National Forest Foundation

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Allen Lake Restoration Design
Statement of Work and Request for Proposals
Coconino National Forest, Arizona

Background and Statement of Work: The National Forest Foundation (NFF), in partnership with Coconino National Forest (CNF) seeks a contractor to produce a design for the Allen Lake Restoration Project.

Allen Lake is located south of Mormon Lake on the Coconino National Forest. Allen Lake is not a traditional lake, but is a broad, shallow ephemeral meadow wetland that was excavated using explosives to create bird nesting islands. However, the excavated channels failed to hold water and subsequently lowered the ground water table resulting in a dry upland grass system. Efforts to seal the excavated channels to facilitate water retention have failed.

Allen Lake has been the focus of several prior studies and alternatives analysis. This project will build on past work, including *Field Evaluations and Recommendations for Allan (sic) Lake Wetland Restoration* completed by Natural Channel Design in 2004 (Attachment C), and will produce a final stamped engineered design suitable for contracting.

The objective of the Allen Lake Restoration project is to restore hydrologic function in the meadow, reducing channel incision to raise the water table and improve wet meadow characteristics.

As the congressionally chartered nonprofit partner to the Forest Service, the NFF acts as a funding and implementation partner for the restoration of Allen Lake. It is anticipated that implementation of the Allen Lake Restoration project will begin shortly after a finalized design is developed; contractors with implementation and restoration design experience are encouraged to apply.

Information Requested

If interested in submitting a bid for this project, please provide a proposal for the above statement of work by providing:

- technical approach
- work experience
- cost
- capacity for this project
- experience in producing engineered designs for process-based stream and wetland restoration

Specific requirements are detailed below.

I. PROJECT OVERVIEW AND REQUIREMENTS

General Specifications

(a) Description of Work – This Request for Proposals is for a restoration design suitable for construction signed and stamped by a registered certified Professional Engineer in the State of Arizona for the Allen Lake restoration.

1. **Design Scoping and Background:** Conduct meetings with key personnel to review the approach and background. Working with CNF, acquire existing data, past analyses, maps, and information needed to survey site and complete the design.
2. **30% Conceptual Design and Alternatives Analysis**: Develop a conceptual design presenting at least two alternatives for site restoration. Coordinate a meeting with key personnel to present project design approach and potential design alternatives.
3. **60% Design:** Building off the chosen design alternatives, produce 60% plan set for review.
4. **Final Draft Design:** Provide draft final construction plans for review.
5. **Final Design Plans:** Provide final design plans suitable for construction signed and stamped by a registered engineer in the State of Arizona via pdf and 11x17 hard copy.

The Contractor shall identify what they can supply in terms of materials, labor, equipment, supplies, supervision, quality control, and incidentals required to complete the work described. The Contractor shall perform all work in a safe and conscientious manner.

(b) Project Location - Coconino National Forest, Flagstaff Ranger District. Field visits and site survey will be needed to complete project design.

(c) Work Schedule - Preferred start is March 2024 with an anticipated completion date of October 2024.

Other Project Requirements and Specifications

(a) Utilities –There are no or limited sanitation, water, electrical or housing services available within the vicinity of the project site. The Contractor shall make its own arrangements for temporary facilities if needed.

(b) Specifications – Project design drawing and plans should follow all applicable specifications in “Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects” (Federal Project (FP)-14) or most current version.

Insurance Requirements

Upon selection of the winning bid, the Contractor agrees that it has and shall maintain the following insurance coverage indicated below. The effective date of all coverage shall precede the start of any work.

a. State minimum workers’ compensation insurance coverage for its employees, if any.

b. Broad form general liability, property damage, and automotive liability insurance in the minimum amount of $1,000,000 for bodily injury, death, or damage to property of any person and $2,000,000 for bodily injury, death, or damage to property of more than one person. The Contractor shall name NFF an Additional Named Insured and provide NFF with a certificate of insurance evidencing such coverages, prior to the initiation of the Scope of Services.

c. If the Scope of Services includes professional services as identified herein, Contractor shall also provide professional errors and omissions liability insurance. Professional services for purposes of this section include, but are not limited to performing architecture, engineering, landscape architecture, land surveying or planning, preparation and signing or stamping of drawings, maps, surveys or construction specifications, or design and development of computer software, programs or websites by the Contractor or by subcontractors on behalf of the Contractor, for which professional liability insurance would typically be required. The minimum coverage limits required are $1,000,000 for each claim and $1,000,000 annual aggregate.

Prohibited Telecommunications Services and Equipment

The Contractor is responsible for compliance with the prohibition on certain telecommunications and video surveillance services or equipment identified in 2 CFR 200.216.

