

GLORIETA CREEK FINAL LEVEE REMOVAL

WETLAND AND RIPARIAN PLANT PROPAGATION, DELIVERY AND INSTALLATION

SCOPE OF WORK

11-22-2011

CONTENTS

I.	Project overview and general conditions	2
A.	General description.....	2
B.	Scope of work.....	2
C.	Location.....	2
D.	General conditions.....	3
E.	Health and safety	4
F.	Clean up	4
G.	Confidentiality.....	4
H.	Performance period	4
I.	Protection of sensitive features.....	4
II.	Scope of services	6
A.	Seed collection, storage, treatment, germination testing.....	6
B.	Herbaceous plant propagation and delivery	6
C.	Herbaceous plant quality standards	7
D.	Herbaceous plant installation	8
E.	Collection and installation of willow stakes.....	8
F.	Collection and installation of cottonwood cuttings.....	9
III.	Performance standards.....	10
A.	Herbaceous plants	10
B.	Willow and cottonwood cuttings.....	11
IV.	Delivery and payment.....	11
A.	Delivery schedule	11
B.	Fee and payment	11

I. PROJECT OVERVIEW AND GENERAL CONDITIONS

A. GENERAL DESCRIPTION

Pecos National Historical Park (PECO) is responsible for managing riparian and wetland habitats along Glorieta Creek, a half-mile stretch of which was mined for sand and gravel before becoming part of the park. Once mining ended in the mid-1980s, ranchers bulldozed the remaining material into a series of levees, dams, and reservoirs. In the late 1990s, at the request of PECO, the National Park Service (NPS) Water Resources Division and collaborators from Colorado State University (CSU) developed a restoration plan to create a more stable, functional riparian-wetland ecosystem. A final grading and planting plan was implemented in 1999 and 2000, entailing extensive site regrading and the planting of willows, cottonwoods, sedges, rushes, bulrushes, and spike rushes to create riparian-wetland habitat.

Although the majority of the levee material was removed in 1999, portions of the upper reservoir levee were left in place to protect the newly excavated and planted site from being eroded by floods until the stabilizing floodplain vegetation could take hold. During a site assessment in 2007, the original design team determined that sufficient plant establishment had occurred to allow the removal of the remaining levee separating Glorieta Creek from the adjacent, restored floodplain, providing an opportunity for full restoration of natural channel-floodplain functions.

Earthmoving activities, including the excavation and disposal of material from the levee, are covered in a separate contract. The scope of work detailed here deals exclusively with tasks related to the establishment of native wetland and riparian vegetation in the footprint of the removed levee.

B. SCOPE OF WORK

The major components of work to be accomplished under these specifications include the following:

1. Collect seeds/propagules and propagate native herbaceous wetland plants from naturally occurring populations of the requested species (no cultivars) occurring at PECO.
2. Hold and care for plants at the Contractor's nursery for as long as 21 days after the scheduled delivery date if the project is delayed.
3. Deliver plants to project site in PECO.
4. Install contract-grown plants following design specifications.
5. Collect stem cuttings from native riparian trees and shrubs from donor plants located in designated areas within PECO.
6. Install cuttings following design specifications.

C. LOCATION

The project site is located along Glorieta Creek within Pecos National Historical Park (Latitude: 35.53770, Longitude: -105.67874), approximately 2 miles south of Pecos, NM and 25 miles east of Santa Fe (Figure 1). The only access and egress route at the site

will be the dirt road leading from Hwy 63, across Glorieta Creek at the designated crossing point. All vehicles and equipment must remain within the designated work zones shown in Figure 2. The NPS will clearly mark work zones with boundary ropes and/or flagging.

