

Statement of Work

Organization of Tasks

1. Develop a Whychus Creek Restoration and Management Plan consisting of:
 - a. Inventory of existing stream conditions.
 - b. Proposed restoration and management actions.
 - c. Proposed policy-level actions.
 - d. Regulatory considerations.
2. Conduct a Channel Migration Zone study per the WDOE or similar methodology.
3. Conduct site visits, team meetings, and communication necessary to complete the Scope of Work.
4. Conduct up to six community meetings during the course of the planning process.
5. Deliver the final product with 12 months of the initiation of the contract to include:
 - a. Whychus Creek Restoration and Management Plan.
 - b. GIS maps in electronic format.
 - c. Notes and records from the community meeting.

To accomplish the project goals and objectives we have organized these elements into the following tasks with appropriate points of review and feedback from the UWDC, City staff, elected officials, key stakeholders, and the general public.

Task 1. Project Management, Coordination, and Outreach

Task 2. Describe Existing Conditions

Task 3. Complete Field Assessments

Task 4. Develop Proposed Restoration and Management Actions

Task 5. Complete Whychus Creek Restoration and Management Plan

TASK 1. Project Management, Coordination, and Outreach

From experience we know that urban watershed action plans and urban stream restoration projects demand a much higher level of communication, coordination, and public outreach than projects conducted in non-urban watersheds and stream reaches. To address this need, we propose to carry out the tiered communication and outreach approach described below.

Task 1a. Advisory Team Meetings

Soon after negotiating a contract, the WPN Project Manager, Joanne Richter will meet with staff from the Upper Deschutes Watershed Council (UDWC) and a network of agency partners to:

- Clarify our client / consultant relationship and channels of communication.
- Develop the overall goals and objectives for the project.
- Identify all pertinent existing data that will be analyzed in Task 2.
- Identify other state and federal agencies that may be interested in, or involved with, aspects of the Project.
- Clarify our public outreach strategy and identify key community stakeholders.

For the purposes of this proposal we will refer to this small coordinating group as the Whychus Advisory Team (AT). After this initial meeting, Joanne will meet with the AT every three months during the course of the project to discuss preliminary findings and potential issues and concerns. In addition, Joanne will prepare brief project update reports each month during the course of the project to keep the AT informed about the WPN team's progress. Near the completion of Tasks 2 and 3, we propose to have a more involved meeting with the AT to discuss our preliminary results. We would also have a more involved meeting with the AT to present our Task 4 draft restoration and management actions. The purpose of this meeting will be to reach consensus on which projects we will develop conceptual design plans for, and to get direction from AT on how to proceed on revising the restoration actions.

Task 1b. Community Outreach Strategy

Given the high visibility and potential public concerns for this project, we recognize that effective communication with key stakeholders and the community at large will be essential for the successful implementation of the Whychus Creek Restoration and Management Plan. Besides the AT, key stakeholders that must be kept abreast of projects findings and recommendations include the Sisters City Council and Planning Commission, landowners with property located adjacent to or within the City's Flood Plain Zone, the channel migration zone, and the riparian vegetation zone of Whychus Creek, and community members at large.

To accomplish this strategy, we propose to hold three broadly publicized community meetings, and a joint meeting with the Sisters City Council and Planning Commission, at key junctures during the course of the project. The first Community Meeting will be scheduled in early September to inform the community about the goals and objectives of the Project, and to solicit comments and concerns from community members.

The second community meeting will be held sometime in mid to late November at the completion of Task 3. The rationale for this meeting is that Tasks 2 and 3 will generate a broad characterization of the existing ecological conditions, stream channel conditions, the Channel Migration Zone, and stream restoration design constraints. This is a good time to hold a community meeting to discuss our

preliminary findings with the public, to present what we know about existing problems and potential solutions, to discuss our next steps, and to ask the community for their input (e.g., concerns, data gaps, etc.). In this same timeframe, Joanne Richter will also assist Ryan Houston with a briefing of the Sisters City Council to inform Council members of the project's progress.

The third round of community meetings will be held in mid to late January. The rationale for the timing of the third community meeting, and joint meeting with the Sisters City Council and Planning Commission, is to present draft recommendations for restoration and management actions to elected officials, key stakeholders, and community members. The rationale for each proposed action will be discussed in detail, including the problem-solution pathway, conceptual design information, and the estimated costs and benefits of each proposed action.

