

CANEBRAKE AND BOTTOMLAND HARDWOOD FOREST HABITAT RESTORATION AT BENSON CREEK NATURAL AREA

Project Summary:

This project addresses the need for habitat management to increase quality of bottomland hardwood forest and canebrake habitat in the Mississippi Alluvial Valley of eastern Arkansas. The objectives of this project are to increase the quality of bottomland hardwood habitat, expand existing cane stands within forests, and prioritize old field sites for restoration and restore cane to selected areas within those sites. Habitat restoration will benefit a variety of wildlife species, including many species of conservation concern.

Project Lead:

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Project Partners:

Arkansas Natural Heritage Commission (ANHC)

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ANHC
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Total Project Cost: \$49,200

Request: \$24,600

Matching funds (provided by ANHC and TNC): \$24,600

FUNDING PRIORITY ADDRESSED BY PREPROPOSAL

This preproposal addresses the implementation need for restoration and enhancement of canebrake and bottomland hardwood forest habitat in the Mississippi Alluvial Valley (MAV) to increase habitat quality for species of greatest conservation need (SGCN). Completion of the project will take two years.

ECOREGION WHERE PROJECT WILL BE CONDUCTED

The project presented in this preproposal will be conducted in the MAV ecoregion, specifically at Benson Creek Natural Area (BCNA) located in Monroe County, Arkansas. A map of this site is provided in Appendix A.

PROJECT JUSTIFICATION

Historically, dense stands of cane were a prominent feature of the bottomland hardwood communities of the southeastern United States. Canebrakes were described as covering thousands of acres. Canebrakes occurred on the floodplain terraces beneath sparse forest canopy and also in canopy gaps in upland forest and savanna communities. These stands provide habitat for a variety of wildlife species, such as swamp rabbits and canebrake rattlesnakes, as well as variety of Arkansas Wildlife Action Plan SGCN (see Table 1). After European settlement, large expanses of cane were lost to land conversion for agriculture, alteration of flooding and fire regimes, and overgrazing. An estimated 98% of this ecosystem has been lost. As a result, it has been designated as a critically endangered ecosystem and is a conservation priority in the Southeastern United States.

Forest conditions that promote cane within bottomland hardwood stands are listed by the Lower Mississippi Valley Joint Venture (LMVJV) as a component of desired stand conditions in the MAV. The LMVJV also recommends taking action to identify areas for cane restoration and to further advance techniques used in restoration.

Natural disturbance processes such as fire are believed essential for long-term maintenance and regeneration of bottomland hardwood forests. Fire also promotes herbaceous layer development in mature open canopy forests and discourages invasion of woody vines and exotic species. The removal of organic buildup in swamps through fire played a role in successional structure and composition of forested wetlands and the maintenance of the ecosystem. Canebrakes are thought to have depended historically on flooding and fire disturbances.

BCNA contains 1,239 acres and is co-owned and managed by the Arkansas Natural Heritage Commission and The Nature Conservancy. It is located along the western side of Bayou De View and comprises cypress-tupelo swamp, bottomland hardwood forest, and cleared terraces. The Natural Area is adjacent to the Cache River National Wildlife Refuge and Dagmar Wildlife Management Area both of which have restorable canebrakes for which this project will serve as a demonstration. The geologic formations comprise older alluvial and terrace deposits from the Mississippi River and Bayou De View and more recent alluvium from adjacent uplands. The topography is flat and elevations run from 170 to 185 feet above mean sea level. Small patches of giant cane (*Arundinaria gigantea*) occur in several stands across the area. The natural area also includes 700 acres of former agricultural fields that have the potential to be restored to bottomland hardwood forest and canebrake habitat.

GOALS AND OBJECTIVES

The primary goal of this project is to enhance and restore bottomland hardwood and canebrake habitat for a variety of species of conservation concern as identified by the 2009 State Wildlife Action Plan Steering Committee (Table 1).

Objectives:

- 1) Increase quality of bottomland hardwood habitat by re-introducing fire on approximately 250 acres.
- 2) Expand existing cane stands within bottomland hardwood forests.
- 3) Prioritize old field sites for restoration and restore cane on selected sites.