Payment/Performance Security

Contractor shall post cash, a letter of credit, bond, or other financial security that is easily convertible into cash in a form acceptable to the NFF, in its sole determination, to assure completion of the work required under any subsequent agreement and payment of all amounts lawfully due to all persons supplying or furnishing to the Contractor or Contractor's subcontractors with labor, laborers, materials, rental machinery, tools or equipment used or to perform the work. Contractor may incorporate required associated costs into mobilization costs or other approved expenses.

a. Work that is classified as construction in accordance with the Miller Act or Little Miller Act or if required per conditions of the funding source, payment and performance bonding will be required in the full amount of any Agreement. For the purposes of this Request for Proposal, construction is defined as "any contract greater than $100,000 for the construction, alteration, or repair of any public building or public work where the federal government is the owner", or

b. If Contractor is not self-performing at least 85% of the total contract value or if the cost of materials is in excess of the larger of $100,000 or 50% of the contract total, payment and performance bonding will be required in the full amount of the agreement, or

c. If the value of the agreement is in excess of $250,000, Contractor will be required to post financial security in a form acceptable to the NFF in the amount of 5% of the total agreement value up to $250,000 in total financial security.

American Made Products. The work associated with this RFP is subject to Build America, Buy America Act. P.L. 117-58, Secs 70911-70917, and as such, domestic content procurement preference requires all iron and steel, manufactured products and construction materials used within the scope of this Agreement, be produced in the United States.

Federal Exclusion Verification

The selected Contractor will be required to affirm that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

Federal Flowdown Provisions

Flowdown Requirements: Any Agreement associated with this RFP may be subject to flowdown requirements under associated federal or state funding agreements, which are included and made part of by this reference.

II. REQUIRED COMPONENTS

Technical Proposal

Please provide a detailed technical approach to the work.

Contractor Qualifications

(a) Approach – Please describe your approach to undertaking the scope of work to the specifications described above.

(b) Restoration Philosophy Statement – Please provide a paragraph describing your organization's philosophy and approach to stream restoration projects.

(c) Portfolio of Relevant Work – Please provide at least three examples of work. These should include both on-the-ground implementation of wet meadow or other stream restoration projects and any demonstration of their long-term success.

(d) Past Experience – Please provide a brief explanation of previous work experience with land management agencies.

(e) References – Please provide three professional references that can speak to past performance.

Pricing Schedule

The contactor shall price work according to the schedule below. Prevailing wages are required per conditions of funding sources.

Description	Unit	Unit Cost	Quantity	Total Cost
Design Scoping and Background	1			
30% Conceptual Design and Alternatives Analysis	1			
60% Design	1			
Final Draft Design	1			
Final Design Package	1			
			Total Bid	

III. SUBMISSION, EVALUATION, AND CONTACTS

Contractor Selection Process

This is a request for proposals only and bids furnished are not offers from the National Forest Foundation. This request does not commit the National Forest Foundation to pay any costs incurred in the preparation or submission of the proposal or to contract for supplies or services.

The NFF will use the Evaluation Factors below to review each submitted bid. Based on the outcomes of that selection process, the NFF will notify successful and unsuccessful bidders by February 23, 2024 and will prepare a separate contract document.

Evaluation Factors and Relative Importance

The following criteria will be used in the evaluation of submitted proposals, ordered from highest weighting (level 3) to lowest weighting (level 1).

Level 3 Criteria
- Price / cost
- Equipment and contractor capability
- Timing of when contractor can begin and/or finish the project
- Past performance, references, and USFS feedback

Level 2 Criteria
- Technical proposal / proposed approach to project
- Overall strategic benefits to meeting NFF goals and grant needs, requirements, and timelines

Level 1 Criteria
- Benefits to the local community
- Relationship to local community
- Additional selection criteria, as applicable

Point of Contact

For questions about the details of producing the bid, please contact:

Elise Dillingham, Arizona Program Manager
928.333.5920
edillingham@nationalforests.org

Responses will be shared with known interested parties by email or otherwise posted at https://www.nationalforests.org/rfp.