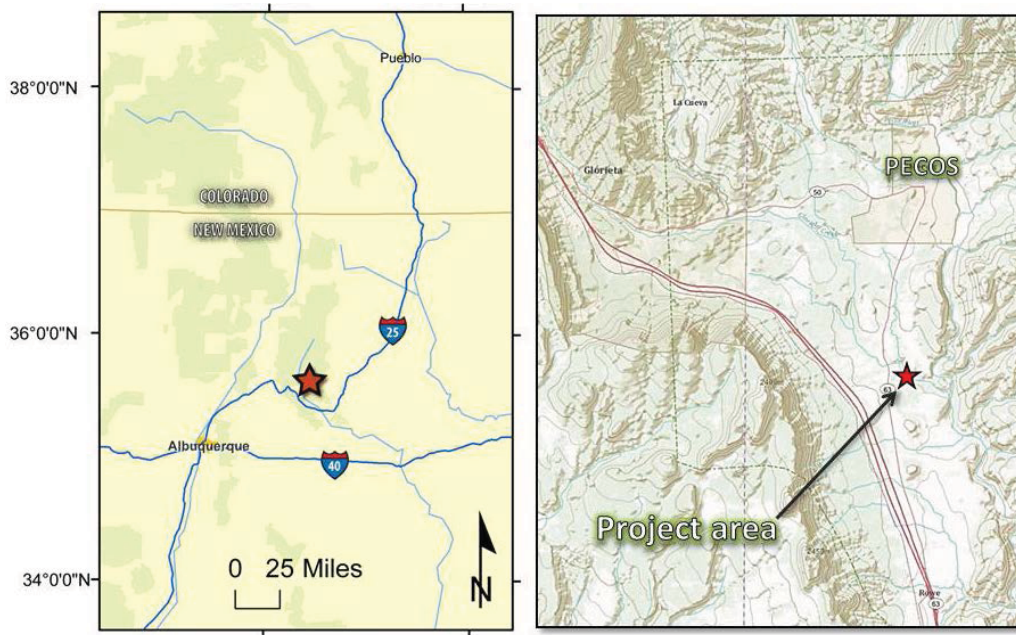


Figure 1. Location of project area.

D. GENERAL CONDITIONS

1. A staging area will be permitted on the west side of the project work area. Confine storage of materials to the staging area approved by the Contracting Officer (COR) and as shown on drawings.
2. Preservation of Natural and Cultural resources is the primary purpose for the establishment of Pecos National Historical Park. Any damage to natural or cultural features or property that occurs will result in an immediate stoppage of operations, so that restoration or repair can be prescribed and procedures for preventing any similar occurrences can be implemented.
3. The cost of any delays and any repair work that becomes necessary as a result of any damage to any natural or cultural features or park property will be the responsibility of the contractor and will result in no additional expense to the Government.
4. Holiday Work Restrictions: No on-site work shall be performed during National Holidays unless otherwise approved by the Contracting Officer.
5. Pecos National Historical Park regulations require that work only be conducted between 8:00 AM and 5:00 PM, Monday through Friday. At all other times the gate leading to the site will be locked.
6. Should onset of adverse weather conditions force the Contractor to stop work prior to completion, the site shall be left in a condition that minimizes safety hazards.

7. Contractor shall remove from the project site all waste and debris created during planting activities.
8. All vehicles and equipment entering the project area must be clean of plant seeds, mud, and soil and be free from oil, fuel or hydraulic fluid leaks.

E. HEALTH AND SAFETY

1. The Contractor must abide by all state and federal regulations pertaining to Health and Safety in the work place.
2. All workers must be provided with and use the necessary protective equipment, including boots, gloves and hard-hats where appropriate, and must be allowed sufficient rest breaks during the workday.
3. All workers must refrain from practices that might endanger themselves or others. Particular attention is drawn to state and federal regulations pertaining to drug and alcohol use in the work place.

F. CLEAN UP

1. At the completion of this scope of work, Contractor shall remove from the job site and properly dispose of all remaining debris, waste materials, excess materials, and equipment required of or created by Contractor.
2. Disposal of waste materials shall be solely the responsibility of Contractor and shall be done in accordance with applicable waste disposal regulations.

G. CONFIDENTIALITY

The information developed under this task order is the property of the U.S. government and shall be kept in strict confidence.

H. PERFORMANCE PERIOD

1. Seed/propagule collection and propagation shall occur from approximately [insert date] through [insert date].
2. Installation of propagated plants at the project site shall occur from approximately [insert date] through [insert date].
3. Collection and installation of willow and cottonwood cuttings shall occur concurrent with installation of herbaceous plant materials, from approximately [insert date] through [insert date].