Class	Common Name	Scientific Name	Habitat¹
Insecta	Carolina roadside skipper	<i>Amblyscirtes carolina</i>	C
Insecta	Lace-winged roadside skipper	<i>Amblyscirtes aesculapius</i>	C
Insecta	Yehl skipper	<i>Poanes yehl</i>	C
Aves	Swainson's Warbler	<i>Limnothlypis swainsonii</i>	C, b
Aves	Kentucky Warbler	<i>Oporornis formosus</i>	B, c
Aves	Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	B, c
Aves	Wood Thrush	<i>Hylocichla mustelina</i>	B, c
Aves	Rusty Blackbird	<i>Euphagus carolinus</i>	B
Aves	Hooded Warbler	<i>Wilsonia citrine</i>	B, c
Aves	American Woodcock	<i>Scolopax minor</i>	B, c

¹ c = cane, b = bottomland hardwood forest, uppercase indicates optimal habitat

METHODS

Objectives 1&2

Prescribed fire will be restored to approximately 250 acres of bottomland hardwood forest. Prescribed burns will follow a written burn plan and will be conducted by Nature Conservancy staff. The application of fire will stimulate growth of cane, promote the expansion of existing cane stands, and increase habitat quality of the remaining bottomland hardwood habitat. To further promote cane expansion, overstory/midstory reduction will be implemented on approximately 20 acres where cane is already dense. Basal area and canopy cover of the overstory layer will also be measured before and after treatment to assess changes in overstory structure. The size and density of the existing canebrake on the area treated for midstory/overstory reduction will be measured before and after treatments to document changes and assess restoration/expansion success. Immediate post-fire effects will also be measured to assess the effectiveness of prescribed burns.

Objective 3

Old field habitats will be surveyed and prioritized for cane restoration efforts. Restoration sites will be selected based on criteria that make them most suitable for cane planting. These

variables will include but are not limited to: 1) soil type 2) drainage 3) adjacency to existing cane stands 4) competition from other vegetation and 5) accessibility. The amount of acres restored will depend on the availability of suitable sites, but should range from 2 to 15 acres.

Before planting, fields will be burned to remove existing vegetation. Herbicide may also be utilized where needed to reduce vegetative competition. Cane will be planted on selected sites using transplants or seedlings derived from tissue culture. Transplants and/or seedlings will be collected/derived from a local donor site to maintain genetic integrity. Fertilizer may be utilized to increase survival of planted cane, if deemed necessary based on site characteristics. Survivorship of planted cane will be monitored and evaluated regularly post-planting to determine restoration success.

All monitoring protocols will be entered into the Natural Resources Monitoring Partnership database before the completion of the project.

PROJECT OUTCOMES

- Restore fire to 250 acres of bottomland hardwood forests for SGCN.
- Reduce overstory/midstory density on 20 acres over existing cane stands.
- Restoration of canebrake habitat to benefit SGCN.

The reintroduction of fire to bottomland hardwood forests at BCNA will increase habitat quality by removing organic debris build-up, promoting herbaceous vegetation, reducing invasive species, and restoring site appropriate structure and species composition. The application of fire will also stimulate cane growth and promote cane stand expansion across the forest. Reduction of the overstory and midstory will create a more open canopy to promote the expansion of existing cane stands. The restoration of cane to old field sites will increase habitat availability for SGCN that rely on or prefer cane for foraging, cover, and nesting habitat.

In addition, this project will generate a method for prioritizing and selecting field sites for cane restoration which may be utilized at other sites in the MAV. This project will also serve to increase our understanding and knowledge of the efficacy of the utilized cane restoration techniques.

Information on the activities and outcomes of this project will be made available to the public through The Nature Conservancy's website, the Arkansas Natural Heritage Commission's website, and through TNC's Arkansas Field Office newsletter. The information will also be presented to the scientific community in the Fall of 2011.

This project will build on the long-standing partnership between the Arkansas Natural Heritage Commission and The Nature Conservancy. ANHC and TNC have co-owned and managed Benson Creek Natural Area since 1993. Since that time, they have worked in concert to restore and protect biological diversity representative of the bottomland hardwood forests and swamp communities at BCNA. They have also worked together to acquire additional tracts to expand the natural area. Recent acquisitions bring the total acreage at BCNA to 1,239 acres, four times the original acreage of 303. Recently acquired tracts are old agricultural fields which will be restored to their natural communities over time.

