REQUEST FOR PROPOSAL

Elm Creek 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

February 22, 2011

Contents

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM
REQUEST FOR PROPOSALS

SUBJECT:	Elm Creek FSM "Proof of Concept" Implementation Design Technical Support, Monitoring and Data Analysis
REQUEST DATE:	February 22, 2011
PRE-PROPOSAL MEETING:	March 4, 2011
CLOSING DATE:	March 16, 2011
POINT OF CONTACT:	Steve Smith Headwaters Corporation (720) 524-6115 *smiths@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.

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 potential performance of management actions. 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 recently 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

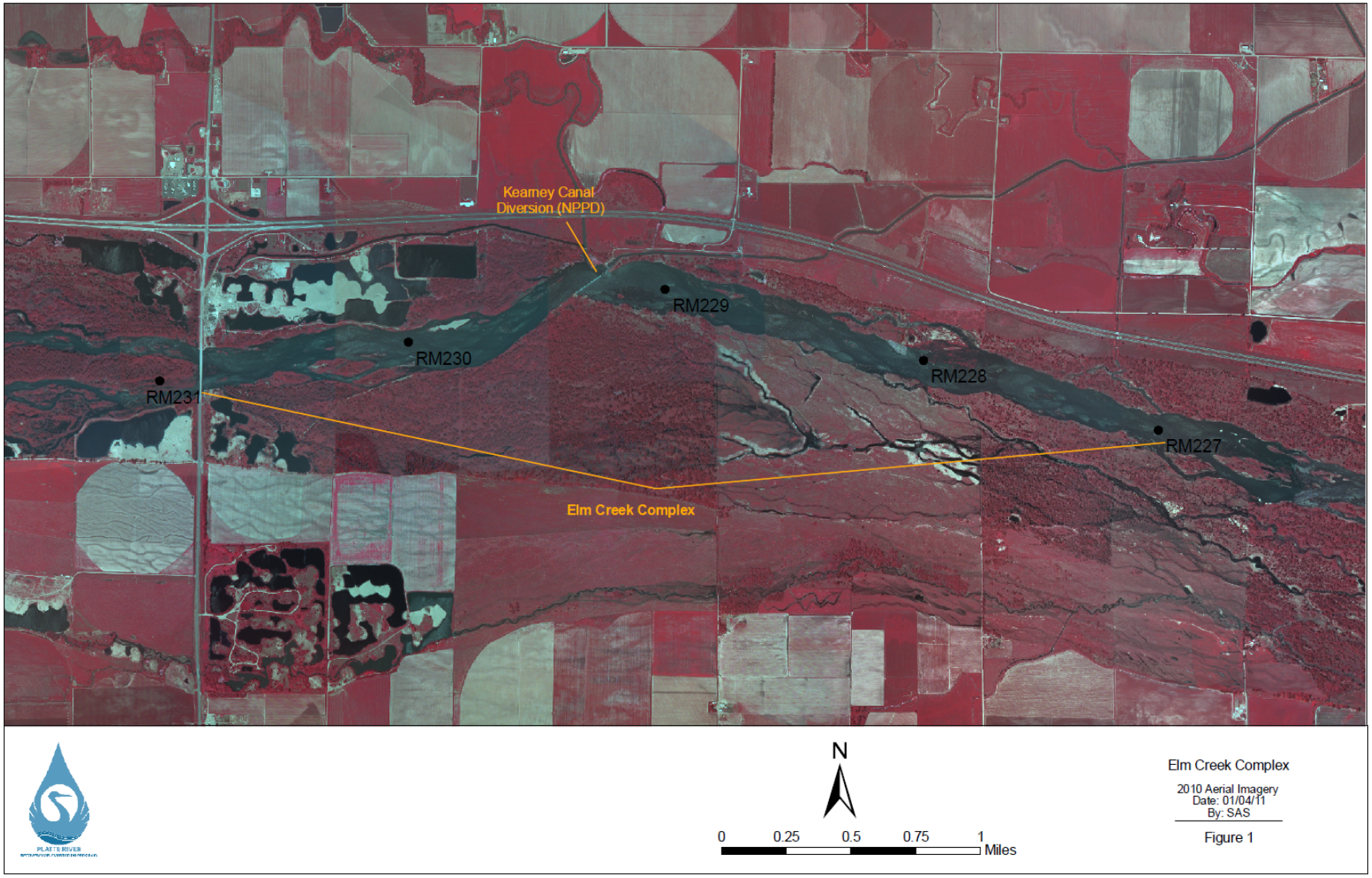
from problem assessment phase and updated/improved conceptual modeling. Refine performance expectations for management action components/designs based on updated modeling.

