 126 acres of the University of Idaho campus. Just north of the creek (in the right

side of photo 2-1), the University of Idaho has constructed a 40-foot wide swale to carry flood flows.

In the future, water quality conditions could improve slightly, even without the proposed project, due to local stream restoration efforts and increased public awareness about the importance of healthy streams.

2.3.4 Air Quality

The Clean Air Act of 1970, as amended, required the U.S. Environmental Protection Agency to adopt national ambient air quality standards for priority pollutants, which include sulfur dioxide, particulate matter, carbon monoxide, ozone, nitrogen dioxide, and lead. These standards are designed to protect human health and welfare. Areas in which the air pollutant levels exceed adopted standards for one or more pollutants are considered to be in "non-attainment." In those areas where pollutant levels do not exceed standards are considered to be in "attainment." Moscow is in an attainment area. Air quality in the area is not expected to change significantly in the future.

2.3.5 Noise

Noise levels within the City of Moscow are typical of those found in urbanized areas and vary by location and time of day. Noise levels, in proximity to roadways, likely range from 60 to 70 A-weighted decibels (dBA) along major roadways and are affected primarily by traffic volumes and speed. Residential noise levels are likely near 50 dBA and may be quieter during evening and nighttime hours. Noise levels in the area are not likely to change dramatically in the future.

2.3.6 Biological Environment

2.3.6.1 Aquatic Habitat

Fish species presently in Paradise Creek include suckers, shiners, dace, and northern pike minnow. Trout were likely present historically. Low flows and poor water quality limit the creek's productivity. This condition is likely to continue in the future.

2.3.6.2 Riparian Habitat

The lower portion of Paradise Creek in the proposed project area is now dominated by non-native reed canary grass. Reed canary grass can provide a tremendous amount of shade along a small stream, but it also can build up within the channel, retaining silt. This silt layer can greatly reduce the abundance of aquatic insects, which are used as food by fish. A small number of trees are also located in this section. A well-mixed band of riparian vegetation exists in the section just below the covered section of Paradise Creek. No vegetation exists along the creek through

the covered section. Vegetation upstream from the covered section varies, but is generally a thin band consisting of grasses and trees. The existing level of riparian habitat is not likely to increase or decrease in the future without the proposed project.

2.3.6.3 Wetland Habitat

Wetlands are defined by hydrophytic vegetation, hydric soils, and a regular hydrologic regime. Wetlands in the Paradise Creek watershed are typically associated with the riparian areas along the creek and its tributaries. Wetlands beside the creek are associated with the creek's water level, but also receive runoff from roads and fields. In many areas, the existing vegetation is dominated by non-native reed canary grass. In addition, there are some native sedges, willows, and alder. The amount of wetlands in the area is not likely to change without the proposed project.

2.3.6.4 Upland Habitat

Over the last 100+ years, dry-land farming has almost completely replaced the original upland vegetation in the area surrounding Moscow. Wildlife resources in the general vicinity of the project area include upland birds, songbirds, waterfowl, raptors, small mammals, reptiles, amphibians, and a few fish species. Active beaver sign was noted in the upstream section of the proposed project area. Wildlife habitat along Paradise Creek is poor, especially within the city limits of Moscow. Continued human development in the future could further degrade upland habitat in the area.

2.3.6.5 Endangered Species

The following species are listed for Latah County, Idaho (FES ref. # 2006-SL-0526, June 1, 2006) under the Endangered Species Act. However, none of these species are found in the proposed work area. It is not anticipated that any of these species would ever establish in the Moscow area.

Endangered: None
Threatened:
- Canada lynx (Lynx canadensis)
- Steelhead (Oncorhynchus mykiss)
- Spalding's catchfly (Silene spaldingii)
- Water howellia (Howellia aquatilis)
- Gray Wolf (Canis lupus) (experimental/non-essential)

Candidate: None

2.3.7 Cultural Environment

2.3.7.1 Cultural Resources

The Palouse Indians once occupied the Paradise Creek area. The first non-Indian settlement likely occurred during the 1860s. The University of Idaho was opened in 1892. The project area is located adjacent to a waterway where there is always the possibility of finding archeological artifacts. The project is located in areas where there has been previous disturbance of the stream channel and adjacent banks.

In September of 2003, cultural resources contractors performed an evaluation of the project's Area of Potential Effect (APE) that included surface surveys, test excavations, and historical research. No cultural properties were observed in the APE during the surface survey or the sub-surface testing operation. After review of the findings of the field evaluation the Corps determined the project would cause no effect to cultural properties and submitted the determination to the Idaho State Historic Preservation Office (SHPO) and the Nez Perce Tribe's Cultural Resource Program. The SHPO concurred with the findings on November 24, 2003.

2.3.7.2 Aesthetics

The aesthetic quality of an area is a subjective factor to quantify. It is a measure of one's perception of how pleasing an area is. The main section of Paradise Creek being considered has been covered, removing it from view. Currently the downstream portion of the proposed project area is basically an ignored area. Much of this reach is parallel to railroad tracks and a section of the Bill Chipman Palouse Trail (Chipman Trail). The upstream section of the project area contains some trees and other vegetation, but is confined by roads and buildings through much of the reach. The aesthetics of the area are not likely to change in the future without the proposed project.

2.3.8 Social-Economic Resources

2.3.8.1 Employment & Labor Force

The estimated population of Moscow is approximately 24,675. The median household income for Moscow is approximately $20,652[1]. The major economic influences providing the area's employment base are educational, health, and social services (54.1 percent); arts, entertainment, recreation, accommodation, and food services (13.4 percent); retail trade (7.6 percent); and professional services (5.8 percent).

[1] Data from U.S. Census Bureau web site http://factfinder.census.gov

2.3.8.2 Recreation and Public Access

The main public recreation feature in the area of the proposed project is the Chipman Trail, which was dedicated in 1998. The trail is part of the federal Rails to Trails program, which preserves railroad corridors for non-motorized transportation and possible future transportation use. A 10 foot wide paved trail, accessible to people of all ages and abilities, extends over several miles of scenic Palouse country while crossing Paradise Creek multiple times. Three emergency phones, two handicap accessible restrooms, benches, bike racks, and trash receptacles are all located along the trail. A series of interpretive signs describe local human and natural history as well as agriculture and ecology topics.

Also located near the proposed project site is a student recreation facility available to University of Idaho students. The facility features two large gymnasiums, a multi-activity court with dasher boards, indoor running track, large cardiovascular and weight training areas, multi-activity rooms, classrooms, juice bar, and locker rooms. The focal point of the facility is a 55-foot-tall climbing pinnacle encased in a glass tower and visible throughout the community. In addition, the University of Idaho's outdoor recreation program is located in the facility. The University of Idaho would like to expand the recreation facility in the future. However, expansion may not be possible without constructing the proposed project because of the current need for the flood overflow swale.

2.3.8.3 Traffic and Transportation

Moscow is located at the intersection of U.S. Route 95 and Idaho State Route 8 in the Idaho panhandle. In Moscow there are also numerous roads and neighborhood streets. Near the proposed project area, there is currently only one signalized crosswalk (at Line Street) crossing State Route 8. This creates a dangerous situation for pedestrians trying to cross Route 8 further west. Rayburn Street is too close to the Line Street intersection to install another traffic control signal and crosswalk. An unsignalized crosswalk has recently been installed near Peterson Street. The University of Idaho plans on removing Rayburn Street and creating a new street opposite Peterson Street. This would allow installation of a traffic control signal and a crosswalk.

An active railroad line runs adjacent to State Route 8. A train travels this route approximately once a week.

2.3.9 Problems and Opportunities

The evaluation of public concerns reflects a range of needs, which are perceived by the public. This section describes these needs in the context of problems and opportunities that can be addressed through water and related land resource management. The problems and opportunities are based on the without project

conditions that are described above. The problems and opportunities that have been identified are:

- **Problem:** A section of Paradise Creek has been channelized and covered which contributes to a fragmented habitat corridor. **Opportunity:** Re-establish a continuous creek and habitat corridor.

- **Problem:** The covered section of the creek is armored with riprap and concrete which contributes to a degraded creek condition. **Opportunity:** Create a more natural channel with vegetated banks and riparian corridor.

- **Problem:** The creek receives untreated storm water runoff from the University of Idaho campus. **Opportunity:** Construct vegetative (wetland, swales, *etc*) or structural (retention/infiltration basins, oil/water separator, *etc*.) systems to aid in improving water quality.

- **Problem:** Much of the upstream and downstream sections of the channel lack woody vegetation with numerous invasive species overpopulating channel banks. **Opportunity:** Revegetate the upstream and downstream sections of the channel with native woody vegetation.

- **Problem:** During low flows, water is stagnant increasing water temperatures. **Opportunity:** Create a low flow channel that will allow for better water circulation.

2.3.10 Planning Objectives

The water and related land resource problems and opportunities identified in this study are stated as specific planning objectives to provide focus for the formulation of alternatives. These planning objectives reflect the problems and opportunities and represent desired positive changes in the without project conditions. The planning objectives are specified as follows:

- Daylight approximately 1,100 ft of Paradise Creek from a covered channel.
- Establish a riparian vegetation corridor along Paradise Creek.
- Improve water quality in Paradise Creek.
- Improve aesthetics in the area.

2.3.11 Planning Constraints

Unlike planning objectives that represent desired positive changes, planning constraints represent restrictions that should not be violated. The planning constraints identified in this study are as follows:

- Compliance with the Paradise Creek total maximum daily load (TMDL) implementation plan. This requires coordination with the Paradise Creek Watershed Advisory Group to limit further water quality impacts to the creek.

- The limited amount of land available for the new channel.

- The need to maintain the existing flow capacity of the creek for flood control.

3.0 - PLAN FORMULATION AND ALTERNATIVE DEVELOPMENT

3.1 Alternative Formulation Rationale

A broad range of alternative approaches were considered in the development of the proposed project. Alternatives for this project were developed from management measures recommended by the local sponsor, local interest groups, public meetings, input from other governmental resource agencies, non-governmental organizations, and the Corps project delivery team.

3.2 No Action

The Corps is required to consider the option of "No Action" as one of the alternatives in order to comply with the requirements of the National Environmental Policy Act (NEPA). With the No Action plan, which is synonymous with the "Without Project Condition," it is assumed that no project would be implemented by the Federal Government or by local interests to achieve the planning objectives. The No Action plan forms the basis which all other alternative plans are measured against.

3.3 Measures to Address Identified Planning Objectives

A management measure is a feature or activity at a site, which address one or more of the planning objectives. A wide variety of measures were considered, some of which were found to be infeasible due to technical, economic, or environmental constraints. Each measure was assessed and a determination made regarding whether it should be retained in the formulation of alternative plans. A stand alone measure is an alternative that can be constructed independent of each other with varying levels of restoration output. A stand alone measure cannot be combined with any other stand alone measure. Optional measures are those measures that can be constructed with any other measure. Optional measures may be combined with each other as well as with any of the stand alone measures. The descriptions and results of the evaluations of the measures considered in this study are presented below:

3.3.1 Stand Alone Measures

Measure 1. Relocate the Paradise Creek channel from just upstream of Line Street, north, parallel to State Route 8. This channel would replace the existing channel under Paradise Creek Street as the main channel. The existing channel under the street would remain in place to convey flood flows when necessary. The existing overflow swale adjacent to Paradise Creek Street would be filled in with material from the new channel. This measure would improve water quality and create a continuous habitat and riparian corridor.

Measure 2. Relocate the Paradise Creek channel from just upstream of Line Street into the existing overflow swale and modify the swale to include vegetation. The

existing channel under Paradise Creek Street would remain in place to convey flood flows when necessary. This measure would improve water quality and create a continuous habitat and riparian corridor.

Measure 3. Uncover and restore the existing Paradise Creek channel. Paradise Creek Street would be removed and the existing channel would be restored. Concrete and riprap in the existing channel would be removed and more natural material would be used to create the stream and riparian habitat. Most of the area within the existing overflow swale would be incorporated into the channel area. This measure would improve water quality and create a continuous habitat and riparian corridor.

3.3.2 Optional Measures

Option a. Wetland Cells. Storm water wetland cells could be constructed near the existing Paradise Creek to capture and treat some of the storm water runoff from part of the University of Idaho campus. This could help improve the overall water quality of Paradise Creek.