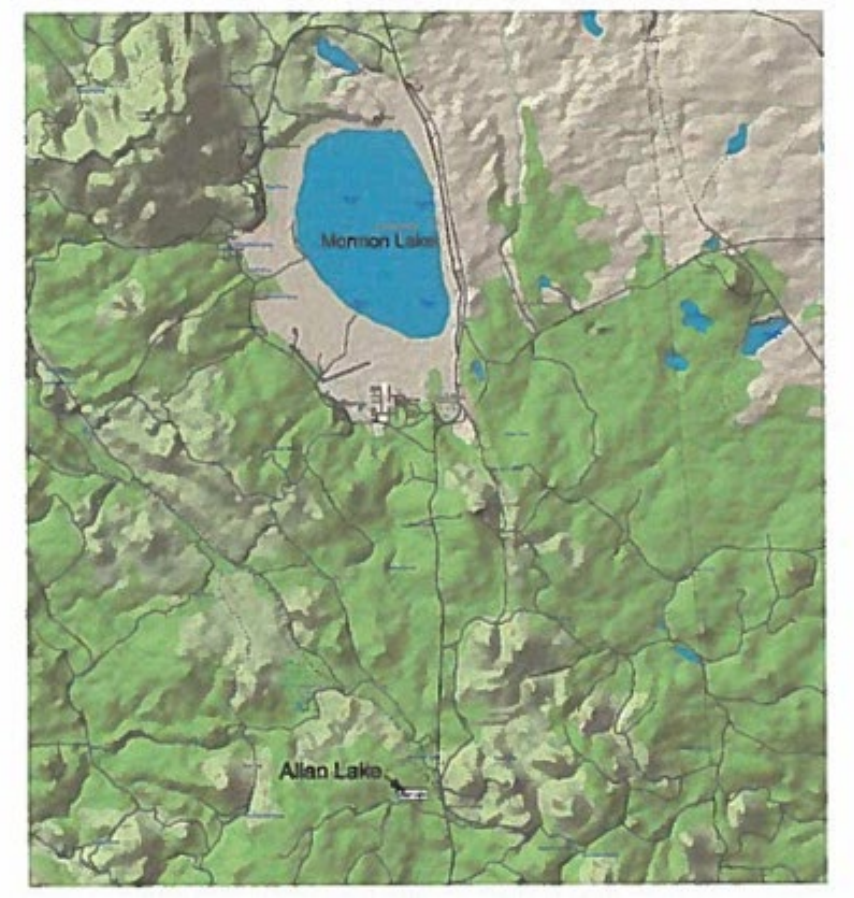
Bid Submission

Submit bids via email to Elise Dillingham, edillingham@nationalforests.org by February 16, 2024.

Equal Opportunity Provider

In accordance with Federal law and U.S. Department of Agriculture policy, the National Forest Foundation is prohibited from discriminating on the basis of race, color, national origin, sex, age, religion, political beliefs, or disability.

Attachment A: Map – Project Location



Attachment B: Allan Lake Aerial View

Attachment C: ***Field Evaluations and Recommendations for Allan (sic) Lake Wetland Restoration***

Natural Channel Design, Inc.

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TRIP REPORT
FIELD EVALUATION
AND
RECOMMENDATIONS

ALLAN LAKE WETLAND RESTORATION
USDA Coconino National Forest

Prepared for:
Arizona Department of Game and Fish
February 2004

Allan Lake lies in the Coconino National Forest just south of Mormon Lake in northern Arizona (Figure 1). The lake is located at an elevation of approximately 7,450 feet within an extensive Ponderosa pine forest. The area was not a lake in the traditional sense but instead a broad, shallow, depressional ephemeral wetland or wet meadow supporting native wetland vegetation within a small closed basin of approximately 1.5 square miles. The wetland was excavated using explosives to create nesting islands. However, the excavated channels failed to hold water and subsequently lowered the ground water table. As a result, the wetland has evolved back to upland grasses. Later efforts to seal the excavations using bentonite were unsuccessful.

The Arizona Department of Game and Fish (AZGF) wishes to restore the seasonal wetland system including the native wetland vegetation. As part of the alternative assessment the AZGF prefers to keep the existing pond. A field survey of the site was conducted on November 4, 2003 by Stephanie Yard of Natural Channel Design, Inc. (NCD) and Rick Miller of the AZGF. Three cross-sections were surveyed along with the elevations of several random points. Aerial photographs were taken of the site in October 2003. This information was used to augment historical information in an evaluation of the existing condition of the site. This document describes the initial evaluation and preliminary recommendations for meeting AZGF goals.

Numerous wet meadow/depressional wetlands throughout the Anderson Mesa were dynamited and have similar lack of function. The AZGF hopes to demonstrate successful restoration practices on Allan Lake and the opportunity exists to restore many others. This restoration approach may be pertinent to the current USFS Anderson Mesa Landscape Scale Assessment and other studies underway.

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BACKGROUND

Ephemeral (seasonal) wetlands or wet meadows are relatively common within the Coconino National Forest north of the Mogollon Rim. These wetlands formed when volcanic silts and clays sealed the bottoms of small open and closed basins. Due to the impervious soils, ground water levels remain relatively high in these systems throughout the year. During and immediately following the wet seasons of spring snowmelt and late summer/fall monsoonal rains the basins would often contain shallow surface waters. Over the following months, evapotranspiration slowly reduce water levels. Much of the year no open water may be present but soil moisture levels remain high sustaining a vigorous community of native wetland plants. These species have adapted to flourish in a wide range of soil moisture conditions from inundation to extended periods of drought.