Task 1c. Project Web Site Development

We have found that establishing a project web site has been a very effective tool to convey interim and final products to both the project technical team as well as stakeholders. Early in the project we anticipate setting up a web site that will allow for upload and download of technical documents, project news items and notes, and draft and final reports. Examples from past projects can be seen at the following sites:

- <http://www.sumptervalley.org/> (this project is in early stages of development)
- <http://oregonwatersheds.net/coast/> (most current example)
- <http://www.upper-roque.org/> (includes maps, photos, documents)
- <http://www.mashel.com/> (final products only)
- <http://ohop.org/> (final products only)

Deliverables for Task 1:

- Monthly project update reports to AT.
- Organize three community meetings and one formal presentation to the Sisters City Council and Planning Commission.
- Produce notes and records from the community meetings including documentation of stakeholder comments and concerns.
- Project web site

TASK 2. DESCRIBE EXISTING CONDITIONS

We will compile and utilize readily available information prior to conducting a field assessment of Whychus Creek. Data is available from a variety of sources in addition to the information listed in the RFP and enumerated below:

1. 2007 LiDAR survey of the entire project area, including topographic information and color aerial photos;

2. Water quality monitoring data (mostly temperature with limited information on other parameters);
3. Fish habitat survey data from Oregon Department of Fish and Wildlife (ODFW), USFS, and others;
4. FEMA floodplain map for the City of Sisters UGB;
5. Historic flow information, including information on natural flows, diversions and other influences;
6. Inventory of existing diversions and fish passage barriers;
7. Various watershed assessments and restoration plans, including those prepared by USFS, UDWC, and ODFW.

Task 2 is divided into major subtasks to describe the flow of work, the deliverables, and to estimate budgets.

Task 2a. Characterize Existing Ecological Conditions

Whychus Creek supports redband trout, bull trout, brown trout and mountain whitefish. The creek historically had spawning runs of spring Chinook salmon and summer steelhead before construction of the Pelton-Round Butte dams on the Deschutes River blocked the fish from ascending into the upper river basin. Reintroduction of summer steelhead to Whychus Creek was initiated in May 2007, with the release of over 150,000 fry in the creek. Given the regional importance of this action, the state, federal, tribal entities as well as the UDWC already have extensive information on habitat quality and needs for Whychus Creek at the watershed scale. For example, the ODFW has identified the primary limiting factors, threats, and strategies to restore habitats for steelhead at the watershed scale for Whychus Creek in the ESA Recovery Plans. In addition, the RFP specifically identifies other existing information that is available for describing current condition. This includes:

- Water quality monitoring data – primarily temperature data.
- Inventory of existing diversions and fish passage barriers
- Various watershed assessments and plans completed by USFS, UDWC, ODFW. As noted, these plans do not specifically address the project area.

The project area focuses on approximately four miles of Whychus Creek that flows through the City of Sisters. We assume, as noted in the RFP, that existing information is at a course scale as it applies to the project area. We will use existing information as an initial step in characterizing current ecological conditions and fill in the information at a finer scale for the project area during Task 3, Field Assessments.

In this initial step, we will identify target aquatic species, habitat requirements, habitat limiting factors, and strategies previously identified in existing reports, but which occur at the watershed or broad reach scale. The existing information will provide the framework for organizing limiting factor assessment for the four mile

project reach. Based on this information we will be able to construct the initial *Habitat Design Guidelines Table* (see Table 1 for an example of this tool). This table will be refined throughout the planning process and integrate with the hydrologic, hydraulic, and geomorphological assessments.

We have found that the *Habitat Design Guidelines Table* provides an important communication device when interacting with the local project committees and stakeholders to promote understanding of fish habitat requirements. As refined by input from the AT, the table will help guide selection of proposed actions (Task 4), and be incorporated into the Whychus Restoration and Management Plan.

Table 1. Fisheries Design Guidelines for Falls Creek Migratory Channel.

| Characteristic | Suggested Guideline |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Desirable Channel Conditions For Fish Migration | Channel Velocity < 2.4 f/s Channel Depth > 0.8 ft |
| Culvert Criteria | 4.0 f/s - Maximum Velocity 0.8 ft. - Minimum Water Depth 0.8 ft. - Maximum Hydraulic Drop |
| Temperate Target During Migration | 10 to 15 degree C |
| Cover | Diverse Elements – LWD, boulders, cobble, & overhead vegetation |
| Riparian | Woody vegetation of willows and cottonwoods for temperature control, overhead cover, and long term LWD recruitment. |
| Holding Pools | Pools - Frequent deep pools with cover provided by LWD, boulders, etc. |
| Adult Upstream Movement | Primary Period – May through June Adults expected to move upstream into Falls Creek at the tail end of the snow melt hydrograph. |
| Adult Downstream Movement | Primary Period – September Post spawning movement |
| Juvenile Downstream Movement | Primary Period Fall – September through October Spring – May through June |

No fine-scale riparian zone information is known to exist for the project area along Whychus Creek. Current aerial photographs and watershed-scale information provides some base information about riparian composition, but does not specifically address the site-specific functions or ecosystem services that the riparian zone provides to the stream system. Historic information about development and prior activities will be evaluated to describe the ecological conditions of the riparian zone. As stated in the RFP, additional information is necessary to develop a restoration plan; our approach for developing a *Riparian Diagnostic Matrix* and associated fine-scale map is outlined in Task 3b below.