I. PROTECTION OF SENSITIVE FEATURES

1. Cultural Resources:
 - A. No cultural resource sites are known to lie within the work area. Prior to work implementation, the park's archeologist or his/her representative will instruct all project personnel about the sensitivity and importance of park resources and their historic significance. Project personnel will specifically be instructed regarding:

- The illegality of collecting artifacts on federal lands to avoid any potential Archeological Resource Protection Act (ARPA) violations.
 - Notification of appropriate park staff in the event unidentified cultural resources or human remains are discovered.
- B. If any unidentified cultural resources or human remains are encountered, work will be halted in the vicinity of those resources and the park archeologist (or otherwise designated NPS staff member) will immediately be notified.
2. Natural Resources
- A. Compliance procedures will follow those stated in the Resource Management Plan, and those currently recommended by resource managers. In general, natural resource compliance will occur prior to implementation of any project work.
- B. Qualified staff will conduct appropriate review and survey of the project area for plant and animal species of concern prior to work in the project area. No listed threatened or endangered species are known to be located in work unit.
3. National Environmental Policy Act and National Historic Preservation Act Compliance
- Compliance with the National Environmental Policy Act and the National Historic Preservation Act will be documented prior to any work taking place.
4. Sensitive features within the work area will be identified and marked with center stakes/flags and/or pin flags before work commences.
5. Mitigations to protect sensitive features from unacceptable damage/loss from work activities will be identified and be in place before any work commences in the project area.
6. In general, contract personnel will avoid entering (by vehicle or foot) any marked or otherwise identified sensitive feature unless directed to do so by the cultural/natural resource manager assigned to the project.

II. SCOPE OF SERVICES

A. SEED COLLECTION, STORAGE, TREATMENT, GERMINATION TESTING

1. The Contractor shall be responsible for collecting sufficient amounts of seed/propagules as necessary to meet the bid quantities for the plant species listed in Table 1 below.
2. Seed/propagules must be collected from naturally occurring populations of these species located within the designated collection area at the Glorieta Creek site labeled on Figure 2. With explicit permission of the Contract officer or designated representative, additional collection sites within PECO may be identified if there is inadequate seed availability in the designated seed collection area.
3. The bid schedule will request bid prices for plants produced in 5, 7.5, and 10 cubic inch tubes. Actual numbers of plants ordered by NPS may vary from the quantities in Table 1 by as much as 25%, depending upon the bid prices received.
4. Any germination testing to determine the amount of seed needed for producing the ordered quantities and any propagation testing needed to develop methods is the responsibility of the Contractor and will not be paid as a separate item.
5. Seeds shall be stored at the grower's facility in controlled conditions as appropriate to these species, and will be treated as necessary to ensure germination and healthy growth.
6. The Contractor shall maintain careful labeling, control, and handling of seeds throughout the storage, treatment, and germination process so as to assure correct identification and genetic integrity of plant species.
7. No substitutions will be accepted for seed/propagule sources or plant species without the approval of the Contract Officer.

Table 1. Wetland species to be collected

Species	Common name	Quantity
<i>Carex nebrascensis</i>	Nebraska sedge	5350
<i>Schoenoplectus pungens</i>	common threesquare	5350
<i>Distichlis spicata</i>	inland saltgrass	2315
<i>Juncus arcticus</i>	arctic rush	4280

B. HERBACEOUS PLANT PROPAGATION AND DELIVERY

1. Plants shall be grown and delivered in 5, 7.5, or 10 cubic inch tubes, depending upon which bid items are accepted. Recognizing that commercial tubes vary in size, bids for tubes varying up to +/- 1 cubic inch from these sizes will be allowed, but must be specified in the bid. One exception: bids for tubes less than 5 cubic inches will not be accepted.
2. Containers (tubes) shall be lined with ridges to prevent root spiraling and shall be designed to promote air-pruning. Root-bound plants or plants with root spiraling will not be accepted.