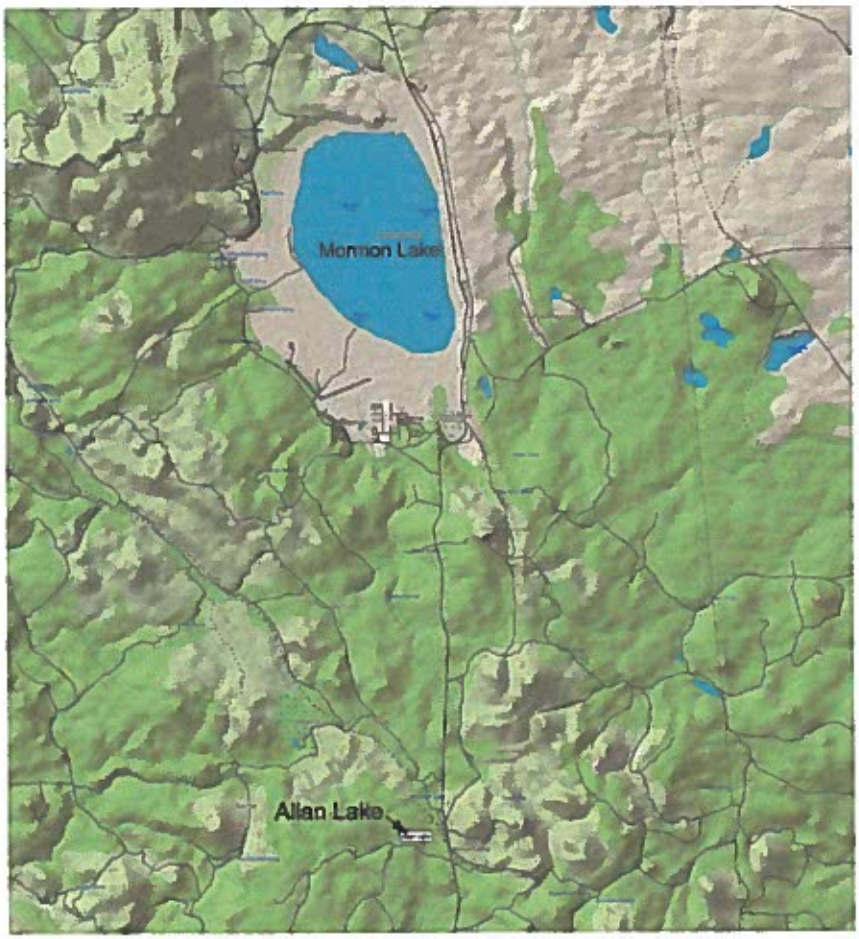

Figure 1. Location Map – Allan Lake.

Mormon Lake, Lake Mary, Rogers Lake, and Dry Lake are larger and better-known examples of these wetlands (Figure 2). A significant ephemeral wetland complex can be found on Anderson Mesa to the east of Allan Lake.

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Figure 2. Lake Mary wet meadow. Photo taken in May 2003 (NCD).

Plant production is very high with biomass production as much as twenty-five times that of adjacent lands (Zeedyk 1995). Due to the regional hydrologic cycle, production of the wetland plants was most vigorous in the late spring and the late fall. The fact that these times coincide with the migration cycle of many birds lead some experts to believe these areas provided critical food and energy during migrations. Depressional wetlands of the arid and semi-arid southwest provide important habitat for wintering and migrating wetland birds and some amphibians, and they can provide for the replenishment of soil and ground water (USDA-NRCS 1997).

However, water has been an equally important resource for humans in the area. Because of their natural ability to collect water, many of these wetlands have been altered by the construction of cattle tanks and other structures designed to create greater volumes of open surface water and nesting islands. In many cases, this resulted in the creation of deeper excavations thereby concentrating the water in a smaller area of the basin and reducing the extent and vegetation composition of the original wetland.

EXISTING CONDITION

Allan Lake was originally an ephemeral wetland within a small closed basin. During the late1800's a logging camp was established adjacent to the Lake and a pond was dug to provide water. In 1986 explosives were used to excavate a series of canals in the rough shape of a wagon wheel (Figure 3). The figure is nearly 600 to 800 feet in diameter. Individual channels are approximately 30 feet wide and 5 to 6 feet deep (Figure 4).

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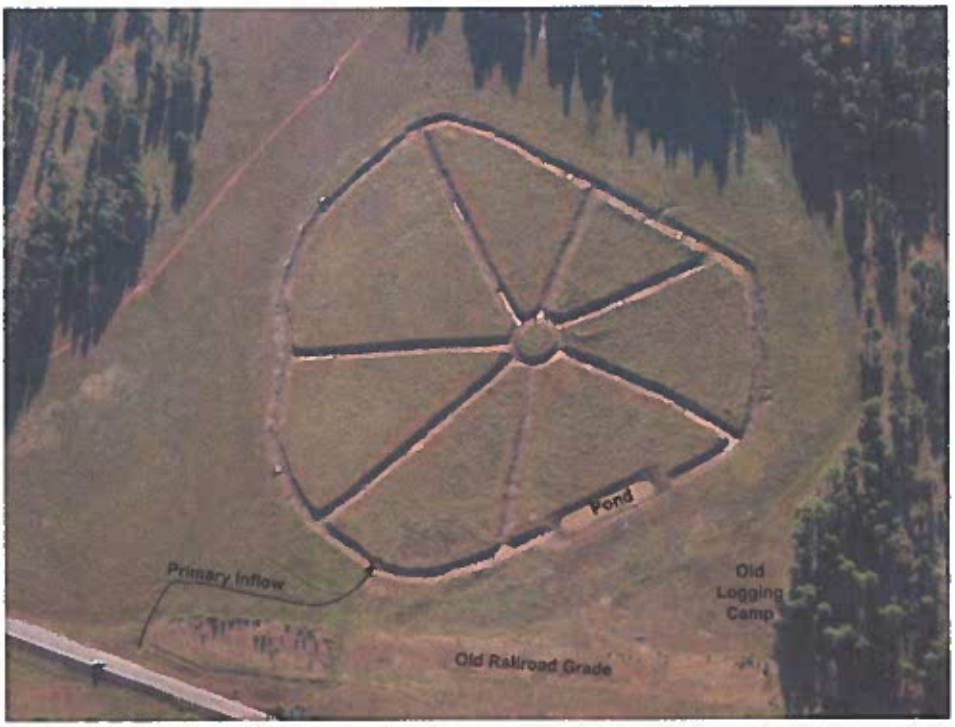