Task 2b. Develop Hydrologic Framework and Design Flow Analysis

Whychus Creek exhibits a flow regime typical for eastside Cascade streams, with high flow occurring both in response to winter rain-on-snow events (Dec-Feb, Figure 2), as well as spring snowmelt (May-July, Figure 2). Water withdrawals upstream of the project area result in significant reductions in summertime baseflows throughout the project reach (Figure 3). Both flow regime and water withdrawals have significant influence on sediment dynamics, available habitat, channel geometry, and riparian dynamics within the project reach. A cursory review of existing information indicates that considerable work has been done on characterizing water withdrawals throughout the project area (e.g. see Figure 3).

Furthermore, several years of continuous flow data exist for gage #14976050, located next to the Sisters City Park immediately upstream of the Highway 20 bridge (Figure 1).

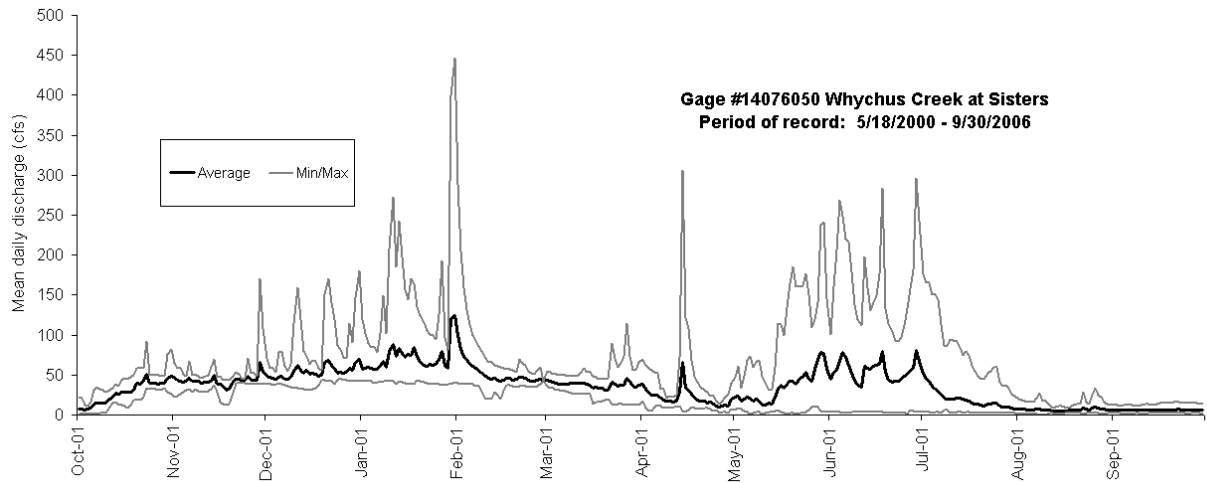


Figure 2. Gage #14076050 Whychus Creek at Sisters. Period of record: 5/18/200 - 9/30/2006

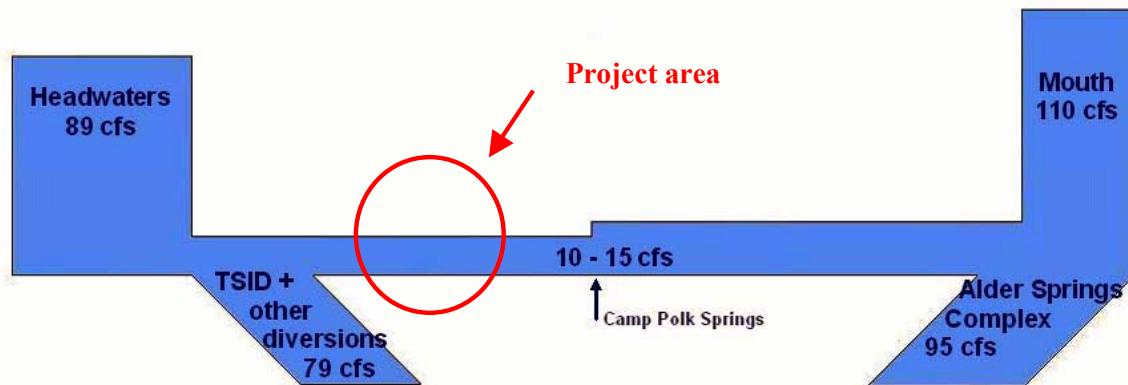


Figure 3. Simplified schematic of historic average July flow for Whychus Creek¹.