3. Plants shall be grown in sterilized topsoil so that no unintentional plant introductions occur.
4. The Contractor shall maintain careful labeling, control, and handling of plants throughout the propagation, storage, and delivery processes so as to assure correct identification and genetic integrity of plant species.
5. Plants shall be grown for a sufficient length of time in controlled conditions to ensure vigorous, healthy plants with well-developed leaves and root systems. Live, healthy root systems shall extend to the bottoms and sides of the containers.
6. Root systems shall be sufficiently developed such that they hold the entire soil mass together when the plants are removed from the tubes.
7. Plants shall be healthy with minimal to no leaf spots, leaf damage, leaf discoloration, chlorosis, wilting or curling, or evidence of insects. Plants not meeting these health or root development conditions will be rejected by the NPS.
8. Prior to delivery, plants shall be hardened for full sun and outdoor conditions commonly expected for the approximately 6790 feet NGVD elevation at PECO.
9. Plant containers (tubes) shall be weed-free when delivered to the park.
10. Plants shall be transported in an enclosed, temperature-controlled vehicle and delivered in a moist, healthy condition. Any plants that have been allowed to dry out or have been exposed to high temperatures or other undue stress during delivery will not be accepted at the project site.
11. For each load of plants delivered to the site, the Contractor shall furnish to the Contract officer or designated representative (at the time of delivery) a letter of certification containing the following:
 - Name and location of supplier
 - Plant numbers and species delivered
 - Signature of Contractor's key official
12. All plants shall be clearly labeled as to the species.
13. Plants shall be delivered to PECO in trays containing the specified tube sizes and shall be temporarily off-loaded by the Contractor at a site designated by the Contract officer or designated representative within the park prior to installation.
14. The Contractor is responsible for providing any fencing and irrigation that may be needed to care for plants that have been delivered to the project site prior to and during the planting.

C. HERBACEOUS PLANT QUALITY STANDARDS

1. The Contractor shall be responsible for, and will not be paid for, plants experiencing dieback, yellowing, or mortality over the first two weeks following plant acceptance and installation.
2. The NPS retains the right to visit the Contractor's nursery to inspect facilities, observe germination/propagation/plant storage procedures, and inspect plants prior to each progress payment.

D. HERBACEOUS PLANT INSTALLATION

1. Contractor shall install herbaceous plants on 18" centers.
2. Species will be planted into their respective zone indicated in Table 2 and Figure 3.
3. Each individual plant shall be installed into a hole equal to the size of the container. The hole shall be formed using a dibble, crowbar, or similar tool. The plant shall then be removed from the container with as little disturbance to roots as possible, the plant placed in the hole, and soil packed firmly around the roots, as approved by the COR or their designated representative. Plants shall be installed vertically and shall not have the roots folded or "j-rooted" into the holes (i.e., bottom of root structure shall be in contact with the bottom of the hole and not forced in and bent sideways or upward). Holes shall not be so deep that the root crown of the installed plant is below the existing soil surface.
4. Plants shall be installed immediately after being removed from the tubes (i.e., not removed from tubes and staged beforehand, leaving them exposed to drying conditions).
5. The planting crews will not be allowed to re-enter planted areas after planting is completed unless approved by the COR or their representative.

Table 2. Wetland species to be collected

Species	Common name	Planting zone
<i>Carex nebrascensis</i>	Nebraska sedge	1
<i>Schoenoplectus pungens</i>	common threesquare	1
<i>Distichlis spicata</i>	inland saltgrass	2
<i>Juncus arcticus</i>	arctic rush	2

E. COLLECTION AND INSTALLATION OF WILLOW STAKES

1. The contractor is responsible for collecting sufficient willow cuttings necessary to meet the bid quantities for the willow species listed in Table 3. A total of 1,526 willow stakes of two species (as specified in Table 3) shall be planted into the appropriate planting zone (Zone 1 in Figure 3). The area of Zone 1 is 2,054 sq. yards, so the willow stake planting density is 1 stake per 2 sq. yards.
2. Stems (cuttings) shall be collected from designated collection zones along Glorieta Creek indicated in Figure 2. Additional collection zones will be identified by the NPS along lower Glorieta Creek or the Pecos River within PECO, if needed.
3. All cuttings will be of live stems (live buds present) and will be collected from dormant plants, prior to leaf-out. Cuttings shall be straight and all side branches shall be removed. Damage to buds during cutting, storage, and planting shall be avoided. Cuts must be clean without stripping the bark. Cuttings with stripped bark will not be accepted,
4. Cuttings will be a minimum of 36 inches in length. No portion of the cutting will be less than 1/2-inch diameter (larger is better) unless smaller diameters are approved by the Contract Officer or their designated representative. Use newer growth, not older branches with thick bark.