Deliverables and Anticipated Timeline

- Fireline preparation (months 2-18)
- Prescribed burns (winters 2009, 2010)
- Overstory/midstory reduction (winter 2009)
- Pre-treatment monitoring (months 1-18)
- Post-treatment monitoring (months 3-24)
- Restoration site selection (months 1-12)
- Transplanting of cane to restoration site (Jan.-Mar 2011)
- Transplant survival monitoring (winter/spring 2011)
- Enter monitoring methodology into the natural resources monitoring partnership database (months 1-24)
- Update Comprehensive Wildlife Conservation Strategy database (summer 2011)
- Inform the public of conservation activities and outcomes (months 12-24)
- Update scientific community on conservation actions and outcomes (Fall 2011)

Allison Fowler: Allison Fowler is a Field Ecologist for The Nature Conservancy in Little Rock, Arkansas. Her responsibilities include collecting and analyzing data on plant and avian communities in response to management activities, conducting post-fire evaluations, and assisting in coordinating invasive species efforts. Allison received a B.S. in wildlife ecology and management from Arkansas State University and an M.S. in Forest Resources from the University of Arkansas at Monticello. She has conducted research on Loggerhead Shrikes (*Lanius ludovicianus*) and swamp rabbits (*Sylvilagus aquaticus*). She has published one scientific paper on the habitat characteristics and abundance of swamp rabbits in eastern Arkansas.

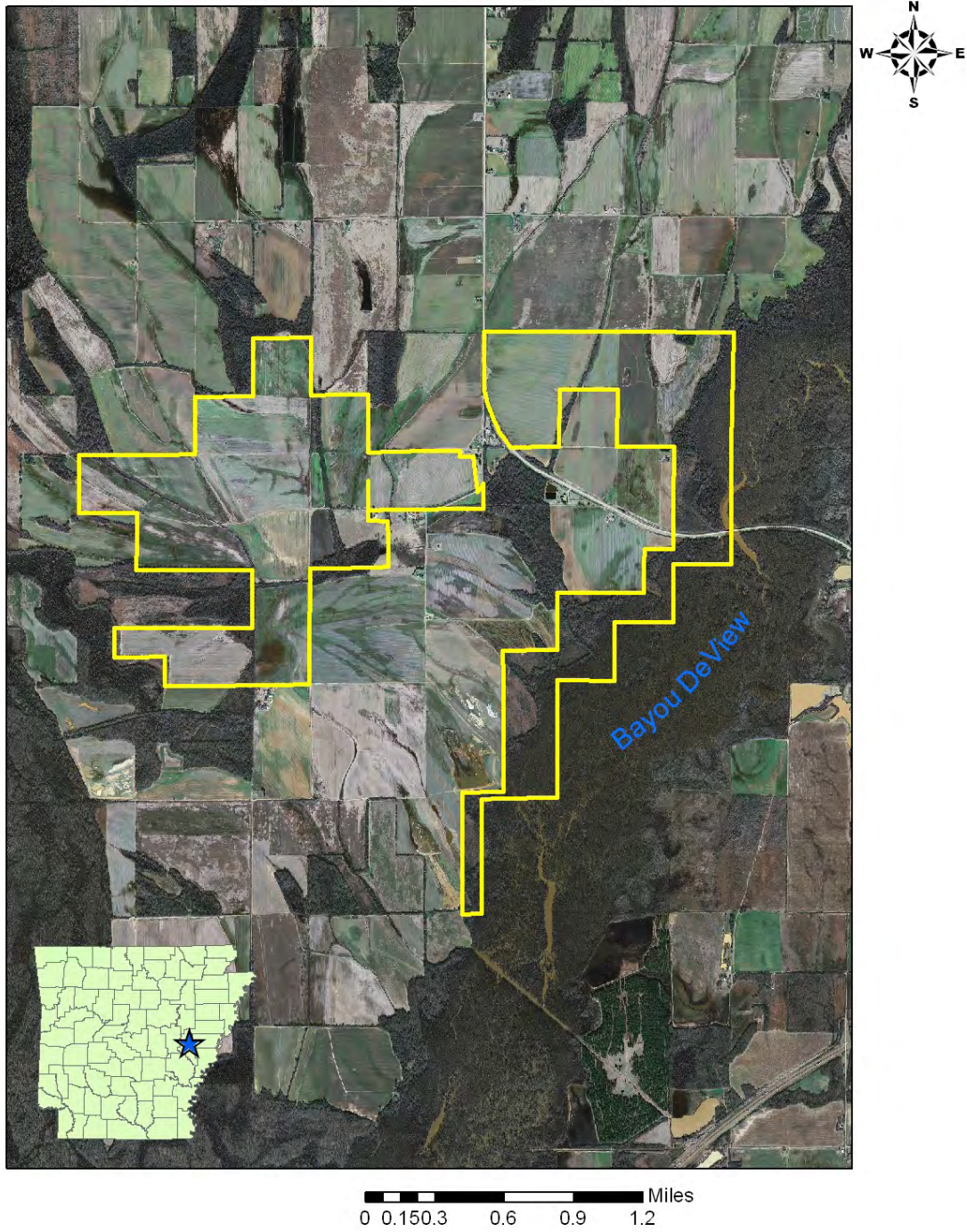
Bill Holimon: Bill Holimon is an Ornithologist and is Chief of Research for the Arkansas Natural Heritage Commission. Bill received a B.S. in biology from the University of Arkansas at Little Rock and an M.S. in biology from New Mexico State University. Bill previously worked for The Nature Conservancy in Texas on conservation of two federally listed endangered bird species, the Golden-cheeked Warbler (*Dendroica chrysoparia*) and Black-capped Vireo (*Vireo atricapilla*). In addition, he has conducted extensive work on various taxa of Red Crossbills (*Loxia curvirostra*) throughout North America. Bill is a native Arkansan who has published four scientific papers on rare birds of Arkansas; three on grassland birds and the fourth on the endangered Red-cockaded Woodpecker (*Picoides borealis*).

