REQUEST FOR PROPOSAL

Shoemaker Island Flow-Sediment-Mechanical "Proof of Concept" Experiment Implementation Design Technical Support, Monitoring, and Data Analysis

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM
Office of the Executive Director
4111 4th Avenue, Suite 6
Kearney, Nebraska 68845

May X, 2012

Contents

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM
REQUEST FOR PROPOSALS

SUBJECT:	Shoemaker Island FSM "Proof of Concept" Implementation Design Technical Support, Monitoring and Data Analysis
REQUEST DATE:	May X, 2012
PRE-PROPOSAL MEETING:	May X, 2012
CLOSING DATE:	May X, 2012
POINT OF CONTACT:	Jason Farnsworth Headwaters Corporation (308) 991-7602 *farnsworthj@headwaterscorp.com*

I. OVERVIEW

The Platte River Recovery Implementation Program (Program) was initiated on January 1, 2007 between Nebraska, Wyoming, Colorado, and the Department of the Interior to address endangered species issues in the central and lower Platte River basin. The species considered in the Program, referred to as "target species", are the whooping crane, piping plover, interior least tern, and pallid sturgeon. Program participants have reached an agreement for participation in the First Increment of the Program for the period from 2007 through 2019.

A Governance Committee (GC) reviews, directs, and provides oversight for activities undertaken during the Program. The GC is comprised of one representative from each of the three states, three water user representatives, two representatives from environmental groups, and two members representing federal agencies. The GC has named Dr. Jerry Kenny to serve as the Program Executive Director (ED). Dr. Kenny established Headwaters Corporation as the staffing mechanism for the Program. Program staff are located in Nebraska and Colorado and are responsible for assisting in carrying out Program-related activities.

The Program's management objectives are to 1) improve survival of whooping cranes during migration, 2) improve least tern and piping plover production, and 3) avoid adverse impacts on pallid sturgeon in the Lower Platte River. One of the Program's management strategies to achieve these objectives is the Flow-Sediment-Mechanical (FSM) management strategy. The FSM strategy includes the following management actions:

1. Flow – Augment Q1.5 through flow releases to create short duration high flows (SDHF) of 5,000 to 8,000 cfs for 3 days in 2 out of 3 years.

2. Sediment – Augmentation of approximately 150,000 tons of medium sand annually to offset sediment deficit upstream of Kearney.

3. Mechanical - Channel widening, clearing and leveling of in-channel islands and flow consolidation (85 - 90% of 8,000 cfs in a single channel).

The Program has committed to using the process of adaptive management (AM) to reduce uncertainty associated with the ability of management actions to create and/or maintain habitat for the Program's target species. This is achieved by explicitly acknowledging uncertainty in the form of alternative hypotheses of management action performance and testing the hypotheses through implementation of management experiments. Uncertainty associated with implementation of the FSM management strategy is formalized in the Program's Adaptive Management Plan (AMP) in the form of physical process broad and priority hypotheses. Broad hypotheses that pertain to the FSM management strategy include:

PP-1: Flows of varying magnitude, duration, frequency and rate of change affect the morphology and habitat quality of the river, including:

- Flows of 5,000 to 8,000 cfs magnitude in the habitat reach for a duration of three days at Overton on an annual or near-annual basis will build sandbars to an elevation suitable for least tern and piping plover habitat;
- Flows of 5,000 to 8,000 cfs magnitude in the habitat reach for a duration of three days at Overton on an annual or near-annual basis will increase the average width of the vegetation-free channel;
- Variations in flows of lesser magnitude will positively or negatively affect the sandbar habitat benefits for least terns and piping plovers.

PP-2: Between Lexington and Chapman, eliminating the sediment imbalance of approximately 400,000 tons annually in eroding reaches will:

- Reduce net erosion of the river bed;
- Increase the sustainability of a braided river;
- Contribute to channel widening;
- Shift the river over time to a relatively stable condition, in contrast to present conditions where reaches vary longitudinally between degrading, aggrading, and stable conditions; and
- Reduce the potential for degradation in the north channel of Jeffrey Island resulting from headcuts.