As part of this task we will use existing information to summarize impacts due to water withdrawals on hydrologic processes and aquatic habitats. This information will feed directly into the flow-related restoration and management actions developed under Task 4 below. Furthermore, we will use existing gage records to develop design discharge values critical to the development of in-stream restoration strategies. Included in this initial analysis will be a review of existing data to characterize the basic sediment regime of the stream system. This will include review of existing watershed assessments to determine sediment sources and routing.

¹ From Logan, M. and L. Jones. 2007. Upper Deschutes Watershed Council Water Quality Monitoring Program Technical report, Whychus Creek Watershed Project Monitoring 2007, Whychus Creek Watershed, Deschutes Basin, Oregon. Upper Deschutes Watershed Council, Bend, OR

Task 2c. Develop Geomorphic Framework and Initial Project Base Map.

Prior to field review it is necessary to place the project area into the proper geomorphic context. This necessitates considering the project area over a range of spatial scales. In the larger context the City of Sisters and the project area are located within a broad area of glacial outwash sediments, immediately down-gradient from the predominantly basalt geology of the Whychus Creek headwaters². Faults in the vicinity of the project area influence the location of some streams (e.g., Indian Ford Creek) and springs. An understanding of this larger-scale geologic structure is necessary to identify processes within the project area (e.g., sediment supply and transport) as well as potential constraints to restoration (e.g., possible stream flow loss in areas of unconsolidated sediments). This task will be performed through a review of existing geologic reports and data.

A finer-scale understanding of the geomorphology of the project area is also needed to identify the constraints and opportunities on channel, floodplain, and channel migration zone (CMZ) restoration. It is our understanding that recent LiDAR data exist for the entire project area. We have used LiDAR in past projects to generate initial project base maps, and to stratify the project area into geomorphically similar reaches. Based on our experience working in Whychus Creek, we are aware of subtle changes in gradient and confinement that likely result in different areas acting as transport and depositional reaches. For example, the confined channel in the vicinity of Highway 20 acts primarily as a transport reach, while immediately downstream, in the vicinity of the Creekside Development, channel gradient decreases, deposition occurs, and a wide CMZ is present. The LiDAR data will be used to initially identify these reaches prior to field review. The LiDAR data will also be used to establish a first approximation of floodplain and CMZ extent.

Initial base maps will be developed using high-resolution color orthophotography, overlain with topography (derived from LiDAR) and tax-lot boundaries.

Task 2d. Initiate Channel Migration Zone Delineation

The Washington Department of Ecology publication #03-06-027, *Framework for Delineating Channel Migration Zones*, will serve as the overall guiding methodology for establishing the location of the CMZ. This document does not dictate a precise step-by-step procedure for establishing CMZ location, but rather presents the various components that contribute to the entire CMZ. It is intended to provide planners a tool in erosion hazard management of dynamic alluvial systems. Determination of the Whychus Creek CMZ will establish the four components identified by the publication as comprising the total CMZ

The initial delineation of the CMZ will be conducted as an office exercise followed by field assessment and verification conducted under Task 3. The primary tools aiding in the initial delineation of the CMZ will be the LiDAR survey, all historic and current aerial photos, and available maps. Additionally, secondary sources such as fish habitat data, City and County land use information, and FEMA data

² Sherrod, D.R et al. 2004. Geologic Map of the Bend 30- x 60- Minute Quadrangle, Central Oregon. Interpretive Map I-2683. U.S. Geological Survey, Reston, VA

will be reviewed as they often aid in fine-tuning the location of the CMZ. Past projects involving CMZ identification have taught us that one of the key tasks is accurate registration of all sources prior to developing the actual CMZ map. Typically, sources possess a range of scales that must be verified and accounted for in preparation of the actual CMZ GIS layer.

While establishing the location of the CMZ is largely a mapping exercise, data collected during this effort will be used to more fully understand the processes that dictate channel conditions. In addition to simply locating CMZ boundaries, rates of channel movement will be determined to aid in predicting future channel shifting.