- **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 Elm Creek Complex near Elm Creek, 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

The Elm Creek Complex includes approximately four-mile long reach of Platte River channel extending from the Highway 183 bridge to approximately two miles downstream of the Nebraska Public Power District's Kearney Canal diversion structure as shown in **Figure 1**. Flow is consolidated upstream of the diversion by the Elm Creek Bridge and levees built to confine river flow for the diversion structure and remains consolidated for approximately two miles downstream of the diversion. During Program negotiations in the late 1990's, this reach was considered to be a "model" site for the feasibility of the FSM management strategy because the channel (which was consolidated by the diversion) exhibited a braided morphology largely free of vegetation (**Figure 2**).


Kearney Canal
Diversion (NPPD)
RM229
RM230
RM231
RM228
RM227
Elm Creek Complex
N
0 0.25 0.5 0.75 1
Miles
Elm Creek Complex
2010 Aerial Imagery
Date: 01/04/11
By: SAS
Figure 1

168


I-80 Elm Creek Interchange
Interstate 80
Kearney Canal
Kearney Canal Diversion
RM-229
RM-230
RM-231
Legend
River Mile
N
Miles
0.25
1998 CIR AERIAL IMAGERY MAP
Date: 4/6/10
By: JMF
Figure 2

169
170

During the drought of 2002-2007, this reach experienced significant expansion of in-channel vegetation, resulting in narrowing of the unvegetated channel with the development of a multitude of vegetated high bars that have persisted through two significant flow events of 13,000 and 8,000 cfs during the last three years. This transition away from desirable channel form and function (from a habitat standpoint) and existing flow consolidation makes this reach an ideal candidate for implementation 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 Elm Creek Complex FSM "proof of concept" management experiment include:

1) ***Evaluate ability of SDHF to increase riparian plant mortality and (consequently) raise green line resulting in more exposed sandbar area and wider unvegetated main channel.*** 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.

2) ***Evaluate ability of SDHF to increase the height of sandbars by 30% to 50% from existing conditions.*** 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.

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 SDHF releases, sediment augmentation, and in-channel mechanical actions (flow consolidation and channel manipulation. Flow releases and sediment augmentation may begin as early as 2011 and will be evaluated on both a system and project-scale. The other potential FSM action(s) at this site are mechanical in nature. Flow consolidation is already in place due to the Elm Creek Bridge and Kearney Canal diversion. 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 performance of flow, sediment, and mechanical actions in this reach. Disking and clearing of vegetated sandbars occurred in October of 2010. This action is being taken prior to initiation of the management experiment for two reasons:

1. Bars have become vegetated with species and age-classes of vegetation that were not hypothesized to be able to be scoured by SDHF flows. Mechanical removal of this vegetation is necessary in order to "reset" in-channel vegetation to conditions that are hypothesized to be able to be maintained with flow. This work is most easily accomplished in the fall. As such, the Executive Director's office decided to proceed with the mechanical work.

2. This is a multi-year management experiment, which provides the opportunity to evaluate FSM performance in relation to various vegetation species and age-classes. Mechanical removal of vegetation prior to initiation of the management experiment will simplify vegetation monitoring by "resetting" the age-class of all in-channel vegetation. Vegetation age class can then be more accurately estimated during the experiment.