Option b. Downstream Restoration. This option would mainly involve channel reshaping, bioengineering stabilization methods, construction of a low flow channel, and revegetation with native riparian plants downstream of University of Idaho's Recreation Center. The downstream option is the uncovered section of Paradise Creek that runs parallel with Highway 8 in between the recreation center and Perimeter Drive. This measure would improve the habitat and riparian corridor for this section of the creek as well as improve water quality.

Option c. Upstream Restoration. This option would restore the Paradise Creek channel from Eighth Street to West Sixth Street. Environmental improvements would be made from the upper limits of the selected alternative to Highway 95. This option would mainly involve channel reshaping, bioengineering stabilization methods, construction of a low flow channel, and revegetation with native riparian plants. This measure would improve the habitat and riparian corridor for this section of the creek as well as improve water quality.

Option d. Restore the Paradise Creek channel adjacent to West Sixth Street. This option would restore the Paradise Creek channel from Line Street up to Sixth Street. The creek corridor in this stretch is very narrow, confined by parking lots, a street, a school, and play fields. Though the creek has been straightened in this stretch, much of it is bordered by large trees.

3.4 Preliminary Plans Eliminated from Further Consideration

Stand Alone Measure Number 3 - Uncovering the stream and restoring it in its present location was removed from consideration because it would eliminate

Paradise Creek Street and all access that it provides including emergency and law enforcement vehicles.

Optional Measure Letter a – During the preliminary planning phase of the study, this measure was considered to be combinable with any stand alone measure. Based on preliminary hydrological analysis of stand alone measure 1, storm water run off in the area in inadequate to solely support a wetland in this location. Basically, once the creek is relocated to the north in measure 1, there will not be enough water to support a viable wetland in the area defined. Therefore, optional measure a is only combinable with stand alone measure 2.

Optional Measure Letter d - The option of restoring the creek adjacent to West 6th Street was removed from consideration because this section of creek is already relatively well vegetated with large trees. Modifying this narrow section would decrease its habitat value for many years.

3.5 Final Array of Alternatives

With those management measures or plans that survived the screening described above, a final array of alternatives was formulated. Every possible combination of the measures and options was evaluated in an incremental cost analysis.

3.6 Optimization and Best Buy Analysis

Environmental plan evaluation consists of a comparison of the environmental outputs and the economic costs of alternative plans. The cost effectiveness analysis and incremental cost analysis procedures provide a structured framework to assist in environmental plan evaluation. The following analysis was accomplished by utilizing the planning methodology incorporated in the Institute of Water Resources' Cost Effectiveness and Incremental Cost Analysis program (IWR-PLAN). Every possible combination of solutions is derived and a total cost and total output is calculated for each combination. The program then conducts cost effectiveness analysis; first identifying the least cost combination for every possible level of output, and then identifying the cost effective set of combinations by screening out plans where more output could be provided by another combination at the same or less cost. Once the cost effective set of combinations is identified, the program calculates the incremental cost and incremental output of moving from each combination to the next larger combination. The program also identifies the subset of the cost effective set which is the most efficient in production, or "best-buys", as scale increases from the smallest to the largest combination.

Alternatives evaluated include; the no action alternative and various combinations of restoration measures. The ecosystem output variable is stated in acres of habitat improvement. Project outputs were determined by estimating the additional amount of riparian habitat that would be provided by each alternative (acres).

Table 3-1 presents the study measures. Measures for this analysis are 1. Relocate Channel to the North, 2. Relocate Channel into the Existing Overflow Swale, a. Storm water Wetland Cells, b. Include Downstream Reach, and c. Include Upstream Reach. In addition, the No Action Alternative was analyzed. Again, not all measures are combinable. For example, measures 1 and 2 are two ways to relocate the creek and only one or the other would be part of any alternative.

Table 3-1. Management Measures

Measure	Description
1	Relocate Channel to the North
2	Relocate Channel into the Existing Overflow Swale
a	Storm Water Wetland Cells
b	Include Downstream Reach
c	Include Upstream Reach

Upon running the model, there were 20 combinable alternatives identified. Table 3-2 presents the 20 combinations with preliminary cost estimates at October 1st, 2003 price level. Alternatives range from the no action alternative with 0 benefits and $0 cost to the 20th combination that has a cost of $2,997,000 with benefits equaling 5.9 acres.

Table 3-2. Alternative Combinations (October 1st, 2003 price levels)

Counter	Management Measures					Benefit	Cost	Average Cost
	1	2	a	b	c	(acres)	($1,000)	($1,000)/acre
1	NO ACTION					0	$0	$0
2	0	0	1	0	0	0.4	$472	$1,180
3	0	0	0	0	1	0.7	$425	$607
4	0	0	1	0	1	1.1	$897	$815
5	0	1	0	0	0	1.4	$617	$441
6	0	1	1	0	0	1.8	$1,089	$605
7	0	0	0	1	0	2	$1,210	$605
8	0	1	0	0	1	2.1	$1,042	$496
9	0	0	1	1	0	2.4	$1,682	$701
10	0	1	1	0	1	2.5	$1,514	$606
11	0	0	0	1	1	2.7	$1,635	$606
12	0	0	1	1	1	3.1	$2,107	$680
13	1	0	0	0	0	3.2	$1,362	$426
14	0	1	0	1	0	3.4	$1,827	$537
15	0	1	1	1	0	3.8	$2,299	$605
16	1	0	0	0	1	3.9	$1,787	$458
17	0	1	0	1	1	4.1	$2,252	$549
18	0	1	1	1	1	4.5	$2,724	$605
19	1	0	0	1	0	5.2	$2,572	$495
20	1	0	0	1	1	5.9	$2,997	$508

To further refine the number of alternatives remaining, criteria to distinguish the cost effectiveness of each alternative were established. The screening for cost effectiveness included the following.

The same output level could be produced by another plan at less cost;
A larger output level could be produced at the same cost; or
A larger output level could be produced at less cost.

From the cost effectiveness analysis, 9 combinations remained. Table 3.3 shows the cost effective combinations with Figure 3-1 graphically depicting these plans.

Table 3-3 Cost Effective Combinations (October 1, 2003 price levels)

Counter	Management Measures					Benefit (acres)	Cost ($1,000)	Average Cost ($1,000)/acre
	1	2	a	b	c			
1	NO ACTION					0	$0	$0
3	0	0	0	0	1	0.7	$425	$607
5	0	1	0	0	0	1.4	$617	$441
8	0	1	0	0	1	2.1	$1,042	$496
13	1	0	0	0	0	3.2	$1,362	$426
16	1	0	0	0	1	3.9	$1,787	$458
17	0	1	0	1	1	4.1	$2,252	$549
19	1	0	0	1	0	5.2	$2,572	$495
20	1	0	0	1	1	5.9	$2,997	$508

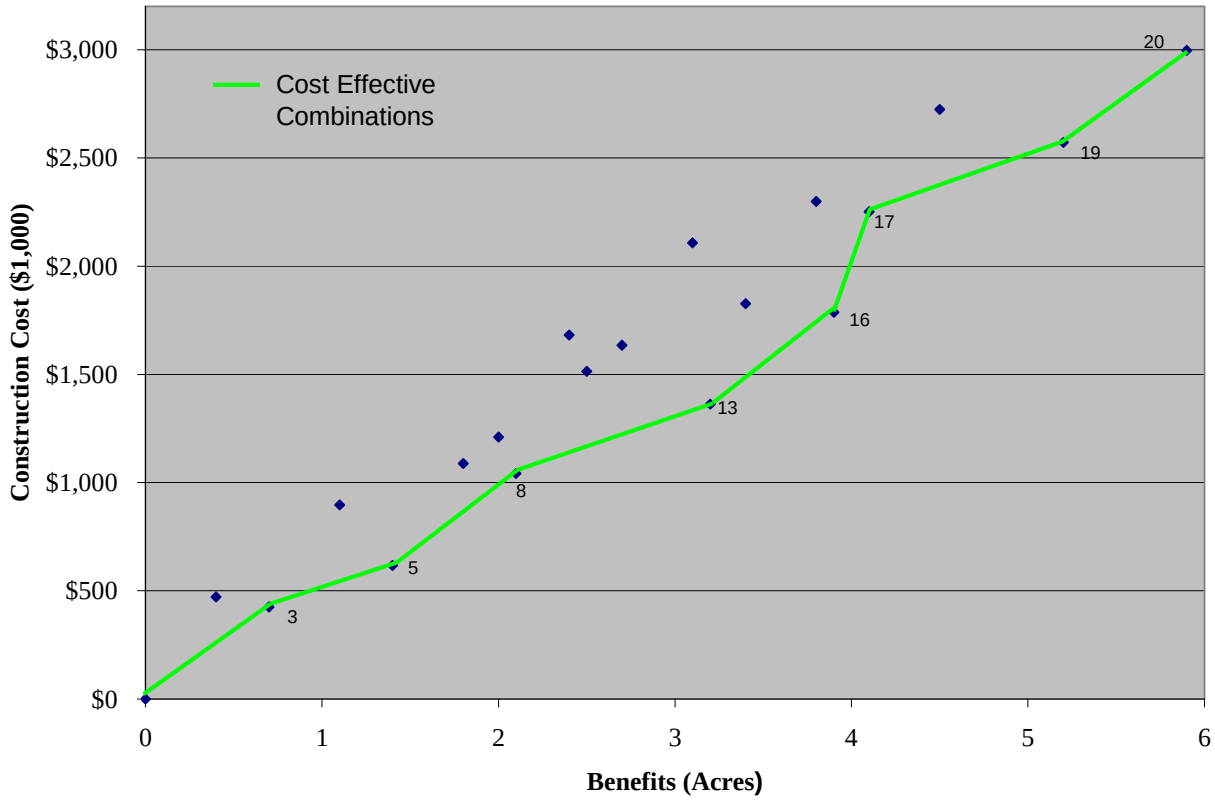


Figure 3-1. Cost Effective Combinations

From the cost effective combinations, best buy plans were determined. A best buy is designated by those cost effective plans that have the greatest increase in output or benefit for the least increase in cost. Each cost effective plan was first compared to the no action alternative and ranked. This ranking provided the first best buy plan. From here, each remaining plan was compared to the first best buy plan and ranked. This analysis yielded the second best buy and so on. There can be multiple best buy plans and any of them can be chosen as the preferred alternative. Table 3-4 presents the best buy combinations.

Table 3-4 Best Buy Combinations (October 1, 2003 price levels)

Counter	Management Measures					Benefit	Cost	Average Cost
	1	2	a	b	c	(acres)	($1,000)	($1,000)/acre
1	NO ACTION					0	$0	$0
13	1	0	0	0	0	3.2	$1,362	$426
19	1	0	0	1	0	5.2	$2,572	$495
20	1	0	0	1	1	5.9	$2,997	$508

The three best buy combinations (combination 13, 19 and 20) as well as the no action alternative are carried forth in the analysis and further described as alternatives.

3.7 Alternatives

3.7.1 Alternative A: No Action

The no action alternative assumes that no project would be implemented by either the Corps or local interests to achieve the planning objectives. The no action alternative is synonymous with the without project condition.

3.7.2 Alternative B: Relocate Channel to the North (combination 13)

As a means to improve aquatic and riparian habitat features in the area, the covered section of Paradise Creek would be relocated, which would daylight the channel. This alternative would include two main elements: (1) Construct a diversion and high flow control structure at the existing debris trapping bar screen just upstream of Line Street, and (2) Construct approximately 2,000 ft of new channel routed north along the east side of Line Street to Third Street, crossing under Line Street, and then north and west adjacent to State Route 8, tying back into the existing channel. This land currently consists of open lawn grass, an active railroad line, and a railroad bed which was converted into a trail. The trail system would be moved along side the new channel alignment. The new channel and floodplain would be constructed as large as possible within the property constraints. High flows that cannot be contained within the new stream corridor would be routed into the existing covered channel.

This new alignment would restore this section of the creek's structure and function and is close to the location where the creek was located over 100 years ago. This new channel segment would include gentle channel meanders and riparian vegetation, improving the habitat and aesthetics of the creek and enhancing its ability to provide water quality treatment. The existing overflow swale parallel to Paradise Creek Street would be filled with material from the new channel. Figure 3-2 shows the site plan of the purposed alternative.

Following is a list of steps to be undertaken for this alternative. This list does not prescribe the exact sequence for all of the steps.

- Rayburn Street, north of the existing recreation center campus parking lot to the intersection with State Route 8 would be closed. It might later be totally removed by the University of Idaho. The University of Idaho plans to build a new street, including two stream crossings (one over the new channel and one over the overflow channel), at Peterson Street in the future. The abutments for the new bridges (or box culverts) at Peterson Street will be coordinated at the same time as channel relocation work to minimize future disturbance to the riparian zone.