PP-3: Designed mechanical alterations of the channel at select locations can accelerate changes towards braided channel conditions and desired river habitat using techniques including:

- Mechanically cutting the banks and islands to widen the channel to a width sustainable by program flows at that site, and distributing the material in the channel;
- At specific locations, narrowing the river corridor and increasing stream power by consolidating over 85 percent of river flow into one channel will accelerate the plan form change from anastomosed to braided, promoting wider channels and more sandbars.
- Clearing vegetation from banks and islands will help to increase the width-to-depth ratio of the river

These hypotheses provide a broad view of the possible changes in river morphology/channel characteristics that may be produced through implementation of FSM management actions. More detailed hypotheses that address uncertainty in underlying physical process relationships are formalized in the AMP as flow, sediment, and mechanical priority hypotheses. The Program has refined the list of priority hypotheses. Tier I physical process priority hypotheses include:

Flow #1: ↑ the variation between river stage at peak (indexed by Q1.5 flow @ Overton) and average flows (1,200 cfs index flow), by ↑ the stage of the peak (1.5-yr) flow through Program flows, will ↑ the height of sandbars between Overton and Chapman by 30% to 50% from existing conditions.

Flow #3: ↑ 1.5-yr Q with Program flows will ↑ local boundary shear stress and frequency of inundation @ existing green line (elevation at which riparian vegetation can establish). These changes will ↑ riparian plant mortality along margins of channel, raising elevation of green line. Raised green line = more exposed sandbar area and wider unvegetated main channel.

Flow #5: ↑ magnitude and duration of a 1.5-yr flow will ↑ riparian plant mortality along the margins of the river. There will be different relations (graphs) for different species.

Sediment #1: Average sediment augmentation near Overton of 185,000 tons/yr under existing flow regime and 225,000 tons/yr under GC proposed flow regime achieves a sediment balance to Kearney.

Mechanical #2: ↑ the Q1.5 in the main channel by consolidating 85% of the flow, and aided by Program flow and a sediment balance, flows will exceed stream power thresholds that will convert main channel from meander morphology in anastomosed reaches to braided morphology with an average braiding index > 3.

The AM process dictates that these hypotheses be tested within the construct of management experiments. Doing so provides a mechanism for prediction, implementation, and analysis of the performance of actions in achieving management objectives. More importantly, it also defines necessary action adjustments based on the range of possible performance outcomes. This ensures that the monitoring and analysis feedback loop is closed and actions are adjusted to improve performance.

Implementation design is the step in the AM process where experimental, civil, and monitoring and analysis designs are developed for a management experiment. This design process is critical to the success of management experiments because it provides a foundation for all subsequent implementation and evaluation actions and ensures that data collection and analysis inform management action decision making. Implementation design components include:

- **Management Action Review and Refinement** – Review proposed management action performance (and associated hypotheses) based on indicators and performance criteria from problem assessment phase and updated/improved conceptual modeling. Refine

performance expectations for management action components/designs based on updated modeling.

- **Experimental Design** – Perform statistical analysis of possible outcomes of management experiment based on refined understanding of performance expectations and remaining model/physical process relationship uncertainty. Use to develop experimental design that presents spatial and temporal distribution of actions (locations, replicates, etc) that are expected to provide information necessary to assess management action performance and facilitate decision making.
- **Civil Design –** Design and permitting for management actions that will be implemented under the experimental design.
- **Monitoring and Analysis Design –** Development of conservation monitoring and data analysis plans for management experiment. Data will be used to evaluate performance.
- **Performance Evaluation –** Development of data analysis decision tree that defines management experiment performance criteria and dictates alternative courses of action under a range of possible outcomes.

The GC submits this Request for Proposals (RFP) to solicit proposals from Consultants to provide technical services in support of the development and implementation of an FSM "Proof of Concept" management experiment at the Program's Shoemaker Island Complex near Wood River, Nebraska. The scope of services includes 2-dimensional hydraulic and sediment transport model development and calibration, statistical analysis for experimental design, annual implementation and effectiveness monitoring, and synthesis and analysis of monitoring data in support of performance evaluation. The term Consultant shall be used throughout this document to describe both the RFP Respondent providing the proposal and Consultant (the successful Respondent) who would be performing the work upon award of the project.