The Consultant will be responsible for providing technical services in support of the development and implementation of this "proof of concept" management experiment. Consultant services to be completed for this RFP are as follows (additional detail is provided in the Scope of Work):

1) Technical Support for Management Experiment Implementation Design
   a) 2-dimensional hydraulic and sediment transport model development, calibration and sensitivity analysis for four-mile 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) Development of monitoring and data analysis plan to improve predictive capacity of model and evaluate management experiment performance.

e) 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 protocol.
   b) Annual analysis of geomorphology and vegetation data per data analysis plan.
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.

III. SCOPE OF WORK

The tasks and deliverables for the Elm Creek FSM test site monitoring, analyses, and modeling to be completed by the Consultant as a result of the work described in this RFP are as follows. Task 1 includes project management and initiation, and the subsequent tasks are part of the adaptive management (AM) cycle: experiment design, implementation, monitoring, evaluation/assessment, and adjustments. AM tasks should incorporate previous Program information and work products to design and implement an experiment capable of testing FSM-related hypotheses. Management actions will include mechanical channel manipulation, sediment augmentation, and Program-controlled short duration high flows (SDHF). Management objectives include scouring seedling vegetation and building sandbars. The management experiment will be designed to include appropriate data collection and analyses to evaluate the experiment outcomes, and to apply the results to evaluate Program hypotheses and maximize the learning potential from the management experiment results. **This contract will be on a three year basis, with the option to renew, recompete, or cancel at the discretion of the ED Office following each three year period of work.**

1) Project Initiation and Management

a) ***Objective*** – Facilitate scoping of tasks to efficiently complete the objectives of the work to be completed at the Elm Creek Complex. Detailed project scoping and budgeting should be completed for this task. Provide Program stakeholders information on project progress. Document project progress through monthly invoices and progress reports.

b) ***Task Description*** –

i. ***Kickoff and Scoping:*** Kickoff meeting with ED Office staff and Program stakeholders to finalize project scope of work and budget. Objectives of each the tasks for this scope of work will be discussed during the meeting. Review and refine scope of work and project timeline and establish a firm budget building off the budget estimate included in the proposal from the selected Consultant (see Section IV below). Following the kickoff meeting, a site visit will be held to review the site preparation work for the Elm Creek Complex, and to discuss the monitoring to be completed at the site.

ii. ***Project Management and Meetings:*** Coordinate work and solicit input from Program staff and participants throughout the project. Meetings will be conducted as necessary for the coordination of project activities and to keep the

Technical Advisory Committee (TAC) and GC informed of project progress. Specific Program committee meetings required for this scope of work are described under each related task below. Bi-weekly conference calls will be held with ED Office staff to assess project progress, and to coordinate with the ED Office regarding work to be completed in the future. ED Office staff will provide the Consultant with input on previous findings, and the timing and scope of upcoming monitoring and reporting tasks.

c) ***Deliverables –*** Detailed scope, schedule, and budget documents. Meeting minutes from all Project Management meetings; draft minutes in Microsoft Word format provided to ED Office for review/comment; final minutes in PDF format. Copies of all formal presentation materials for Program committee meetings described throughout this scope of work. Monthly invoices to the ED Office, including a summary of work completed in the current month, anticipated work for the following month, and percent complete for scope of work and budget by task.

2) AM Design - 2-dimensional Hydraulic and Sediment Transport Modeling

a) ***Objective*** – Construct, calibrate, and validate a 2-dimensional hydraulic and sediment transport model for the Elm Creek Complex project reach from the Elm Creek Bridge to approximately two miles below the Kearney Canal diversion (total of approximately 4 miles). An existing model platform will be applied for model construction, such as the Bureau of Reclamation's SRH-2D platform or other Program approved platform. The model will be used to design management experiments at the Elm Creek Complex, assess management experiment outcomes/performance, and determine necessary action adjustments.