Figure 3. Allan Lake aerial view. Original logging camp pond is in the lower right part of the "wheel". Photo taken in October 2003 (NCD).

Figure 4. Allan Lake excavated channel.
Note the lack of moisture and vegetation in the channel sides & bottom.
Photo taken in November 2004 (NCD).

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The logic of the shape of the excavation is not known but the feature was almost certainly excavated to create nesting islands and increase open surface water. In that objective it failed, as the excavated channels no longer hold water for any appreciable time. As a result, the ground water table is commonly 5 to 6 feet or more below the basin/meadow floor. Lateral moisture movement by capillary action is restricted by the channel network. Wetland vegetation can no longer reach the common ground water depth and upland grass species have replaced them.

CONCLUSIONS

Two mechanisms have been put forward to explain the failure of the impervious soils.

1) Excavations may have penetrated the thin clays that sealed the basin. Once broken, the basin floor can no longer hold water. An attempt to reseal the channels using bentonite was unsuccessful.
2) Explosives used to blast/excavate the channels may have fractured the impervious bottom allowing water to soak through. The fact that the original pond, dug by hand over a century ago still holds water despite its greater depth lends credence to this possibility.

To achieve the project objectives of restoring the wetland and increasing wetland vegetation, a means must be found to successfully maintain higher water levels.

Critical components for restoration of Allan Lake ephemeral wetland include:

- Restore Natural Water Depths: The ground water table needs to be elevated to the historic condition for wetland vegetation to be re-established. This requires filling the excavated channels to a higher elevation.

- Reduce Seepage Loss: Plans for reducing seepage losses by sealing the basin bottom should be part of the design components. The problem of reducing seepage losses is one of reducing the permeability of the soils to a point where the losses become tolerable. The failure of previous efforts using bentonite makes a simple sealing of the existing channels difficult. Filling the excavated channels in compacted layers and using chemical additives for sealing may be used to decrease seepage.

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- Restore Native Wetland Plants: Typical vegetation expected in a wet meadow habitat is wetland obligate and facultative grasses, grass-like plants and forbs, and scattered upland plants. Typical vegetation in a playa habitat is submergent and emergent wetland obligates (cattail, rushes, bulrush, pondweeds). It is assumed that the wetland seed bank exists and that natural colonization will take place. A critical factor regarding vegetation is stable slopes. There is a direct relationship between slope gradient, slope stability, and plant species growth and survival. The existing sideslopes of the excavated channels have a sideslope of 3:1 and are too steep to maintain vegetation (see Table 1 for Slope Analysis). In addition the soils are loose and disturbed during freeze-thaw cycle.

Table 1. Slope Analysis.

Channel banks:	3:1	unvegetated
Pond banks	5:1	unvegetated
Railroad Grade:	10:1	vegetated (grasses)
Historic wetland:	100:1	vegetated (wetland plants)

ALTERNATIVES

1. Do Nothing: The old logging pond would continue to hold water and the excavated channels will continue to have excessive seepage losses. The vegetation in the basin would remain upland grass species. Existing channels are shown in Figure 5 Cross-Section and Figure 6 Estimated Water Table.

2. Completely fill existing channels: The old logging pond would remain. All channels would be filled back to the basin floor elevation. Total earthwork volume is about 16,000 cy. Because the explosives blew the channel material to powder (i.e. smithereens) there is not sufficient earthfill available to fill channels back historic elevation. (See historic wetland surface in Figure 5 Cross-Section.)

3. Partially fill existing channels: The old logging pond would remain. All channels would be filled and compacted in layers upto 2.5 to 3 feet above the existing channel elevation. This would create 100 feet wide shallow depressions (around 2 feet deep). Total earthwork volume is about 9,500 cy. Earthfill would be available from the widening of the channels. The post construction channels are shown Figure 5 and Figure 6. The water table should rise to within 2 feet of the original basin (see Figure 6.) By keeping the existing pond there may be additional seepage loss. A chemical additive (vegetable oil based resinous polymer emulsion) for sealing the shallow depressions may be used.
   ****RECOMMENDED ALTERNATIVE****