II. PROJECT DESCRIPTION

In 2011, the Program began implementation of a FSM "Proof of Concept" management experiment at the Elm Creek Complex near Elm Creek, Nebraska. That reach was chosen as the first "Proof of Concept" site because flows are consolidated by the Kearney Canal Diversion and the presence of the diversion in the middle of the reach produces a range of hydraulic and sediment transport conditions. The Program has completed the first year of activities associated with that project, including development of monitoring protocols, 2-dimensional modeling, and pre/post runoff monitoring. Analysis of the first year of monitoring data has also been completed and the Program is working with the contractor to finalize the first year monitoring report and implementation design document for that project. While the first year of the management experiment at the Elm Creek Complex provided very useful data, there has been some concern that the presence of the diversion, as well as the general sediment deficit in the reach, may limit the Program's ability to apply learning at this location to other reaches. The Shoemaker Island FSM "Proof of Concept" project will provide another replicate of this management experiment in a reach that is in sediment balance and is not impacted by water development or transportation infrastructure.

The Shoemaker Island Complex includes an approximately 2.6-mile long reach of Platte River channel extending from approximately 1.5 miles downstream of the Highway 11 bridge to approximately one mile upstream of Alda Road as shown in **Figure 1**. The Program owns the north bank and associated accretion lands in this reach. The south bank is in Private ownership and the Program is working with these landowners to obtain permission to implement research and monitoring on their accretion lands. The complex is located in the downstream portion of the Associated Habitat reach where the channel is in sediment balance. Because of this, the Shoemaker Island Complex has been chosen for implementation of second replicate of a "Proof of Concept" management experiment to evaluate the performance of the FSM management actions in creating and/or maintaining channel characteristics that are consistent with the Program's management objectives. Learning objectives for the Shoemaker Island Complex management experiment include:

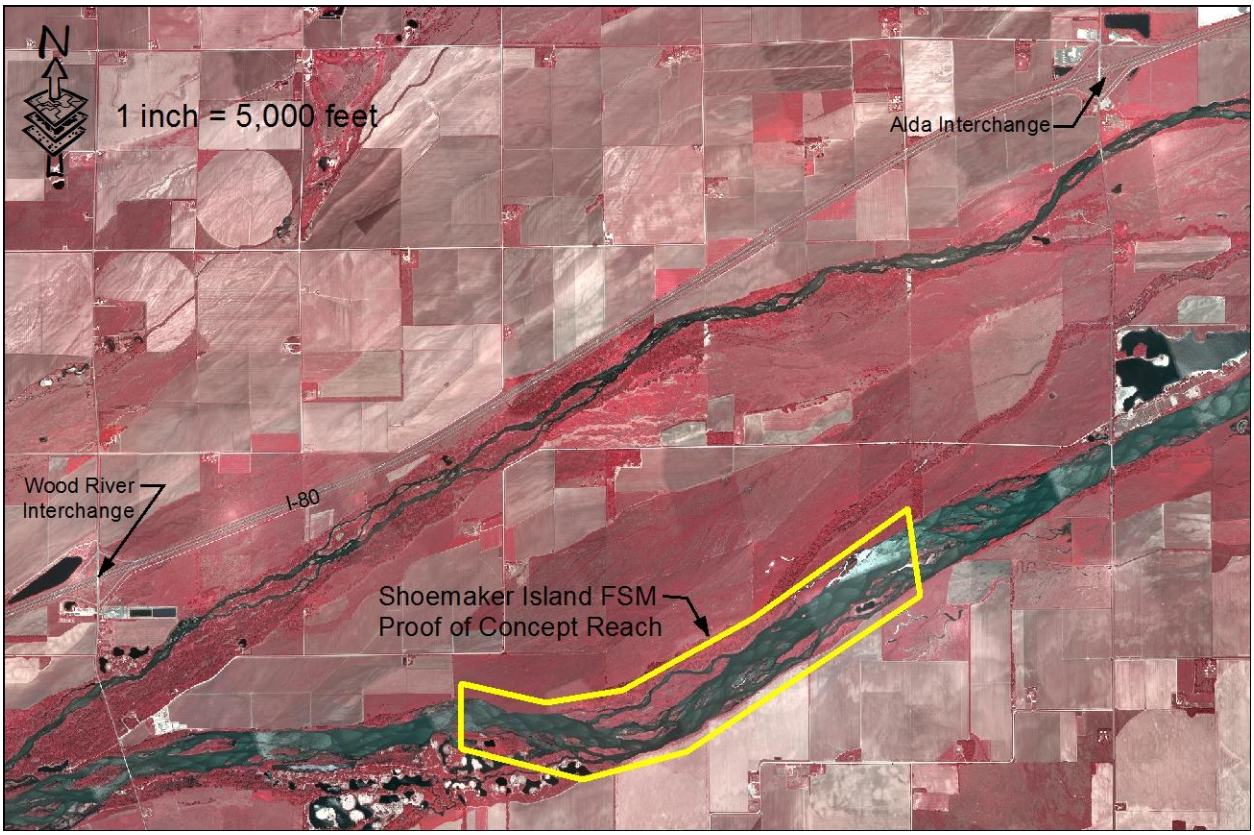

Figure 1. Shoemaker Island FSM Proof of Concept project reach.