Channel migration events will be cross referenced with events such as large floods, ice dam formation and break-up, sediment influxes due to natural and man made events, changes to the channel bed resulting from utility and public works projects, and major land use changes within the basin. This cross-referencing will greatly improve our understanding of the specific causal mechanisms responsible for channel movement. This understanding will be key to development and prioritization of effective restoration activities and policy-level actions.

Deliverables for Task 2:

- Ecological conditions to include fish habitat, passage barriers, water quality, riparian plant and upland communities.
- Project Base Map of the stream system and associated riparian zones based on LiDAR and other sources.
- Initial draft of the *Habitat Design Criteria Table*.
- Initial riparian assessment and draft of the *Riparian Diagnostic Matrix*.
- Hydrologic characterization, water rights, points of diversions, peak flow analysis, and stream design flows.
- Geomorphic framework combining reach breaks with ownership and governmental boundaries.
- Initial assessment of Channel Migration Zone (to the extent feasible based on aerial photos and GIS).
- Suggested revision (as appropriate) to the subsequent tasks based on the review of existing data.

TASK 3. COMPLETE FIELD ASSESSMENTS

The intent of this task is to calibrate the existing conditions assessment based on field observations, fill in data gaps, and complete field measurements needed for the Channel Migration Zone.

Task 3a. Fish Habitat and Fish Migration Barrier Assessment

The intent of the fish habitat assessment is not to collect extensive field data, but rather to refine the existing assessment of habitat limiting factors at a finer scale for the four-mile project area. We will use the existing information reviewed in Task 1 to categorize limiting factors, and identify those of specific interest to the target fish species (e.g. summer steelhead). Limiting factors such as water temperature and minimum flow conditions cannot be assessed in a brief field survey, so these factors will be evaluated using existing information and by indirect methods. Habitat quality measures that can be evaluated in a field survey at this scale of effort include substrate quality, percent fines, pool frequency, pool quality, large wood debris (LWD) frequency, and general rearing habitat complexity.

If fish passage barriers occur we will evaluate the barriers based on standard protocols such as the San Dimas method³ or other methods being used in the Deschutes to provide comparable results. WPN has extensive experiencing in evaluating fish passage barriers and designing projects to eliminate fish barriers. Barriers at irrigation diversions are evaluated in a similar manner; we have specifically used the Washington methodology to evaluate passage at irrigation diversions⁴.

Task 3b. Riparian Plant Communities

Riparian zones are an important and necessary element to the stream restoration design, as they provide a suite of services that meet habitat and stability considerations for the stream system. Because riparian zones are inherently patchy environments, having shifting densities of plant species, structures (trees, grasses), soils, and topographies, existing riparian mapping for Whychus Creek is likely not complete or highly accurate for a restoration design. In the project area, our understanding of the current watershed-scale assessments indicate few details of the riparian zones vegetation and overall health at a scale that provides for site-specific enhancement measures. Hence, it is necessary to conduct a detailed survey of the riparian zones for the project area.

During the field assessment phase of this project, we will walk the creek and evaluate how the riparian zone contributes *services* to the stream system. Shifting vegetation types and associated land uses (e.g. development, grazing, and agriculture) contribute different ranges and qualities of services to the stream channel. The initial task is to evaluate and inventory the riparian zones for potential and current vegetation types, and to evaluate how these vegetation types are meeting the range of necessary services to the stream system. The services to be evaluated include, but are not necessarily limited to:

- Stream shading
- Wood recruitment / pool forming components
- Bank stability
- Sediment buffering

³ USFS, 2005. National Inventory and Assessment Procedure for Identifying Barriers to Aquatic Organism Passage at Road Stream Crossings. USFS, San Dimas, Ca.

⁴ WDFW, 2000. Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual. WDFW, Olympia, WA.

- Allocthonous inputs
- Floodplain habitat and conveyance stability
- Buffer zones from nearby development (stormwater runoff, recreation, etc)

These inventory evaluations will be summarized along the project reaches using a *Riparian Diagnostic Matrix* table that indicates what riparian zone services are present or limiting, and what vegetation components are meeting or failing to meet these services. Using this matrix, a stepwise evaluation will be conducted for the length of the project area, highlighting where the current status is functioning within the desired range, and where site-specific prescriptions can be made to increase the quality to the stream system. This will result in a fine-scale map that will prescribe a range of treatments that will then be used to develop project implementation cost estimates. The *Riparian Diagnostic Matrix* and associated map can also serve to define a specific series of goals for monitoring stream restoration success.

Task 3c. Channel Migration Zone Assessment

An understanding of current and past channel and CMZ condition is essential to provide a framework for identifying the geomorphic processes responsible for channel formation and maintenance, and to identify constraints to, and opportunities for, future channel enhancement.