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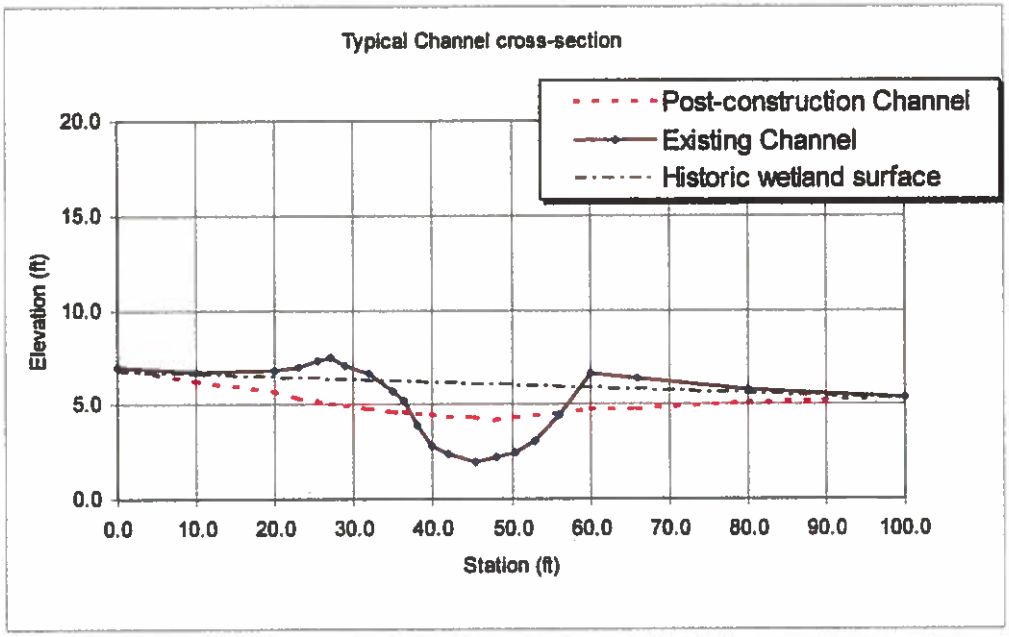

Figure 5. Cross-Section (Showing existing, historic wetland surface, and proposed partially filled channel)

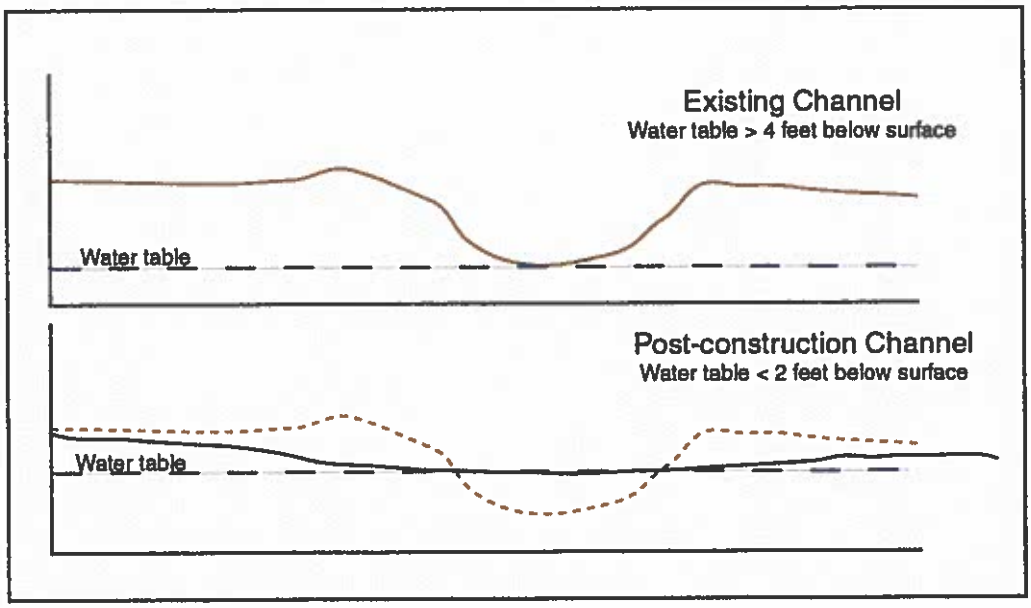

Figure 6. Estimated Water Table (existing channel and post-construction channel)

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MONITORING

Understanding ground water elevations and movement is essential to the success of the project. Therefore a monitoring program should be developed and implemented to document and evaluate seasonal ground water elevations.

REFERENCES

U.S. Department of Agriculture, Natural Resources Conservation Service. 1997. Wetland Restoration, Enhancement, or Creation. Engineering Field Handbook – Chapter 13.

Zeedyk, William D. 1995. Managing Roads for wet meadow ecosystem recovery. USDA Forest Service FHWA-FLP-96-016.

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ALLAN LAKE WETLAND RESTORATION

DEMONSTRATION PROJECT

The success of any restoration is dependent on the ability to effectively restore pre-excavation hydrology. If the natural impermeability of the wetland cannot be restored, the area will continue to support grassland species rather than a wetland plant community. Therefore we suggest a pilot project be implemented to first to evaluate the restoration techniques.