- Construction of a diversion structure at the existing debris trapping bar screen just upstream of Line Street.

- Construction of a pedestrian bridge just downstream of the diversion structure. This bridge would also function as a high flow control and protect utilities crossing in the area.

- Construction of a new traffic bridge/box culvert on Line Street just south of the intersection with Third Street.

- Approximately 2,000 ft of new channel would be constructed, routed north along the east side of Line Street to Third Street, crossing under Line Street, and then heading north and west adjacent to State Route 8. The new channel would then tie into the existing Paradise Creek channel. The new channel would contain a low flow channel located near the middle of the new creek bed. The existing channel under Paradise Creek Street would remain in place as an overflow channel and to convey the existing storm water discharge.

- Several large trees, identified for removal due to the new creek alignment, would be utilized as fish habitat structures in the new channel.

- The new channel would be stabilized with bioengineering materials and planted with native riparian plants and trees.

- Excess material from the channel excavation would be stockpiled along the existing overflow swale until the stream is diverted into the new channel. Once the stream is diverted into the new channel, the overflow channel would be filled in with the stockpiled material.

- Utilities would need to be relocated or modified. The new alignment would cross a city water line near the diversion structure and two sewer lines just west of Line Street.

- A 12-foot wide access and maintenance path would be placed at the edge of the riparian zone.

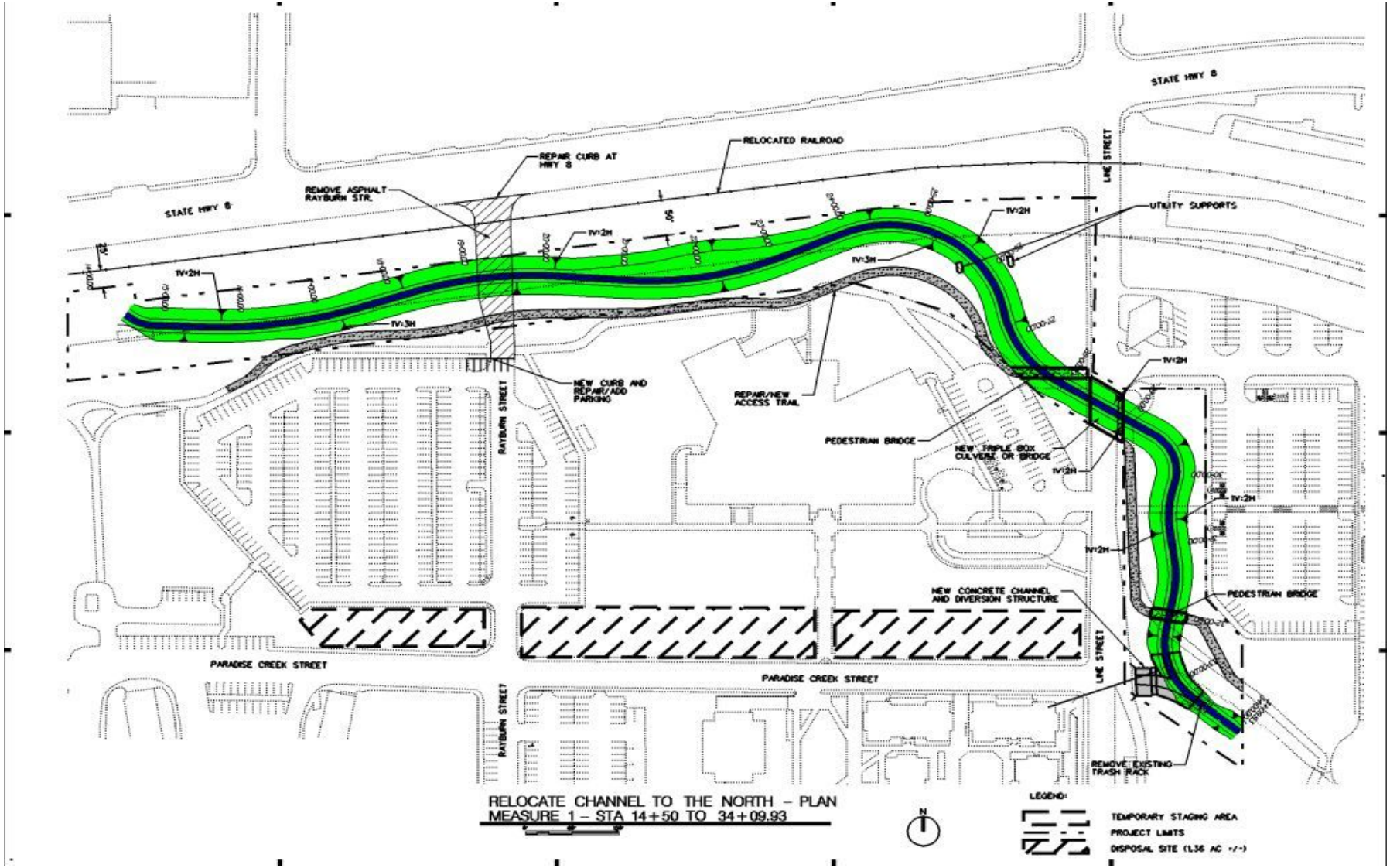


Figure 3-2. Alternative B - Relocate Channel to the North

3.7.3 Alternative C: Relocate Channel and Downstream Restoration (combination 19)

This alternative would include the measures in Alternative B and extend the restoration corridor further downstream on Paradise Creek. The University of Idaho recently acquired much of this property. Channel improvements may not encroach closer than 25 ft of the railroad tracks. Environmental improvements to Paradise Creek would be made from the lower end of Alternative B to Perimeter Drive. This alternative would increase the amount of environmental benefit. The downstream part of this alternative would mainly involve channel reshaping, bioengineering stabilization methods, construction of a low flow channel, and revegetation with native riparian plants. Figure 3-3 shows the site plan of the included downstream reach for this alternative. The site plan for the channel relocation is shown in figure 3-2.

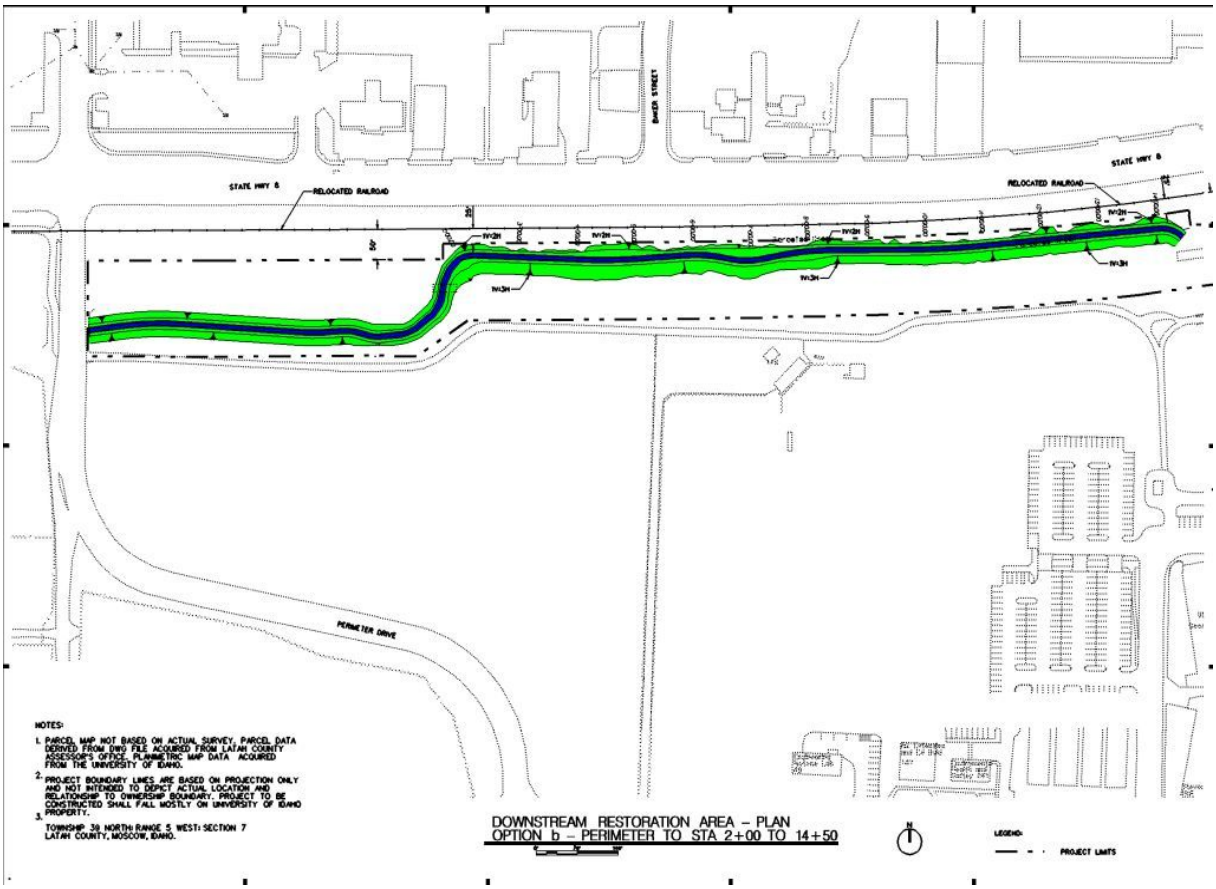


Figure 3-3. Part of Alternative C - Downstream Restoration

3.7.4 Alternative D: Relocate Channel and Downstream and Upstream Restoration (combination 20)

This alternative is the combination of the remaining options: relocating the channel to the north, the downstream restoration and the upstream restoration. A new channel would be constructed north of Line Street with downstream restoration occurring along Highway 8 and additional upstream restoration between 6th Street and College Avenue. The restoration in the upstream section would mainly involve channel reshaping, bioengineering stabilization methods, construction of a low flow channel, and revegetation with native riparian plants. For description on construction involving relocating the channel and the downstream restoration effort, see paragraph 3.7.2-3.7.3. The site plan for the channel relocation is shown in figure 3-2. See figure 3-3 and 3-4 for the downstream restoration and upstream restoration efforts respectively.