1) ***Evaluate the relationship between peak flows (magnitude and duration) and sandbar height and area.*** Understanding the relationship between river stage at peak and sandbar height in relation to maximum water surface elevation are fundamental to testing the Program's FSM management strategy. The EIS analysis assumed that sandbars form to the water surface elevation during high flow events but that under the current flow regime, there is not enough difference between the 1.5-year return frequency flow elevation and the normal water surface elevation during the summer nesting months to create sandbars that are high

enough for nesting. As such, doubling the 1.5-year return frequency flow from approximately 4,000 cfs to approximately 8,000 cfs would increase bar heights by 30% to 50% as presented in Priority Hypothesis Flow 1.

Sandbar formation during the natural flow events of 2010 and 2011, which exceeded SDHF magnitude and duration, indicates that sandbars are not forming to the water surface elevation during high flow events. However, this has raised additional questions about:

- ***i)*** the relationship between sediment transport (surplus/deficit) and the frequency of sandbar occurrence,
- ***ii)*** the relationship between sediment grain size distribution and sandbar height potential, and
- ***iii)*** the role of hydrograph duration and shape in sandbar height.

2) ***Evaluate the relationship between peak flows (magnitude and duration) and riparian plant mortality.*** Understanding the relationship between flow and riparian plant mortality is fundamental to testing the Program's FSM management strategy. Modeling conducted during Environmental Impact Statement (EIS) development indicated that increasing the 1.5-year return frequency flow from approximately 4,000 cubic feet per second (cfs) to approximately 8,000 cfs through the use of SDHF in two out of three years (under sediment balance) would increase riparian plant mortality sufficiently to maintain wide, braided, unvegetated main channels with exposed sandbars. This relationship is presented in Program Priority Hypotheses Flow 3. Analysis of existing system and project-scale vegetation monitoring is ongoing. Preliminary results indicate a need to continue to evaluate the interaction between scour and inundation mortality as well as the role of lateral erosion in vegetation removal from sandbars.

3) ***Evaluate ability of FSM management strategy to create and/or maintain habitat for whooping cranes, least terns and piping plovers.*** Linking physical process relationships to target species habitat requirements is fundamental to development of management experiment performance criteria and action adjustments. The overarching Program objectives relate to target species survival and productivity. As such, Program management strategies must be capable of creating and/or maintaining river conditions that are suitable for achieving those objectives. Specifically, the FSM management strategy must be able to scour enough vegetation to maintain unobstructed view widths suitable for whooping crane roosting and build/maintain bars of sufficient height and lack of vegetation to function as least tern and piping plover nesting habitat.

As discussed in the overview, actions to be taken under the FSM strategy include flow releases, sediment augmentation, and in-channel mechanical actions (flow consolidation and channel manipulation). One-dimensional sediment transport modeling and system-scale geomorphology monitoring from 2009-2011 indicate that this reach is in sediment balance. Flow consolidation is not a potential management action in this reach due to the nature of the flow split upstream of the Highway 11 Bridge (approximately 70-80% of the flow at 8,000 cfs is consolidated in the main channel). The remaining potential FSM action at this site is in-channel clearing and leveling.

The Program has entered into management agreements with private and conservation landowners in the complex reach and has secured the ability to conduct in-channel vegetation control through mechanical disking and clearing. This provides the Program with the opportunity to evaluate the interactions/relationships between flow, sediment, and mechanical actions in this reach. Clearing and leveling of in-channel macroforms would be the primary mechanical actions associated with this management experiment and would likely commence in the fall of 2012.