5. No more than 25% of stems from individual donor plants will be harvested unless explicit permission is provided by the Contract officer or designated representative.
6. When cut, the willow stems should immediately be placed, bottom end down, into deep buckets of water filled to at least 18 inches in depth, or into pools of water, immersing as much of the cuttings as possible. The cuttings should be soaked for at least 48-72 hours, and longer if possible. Willow cuttings must never be out of water until the moment they are planted.
7. Cuttings must be planted right-side up, so bottoms should be cut on an angle to identify correct end to insert in the ground. Alternatively, tops may be marked with paint or alternative methods may be proposed (subject to approval by the contract officer) to ensure that cuttings are planted with the correct orientation.
8. Planting shall be accomplished by opening a hole in the ground to a depth of 24 inches and the willow cutting placed completely into the hole with the bottom end down. Excavation of the hole shall be accomplished using a method or methods selected by the Contractor and approved by the Contract Officer.
9. Test sections will be required to demonstrate the Contractor's methodology. This demonstration shall be of sufficient duration to satisfy the Contract officer or designated representative that the proposed method will achieve the desired results.
10. Once the willow cutting is installed, the soil around the cutting must be tamped so that the soil is in contact with the cutting throughout its length and no air pockets exist.
11. No more than 12 inches of the cutting shall extend above the ground surface after planting.

F. COLLECTION AND INSTALLATION OF COTTONWOOD CUTTINGS

1. The contractor shall collect cottonwood cuttings (poles) from designated collection zones along Glorieta Creek in PECO (Figure 2). The contractor is responsible for collecting a sufficient number of cuttings to meet total bid quantities of cottonwood species listed in Table 3. A total of 440 cottonwood cuttings of two species (as specified in Table 3) shall be planted into the appropriate planting zone (Zone 2 in Figure 3). The area of Zone 2 is 1,758 sq. yards, so the cottonwood planting density is 1 cutting per 4 sq. yards.

Note: While *Populus angustifolia* and *P. deltoides* ssp. *Wislizeni* are listed in Table 3, hybrids between the two species (*P. × acuminata*) are prevalent along Glorieta Creek and the Pecos River. At the discretion of the Contract officer or their designated representative, cuttings of *P. × acuminata* will be acceptable, provided the total number of cottonwood (*Populus* spp.) cuttings in Table 3 is reached.

2. Additional collection zones in PECO (beyond those shown in Figure 2) will be identified by the NPS along lower Glorieta Creek or the Pecos River, if needed.
3. All cuttings will be of straight, dormant live stems (live buds present) and will be collected prior to leaf-out. Cuttings will be a minimum of 60 inches in length. No portion of the cutting will be less than 2 inches in diameter. Any side branches will be removed, but care will be taken to not injure buds along the main stem. Cuttings must be from newer growth (2-4 years old), not older branches with thick bark. Cuts must be clean without stripping the bark. Cuttings with stripped bark will not be accepted,
4. No more than 25% of stems from individual donor plants will be harvested unless explicit permission is provided by the NPS.

5. When cut, the cottonwood poles should immediately be placed, bottom down, into deep buckets of water filled to a depth such that at least the lower half of each cutting is immersed in water. Alternatively, the cuttings may be bundled and floated or immersed in pools of water. Cuttings must be soaked for at least 48-72 hours, longer if possible, and must never be out of water until the moment they are planted. The top end of cuttings should be marked to ensure cuttings are planted with the correct orientation (bottom down).
6. Planting shall be accomplished by opening a hole in the ground to a depth of 36 inches (deeper accordingly if the cuttings are longer than 60 inches) and the cutting placed into the hole with the bottom end down. Excavation of the hole shall be accomplished using a method or methods selected by the Contractor and approved by the Contract Officer.
7. Test sections will be required to demonstrate the Contractor's methodology. This demonstration shall be of sufficient duration to satisfy the Contract officer or designated representative that the proposed method will achieve the desired results.
8. Once a cutting is installed, the soil around the cutting must be tamped so that the soil is in contact with the cutting throughout its length and no air pockets exist.
9. Cottonwoods shall be planted only into the appropriate planting zone (Zone 2) as identified in Figure 3.
10. Twenty-four inches of the cutting shall extend above the ground surface after planting.