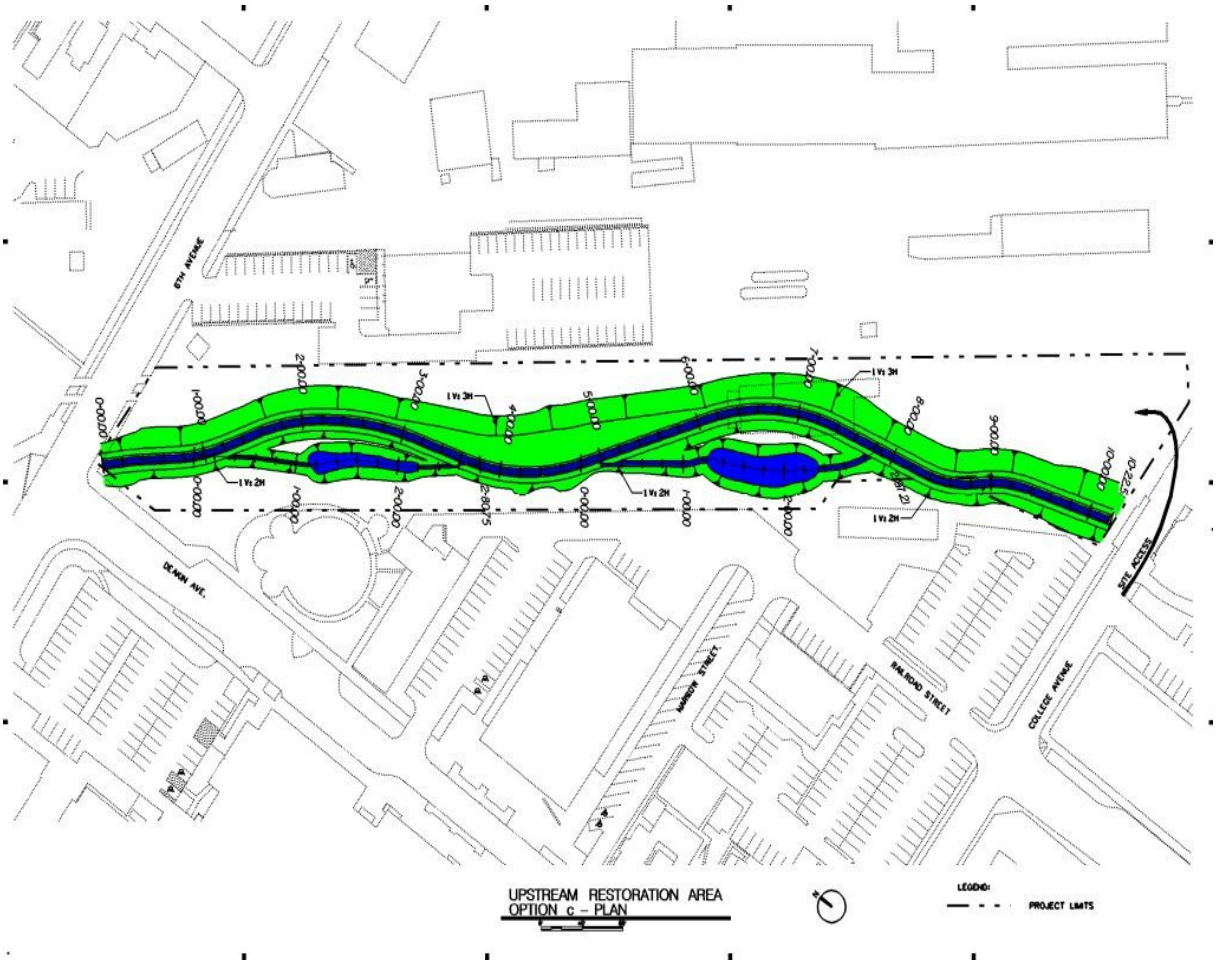


Figure 3-4. Part of Alternative D - Upstream Restoration

4.0 - ALTERNATIVE EVALUATION

4.1 Evaluation Methodology

Comparison is the fifth step in the planning process, which is based on the evaluation of the impacts of the alternatives, the fourth step in the planning process. The evaluation of impacts is based upon a comparison of condition with and without the implementation of the alternative plans.

Table 4.1 is a summary of the findings presented in the Environmental Assessment for this portion of Paradise Creek. The table is based on the measures presented in Section 3.3 of this report. The table uses the same data found in Table 3-1 of Appendix E, except the effects for each option are combined (added) to identify the cumulative effects for each alternative. For instance, the cumulative effects for Alternative C are the sum of the effects for measure 1 (EA – Alt 2 relocate channel north) plus the effects for measure b (EA – option 2 include downstream). Each resource has a range from -6 to +6 for long term and short term effects. More detailed evaluations of the environmental impacts of the measures are presented in appendix E, FONSI and Environmental Assessment.

Table 4-1. Effects Summary Table

Resource	Alt A No Action		Alt B Relocate Channel		Alt C Relocate Channel & Downstream Restoration		Alt D Relocate Channel & Upstream & Downstream Restoration	
	S	**L**	**S**	**L**	**S**	**L**	**S**	**L**
Vegetation	0	0	-1	2	-1	4	-1	5
Wildlife	0	0	0	1	0	3	0	4
Aquatic Resources	0	0	-1	2	-2	4	-3	5
T&E Species	0	0	0	0	0	0	0	0
Wetlands	0	0	0	1	0	2	0	3
Floodplains	0	0	1	1	1	1	1	1
Aesthetics	0	0	-1	2	-2	4	-3	5
Land Use	0	0	2	2	3	3	4	4
Cultural Resources	0	0	0	0	0	0	0	0
Recreation	0	0	1	1	2	2	2	2
Socio-Economics	0	0	1	1	2	2	3	3
Transportation	0	0	-2	0	-3	0	-4	0
HTRW	0	0	0	0	0	0	0	0
Air Quality	0	0	-1	0	-1	0	-1	0
Noise	0	0	-1	0	-2	0	-3	0
Geology & Soils	0	0	0	0	0	0	0	0
Surface Water	0	0	-1	1	-2	2	-3	3
Stormwater	0	0	-1	1	-2	2	-3	2
Groundwater	0	0	0	0	0	0	0	0
Utilities/Public Services	0	0	-1	0	-1	0	-2	0
Sum	**0**	**0**	**-5**	**15**	**-8**	**29**	**-13**	**37**
Overall	**0**		**10**		**21**		**24**	

S = Short Term Impacts
L = Long Term Impacts

Negative values depict negative impacts, 0 depicts no effect, and positive values represent benefits. The sum of all the values for each parameter gives a general overall comparison of the alternatives. Alternative D – Relocate Channel including upstream and downstream Restoration would have the most overall benefits in addition to the largest summation of long-term benefits.

4.2 Environmental Resources and Consequences

The action alternatives that would restore the ecosystem along Paradise Creek are very similar to each other. Each alternative incorporates one or more of the management measures identified in Section 3.3 of this document. The differences in alternatives come with the various combinations of geographic areas to be restored and the total area restored. Since impacts and benefits between the alternatives would be similar, the "No Action" description for each of the environmental opportunities identified in Section 2.4.9 will be followed by a brief comparison of the alternatives if there is any difference between them, and then a narrative of direct, indirect, and cumulative impacts.

4.2.1 Creek Habitat Corridor Connectivity

4.2.1.1 No Action - The fragmented creek and habitat corridor of Paradise Creek would continue to be affected by confinement, channelization, and the covered creek.

4.2.1.2 Impacts of the Proposed Action - Since all of the remaining alternatives contain the management measure of daylighting the creek, a more continuous habitat corridor along Paradise Creek would result from all of the action alternatives.

- Direct Adverse Effects – None anticipated.

- Direct Beneficial Effects – Fish and wildlife in the area would benefit from a more continuous creek habitat corridor. Benefits would include a more natural lighting condition to the creek channel, more diversity to the creek structure and the re-establishment of riparian and upland vegetation. These improvements to the continuous creek corridor may improve fish passage and travel corridor conditions for wildlife.

- Indirect Adverse and Beneficial Effects – None anticipated.

- Cumulative Impacts – Improving the aquatic ecosystem in this area further extends restoration efforts completed in areas upstream of the proposed project area and encourages similar projects to continue in the future.

4.2.2 Riparian Habitat / Vegetation

4.2.2.1 No Action - Existing vegetation conditions would remain in the present highly degraded state throughout the proposed project area. Additionally, the covered section of Paradise Creek would continue to limit the amount and variety of vegetation available.

4.2.2.2 Impacts of the Proposed Action - For alternative B, there are no long term adverse impacts. Daylighting the channel will only improve riparian habitat and promote vegetation growth. For alternatives C, and D the limited vegetative community types that currently survive in the area would experience some temporary and permanent impacts related to construction and operation of the project. Adverse impacts would be limited to construction activities while the completed project would have beneficial impacts when riparian and upland areas are re-established along Paradise Creek. The various alternatives would provide different amounts of vegetation as shown in Table 4-2.

Table 4-2. Restored Vegetation by Alternative

Action Alternative	Riparian Vegetation
Alternative B	3.2 acres
Alternative C	5.2 acres
Alternative D	5.9 acres

- Direct Adverse Effects – The existing pockets of reed canary grass and riparian vegetation will be impacted temporarily and/or permanently by construction, excavation, and/or filling activities associated with the proposed action. The direct adverse impacts to vegetation would include lack of water, where the alignment is abandoned, and destruction of vegetation where new channel segments are excavated or stabilized.

- Direct Beneficial Effects – A completed project would result in the establishment of between 3.2 and 5.9 acres of riparian vegetation. The amount, quality, and diversity of this vegetation would increase as it matures. As this vegetative structure develops, it would provide shade and cover for fish and wildlife species as well as provide additional creek bank stability.

- Indirect Adverse Effects – Improving the riparian and vegetation corridor may increase human interaction with the re-established vegetation. Added walking traffic may create unplanned walking paths within both the upland and riparian areas.

- Indirect Beneficial Effects – A mature and diverse vegetative community, even in an urban setting, would include the food organisms produced from the vegetation that would contribute to the overall heath of the aquatic system.

- Cumulative Impacts – Re-establishment of the vegetative community along newly uncovered or realigned sections of Paradise Creek would increase the continuous habitat corridor for fish and wildlife.

4.2.3 Water Quality

4.2.3.1 No Action – The water quality in Paradise Creek would continue to be affected by channelization, covering, and stormwater run-off.

4.2.3.2 Impacts of the Proposed Project – Impacts from one environmental restoration project, whether adverse or beneficial, would not have a significant effect on the water quality in Paradise Creek. There would be short-term impacts to water quality from construction activities and initial water diversion into the new channel. Alternative B would have the least short-term impacts to water quality because the new channel is being constructed in the dry. Alternative C and D would have greater short-term adverse impacts, but greater long-term benefits.

- Direct Adverse Effects - During construction of Alterative C or D the creek banks may be subject to erosion, which could cause additional sediments to enter existing waters. Increased suspended soils (turbidity) may also result from the addition of water to a newly developed channel.

- Direct Beneficial Effects – Improved water quality and overall stream health would be attributed to actions; *i.e.*, increased sinuosity, in-stream diversity, low-flow channel, and establishing riparian and upland vegetation. Upland vegetation serves as a buffer zone that provides some filtration of stormwater run-off contaminants prior to entry into Paradise Creek.

- Indirect Adverse or Beneficial Effects – None anticipated.

- Cumulative Impacts – None anticipated.

4.2.4 Low Flow Channel

4.2.4.1 No Action – Currently, there is no continuous low flow channel in Paradise Creek. The water moves little during low flow and ponds. This aids in increasing water temperatures and decreasing water quality.

4.2.4.2 Impacts of the Proposed Project – None anticipated.

Table 4-3. Linear Feet of Low Flow Channel

Alternative	Low Flow Channel (ft)
Alternative B	1960
Alternative C	3890
Alternative D	5400

- Direct Adverse Effects – Temporary impacts to water circulation during construction may include increased turbidity in the creek. Turbidity in the creek would result when construction is complete and water is diverted into a newly developed or newly daylighted channel. This impact would be temporary in nature.

- Direct Beneficial Effects – Creation of a low flow channel through the Paradise Creek reach would increase water circulation and improve water quality. This has the potential to increase sinuosity and in-stream habitat as well as aid in establishment of a riparian area which would benefit all aquatic species.

- Indirect Adverse and Beneficial Effects – None anticipated.

- Cumulative Impacts – None anticipated.

4.3 Incremental Cost Analysis

An incremental cost analysis was used to show the incremental cost and incremental benefits (outputs) of moving from one alternative to the next larger alternative. Alternative B has the lowest average cost but also has the lowest number of benefits. Alternative C and D add more acreage for nearly the same incremental cost ($605 and $607) yet Alternative D has the highest total output. Table 4-4 displays all incremental results.