III. SCOPE OF WORK

The Consultant will be responsible for providing technical services in support of the development and implementation of this "Proof of Concept" management experiment. General Consultant services to be completed for this RFP are as follows:

1) Technical Support for Management Experiment Implementation Design
   a) 2-dimensional hydraulic and sediment transport model development, calibration and sensitivity analysis for complex reach using an existing model platform (e.g., Bureau of Reclamation SRH-2D model, or other Program approved platform).
   b) Model application to refine expectations of management action performance.
   c) Perform statistical analysis of possible outcomes of management experiment based on model uncertainty. Use to develop experimental design that presents spatial and temporal distribution of possible mechanical vegetation treatments that are expected to provide information necessary to assess management action performance and facilitate decision making.
   d) Technical support for development of performance evaluation decision tree based on performance criteria and possible action adjustments.
2) Monitoring and Data Analysis
   a) Annual implementation of project-scale geomorphology and vegetation monitoring before and after an SDHF or natural flow event. The existing project-scale protocol for the Elm Creek FSM project is included as Attachment 1 for reference.
   b) Annual analysis of project-scale geomorphology and vegetation data to evaluate physical process relationships and management action performance. The existing data analysis and reporting plan for the Elm Creek FSM project is included as Attachment 2 for reference.
   c) Annual model refinements and updates based on monitoring data and analysis.
3) Reporting and Performance Evaluation
   a) Development of annual summary report and participation in AMP reporting sessions.
   b) Development of preliminary management experiment performance evaluation report following year-two implementation.

The final tasks and deliverables for the monitoring, analyses, and modeling will be developed jointly by the EDO and the Consultant. **This contract will be on a three year basis, with the option to renew, re-compete, or cancel at the discretion of the Program.**

PROJECT BUDGET

The Program has budgeted $250,000 for this project in calendar-year 2012. An estimated project budget should **NOT** be submitted in the proposal and proposals will not be evaluated based on cost. A final scope of work and project budget will be negotiated prior to commencement of work.

IV. CONTRACT TERMS

The selected Consultant will be retained by:

Nebraska Community Foundation
PO Box 83107
Lincoln, NE 68501

Proposal should indicate whether the Consultant agrees to the contract terms as outlined in the attached Program's Consultant Contract (Attachment 3), or provide a clear description of any exceptions to the terms and conditions.

The initial term of the contract will be for a period beginning in June 2012 and terminating in April 2015 with an option to renew at the sole discretion of the GC. Contracted services will be performed on a time and material not to exceed basis. Under the final contract, written Notice to Proceed from the Executive Director will be required before works begins. All work will be contingent on availability of Program funding.

V. SUBMISSION REQUIREMENTS

All interested parties having experience providing the services listed in this RFP are requested to submit a proposal.

Instructions for Submitting Proposals

One paper copy and one electronic (PDF) copy of your proposal must be submitted to Jason Farnsworth at the Program office in Kearney Nebraska *no later than 5:00 p.m. Central time on May X, 2012*. Maximum allowable proposal PDF size is 8MB, and proposals are to be limited to a total of 50 pages or less. A proposal is late if received by the office any time after 5:00 p.m. Central time and will not be eligible for consideration.

Questions regarding the information contained in this RFP should be submitted to Jason Farnsworth at *farnsworthj@headwaterscorp.com*. A list of compiled Consultant questions and responses will be maintained on the Program web site (*www.PlatteRiverProgram.org*) in the same location as this RFP solicitation.

RFP Schedule

The ED Office expects to complete the selection process and award the work by approximately May X, 2012. The following table represents the RFP schedule:

Description	Date	Time (Central)
Issue RFP	May X, 2012	NA
Pre-proposal meeting	May X, 2012	2:00 PM
Last day for respondents to submit questions regarding the RFP	May X, 2012	5:00 PM
Proposals due from respondents	May X, 2012	5:00 PM
Evaluation of proposals	May X, 2012 thru June X, 2012	
Award of Work	On or before June X, 2012	
Start of Work	Approximately June X, 2012	
Completion of Work	Approximately April X, 2015	

Pre-Proposal Meeting

A mandatory pre-proposal meeting of interested parties will be held on May X, 2012 from 2:00 to 3:30 p.m. Central Time via conference call for the purpose of familiarizing the respondents with the work scope and requirements included herein before submitting a response to this RFP. Please email Jason Farnsworth (farnsworthj@headwaterescorp.com) for the conference call dial-in information along with a list of people from your party expected to join in the pre-proposal conference call by 3:00 p.m. Central Time on May X, 2012.

The meeting will include a brief overview by the ED Office regarding the objectives of the project, the scope of services, and the timeline. It is the respondent's responsibility, while at the pre-proposal meeting/conference call, to ask questions necessary to understand the RFP so the respondent can submit a proposal that is complete and according to the RFP requirements. No minutes will be distributed by the ED Office regarding the meeting.