It is recommended that several of the upslope channels adjacent the pond be filled. This would serve as a demonstration to the final success of restoring the entire wetland. Using these select channels will still allow inflow into the pond. See Figures 7 and 8 for the conceptual design of areas treated.

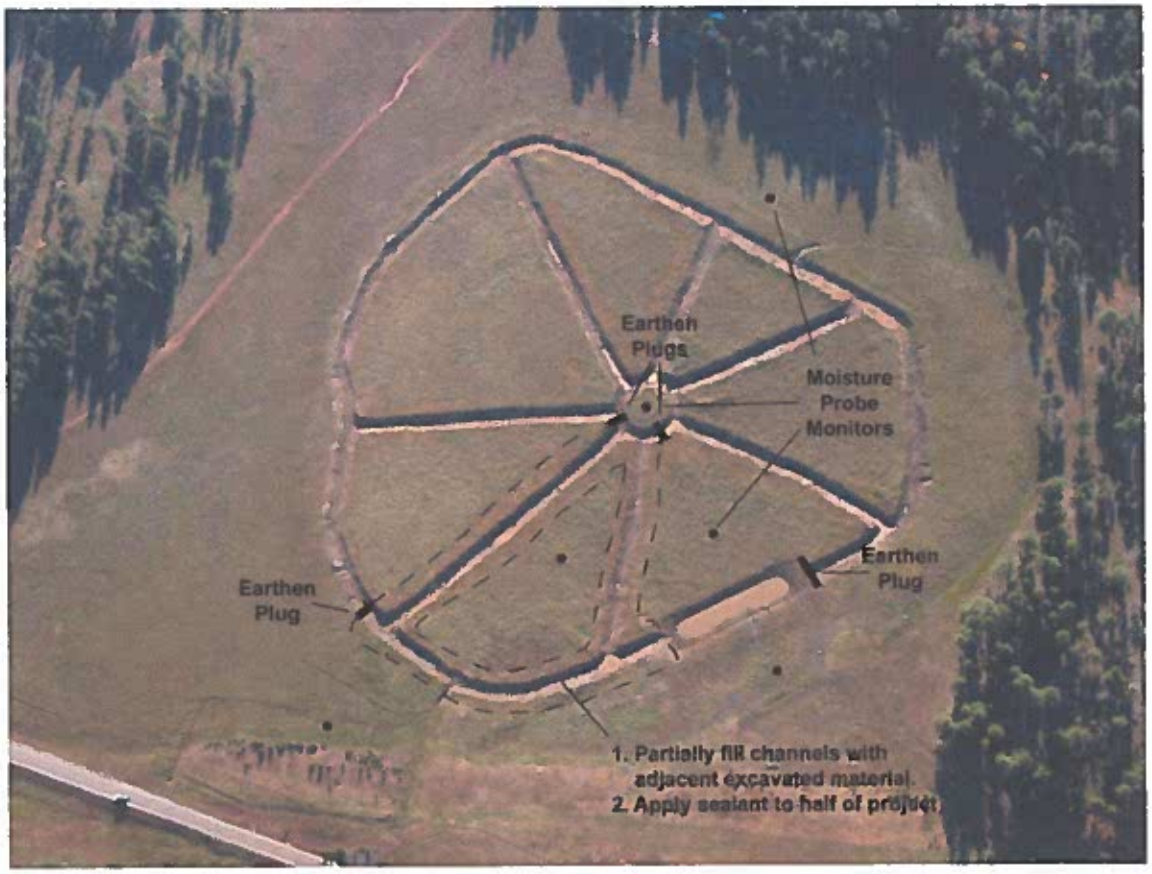

Figure 7. Plan View of Demonstration Project

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1. Isolate section by plugging channels as shown in Figure 7.

2. Partially fill designated channels as shown in Figures 7 and 8.

   The bottom of the channel shall be thoroughly scarified before placement of fill material. The surface shall have moisture added or it shall be compacted and bonded to the foundation. The fill material shall contain sufficient moisture such that a sample taken in the hand and squeezed shall remain intact when released. Material that is too dry shall have water added and mixed until the requirement is met. Fill should be brought up in horizontal layers not to exceed:
   - Six (6) inches of loose fill for wheel compaction or
   - Eight (8) inches of loose fill for sheepsfoot roller or
   - Three (3) inches of loose fill for dozer compaction

3. Apply sealant to half of the treatment area per manufacturer's recommendations (see Figure 7 and attached technical data). The soil shall be treated with the sealant material and compacted in lifts.

4. Revegetate with native wetland vegetation.

5. Install moisture probe monitors as shown in Figure 7 to determine change in the hydrologic system.

6. If the pilot project is successful in demonstrating success in restoring the wetland hydrology then the remaining excavated channels could be treated. At that time planting of native wetland obligates will accelerate the restoration.