Table 4-4. Incremental Benefits and Incremental Costs (October 1, 2003 price levels)

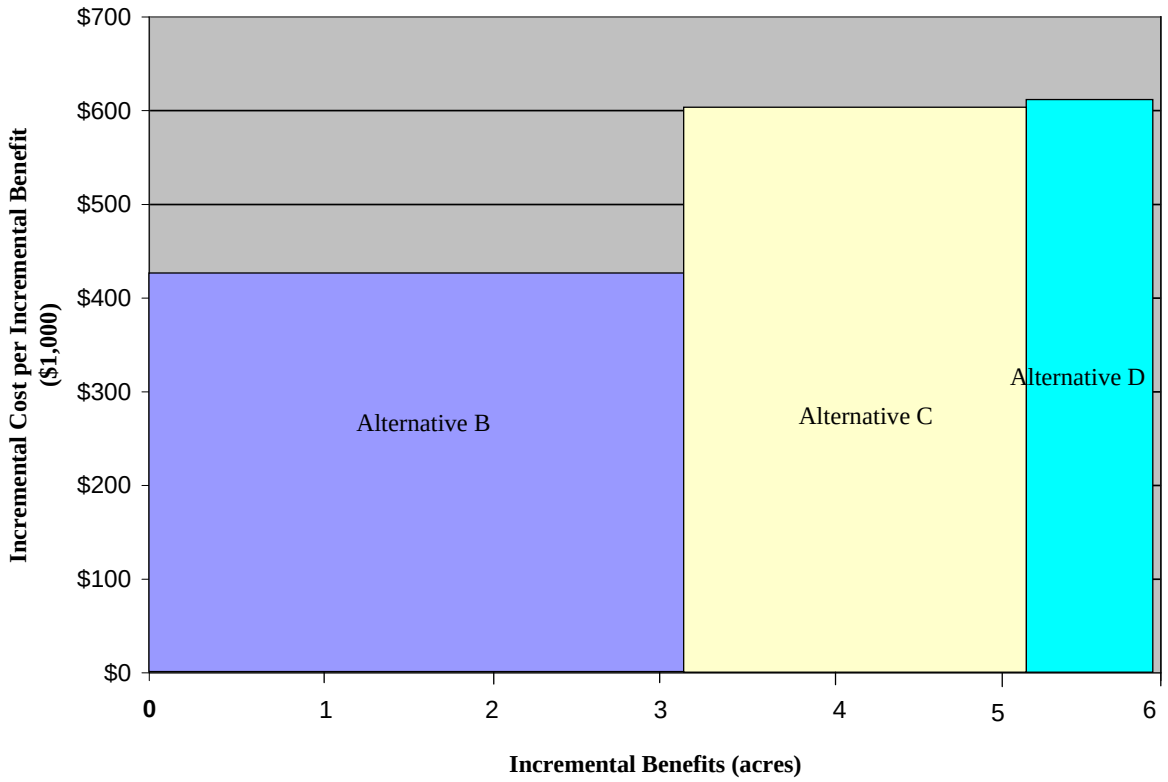
Alternative	Benefits (acres)	Construction Cost ($1,000)	Cost per Benefit ($1,000/acre)	Incremental Cost ($1,000)	Incremental Benefits	Incremental Cost per Incremental Benefit ($1,000)
A	0	$0	$0	$0	N/A	$0
B	3.2	$1,362	$426	$1,362	3.2	$426
C	5.2	$2,572	$495	$1,210	2	$605
D	5.9	$2,997	$508	$425	0.7	$607

4.4 Alternative Selection

As part of the Corps' planning process, the alternatives were evaluated with respect to cost and environmental benefit. The Corps has several different national objectives. A system of "plans" or "accounts" is used to compare projects. For ecosystem restoration projects, the Corps objective is called the National Ecosystem Restoration (NER) Plan.

Looking at Figure 4-1, Alternative D reasonably maximizes benefits in regards to cost. Additionally, alternative D maximizes the amount of environmental benefits that could be attributed to this project.

Figure 4-1. Incremental Analysis (October 1, 2003 price level)



5.0 - RECOMMENDED PLAN

The alternative that reasonably maximizes the benefits in relation to cost and meets the planning objects is Alternative D – Relocate the channel including upstream and downstream restoration.

5.1 Plan Description

This alternative would include three main elements: (1) Construct approximately 2,000 ft of new channel routed north along the east side of Line Street to Third Street, crossing under Line Street, and then north and west adjacent to State Route 8, tying back into the existing channel, (2) channel reshaping and revegetation in the downstream section, and (3) channel reshaping and revegetation in the upstream section. Additionally, the existing maintenance path would be moved along side the new channel alignment. The new channel and floodplain would be constructed as large as possible within the property constraints to maximize environmental benefits and flood capacity.

This new channel segment would include gentle channel meanders and riparian vegetation, improving the habitat and aesthetics of the creek and enhancing its ability to provide water quality treatment. The existing overflow swale parallel to Paradise Creek Street would be filled with material from the excavation of the new channel.

5.2 Natural Features

The proposed footprint for the new Paradise Creek alignment encompasses more than 15 acres of land on or around the University of Idaho campus. The proposed alignment crosses through existing streets and sidewalks. Topography for the ground surface in the area is generally flat.

5.3 Survey and Mapping

The University of Idaho provided two-dimensional mapping of the project area. All map data is in English units and is based on Washington Coordinate System, South Zone, utilizing NGVD29 and NAD27 vertical and horizontal datum. A full survey of the project area is planned during the design portion of the project. The existing survey is out of date, does not have data on the existing channel bottom, nor is it three-dimensional. Cross sections of the existing channel will also need to be obtained to refine the hydrologic analysis. Additional utility information will need to be obtained to include the location of the Avista utility poles in the vicinity of the upstream channel reshaping area.

5.4 Geotechnical

No test pits or borings were performed for this project. The URS Corporation collected samples using a Standard Split Spoon (SPT) sampler and a Dames & Moore (D&M) Type U sampler for the 600-Bed Residential and Classroom/Multi-Use Facility located between Rayburn and Line streets and Sixth and Paradise Creek streets. Samples were collected in April 2001. Test results indicate silts and clays are present up to 40 ft below the surface.

GeoEngineers-Gifford completed drilled borings for the Student Recreation Center located between Rayburn and Line streets and Paradise Creek Street and the alignment proposed in relocating the channel for the Paradise Creek project. Samples were collected in March and December 1999. Test results indicate four general soil units. Fill consisting of 3-12 inches of brown gravel was on the surface. An upper silt layer extends between 5 and 11.5 ft below the fill. Sands and gravels extend between 5 and 28 ft below the existing grade. A lower clay unit was encountered below the sands and gravels and extends to the depth of the borings.

Soils information for the upstream reshaping project was not available. A simplified investigation is needed to complete design in the area. This would involve a maximum of 3 borings to verify design assumptions and remove any questions about contaminated soils in the newly acquired railroad properties.

5.5 Restoration Tools

The restoration tools consist of new channel construction, a diversion structure, filling of overflow drainage swales, reshaping, pond development, and revegetation of upstream and downstream channel and upland areas.

5.5.1 New Channel Construction

The water that flows in the covered channel under Paradise Creek Street will be diverted to a new channel that flows north, paralleling Line Street. The creek will turn west under Line Street and run parallel to Highway 8. The new channel will tie into the existing channel north of the University of Idaho where the creek currently makes a 90 degree turn (see section 10 - Drawings). The channel thalweg will be meandering. The root wads of cleared trees will be used as aquatic habitat and the channel slopes will be planted and protected with erosion control materials.

The new channel begins at the existing trash rack immediately upstream from Line Street. The trash rack will be removed and the channel diverted to the north away from the existing box culvert at Line Street. A 5-foot tall concrete diversion structure will force the low channel flows to the north into the new channel alignment. The channel in this location will be concrete lined to prevent erosion in this critical area. During flows in excess of 1,000 cfs the creek will flow thru both the new channel, the existing box culvert, and under Line Street thru the covered channel under Paradise

Creek Street. This channel will remain in service as storm drainage collection and for handling larger storm events.

The new channel will consist of a low flow channel approximately 2 ft deep and 8 to 10 ft wide. The low flow channel will meander within the general channel cross section. The upper channel slopes will range from 1V:3H to 1V:2H and will be protected with a double layer moderate flow erosion control fabric. The slopes will be vegetated with native species, coir logs, and root wads will be incorporated into the design for erosion protection and fish and wildlife habitat.

From the diversion structure, the new channel will head north between Line Street and the existing student parking lot. Channel crossings will be constructed for both pedestrian and vehicle traffic. A pedestrian bridge will be constructed just downstream of the beginning of the new channel alignment. This is in the location of the existing Paradise Creek path. It is also placed in this location to provide cover for a 12 inch waterline which will need to cross the channel. Another pedestrian bridge will be constructed at Third Street to provide access from the east side of the street to the recreation center on the west. This bridge will also serve the purpose of providing cover and support for the sanitary sewer line crossing in that location. A triple box culvert is envisioned at the location where the new channel will cross under Line Street. The bridge will be wide enough to accommodate a sidewalk for pedestrians and provide conduit for underground electrical, communications, and water utility lines crossing the channel.

Two additional sewer lines are presently located just north of the Third and Line Street intersection. The lines are shallow, have a history of not having an appropriate slope, and are planned to be upgraded during future infrastructure improvements. City engineers indicated any loss of slope or length added to these lines would greatly reduce their effectiveness. With this in mind, it was decided to keep both the lines in their present location and provide footing supports and HDPE (high density polyethylene) pipe for the utility crossings. The City will be an integral player during final design in regards to the final location for the crossings. The City's plans for the upgrading of these utilities will be incorporated into our final design to ensure that these upgrades do not interfere with the restoration efforts.

At present the area where the new channel will cross under Line Street and head northwest is vegetated with tall pine trees. These trees will need to be removed to accommodate the new channel alignment. The trees will be cut approximately 15 ft from the ground and removed with the root wad attached. The root wads will be placed strategically along the channel alignment for fish and wildlife habitat.

Beginning at approximately Station 25+00 the new channel will turn to the west and meander between the existing railroad and recreation complex parking area. The channel will be located such that its construction does not affect the two sewer lines just north of the recreation complex. The channel will continue west for

approximately 900 feet and join the existing Paradise Creek where it presently makes a sharp dogleg to the west.

Presently Rayburn Street extends from the Recreation Center parking lot north until it intersects State Highway 8. The intersection is not controlled by a traffic signal due to its proximity with the Line Street intersection. This creates a difficult situation for both pedestrian and vehicular traffic leaving campus via Rayburn Street. The University of Idaho has plans to remove Rayburn Street and create a new access to the highway at Peterson Street. This intersection would provide a better flow of traffic leaving the University of Idaho and would also be far enough away from Line Street to allow for a traffic signal. At this time, this project's design will incorporate the removal of Rayburn Street from the edge of the existing student parking lot at the recreation center to the intersection with Highway 8. The road is asphalt without curb and gutter except at the parking lot. The curb and gutter, parking lot, and an existing island will be removed, the asphalt repaired, and additional parking places will be incorporated into the area.

The University of Idaho will be involved in the final alignment of the new channel specifically in the area of the planned crossing for the Peterson Street addition. It is expected that the channel slopes will be steepened slightly in the area and the vegetated area will be reduced to allow for bridge footings outside the channel footprint so that future plans do not interfere with the integrity of the creek. At this time, it is assumed that the crossing will be approximately 40 foot wide with two traffic lanes and curb and sidewalk on both sides.

The existing overflow drainage swales along Paradise Creek Street will be filled so the ground is flush with the adjacent surface. This will provide a convenient and cost effective disposal area for a portion of the material removed during channel excavation. (The material may have to be stockpiled temporarily somewhere.)

5.5.2 Upstream Restoration

The upstream channel between Sixth Street and College Avenue will be widened to add meanders of the low flow channel, ponds during high flows, and provide extra flood capacity. The design will be similar to the work that was done on the channel upstream of College Avenue. The low flow channel will be lined with coir logs and root wads as will the outlets from the pond areas. The feasibility level design was accomplished using existing survey data which does not appear to reflect the present locations of Avista utility poles in this area. The exact locations of meanders and ponds along this alignment may change when final surveys are completed. The general design of a meandering channel with small side benches and ponds will remain.

Currently, a maintenance path runs along the east side of the current creek between Sixth Street and College Avenue. This maintenance path will be recreated once the

new alignment of the creek is constructed so that on going maintenance by Avista can be sustained.

5.5.3 Downstream Restoration

The downstream channel centerline will be moved south, away from the railroad track, and widened in some areas to add meanders of the low flow channel and provide extra flood capacity. Again the slope will be protected with a double layer moderate flow erosion control fabric. Coir logs will be incorporated into the design to support the low flow channel sides.

5.5.4 Paradise Creek Path

To fulfill requirements under a city easement and accommodate maintenance and pedestrian traffic, an existing path (Paradise Creek Path) runs parallel to Highway 8 starting at Perimeter Street, crossing Line Street, and running parallel to Line Street. The length of the path in the vicinity of the new channel construction footprint is approximately 1,700 ft. Portions of the path will be removed and re-established during the construction phase of the new channel. The path will be recreated fulfilling the sponsor's obligation to the City of Moscow. This path connects to the Chipman Trail, which extends to Pullman, Washington.

5.6 Construction Access and Staging Areas

The project site is easily accessed from the University of Idaho campus. The main project area and the area for the downstream option may be accessed via Line Street, Rayburn Street, and/or University of Idaho's lot 25. The area for the upstream option may be accessed via College Avenue, Sixth Street, and the Human Resources and Purchasing parking lot.

Staging areas will be located adjacent to the project areas on the University of Idaho's property, as shown on the drawings (see section 10 - Drawings).

5.7 Construction Materials

5.7.1 New Channel Construction

Materials for the new channel alignments will consist of slope protection materials, including but not limited to coir fiber logs, coir mats, straw blankets, and plantings. Trees removed to construct the new channel will be used as root wads along the banks. Material removed during the new channel construction will be used to fill the overflow drainage swale.