Proposal Content

Proposals should respond to the following general topics:

1) **Project understanding:** Discussion that demonstrates the Consultant's understanding of key physical process relationships and uncertainties to be addressed by this project and the adaptive management framework that will be used by the Program and the Consultant to address those uncertainties.

2) **Project approach:** Discussion of the Consultant's approach to achieving the learning objectives of this project including critical issues, tasks, or considerations that may have shaped your approach. This section should not be a reiteration of the general scope of work presented in Section III of this RFP. That scope was provided as general guidance and original thinking and/or discussion of improvements to that approach are welcome.

3) **Qualifications and project experience:** Provide project team organization, resumes/qualifications, and responsibilities. Identify relevant project experience including the involvement/role of the proposed team in those projects.

4) **Schedule:** Identify general schedule and critical issues for tasks in 2012. Given that the final scope will be developed following Consultant selection, the schedule discussion should focus on critical tasks, potential constraints or challenges and how event-based data collection will be accomplished by your team given the need to respond on short notice (e.g., following high flow events associated with snowmelt runoff and/or rainstorms).

5) **Conflict of interest statement** addressing whether or not any potential conflict of interest exists between this project and other past or on-going projects, including any projects currently being conducted for the Program.

6) **Description of insurance** shall be provided with the proposal. Proof of insurance will be required before a contract is issued. Minimum insurance requirements are described in the attached Program's Consultant Contract (Attachment A).

7) **Acceptance of the terms and conditions** as outlined in the attached Program's Consultant Contract, or clear description of any exceptions to the terms and conditions.

Criteria for Evaluating Proposals

The Governance Committee appointed a Proposal Selection Panel that will evaluate all proposals and select a Consultant based on the following principal considerations:

1. The Consultant's understanding of the overall physical process relationships and uncertainties to be addressed in this management experiment using an adaptive management framework.

2. The Consultant's approach to meeting the learning objectives of this project including identification of and addressing critical project tasks and issues.

3. Qualifications and the relevant experience of the proposed project team members and firm.

Award Notice

After completing the evaluation of all proposals and, if deemed necessary, interviews, the Proposal Selection Panel will select a Consultant. That firm will negotiate with the ED Office to establish a fair and equitable contract. If an agreement cannot be reached, a second firm will be invited to negotiate and so on. If the Program is unable to negotiate a mutually satisfactory contract with a Consultant, it may, at its sole discretion, cancel and reissue a new RFP.

Program Perspective

The Governance Committee of the Program has the sole discretion and reserves the right to reject any and all proposals received in response to this RFP and to cancel this solicitation if it is

deemed in the best interest of the Program to do so. Issuance of this RFP in no way constitutes a commitment by the Program to award a contract, or to pay Consultant's costs incurred either in the preparation of a response to his RFP or during negotiations, if any, of a contract for services. The Program also reserves the right to make amendments to this RFP by giving written notice to Consultants, and to request clarification, supplements, and additions to the information provided by a Consultant.

By submitting a proposal in response to this solicitation, Consultants understand and agree that any selection of a Consultant or any decision to reject any or all responses or to establish no contracts shall be at the sole discretion of the Program. To the extent authorized by law, the Consultant shall indemnify, save, and hold harmless the Nebraska Community Foundation, the states of Colorado, Wyoming, and Nebraska, the Department of the Interior, members of the Governance Committee, and the Executive Director's Office, their employees, employers, and agents, against any and all claims, damages, liability, and court awards including costs, expenses, and attorney fees incurred as a result of any act or omission by the Consultant or its employees, agents, sub-Consultants, or assignees pursuant to the terms of this project. Additionally, by submitting a proposal, Consultants agree that they waive any claim for the recovery of any costs or expenses incurred in preparing and submitting a proposal.

VI. AVAILABLE INFORMATION

The following pertinent Program-related documents can be accessed from the Program web site (*www.PlatteRiverProgram.org*):

- *Platte River Recovery Implementation Program, Final Program Document.* October 24, 2006.
- *Platte River Recovery Implementation Program, Attachment 3, Adaptive Management Plan*. October 24, 2006.

Attachment 1 – Project-Scale Geomorphology and Vegetation Monitoring Protocol

Attachment 2 – Elm Creek Adaptive Management Experiment Geomorphology and Vegetation Monitoring and Analysis Plan

433 Attachment 3 – Standard Consultant Contract