b) ***Task Description*** – A 2-dimensional hydraulic and sediment transport model will be constructed based on Program LiDAR data and aerial photography. Additional project-scale monitoring data collected under this scope of work (**Task 7**) will be used to calibrate and validate the model. The existing Program 1-dimensional hydraulic and sediment transport model will be used to establish boundary conditions for the 2-dimensional model. The following sub-tasks will be completed.

i. ***Establish boundary conditions for 2-dimensional model:*** the Program's existing 1-dimensional model from Lexington to Odessa will be run for the Elm Creek reach to establish boundary conditions for the 2-dimensional model (e.g., rating curves for stage-discharge and sediment transport-discharge for the downstream end of the model).

ii. ***Develop 2-dimensional hydraulic and sediment transport model:*** a 2-dimensional hydraulic and sediment transport model of the Elm Creek site will be developed, calibrated, and validated based on data collected for this scope of work (**Task 7**). The model will be developed using an existing model platform to be approved by the Program. The model will include a mesh-based computational grid with resolution that aligns with the Program's LiDAR data (i.e., 0.7-m resolution). Output data from the 2-dimensional model should be in a format and resolution compatible with Program LiDAR data, such that simulated data (e.g., flow velocity, depth, and shear stress) can

easily be mapped over existing topographic data. Topographic data collected for this scope of work will supplement and refine LiDAR topographic data as necessary. Project-scale monitoring data collected under this scope of work (**Task 7**) will be used to calibrate and validate the model. Sensitivity analyses will be completed as part of model calibration/validation to identify areas of uncertainty and critical data to be monitored. Program-relevant flows of between 1,000 and 10,000 cfs should be included in the model, with at least 5 flow profiles explicitly included in the model.

c) ***Deliverables*** – Calibrated 2-dimensional hydraulic and sediment transport model for the Platte River from the Elm Creek Bridge to two miles below the Kearney Canal Diversion, including all model input and output files. Initial draft 2-dimensional hydraulic and sediment transport models will be submitted to the ED Office by June 15, 2011. The model will be modified and resubmitted annually based on physical changes at the Elm Creek proof-of-concept site (e.g., changes in vegetation and topography), and comments from the ED Office and Program stakeholders. A technical report describing model development and calibration will be submitted with the initial draft 2-dimensional hydraulic and sediment transport models by June 15, 2011. A one-day model training session will be led by the Consultant at the ED Office to train ED Office staff and Program stakeholders in the use of the model.

3) AM Design - Information Review

a) ***Objective*** – Gain an understanding of FSM-related hypotheses and concepts developed for the Program, and utilize existing information and resources in the design of the management experiment to be completed at the Elm Creek complex.

b) ***Task Description*** – Review existing reports and information related to the FSM management strategy: Program broad and priority physical process hypotheses and related performance indicators and decision criteria, the Program's draft project-scale monitoring protocol, and the Elm Creek Complex monitoring plan. Review investigations and work products completed for the Program: Program Adaptive Management Plan, 1-dimensional hydraulic and sediment transport model, vegetation scour directed research (USDA-ARS), stream power investigation (Anderson Consulting Engineers and Chester Watson), and system-scale geomorphology and in-channel vegetation monitoring data.

c) ***Deliverables*** – Technical memorandum summarizing existing Program tools and information that will be used in the implementation design of the Elm Creek management experiment. Any data gaps and additionally needed information that will not be available from the listed existing reports and investigations should be identified in the memorandum.

4) AM Design - Model Application

a) ***Objective*** – Run potential management experiment options with the 2-dimensional hydraulic and sediment transport model developed for this scope of work (**Task 2**) to predict the range of potential experiment outcomes.

b) ***Task Description*** – Apply the 2-dimensional hydraulic and sediment transport model to simulate various management action scenarios. Experiment outcomes will be simulated for several variations of SDHF timing, duration, and magnitude. Mechanical channel manipulation scenarios to be simulated include vegetation removal and island lowering. The model will be run under a range of background conditions for hydrology, channel topography, and sediment transport. The potential ability for SDHF to scour seedling vegetation and increase sandbar height will be predicted with the model. Sensitivity analyses will be completed to acknowledge the potential effects of uncertainty on management experiment outcomes, and to identify design parameters that will have the greatest influence on outcomes. Modeled outcomes will then be compared to Program performance criteria developed for priority physical process hypotheses to predict the ability to achieve management objectives. Note that the management experiment will continue with physical process learning and validation regardless of whether the model predicts that management objectives can be achieved.