The diversion structure will be a reinforced concrete channel. A concrete weir leading into a triple box structure will be placed at the junction of the Paradise Creek Street overflow and new channel. The pedestrian bridge just downstream of the

diversion structure will have a concrete beam along the upstream end of the structure extending 3 ft into the channel to control the amount of flow into the new channel.

5.7.2 Upstream and Downstream Restoration

Materials for the new channel alignments will consist of slope protection materials including but not limited to coir fiber logs, coir mats, straw blankets, and plantings. Trees removed to construct the new channel will be used as root wads along the banks. Additional materials for the upstream and downstream options will consist of trees, cuttings, and riparian vegetation.

5.8 Construction

It is anticipated the construction work will be contracted through an Invitation for Bid contract during the low flow period of summer and fall.

5.8.1 New Channel Construction

Construction for the new channel will involve demolition of Rayburn Street; tree removal; new channel excavation; relocation of water, electrical, communications, and sewer utilities; planting cuttings, trees, and grasses; placing root wads, two new pedestrian bridges; and a street bridge at Line Street.

The diversion system consisting of the concrete channel and diversion structure will be constructed after the new channel has been constructed and a temporary diversion structure has been installed.

Material excavated for the new channel, would be placed in the drainage swale after the water has been diverted into the new channel to ensure that flood flow capacities are available if needed. The area would be graded and seeded.

5.8.2 Upstream and Downstream Restoration

Construction for the upstream and downstream options will involve excavation and riparian and upland vegetative planting.

5.9 Operation and Maintenance

Operation and Maintenance (O&M) of the completed project would be required. It is anticipated that approximately $5,000 per year will be needed to maintain the access roads and utility crossings and invasive species maintenance. This cost would be the responsibility of the sponsor.

5.10 Real Estate

For the recommended plan, 15.36 acres of land will be required for initial construction of the three main elements. The majority of this land is owned in fee by the sponsor (14.56 acres). As a matter of fact, all land required for the upstream restoration and the majority of the land required for relocating the channel is owned by the University of Idaho. The area not owned in fee (0.8 acres) will require a perpetual easement agreement for the restoration project between the University of Idaho and the Palouse River and Coulee City Railroad, Inc. The NFS currently has a license agreement with Palouse River and Coulee City Railroad, Inc. allowing for restoration activities to occur in their portion of the footprint but unfortunately, the agreement is not compliant with USACE requirements for a perpetual easement. The land impacted by the easement agreement is mostly (0.7 acres) located in a section of the downstream restoration footprint. A copy of the license agreement can be found in section 11 of this report. A full description of real-estate requirements for the recommended plan can be found in appendix A.

The lands, easements, rights-of-way, and disposal sites (LERRD) required to support construction and subsequent operation and maintenance is presented in appendix A of this report as three (3) separate main elements that can stand alone or be combined to represent the “Recommended Plan”. The objective is to construct all three main elements; however should the Palouse River and Coulee City Railroad, Inc. not be willing to grant the NFS the necessary perpetual easement rights, and the NFS determines that it does not desire to exercise its rights of eminent domain to acquire the additional necessary rights, the project footprint can be reformulated in the next project phase to eliminate the railroad portion of the project footprint and thus eliminate the need for the perpetual easement.

Standard estates to be acquired include fee interest, temporary work area easement, and temporary disposal site easement. The real-estate plan (REP) also contains a perpetual environmental easement estate specifically developed for this project, (see appendix A, paragraph A.8.1). The non-standard estate is being proposed because it is highly unlikely that the NFS will be able to acquire fee interest from the Palouse River and Coulee City Railroad, Inc., for this portion of the project footprint. The non-standard estate presented will be forwarded with a recommendation to HQ, USACE for a policy deviation and non-standard estate approval.

Following execution of the Project Cooperation Agreement (PCA), the NFS will require approximately 14 months for completing their real estate activities, and certifying the lands available to the Corps before advertising for project construction. If the railroad portion is eliminated from the project, then the duration needed for land certification would be less (i.e. 4 months, more or less). Following authorization for entry, the NFS will provide the Corps with the supporting lands, easements, and rights-of-way credit documentation for review and acceptance.

Below is a summary of the real estate baseline cost (in present dollars). Table 5-1 shows the acreage and estimate of value for all the project lands necessary for project implementation, including the perpetual easement from the railroad. Table 5-2 shows the acreage and estimate of value for all the project lands necessary for project implementation, not including the perpetual easement from the railroad.

Table 5-1. Total LERRD Summary (including Railroad Perpetual Easement)

Project Elements	Total Acres	Total Estimated Value
New Channel Construction	7.06	$648,000
Downstream Restoration	5.40	$427,000
Upstream Restoration	2.90	$523,000
Total Lands and Damages	**15.36**	**$1,598,000**
Estimated NFS's Admin Costs	**--**	$37,000
Total Estimated LERRD Costs	**15.36**	**$1,635,000**
Contingency 25%		$409,000
Total Estimated LERRD Costs		**$2,044,000**

Table 5-2. Total LERRD Summary (not including Railroad Perpetual Easement)

Project Elements	Total Acres	Total Estimated Value
New Channel Construction	6.96	$648,000
Downstream Restoration	4.70	$427,000
Upstream Restoration	2.90	$523,000
Total Lands and Damages	**14.56**	**$1,598,000**
Estimated NFS's Admin Costs	**--**	$28,000
Total Estimated LERRD Costs	**14.56**	**$1,626,000**
Contingency 25%		$407,000
Total Estimated LERRD Costs		**$2,033,000**

The NFS's estimated administrative costs included sponsor's acquisition costs (costs incidental; e.g. title survey, appraisal costs, negotiations, recording fees, legal fee, etc). The NFS could get credit for its prior acquisition costs for the lands previously acquired if those costs are within five (5) years of signing a Project Cooperation Agreement. Additionally the NFS will need to follow the federal appraisal principles for LERRD crediting purposes for all lands owned prior to the Division Commander's approval of the project.

The Federal review and assistance costs (e.g. providing the NFS with the LERRD requirements, review of acquisition documents, review of acquisition and crediting appraisals, coordination meetings, review for sufficiency of area and legal interests, and crediting activities) are estimated to be $85,000.

Off project locations for staging and storage are not anticipated during construction and hence have not been discussed herein. However, if this requirement changes, it is recommended that a standard temporary work area easement set forth within

Engineering Regulation 405-1-12, figure 5-6.15, be utilized. The project does not require the acquisition of additional real estate interests for either borrow or disposal purposes. Borrow materials needed to construct this project along with any necessary disposal facilities would be secured separately from locally available commercial or municipal sources.

For more information on real-estate including maps, assessment of the NFS's real estate acquisition capability, the plan for certifications of lands, and the draft attorney's certificate and risk analysis form see appendix A.

6.0 - ENVIRONMENTAL REVIEW REQUIREMENTS

The Paradise Creek Ecosystem Restoration Project is in compliance with environmental laws and Executive Orders as described below.

6.1 Federal Statutes

6.1.1 Clean Water Act

The Clean Water Act sets national goals and policies to eliminate discharge of water pollutants into navigable waters, regulate discharge of toxic pollutants, and prohibit discharge of pollutants from point sources without permits. The act also authorizes the Environmental Protection Agency (EPA) to establish water quality criteria that are used by states to establish specific water quality standards.

The TMDLs (total maximum daily load) for all of the listing pollutants have been established (excluding flow and habitat modification). The proposed project must comply with the Paradise Creek TMDL Implementation Plan in order to receive Section 401 Water Quality Certification from the Idaho Department of Environmental Quality. In addition, the proposed project meets the requirements of Nationwide Permit number 27, Stream and Wetland Restoration Activities, however, since Paradise Creek is listed under section 303(d), a 401 Certification from the Idaho Department of Environmental Quality is still required.

6.1.2 Endangered Species Act (ESA)

The ESA [16 United States Code (USC) 1531-1544], amended 1988, established a national program for the conservation of threatened and endangered species of fish, wildlife, and plants and the habitat upon which they depend. Section 7(a) of the ESA requires Federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service as appropriate, to ensure their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats.

The proposed project would be in compliance with the ESA. There are no listed species present in the proposed project location, nor would this project modify or destroy any critical habitat. It would improve the overall habitat condition in the area. Prior to the start of construction, the Corps will re-check the ESA list to verify no species have been added.

6.1.3 Fish and Wildlife Coordination Act (FWCA)

The FWCA (16 USC 661 *et seq*.) requires consultation with USFWS when any water body is impounded, diverted, controlled, or modified for any purpose. The USFWS and state agencies charged with administering wildlife resources are to conduct surveys and investigations to determine the potential damage to wildlife and the

mitigation measures that should be taken. The USFWS incorporates the concerns and findings of the state agencies and other Federal agencies into a report that addresses fish and wildlife factors and provides recommendations for mitigating or enhancing impacts to fish and wildlife affected by a Federal project.

The USFWS was contacted by electronic mail (e-mail) early in the planning phase of the project. In a phone reply, USFWS determined that a Coordination Act Report would not be required for the project.

6.1.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 USC 715 *et seq*.) requires that lands, waters, or interests acquired or reserved for purposes established under the Act be administered under regulations promulgated by the Secretary of the Interior. The Act provides protection to migratory birds and prohibits the destruction of their active nests or nestlings.

Although very little vegetation suitable for nesting is available in the area of the proposed project, care would be taken during construction to avoid any disruption to migratory birds. Should there be nests or nestlings in the area, constructions activities would be modified to avoid disturbance.

6.1.5 National Environmental Policy Act (NEPA)

The environmental assessment (appendix E) was prepared pursuant to regulations implementing the NEPA (42 USC 4321 *et seq*.). The NEPA provides a commitment that Federal agencies will consider the environmental effects of their actions. The environmental assessment was distributed for public review on June 30, 2006. The public comment period ended August 25, 2006. Seven individuals sent comments. These comments were addressed in a comment response package as part of our Finding of No Significant Impact (FONSI). The FONSI will be signed when this Feasibility Report is finalized and included in appendix E.

6.1.6 National Historic Preservation Act

Section 106 of the National Historic Preservation Act requires that Federal agencies evaluate the effects of Federal undertakings on historical, archeological, and cultural resources and consult with the State Historic Preservation Office, consulting entities, and other interested parties regarding cultural resource impacts.

After review of our cultural resources contractor's findings from a field evaluation, the Corps of Engineers determined the project would cause no effect to cultural properties and submitted the Agency’s determination to the Idaho State Historical Preservation Office (SHPO) and Nez Perce Tribe. The SHPO’s concurrence with the agency’s findings was received on November 24, 2003.

6.2 Executive Orders

Executive Order 11988, *Floodplain Management Guidelines*, May 24, 1977 outlines the responsibilities of Federal agencies in the role of floodplain management. Each agency shall evaluate the potential effects of actions on floodplains and should avoid undertaking actions that directly or indirectly induce growth in the floodplain.

Based on the determination made in Appendix C, *Hydrology*, the proposed project would not reduce the capacity of the floodplain.

6.3 State and Local Permits

At this time, there are two non-federal permit requirements:

6.3.1 Stream Alteration Permit from Idaho Department of Water Resources (IDWR).

Coordination has been on going with IDWR and their permit requirements are generally incorporated into the restoration plan. A Stream Alteration Permit will be obtained by the non-federal sponsor and would be coordinated between the Corps, sponsor, and the contractor.

6.3.2 Water Quality Certification from Idaho Department of Environmental Quality (IDEQ).

The Corps requested water quality certification from IDEQ prior to releasing the environmental assessment to the public. IDEQ responded that they would not make a decision on water quality certification until the final alternative is selected. The Corps requested water quality certification upon selection of the preferred alternative. Water quality certification was issued on October 31, 2006.

7.0 - IMPLEMENTATION

The schedule for project implementation assumes authorization under the Continuing Authority Program which is authorized by WRDA of 1996. After project authorization, the project would be eligible for construction funding. The project would be considered for inclusion in the President's budget based on: national priorities, magnitude of the Federal commitment, economic and environmental feasibility, level of local support, willingness of the NFS to fund their share of the project cost, and the budget constraints that may exist at the time of funding. Once Congress appropriates Federal construction funds, the Corps and the non-Federal sponsor would enter into a project cooperation agreement (PCA). This PCA would define the Federal and non-Federal responsibilities for implementing, operating, and maintaining the project.