Existing and historic channel condition will be assembled as described in Task 2d above. However, it is likely that there will be gaps in our understanding of channel condition. As part of this task we will acquire representative channel and valley dimension, form, and substrate data to characterize the stream reaches. We will also acquire this information for reference areas if suitable reference sites can be located. Limited channel and floodplain cross-sectional field data may be collected to validate and calibrate LiDAR data. Channel modifications not identified (or misidentified) under Task 2 (e.g., riprap, dikes, etc) will also be noted and added to the revised base maps.

Included in this portion of the assessment will be a qualitative evaluation of current and historic sediment sources and routing. While it is beyond the scope of this evaluation to provide a detailed sediment budget, it is necessary to understand how sediment is generated and moves within the system. Based on the level of information garnered from Task 2, selected sites will be visited to determine the type and relative quantity of sediment available to the channel network, extent and location of reaches where sediment deposition or paucity has significantly influenced channel form, and what constraints/opportunities sediment dynamics will provide for the alternatives developed in Task 4.

Task 3d. Community Meetings to Present Technical Findings

Tasks 2 and 3 will generate a broad characterization of the existing ecological conditions, stream channel conditions, the Channel Migration Zone, and stream restoration design constraints. This is a good time to hold a community meeting to discuss our preliminary findings with the public, to present what we know about existing problems and potential solutions, to discuss our next steps, and to ask the community for their input (e.g. concerns, data gaps, and other relevant information). We will organize a broadly publicized community meeting to provide the consultant team and AT with an opportunity to solicit potentially new

information or data. The community meeting will also provide an opportunity to identify any unanticipated challenges or resistance from concerned constituents. Having an opportunity to identify these potential problems, and to begin addressing them in a collaborative fashion with the concerned parties prior to developing the draft management plan, can help alleviate these identified concerns, help establish communications channels with the broader public, and enhance the success of the overall project.

Joanne Richter will work with the UDWC and AT to create the exact format for the community meeting, based on local knowledge from the AT and key stakeholders. Considerations that will be evaluated will include timing of the meetings (e.g. evening, late afternoon, weekends, etc.) and format (open house with information kiosks, or presentations by the consultants and AT members followed by Q & A/discussion sessions with the public). The intent will be to craft a design that maximizes the effectiveness of these meetings with the Sisters community, and provide an opportunity for greater information exchange between the WPN team, the AT, and the broader community.

Deliverables for Task 3:

- Complete Existing Conditions Summary based on Task 1, Task 2, and Task 3.
- Complete Channel Migration Zone delineation and map.
- Revise GIS maps and other spatial analysis based on field data.
- Summarize outcomes from the community meeting.

TASK 4. DEVELOP PROPOSED RESTORATION AND MANAGEMENT ACTIONS

The RFP describes the outcome of this task as a discussion of “*reach-by-reach proposed management actions, with an emphasis on holistic actions that address the root causes and prevent future problems*”. In addition the overall restoration plan is to include proposed policy level actions that may be taken by the city as well as proposed regulatory considerations.

To achieve the desired outcome, we visualize that the Whychus Restoration and Management Plan will address Whychus Creek at several levels of organization. At the broadest level, the plan will evaluate existing planning and regulatory programs, and recommend changes that could be implemented to address the issues associated with development within the floodplain. At the stream channel scale, we visualize a hierarchical approach that organizes potential project sites within geomorphic reaches. Restoration actions at the project site scale need to contribute to resolution of the problem identified at the reach scale (or greater hierarchy) to assure an emphasis on functions and values, not on site-specific structural issues. We have used this 20 - 30% conceptual design system successfully in several other stream restoration planning efforts that have progressed to 100% design and implementation (see project descriptions for

Mashel River, Ohop Creek, Patawa Creek, and Tutuilla Creek in Section 3 of this proposal).

Restoration actions will be developed in an iterative sequence as described in Task 4b to Task 4d. First, all potential projects will be identified at a conceptual level in a table linking project descriptions to map locations. This initial table of restoration actions will be submitted to the AT for review and advice on which actions meet priority needs to design in further detail. We will then focus on the recommended actions and more fully describe the design trajectories. Conceptual project plans and estimated costs will be described at approximately the 20% design scale (including plan views and cross sections), sufficient to complete grant applications for project funding (see Task 4d).