c) ***Deliverables*** – Draft technical memorandum documenting management experiment scenario results and potential outcomes. One informal meeting with ED Office to discuss model application results, and provide recommendations for management experiment implementation. The model application results summary meeting will take place at the ED Office in Kearney, Nebraska. A final technical memorandum addressing ED Office comments will be completed following the model application meeting.

5) AM Design - Management Experiment Statistical Design

a) ***Objective*** – Investigate the potential for implementing various mechanical channel action scenarios (e.g., selective macroform lowering and in-channel vegetation removal) to maximize the learning potential for the Elm Creek management experiment. Provide statistical design of mechanical channel actions if determined to increase learning potential of management experiment.

b) ***Task Description*** – Simulate the potential effects of implementing various mechanical channel actions using the 2-dimensional hydraulic and sediment transport model. Identify potential channel manipulation actions that would increase the learning potential of the Elm Creek management experiment. Scenarios to be considered include: selective mechanical removal of in-channel vegetation and selective island lowering to differentiate background channel conditions to test Elm Creek management objectives. Provide statistical analysis of potential management experiment outcomes, and provide design input on mechanical action scenarios.

c) ***Deliverables*** –Draft technical memorandum presenting mechanical treatments to be implemented during Elm Creek management experiment to maximize FSM learning potential. Final memorandum based on comments from ED Office.

6) AM Design - Performance Evaluation Decision Tree

a) ***Objective*** – Provide technical support for the development of a performance evaluation decision tree of potential action adjustments based on the potential range of experiment outcomes. The decision tree will be used in conjunction with model results and

monitoring data to evaluate management experiment outcomes, and will provide a quantitative means for evaluating the performance of the management experiment.

b) ***Task Description*** – Provide technical support and input to the ED Office staff in developing a decision tree to guide the adjustment of management actions at the Elm Creek Complex. Input will be based on Consultant's hydraulic and sediment transport modeling. ED Office will rely on the Consultant to help develop a decision tree that links model outcomes with monitoring data to help guide future adjustments of management actions under a range of possible outcomes. Performance measures and decision criteria from priority hypotheses will be important in establishing decision criteria, and in developing a range of potential action adjustments under various management experiment outcomes. Two potential types of action adjustments will be outlined in the performance evaluation decision tree: performance measures that would trigger management action adjustments, and impact trigger thresholds that would lead to management experiment suspension if exceeded.

c) ***Deliverables*** – ED Office will develop a draft memorandum describing the performance evaluation decision tree and management experiment performance measures. Consultant will provide input to the ED Office for the memorandum, and participate in one TAC meeting to discuss the decision tree concept.

7) AM Monitoring and Data Analysis

a) ***Objective*** – Monitoring will be completed with emphasis on "need to know" information that will be used to evaluate management action performance. Two types of monitoring will be completed: implementation monitoring (what is being done/constructed), and effectiveness monitoring (physical habitat response to management actions). An annual presentation of monitoring results and analyses will be completed for Program stakeholders and other Program consultants.

b) ***Task Description*** – Complete monitoring of the Elm Creek complex to provide data necessary to assess the performance of the Elm Creek complex FSM management experiment. Analyze the data collected, and relate results to the performance evaluation tree developed for the Elm Creek complex. The following sub-tasks will be completed:

i. ***Elm Creek complex project-scale monitoring:*** Complete project-scale monitoring at the Elm Creek complex according to the Program's project-scale monitoring protocol and the Elm Creek complex monitoring and data analysis plan to be provided to the Consultant by the ED Office. For purposes of completing a proposal, Consultants can assume two monitoring events per year (total of 6 monitoring events during the three-year contract). Monitoring events will include some combination of annual baseline monitoring, and also event-based monitoring immediately following high flow events. The first sampling event will take place in April or May 2011, and will include baseline sampling.