The Corps would officially request that the sponsor acquire the necessary real estate or rights to real estate immediately after the signing of the PCA. The advertisement of the construction contract would follow the certification of the real estate and completion of plans and specifications. The final acceptance and transfer of the project to the non-Federal sponsor would follow the delivery of an O&M manual and as-built drawings. The estimated schedule for project implementation is shown in Table 7.1 and in appendix D, Project Management Plan.

7.1 Cost Apportionment

The project cost would be shared between the Corps and the local sponsor at a 65/35 percent split. Part of the sponsor's cost includes all real estate and work in-kind costs. The NFS has capability to aid in the design and implementation phase of the project. The University of Idaho has an accredited engineering, water resource, and landscape architect undergraduate and graduate programs. The NFS is also responsible for O&M of the project after construction completion, which would include invasive weed abatement, and periodic monitoring.

7.2 Fully Funded Cost Estimate

The fully funded estimate for the selected plan includes price escalation using Office of Management and Budget inflation factors. Project funding requirements by fiscal year are summarized in Table 7-1, as fully funded estimates.

Table 7-1. Fully Funded Estimate (October 1st, 2006)

Total Project Costs ($1,000)					Federal Funding Needs ($1,000)			
	Totals	Non Fed	Fed	Prior Years	FY 08	FY 09	FY 10	FY 11
Feasibility Study	486		486	486				
Project Management	64	22	42		19	11	6	6
Plans & Specs	524	147	377		117	260		
Construction Management	225		225				191	34
Construction	3219		3219				3219	
LERRD	2173	2173						
Totals	6691	2342	4349	486	136	271	3416	40
Cost Breakdown:								
LERRD		2173				2173		
Cash								
Work In-Kind		169				169		
Total		2342				2342		
Annual O&M		5						

* Costs include escalation and contingency

7.3 Financial Analysis

The University of Idaho has expressed the desire for implementing the project and sponsoring project construction in accordance with the terms of local cooperation that are set forth in the Chapter 9 of this report. The financial analysis indicates the non-Federal sponsor is financially capable of participating in the selected plan and contributing their cost share of 35% of the total project costs. Since the estimated total LERRD costs for this project exceed 25% of the total project costs, the sponsor has submitted a letter waiving their right of reimbursement should the LERRD costs exceed the sponsor's cost share responsibility.

8.0 - PUBLIC INVOLVEMENT AND REVIEW

8.1 Public Involvement

To announce the start of the feasibility phase, a public notice was issued to residents; Federal, State, and local agencies; and interested groups. The recipients were invited to comment on the results of the earlier completed reconnaissance study and provide input to the feasibility study, including the scoping of the environmental issues that should be address throughout the study. The notice announced a public workshop held on February 5, 2003 in Moscow, Idaho, where the public was given the opportunity to comment. Initial project proposals were presented and input from the public was sought. Approximately 35 people attended the meeting.

A final public meeting will be held in Moscow upon completion of the feasibility study to present the findings of the study and provide the public an opportunity to express their views on the results and recommendations of the feasibility study.

8.2 Institutional Involvement

8.2.1 Study Team

During the feasibility study, staff from the University of Idaho participated as members of the study team. This involvement has led to support for the implementation of the selected plan.

8.2.2 Agency Participation

During the feasibility study, coordination with the Idaho Department of Environmental Quality, the Idaho Department of Water Resources, the Idaho Department of Fish and Game, and the USFWS was conducted. All recommendations have been given full consideration. The views of Federal and regional agencies are summarized as follows:

IDEQ – The project must be in compliance with the Paradise Creek TMDL analysis and IDEQ will exercise its Water Quality Certification authority after the final alternative is selected. Consultation with the Paradise Creek Watershed Advisory Group should also be completed. The newly constructed stream channel will be subject to increased solar exposure. The Corps needs to monitor stream temperatures before, during, and after project completion. If significant stream temperature increases result, the Corps will need to mitigate those increases.

IDWR – The proposed project is in an area of perennial stream flow. A Stream Alteration Permit would be required for the project.

USFWS - No threatened or endangered species would be found in the area. The project would be beneficial to the natural environment.

8.3 Report Recipients

The environmental assessment was sent to the following list of people. The Finding of No Significant Impact and a notice of availability of the Feasibility Report will also be sent to them.

Aaron Ament – Moscow City Council
Cindy Barrett – Idaho Department of Environmental Quality
Gerald Billington – University of Idaho

Roger Blanchard – University of Idaho
Kathleen Bodley – Pullman Civic Trust
Tracy Buchert – Palouse Clearwater Environmental Institute
John Cardwell – Idaho Department of Environmental Quality
Nancy Chaney – Mayor of Moscow
Senator Larry Craig – Idaho State Senator
Senator Mike Crapo – Idaho State Senator
Dwight Curtis – Moscow Parks and Recreation
John Dickinson – Moscow City Council
Patrick Evans – Natural Resources Conservation Service
Scott Fedale – Moscow Commission on Health and the Environment
Randal Fife – City of Moscow
Zachary Funkhousen – Idaho Department of Transportation
Michelle Fuson – Latah County Planning and Building Department
Robert Goodrich – Moscow Commission on Health and the Environment
Andrew Grant – Latah County Parks and Recreation
Cal Groen – Idaho Department of Fish and Game
Jane Hess – Moscow Commission on Health and the Environment
Fred Hutchinson – Paradise Creek Watershed Advisory Group
Brian Johnson – University of Idaho
Paul Kimmell – Latah County Commissioner
Tom Lamar – Palouse Clearwater Environmental Institute
Bill Lambert – Moscow City Council
Ron Landeck – Latah Trail Foundation
Susan Martin – U.S. Fish and Wildlife Service
Les McDonald – City of Moscow
Gary McFarland – Friends of the Clearwater
Rebecca Miles – Nez Perce Tribe
Carey Myler – Soil Conservation Commission
Jack Nelson – Latah County Commissioner
Representative Butch Otter – Idaho State Representative
Daniel Pafferty – Moscow Commission on Health and the Environment
Linda Pall – Moscow City Council
Raymond Pankopf – University of Idaho
David Pierce – Moscow Commission on Health and the Environment
Joel Plaskon – City of Moscow
Gary Riedner – City of Moscow

Representative Shirley G. Ringo – Idaho State Representative
Steve Robischon – Palouse Basin Aquifer Committee
Senator Gary Schroeder – Idaho State Senate
Susan Scott – Moscow Resident
David Skinner – Palouse Prairie Foundation
Ken Stinson – Latah Soil and Water Conservation District
Ann Storrar – Nez Perce Tribe
Bob Stout – Moscow City Council
Tom Stroschein – Latah County Commissioner
Greg Taylor – Idaho Department of Water Resources
Representative Tom Trail – Idaho State Representative
John Weber – Moscow City Council
Mark Workman – City of Pullman
Gerry Wright – Palouse Land Trust

8.4 Public Views and Responses

A complete list of public comments and responses is contained with the Finding of No Significant Impact (FONSI) in Appendix E.

9.0 - RECOMMENDATIONS

I recommend that Alternative E, Relocating the Channel North and including downstream and upstream reaches, be authorized for implementation as a Federal project, with such modifications thereof as in the discretion of the Commander, US Army Corps of Engineers may be advisable. The estimated first cost of the recommended plan is $6,691,000 and the estimated annual operations, maintenance, repair, rehabilitation, and replacement (OMRR&R) cost is $5,000. The Federal portion of the estimated first cost is $4,349,000. The non-Federal sponsor shall, prior to implementation, agree to perform the following terms of local cooperation:

a. Provide 35 percent of total project costs allocated to ecosystem restoration, as further specified below:

(1) Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project; and

(2) Provide, during construction, any additional costs as necessary to make its total contribution equal the percent of total project costs allocated to ecosystem restoration.

b. Give the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the local sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing the OMRR&R of the project.

c. Assume responsibility of (OMRR&R) of the project or completed functional portions of the project, including mitigation features without cost to the Government, in a manner compatible with the project's authorized purpose and in accordance with applicable Federal and State laws and specific directions prescribed by the Government in the OMRR&R manual and any subsequent amendments thereto.

d. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended. Comply with Section 103 of the WRDA of 1986 and Public Law 99-662, as amended, which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until the non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element.

e. Hold and save the Government free from all damages arising from the construction and OMRR&R of the project and any project-related betterments,

except for damages due to the fault or negligence of the Government or the Government's contractors.

f. Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extent and in such detail as will properly reflect total project costs.

g. Perform, or cause to be performed, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way necessary for the construction, operation, and maintenance of the project; except that the non-Federal sponsor shall not perform such investigations on lands, easements, or rights-of-way that the Government determines to be subject to the navigation servitude without prior specific written direction by the Government.

h. Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-of-way that the Government determines necessary for the construction, operation, or maintenance of the project.

i. Agree that, as between the Federal Government and the non-Federal sponsor, the non-Federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and, to the maximum extent practicable, conduct OMRR&R on the project in a manner that will not cause liability to arise under CERCLA.

j. Prescribe and enforce regulations to prevent obstruction of or encroachment on the Project that would reduce the level of protection it affords or that would hinder operation or maintenance of the Project.

k. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 Code of Federal Regulation (CFR) part 24, in acquiring lands, easements, and rights-of-way; performing relocations for construction, operation, and maintenance of the project; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

l. Comply with all applicable Federal and State laws and regulations, including Section 601 of the Civil Rights Act of 1964, Public Law 88-352, and Department of Defense Directive 5500.11 issued pursuant thereto, as well as Army Regulation 600-7, entitled "*Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army*," and Section

402 of the WRDA of 1986, as amended (33 USC 701b-12), requiring non-Federal preparation and implementation of floodplain management plans

m. Inform affected interests, at least annually, regarding the limitations of the protection afforded by the project.

n. Publicize floodplain information in the areas concerned and provide this information to zoning and other regulatory agencies for their guidance and leadership in preventing unwise future development in the floodplain and in adopting such regulations as may be necessary to ensure compatibility between future development and protection levels provided by the project.

o. Do not use Federal funds to meet the non-Federal sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is authorized.

The recommendations contained herein reflect the information available at this time and current departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch.

_____

Anthony J. Hofmann
Lieutenant Colonel, Corps of Engineers
District Engineer

10 – DRAWINGS

11 – PARADISE CREEK LICENSE

The Paradise Creek License agreement is an agreement between the NFS and the Palouse River and Coulee City Railroad, Inc. for the 0.8 acres of land owned by the railroad but desired for restoration effort identified for the Paradise Creek ecosystem restoration project. The agreement was issued in December 20th, 2004.

The Paradise Creek License grants to the NFS, "a perpetual, nonexclusive License ("License") for the investigation, study, maintenance, enhancement and improvement of Paradise Creek and its associated riparian habitat, upon, over and across the property.

The Paradise Creek License conveys a perpetual right to use real property, which runs with the land and is binding upon all successors and assigns. Additionally, the Agreement is not revocable at will by the grantor and it specifically states the NFS is acquiring an interest in the property. Finally, the Agreement conveys to NFS the right to maintain and improve Paradise Creek, which is a long term or permanent requirement/purpose. A copy of the license agreement is attached.

PARADISE CREEK LICENSE

THIS PARADISE CREEK LICENSE ("**Agreement**") is entered into on December 20, 2004, by and between **Palouse River and Coulee City Railroad, Inc.**, a Washington corporation ("**Palouse**"), and **Regents of the University of Idaho**, a public corporation and state educational institution organized and existing under the Constitution and laws of the state of Idaho ("**Regents**").

1. GRANT OF LICENSE.

Palouse, as grantor, hereby grants to Regents (at the sole cost and expense of the Regents), its respective contractors, employees, agents and students, a perpetual, nonexclusive License ("**License**") for the investigation, study, maintenance, enhancement and improvement of Paradise Creek and its associated riparian habitat, upon, over and across the property described in **Exhibit "A"** attached hereto and made a part hereof ("**License Property**"). The Regents may, but shall not be obligated to, exercise the License. The License shall be a burden on the License Property and shall run with the land. In the event Regents does not initiate use of the License by September 30, 2014, this License shall be deemed terminated and Regents shall cooperate to the fullest reasonable extent in recording such termination when such recording is requested in writing by Palouse.

2. IMPROVEMENTS.

Prior to the construction, expansion or modification of any improvements associated with Paradise Creek within the License Property or modification or relocation of Paradise Creek, Regents shall obtain Palouse's prior written approval to the plans and specifications for the improvements in accordance with the procedures set forth in Section 3. All of the foregoing shall be constructed and maintained in accordance with all local, state and federal laws, rules and regulations applicable thereto.