Table 3. Species and quantities of cuttings to be collected and installed as part of scope.

Species	Common name	Quantity	Planting zone
<i>Salix exigua</i>	narrowleaf willow	1272	1
<i>Salix irrorata</i>	dewystem willow	254	1
<i>Populus angustifolia</i>	narrowleaf cottonwood	220	2
<i>P. deltoides ssp. wislizeni</i>	Rio Grande cottonwood	220	2

III. PERFORMANCE STANDARDS

A. HERBACEOUS PLANTS

1. All plants propagated by the contractor shall meet standards identified in sections II B and II C of this document.
2. All plants must be properly installed as detailed in the scope of work and approved by the NPS.
3. Proper installation includes, but is not limited to:
 - Planting in the correct zone
 - Planting at the proper depth
 - Plantings are installed vertically, and soil is properly packed around each planting.
4. Contractor will be responsible for plant dieback, yellowing, or mortality over the first two weeks following plant installation.

B. WILLOW AND COTTONWOOD CUTTINGS

1. All cuttings must be properly installed as described in sections II E and II F of this document.
2. Proper installation includes, but is not limited to:
 - Planting in the correct zone
 - Planting at the proper depth
 - Soil is properly packed around each cutting.
3. The Contractor is responsible for the successful establishment of 75% of the willow and cottonwood cuttings, as determined by the NPS. Successful establishment means that a cutting leafs out in the growing season following installation and then leafs out again with healthy foliage the following spring.
4. If, after the approval of final payment and prior to [insert date], willow or cottonwood cutting mortality is greater than 25%, the Contractor shall promptly, without cost to NPS, remove the dead cuttings and replace them with live, healthy cuttings meeting the original specifications described in this Scope of Work.

IV. DELIVERY AND PAYMENT

A. DELIVERY SCHEDULE

1. Plants shall be delivered as specified in Section I.H. The proposed [insert date] delivery date is a target that NPS will strive to maintain. Beginning on [insert date] the Contractor and the NPS representatives shall discuss and verify by phone and/or email that site conditions at PECO are suitable for delivery and successful planting on the proposed delivery date.
2. The NPS may determine that flood or drought conditions at PECO require an adjustment of the scheduled delivery date to as late as [insert date]. Any such adjustments to the proposed [insert date] delivery date will be discussed with the Contractor, and the Contractor's schedule will be taken into account to the extent practicable in determining an alternative delivery date.

B. FEE AND PAYMENT

1. A progress payment will be made following the delivery and acceptance of the first scheduled Activity Report. Payment will be equal to a percentage of project completion at that time, but no greater than 15%, with an anticipation of seed cleaning and treatment to have been completed.
2. A second progress payment will be made following the delivery and acceptance of the second scheduled Activity Report. Payment will be equal to a percentage of project completion at that time, but no greater than 40%, with an anticipation that the sown seed will have germinated and the plants are growing in sufficient quantities and in a healthy condition at the Contractor's greenhouse facilities as necessary to fulfill the order.
3. Final payment for the plants will be made at the contract price per each unit successfully propagated, delivered, and accepted by the NPS or their designated representative, and having met the quality standards detailed above. Payment at the unit prices shall be full

compensation for seed/propagule collection, storage, treatment, plant propagation and care, and all materials, labor, equipment, transportation, insurance, housing, per diem, and all other costs necessary to produce and install the plants as specified in the contract.

4. Payment for delivery of the plants from the contractor's nursery to PECO and for onsite installation shall be billed as separate items upon completion of these items.



Figure 2. Overview of project area including main planting and collection areas.



PLANTING ZONES

0 20 40 80 FEET



Figure 3. Planting zones