ii. ***Data analyses:*** Complete analyses of Elm Creek management experiment data, and relate analyses to the Elm Creek performance measures and decision criteria to assess FSM hypotheses being tested. The 2-dimensional hydraulic and sediment transport model will be used to determine flow characteristics

(e.g., flow depth, velocity, and shear stress) that occurred at the Elm Creek complex between monitoring events. Flow characteristics will then be related to changes in geomorphology and in-channel vegetation to assess priority-hypotheses using the performance evaluation decision tree. Additional statistical analyses of monitoring and modeling results will likely be needed to determine whether there is a statistically significant relationship between flow characteristics and geomorphology and in-channel vegetation.

iii. ***Reporting:*** monitoring data collection and analysis results will be presented to the ED Office and Program stakeholders. Methods used, statistical trends determined and suggested modifications to the Elm Creek monitoring plan should be presented in annual written reports. Consultant will also participate in the annual Program Adaptive Management reporting sessions (1 per year for the duration of the initial three-year contract), and present monitoring data and analysis results to the Program stakeholders and other Program consultants.

c) ***Deliverables*** – Written annual monitoring and data analysis reports will be submitted to the ED Office in draft format, and then finalized according to ED Office comments. The Consultant will present monitoring and data analysis results annually at TAC meeting, and also to other consultants and Program stakeholders annually at Program AMP reporting sessions. For this task, Consultant can assume participation in three TAC meetings and three AM reporting sessions during the initial three-year contract.

8) AM Evaluation/Assessment

a) ***Objective*** – Evaluate the performance of the management experiment to help take the step from data monitoring and analysis to management decision-making. Policy makers should be able to use the results of the performance evaluation to assess whether action adjustments are needed for the management experiment.

b) ***Task Description*** – Predictive modeling (2-dimensional hydraulic and sediment transport model) will be updated in early 2013 based on physical process learning from 2011 and 2012. The updated model will then be used to revise predicted management experiment outcomes under a range of conditions (SDHF timing, magnitude, and duration). Monitoring data will be used to update the model and to formally evaluate management experiment outcomes/performance. Performance measures and decision criteria from the performance evaluation decision tree developed under **Task 6** will be used to evaluate management experiment outcomes. Anticipated outcomes simulated under the Model Application task (**Task 4**) will be compared to observed outcomes, and the steps in the performance evaluation tree will be used to determine whether action adjustments are needed (**Task 9**). Note that although the formal performance evaluation will only be completed once during the three-year contract, informal assessment of outcomes and performance will be completed throughout the three-year contract to help understand initial results of the management experiment. The formal performance evaluation in early 2013 will be a synthesis of the three years of analysis information summarized for use by policy makers to assess whether action adjustments are needed for the management experiment.

c) ***Deliverables*** – Results of the performance evaluation will be presented to the ED Office and the TAC via a draft technical memorandum and a presentation to be given in 2013. A peer review of the implementation design, monitoring and data analysis, and performance evaluation will be conducted by an independent third-party to be selected by the Program. The Consultant will make necessary edits to address peer review comments, and then a final performance evaluation will be summarized in a final technical memorandum written to the TAC.

9) AM Adjustments

a) ***Objective*** – Modeling and monitoring results will be integrated into the performance evaluation to assess Program decisions, hypotheses, and management experiment objectives. Management experiment actions may be adjusted according to recommended action adjustments.

b) ***Task Description*** – Results of the performance evaluation (**Task 8**) will be presented to the Governance Committee, and recommendations will be made for management experiment action adjustments. Action adjustments could include management action adjustments or potentially suspension, based on action adjustments as outlined in the performance evaluation decision tree (**Task 6**).

c) ***Deliverables*** – Formal presentation to the Program Governance Committee including Elm Creek AM management experiment results, results of performance evaluation, and recommendations for action adjustments.