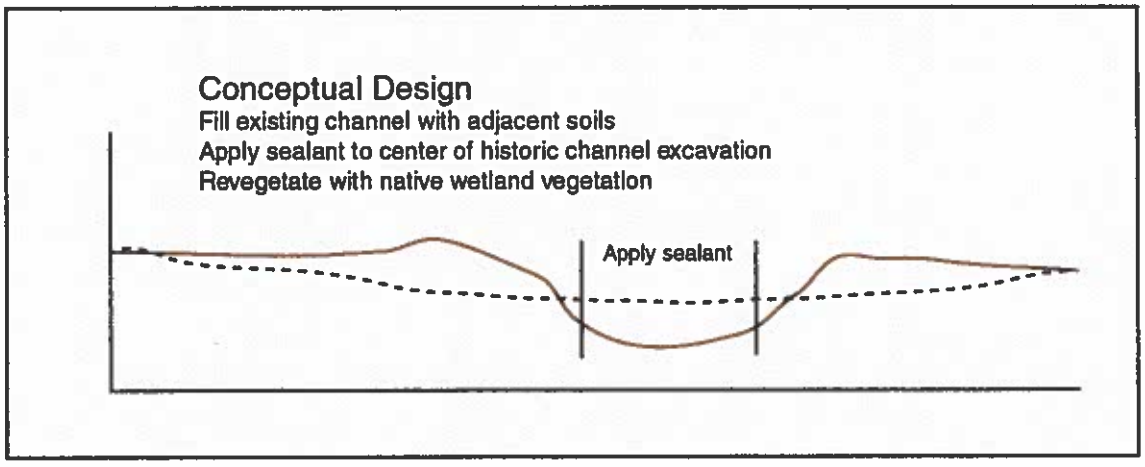

Figure 8. Cross-section of Demonstration Project

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TECHNICAL DESIGN DATA

Existing channel depth:	4.5 feet
Post-construction channel depth:	2.0 feet
Proposed channel treatment length:	1600 feet
Disturbed Treatment Area:	4.0 acres
Earthwork volumes:	2700 cubic yards
Sealant area:	0.5 acres

CONSTRUCTION COSTS

Earthwork:	$ 6,000
Sealant:	$ 3,500

Additional costs include permitting, construction supervision, and monitoring.

NOTES

- Estimated construction time is one week.
- This area may be a jurisdictional wetland under Section 404 of the Clean Water Act. If so permits must be obtained from the Army Corps of Engineers prior to any earthwork.

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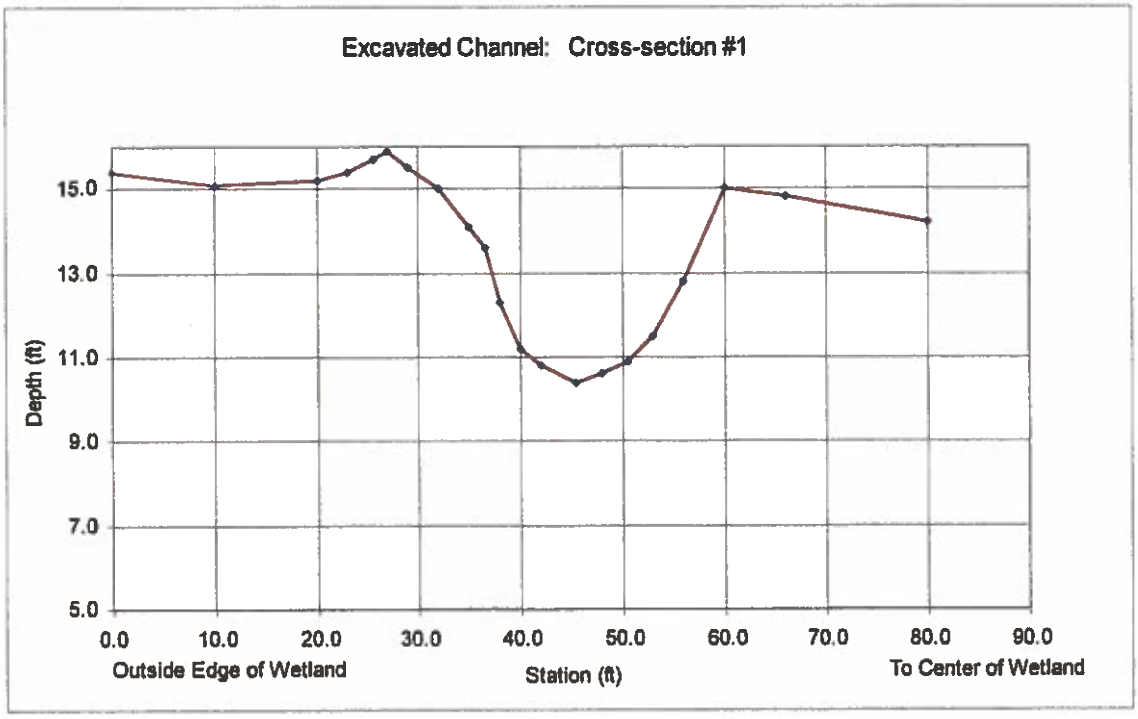
ATTACHMENTS (Survey Data)



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