Task 4a. Evaluate Local Governmental Policies and Other Regulatory Considerations

When developing restoration and management actions for an urban stream such as Whychus Creek, it is very important to not rely solely on scientific analyses to develop proposed actions. Instead it is critical to link this scientific framework with the social, political, and policy frameworks that interplay in each community, in order to ensure that the proposed scientific recommendations will ultimately be understood and supported by the community as a whole. With that in mind, we propose to evaluate various policy-level actions that could assist with the long-term restoration of Whychus Creek. Once these various policy tools are evaluated in the Whychus Creek Restoration and Management Plan, it will be very important for the City of Sisters to develop very specific policy goals and definitions before initiating the development of specific and defensible creek protection measures such as setbacks. That work is outside the scope of this project, but would be a logical implementation step for the City to consider.

Policy-Level Actions

For this project we will identify an array of policy-level actions that the City of Sisters could pursue that would assist with the long-term protection and restoration of the creek system. The City of Sisters Comprehensive Plan and City Code currently specify a Flood Plain Zone that encompasses 26 gross acres of land identified by Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps as being in the 100-year floodplain of Whychus Creek. However, the 100-year floodplain shown on the Zoning Map does not necessarily define where the creek channel is now, or where it might be in 100 years due to channel migration. In addition, the City does not currently have a riparian protection or enhancement ordinance in place that could help protect the creek's riparian vegetation from disturbance⁵.

There are many good examples of various types of stream protection policies that will be evaluated in this section to determine what might be applicable to Whychus Creek, and acceptable to the City of Sisters community as a whole. We will examine specific examples of various local ordinances including those that address channel migration zone

⁵ City of Sisters, 2005. Sisters Comprehensive Plan, Sisters, OR.

protection, floodplain preservation, stream channel protection, and riparian habitat protection. Other policy actions that will be evaluated include incentive programs and best management practices (BMPs) that could be developed for landowners to implement, such as low cost/ high value solutions for improving riparian habitat, shading the creek, and minimizing stream bank erosion. Incentives to offset the cost of the plant material or to provide some economic benefit to the landowner (e.g. property tax credits) are possible ways to encourage landowners to contribute to riparian zone restoration.

Regulatory Considerations

During the course of completing Task 4, we will begin talking with local representatives from the U.S. Army Corps of Engineers (Corps), the U.S. Fish and Wildlife Service (USFWS), and the Oregon Departments of Fish and Wildlife (ODFW), Environmental Quality (DEQ), Division of State Lands (DSL), and Department of Land Conservation and Development (DLCD) to assess what level of permitting and/or agency coordination may be needed for the various restoration actions we will be proposing. Early discussions with these agencies will be important because the level, complexity, and cost of the permitting process can vary widely depending on the type of project being proposed. A summary of anticipated permitting needs will be included in the conceptual plans for each proposed restoration project.

Task 4b. Develop Geomorphic Reach and Project Site Restoration Actions

The previous tasks provide the basis for describing potential restoration actions at both reach and project site scales. Specifically, the field assessments are designed to catalog potential restoration options. These options will be organized into the *Whychus Restoration Action Plan Table* with site projects nested within reaches. The table will include:

- Reach identification
- Map location
- Brief action description
- Property owners by plat number
- Objectives
- Benefits versus challenges
- Estimated cost (within broad cost categories)

Please see the final products available at <http://mashel.com/> for an example of how we have applied this approach in a similar project in Washington State. A series of treatments were identified that addressed the range of concerns present in the project area (see Appendices 3 and 4 in the mashel.com database). These “typical” treatments were then applied to specific locations within the project reach (summarized on the map in Appendix 1). In the Mashel project we further parsed the treatments to a series of pilot project locations (summarized in Appendix 5 and Table 9 of the main report). Although Whychus Creek is a much smaller system, and located in a different ecological setting, we feel that the

approach presented in the Mashel report provides an illustrative example of how we will approach the Whychus project.

Task 4c. Present Draft Restoration and Management Actions

The WPN team will organize a widely publicized community meeting, and a joint meeting with the Sisters City Council and Planning Commission, to present our draft recommendations for restoration and management actions. The rationale for each proposed action will be discussed in detail, including problems addressed, conceptual design information, and the estimated costs and benefits of each proposed action.

These meetings will emphasize that the restoration actions shared at the community meetings are in draft form. The timing of the meetings will be designed to provide the public with an opportunity to submit suggested improvements to the draft plans, with enough time to incorporate these suggestions into the final plans.

Task 4d. Revise Recommended Actions and Develop Conceptual Plans for Selected Projects

Based on direction from the AT and feedback received at the community meetings, the WPN Team will revise the *Whychus Restoration Action Plan Table* and project descriptions, develop conceptual project plans for high priority projects, and describe the recommended sequencing of projects.