Note that there are two AM Implementation Plan activities **not included under this scope** of work. These activities are not included under this scope of work as described for each of the two activities below:

- Problem assessment - Program and ED Office have completed this AM step via the prioritization and sequencing of hypotheses. The Program has already identified channel leveling and clearing followed by short duration high flows as the appropriate management experiment tasks for the Elm Creek complex. As a result, problem assessment is not included in the Consultant's scope of work.
- Management action implementation (i.e., construction) - Since actions will be non-structural, implementation will be coordinated by ED Office and will be based on statistical design.

IV. PROJECT BUDGET

An estimated project budget should be submitted in the proposal, on a not-to-exceed time and expense basis for the work to be completed. A final budget will be established as part of the Project Scoping and Kickoff (**Task 1**), and will build upon the budget estimate provided in the proposal for the Consultant selected to do the work.

Proposals will be evaluated on criteria described in **Section VI** below, including understanding of the objectives of the project, qualifications of the team members, and clarity/content of project schedule, scope, and budget. **The work will not be awarded based solely on a lowest cost basis.**

V. 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 A), 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 April 2011 and terminating in April 2014 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.

VI. 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 electronic copy of your proposal must be submitted in PDF format to Steve Smith at *smiths@headwaterscorp.com* *no later than 5:00 p.m. Central time on March 16, 2011.* 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 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 Steve Smith at *smiths@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 March 30, 2011. The following table represents the RFP schedule:

Description	Date	Time (Central)
Issue RFP	February 22, 2011	NA
Pre-proposal meeting	March 4, 2011	2:00 PM
Last day for respondents to submit questions regarding the RFP	March 11, 2011	5:00 PM
Proposals due from respondents	March 16, 2011	5:00 PM
Evaluation of proposals	March 16, 2011 thru March 30, 2011	
Award of Work	On or before March 30, 2011	
Start of Work	Approximately April 4, 2011	
Completion of Work	Approximately April 4, 2014	

Pre-Proposal Meeting

A non-mandatory pre-proposal meeting of interested parties will be held on March 4, 2011 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 Steve Smith (smiths@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 March 1, 2011.

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. It is highly recommended that all prospective Consultants participate in the pre-proposal meeting/conference call as there shall be no minutes distributed by the ED Office regarding the meeting.

Proposal Content

Proposals should respond to the following general topics:

1) **Executive summary** that presents brief firm overview and condenses and highlights the contents of the proposal in such a way as to provide a broad understanding of the Consultant's qualifications and proposal.

2) **Project understanding** that demonstrates the Consultant understands project goals and objectives and identifies issues critical to project success.

3) **Project approach** that documents how the Consultant would organize and execute the scope of work detailed in this RFP and provides project team organization, resumes, and responsibilities. Specify which team members will work on each specific task.

4) **Qualifications and project experience** relevant to this project including the involvement/role of the proposed team in those projects. Be clear which team members will work on specific tasks outlined in the Project Approach, and focus on those team members' qualifications specific to their assigned task.

5) **Schedule** for completing the tasks identified in the project approach. Include potential constraints or challenges based on the tasks described above. Identify how event-based data collection will be accomplished by your team. Identify any constraints related to team member locations, and describe how those constraints would be overcome to accomplish event-based sampling on short notice (e.g., following high flow events associated with snowmelt runoff and/or rainstorms).

6) **Compensation** for services to complete Phase I of the project – see Section IV above for additional details. Assumptions used must be clearly stated and a total estimated cost must be included. Consultant must specify the estimated number of labor hours for each team member, billable rate and estimated direct expenses (e.g., travel), and total project cost to complete the each task/subtask detailed herein and Consultant's other recommended or optional tasks.

7) **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.

8) **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).

9) **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. Understanding of the overall objectives of the project and approach to meeting those objectives and addressing critical project tasks and issues.

2. Qualifications and the relevant experience of the proposed project team members.

3. Clarity and content of the project schedule, scope, and budget.

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.

VII. 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.