3. APPROVAL PROCEDURES.

Before any action requiring Palouse's approval is commenced, sufficient information shall be sent to Palouse to enable Palouse to make a reasonable decision as to the proposal. Palouse shall not unreasonably withhold, condition or delay its approval to the proposal. Palouse must approve or disapprove the proposal within thirty (30) days after receipt of the proposal, and, if Palouse disapproves the proposal, it shall provide a written explanation in reasonable detail of its reasons for disapproval and guidance on what would be approved by Palouse. If Palouse rejects or disapproves the proposal and fails to provide such explanation within the thirty (30) day period, Palouse shall be deemed to have approved the same provided that, when the approval was sought, Regents stated in writing to Palouse that, if a disapproval with explanation was not made within the thirty (30) day period, approval would then be deemed to have been given. If the proposal is disapproved as provided herein, then an alternate proposal may be submitted, which alternate proposal shall be handled in the same manner as the initial proposal.

4. INSURANCE.

Regents shall maintain at its sole cost and expense commercial general liability insurance, covering bodily injury in the sum of not less than the maximum limit on liability set forth in the Idaho Tort Claims Act (currently $500,000) per person and per occurrence and property damage in the same amount per occurrence. All insurance required hereunder shall be on an occurrence basis or on a claims made basis covering claims occurring during the policy period and reported within three years of the date of occurrence, and shall be maintained in full force and effect in a company or companies authorized to do business in the state of Idaho. All insurance required hereunder and obtained by Regents shall name "Palouse River and Coulee City Railroad, Inc., its agents, its employees, and its assigns" as additional insured. Such insurance policies shall contain a clause in which the insurance company will endeavor to give written notice to the additional insured thirty (30) days in advance of the cancellation of such insurance. Certificates of insurance and additional insured endorsements shall be provided upon written request from Palouse. Said certificates and endorsements shall evidence compliance with all provisions of this Section 4.

5. TAXES.

Palouse shall timely pay when due all taxes assessed against the License Property, if any; subject, however, to the right to contest the amount or validity of all or any part of said taxes and assessments.

6. PROPERTY CONVEYED AS-IS.

Regents are relying solely upon Regents' inspections as to the condition of the License Property. Except as expressly set forth in this Agreement, neither Palouse nor Palouse's agents are making, have made and Palouse expressly disclaims any representations or warranties, express or implied, with respect to any aspect, feature or condition of the License Property including, without limitation, the existence of hazardous waste, or the suitability of the License Property for any intended use under this License. Regents must independently verify all information and reports regarding any aspect or feature of the License Property. Regents is acquiring an interest in the License Property in "As Is" condition with all faults including both latent and patent defects and Regents release Palouse from any and all liability relating to any existing aspect or condition of the License Property, known or unknown, foreseeable or unforeseeable, actual or contingent, arising by statute, common law or otherwise. As used herein "**hazardous waste**" shall mean any hazardous waste or pollutants, contaminants or hazardous waste as defined by the Federal Water Pollution Control Act, the Comprehensive Environmental Response, Compensation and Liability Act of 1990 and any amendments thereto, the Resource Conservation and Recovery Act and any amendments thereto or any similar state, local or federal law, rule or regulation, including, without limitation, asbestos or asbestos containing materials, PCBs, petroleum and petroleum products and urea-formaldehyde.

7. ATTORNEYS' FEES.

In the event either party initiates or defends any legal action or proceeding in any way connected with this Agreement, the prevailing party in any such action or proceeding (in addition

to any other relief which may be granted, whether legal or equitable), shall be entitled to recover from the losing party in any such action its reasonable costs and attorneys' fees (including, without limitation, its reasonable costs and attorneys' fees on any appeal) All such costs and attorneys' fees shall be deemed to have accrued on commencement of any legal action or proceeding and shall be enforceable whether or not such legal action or proceeding is prosecuted to judgment.

8. DEFAULT.

(a) Neither party shall be deemed to be in default of this Agreement except upon the expiration of thirty (30) days (ten [10] days in the event of failure to pay money) from receipt of written notice from the other party specifying the particulars in which such party has failed to perform its obligations under this Agreement unless such party, prior to expiration of said thirty (30) day period (ten [10] days in the event of failure to pay money), has rectified the particulars specified in said notice of default; provided that neither party shall be deemed to be in default if such failure to perform (other than the failure to pay money) cannot be rectified within such thirty (30) day period and within the thirty (30) day period such party has begun and is diligently proceeding to rectify the particulars of such default.

(b) In the event of a default, the non-defaulting party may:

(i) Seek specific performance of this Agreement, and, in addition, recover all damages incurred by the non-defaulting party. The parties declare it to be their intent that this Agreement may be specifically enforced;

(ii) Perform or pay any obligation or encumbrance necessary to cure the default and offset the cost thereof from monies otherwise due the defaulting party or recover said monies from the defaulting party; and

(iii) Pursue all other remedies available at law, it being the intent of the parties that remedies be cumulative and liberally enforced so as to adequately and completely compensate the non-defaulting party.

9. NOTICES.

(a) All notices given pursuant to this Agreement shall be in writing and shall be given by personal service, by United States mail or by United States express mail or other established express delivery service (such as Federal Express), postage or delivery charge prepaid, return receipt requested, addressed to the appropriate party. If a notice must be given to a person other than one designated below, such notice shall be sent to the person and address shown on the then current real property tax rolls of Latah County. All notices to Palouse or Regents shall be given to the appropriate party at the address set forth below:

Palouse: Brad Snow

Property Manager

WATCO Companies

315 West Third Street

Pittsburg, Kansas 66762-4706

Regents: Regents of the University of Idaho
Vice President, Finance and Administration
Box 443168
Moscow, ID 83844-3168

The person and address to which notices are to be given may be changed at any time by any party upon written notice to the other party. All notices given pursuant to this Agreement shall be deemed given upon receipt.

(b) For the purpose of this Agreement, the term "**receipt**" shall mean the earlier of any of the following: (i) the date of delivery of the notice or other document to the address specified pursuant to subparagraph (a) above as shown on the return receipt, (ii) the date of actual receipt of the notice or other document by the person or entity specified pursuant to subparagraph (a) above, or (iii) in the case of refusal to accept delivery or inability to deliver the notice or other document, the earlier of (A) the date of the attempted delivery or refusal to accept delivery, (B) the date of the postmark on the return receipt, or (C) the date of receipt of notice of refusal or notice of non-delivery by the sending party.

10. BREACH SHALL NOT PERMIT TERMINATION.

It is expressly agreed that no breach of this Agreement shall entitle any person or party to terminate this Agreement, but such limitation shall not affect in any manner any other rights or remedies which such person or party may have hereunder by reason of any breach of this Agreement.

11. SUCCESSORS.

This Agreement shall inure to the benefit of and be binding upon Palouse and Regents, their heirs, successors, assigns and personal representatives, and upon any person acquiring the License Property, or any portion thereof, or any interest therein, whether by operation of law or otherwise.

12. CAPTIONS AND HEADINGS.

The captions and headings in this Agreement are for reference only and shall not be deemed to define or limit the scope or intent of any of the terms, covenants, conditions or Agreements contained herein.

13. MODIFICATION AND TERMINATION.

This Agreement may not be modified in any respect or terminated, in whole or in part, except with the consent of Palouse and Regents, or their successors or assigns, and then only by written instrument duly executed and acknowledged by all required parties and recorded in the official records of Latah County, Idaho.

14. JOINT AND SEVERAL.

In the event any party hereto is composed of more than one (1) person, the obligations of said party shall be joint and several.

15. ENTIRE AGREEMENT.

This Agreement contains the entire Agreement between the parties hereto and supersedes all prior Agreements, oral or written, with respect to the subject matter hereof. The provisions of this Agreement shall be construed as a whole and not strictly for or against any party.

16. CONSTRUCTION.

In construing the provisions of this Agreement and whenever the context so requires, the use of a gender shall include all other genders, the use of the singular shall include the plural, and the use of the plural shall include the singular. Furthermore, "**person**" shall include individuals, partnerships, firms, associations, corporations, trusts, governmental agencies, administrative tribunals or any other form of business or legal entity.

17. WAIVER.

The failure of a person to insist upon strict performance of any of the terms or obligations contained herein shall not be deemed a waiver of any rights or remedies that said person may have, and shall not be deemed a waiver of any subsequent breach or default in the performance of any of the terms or obligations contained herein by the same or any other person.

18. NO THIRD PARTY BENEFICIARY RIGHTS.

This Agreement is not intended to create, nor shall it in any way be interpreted or construed to create, any third party beneficiary rights in any person not a party hereto unless otherwise expressly provided herein.

EXECUTED as of the date first above written.

PALOUSE:	**REGENTS:**
Palouse River and Coulee City Railroad, Inc.	**Regents of the University of Idaho**
By: _____	By: _____
Name: _____	Name: _____
Its: _____	Its: _____
	4/13/05

STATE OF Kansas)
) ss.
County of Crawford)

On this 20 day of December, 2004, before me, Lois Zussmis, a Notary Public in and for said State, personally appeared Gary Lundy, known or identified to me to be the Vice President of Palouse River and Coulee City Railroad, Inc., the corporation that executed the within instrument or the person who executed the instrument on behalf of said corporation, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Lois M. Zussmis
Notary Public for ~~Idaho~~ Kansas
Residing at Pittsburg, KS
My commission expires 5-7-05

STATE OF IDAHO)
) ss.
County of Latah)

On this 13th day of April, 2005, before me, Debra L. Eisinger, a Notary Public in and for said State, personally appeared David Chicketts, known or identified to me to be the VP Finance of Regents of the University of Idaho, the corporation that executed the within instrument or the person who executed the instrument on behalf of said corporation, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

DEBRA L. EISINGER NOTARY PUBLIC STATE OF IDAHO

Debra L. Eisinger
Notary Public for Idaho
Residing at Moscow ID
My commission expires 7/31/2010

EXHIBIT "A"

Legal Description of License Property

Commencing at the southwest corner of section 7, Township 39 North, Range 5 West, Boise Meridian, Latah County, Idaho from which the west one quarter corner of said section bears North 01°01'08" East; Thence North 01°01'08" East 1074.28 feet along the west line of the southwest quarter of said section to the intersection with the southerly line of the railroad right of way commonly known as the Union Pacific Railroad Company (UPRR) right of way; Thence along said right of way North 89°36'44" East 168.29 feet to the **Point of Beginning**; Thence continuing along said right of way the following two (2) courses: North 89°36'44" East 576.25 feet to the beginning of a curve; Thence 749.92 feet along said curve to the left with a radius of 5679.58 feet and a chord which bears North 85°51'46" East; Thence leaving said right of way North 07°55'11" West 25.00 feet; Thence southwesterly, and parallel with said right of way, 746.62 feet along a non-tangent curve to the right having a radius of 5654.58 feet and a chord which bears South 85°51'46" West; Thence South 89°36'44" West 576.25 feet; Thence South 00°23'16" East 25.00 feet to the **Point of Beginning**. Containing 0.76 acres, more or less. At no point shall the License Property extend any closer than 25 feet from the centerline of the track as it exists at any given time.

195111

FEE ____ AT THE REQUEST OF:
LATAH COUNTY TITLE CO
DATE & HOUR:
4/27/05 3:38pm
SUSAN PETERSON
RECORDER
27 Smith
Deputy

T39N, R6W, BM
T39N, R5W, BM
12
13
7
18
Point of Beginning
State Highway 8 (Pullman Highway)
BAKER
Gov't Lot 4
N.T.S.
PETERSON DRIVE EXT.
PETERSON DRIVE
"A" STREET
RAYBURN STREET
SE1/4SW1/4
University of Idaho

12 – REFERENCES

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Corps of Engineers. 2004. Final Detailed Project Report and Environmental Assessment: Indian Creek Ecosystem Restoration Project, Caldwell, Idaho. Walla Walla District. September.

Federal Emergency Management Agency. 2002. Flood Insurance Study, City of Moscow, Idaho, Latah County. Community No. 160090V000. April.

Idaho Department of Commerce 2003. 2004. Idaho Census. Internet Webpage http://cl.idaho.gov/portal/

Idaho Division of Environmental Quality. 1997. Paradise Creek TMDL, Water Body Assessment and Total Maximum Daily Load. Idaho Division of Environmental Quality, Lewiston Regional Office. December.

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U.S. Fish and Wildlife Service. 1989. Planning Aid Report: Palouse River Basin Reconnaissance Study, Idaho (in Corps 1989). March.