The level of detail envisioned in a “Conceptual Project Plan” (as requested in the RFP) can be highly variable depending on individual interpretation of the term. To clarify our understanding of what is being requested, we have attached as an appendix to this proposal the Washington State Salmon Recovery Funding Board (SRFB) definition of the different levels of project development assessments and designs (see Appendix 1). For the purposes of this proposal, we will be using SRFB recommendations for a *Conceptual Design Evaluation*. The elements of this level of design are described below, however we recognize that the AT may be looking for a different scale of effort, and if so, we would be glad to revise these elements if WPN is the selected contractor.

Conceptual Design Evaluation elements include:

1. Description of the problem and project site.
2. Identification of specific objectives for addressing the problem.
3. Identification of various alternatives for achieving the project objectives.
4. Evaluation of the various alternatives.
5. Detailed description of preferred alternative(s).
6. Project site plans and cross sections (at the scale provided by LiDAR topography).
7. Initial cost estimate using standard cost approximation procedures.

Deliverables for Task 4:

- Summarize possible local government policies and regulatory programs.

- Develop reach and site specific restoration actions.
- Summarize outcomes from the community meeting and the Sisters City Council / Planning Commission meeting.
- Complete draft conceptual design plans for recommended restoration projects.

TASK 5. COMPLETE WHYCHUS CREEK RESTORATION AND MANAGEMENT PLAN

Based on feedback received from the AT and the two community meetings described in Task 4c above, the WPN team will produce draft and final versions of the Whychus Creek Restoration and Management Plan (Plan) as described below.

Task 5a. Produce Draft Restoration and Management Plan

The draft Plan will include the results of all previous project tasks including:

- A complete summary of all existing conditions based on previous studies and WPN's field assessment work.
- Detailed GIS maps of the stream system that graphically depicts key findings from the Task 2, 3 and 4 analyses including the Channel Migration Zone delineation and proposed restoration sites.
- All monthly project update reports to that were shared with the AT, as well as summaries and records from the four community meetings.
- A summary of proposed local government policies that could be implemented by the City of Sisters, and the likely regulatory / permitting actions that would need to occur during the restoration project design and construction phases of project implementation.
- Conceptual plans (at the 20% design level) for each of the recommended restoration projects.

Task 5b. Produce Final Restoration and Management Plan

The Draft Plan will be finalized based on comments received from the AT and key stakeholders.

Estimated Work Schedule

| Task/Deliverables | 2008 | | | | | | 2009 | | | | | |
|-----------------------------------------------------------------------------|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|
| | July | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
| Task 1 Project Management | | | | | | | | | | | | |
| 1.a Advisory Team (AT) Meetings | | | | | | | | | | | | |
| 1.b Community outreach strategy | | | | | | | | | | | | |
| 1.c Project web site development | | | | | | | | | | | | |
| Monthly Project Updates to AT | | | | | | | | | | | | |
| Task 2 Describe existing condition | | | | | | | | | | | | |
| 2.a characterize ecological conditions | | | | | | | | | | | | |
| 2.b hydrology and design flows | | | | | | | | | | | | |
| 2.c geomorphic framework and base map | | | | | | | | | | | | |
| 2.d Initiate CMZ delineation | | | | | | | | | | | | |
| First Community Meeting (est. 9/10/08) | | | | | | | | | | | | |
| Update to City Council / Planning Comm. | | | | | | | | | | | | |
| Task 3 Complete Field Assessments | | | | | | | | | | | | |
| 3.a Fisheries | | | | | | | | | | | | |
| 3.b Riparian plant communities | | | | | | | | | | | | |
| 3.c Channel migration zone | | | | | | | | | | | | |
| 3.d Second Community Meeting | | | | | | | | | | | | |
| Task 4 Proposed Restoration Actions | | | | | | | | | | | | |
| 4.a Policy and regulatory considerations | | | | | | | | | | | | |
| 4.b Draft reach and site restoration actions | | | | | | | | | | | | |
| 4.c Present draft actions to community and to City Council / Planning Comm. | | | | | | | | | | | | |
| 4.d (1) Revise restoration and management actions | | | | | | | | | | | | |
| 4.d (2) Develop Concept Designs | | | | | | | | | | | | |
| Task 5 Whychus Restoration Plan | | | | | | | | | | | | |
| 5.a draft Restoration & Management Plan | | | | | | | | | | | | |
| AT Review and Comment | | | | | | | | | | | | |
| 5.b Finalize Restoration & Management Plan | | | | | | | | | | | | |
| Present final to City Council / Planning Comm. | | | | | | | | | | | | |