Jennifer Akin: Jennifer Akin is a Plant Community Ecologist for the Arkansas Natural Heritage Commission. Jennifer received a B.S. in biology and a M.S. in botany both from the University of Arkansas at Fayetteville. Jennifer has worked for The Nature Conservancy documenting the recovery of restored wetland and uplands and the National Park Service performing surveys in over two hundred vegetation types in the Sierra Nevada Mountains for production of a vegetation map.

Douglas Zollner: Douglas Zollner is an ecologist currently serving as the Director of Conservation Science for the Arkansas Field Office. He has been working with the Conservancy for 12 years. Zollner also serves as the Conservancy's National Fire Restoration Coordinator, coordinating Conservancy efforts to reduce the threat of altered fire regimes to biodiversity across ownerships at landscapes in the US and Mexico. Zollner has over 25 years of working experience with ecological assessments and conservation planning, woodland and watershed restoration, fire ecology, ecological modeling, and developing and implementing measures of conservation success in an adaptive management context. He received a Bachelor of Science from the University of Arizona in Watershed Management and a Master of Science from Texas Tech University in the Ecology of Arid Lands. He spent the 1980's working on conservation projects overseas, mostly in eastern and southern Africa.

APPENDIX A.

Benson Creek Natural Area



**STATE WILDLIFE GRANT PROGRAM
SUBGRANT PROJECT BUDGET**

1. Budget summary

Complete the project budget summary form below.

Budget Category	State Wildlife Grant Funds (Federal)	Cash Match (Non-Federal)	In-Kind Match (Non-Federal)	Total Project Cost
Salaries	15,000.00	15,000.00		30,000.00
Contract Services			-	-
Supplies and Materials	2,000.00	2,000.00		4,000.00
Travel	3,000.00	3,000.00		6,000.00
Equipment	-	-	-	-
Indirect Costs	4,600.00	4,600.00		9,200.00
TOTAL	24,600.00	24,600.00	-	49,200.00

2. Non-Federal Match (cash and/or in-kind)

Matching funds included in the grant budget are subject to the same requirements and conditions that apply to federal funds. These requirements include the certifications and assurances submitted with the grant application and any conditions attached to the grant award.

Additional details about match can be found here:

<http://wsfprograms.fws.gov/subpages/toolkitfiles/43cfr12.pdf>

3. Budget Narrative

In addition to completing the subgrant project budget summary above, a detailed, itemized budget justification must also be completed on a separate sheet. It must contain the reason for each requested budget item and provide the basis and rationale for its cost. All requested (federal and non-federal) items must be thoroughly justified and clearly tied to project tasks, schedule and deliverables.

4. Indirect Costs

Indirect costs will only be approved if the applicant has an existing, approved rate from a cognizant federal agency. A copy of the current federal approval must be submitted with the grant proposal. Indirect cost rates greater than 10 percent must be must be justified in the budget narrative.

5. Grant period

Project costs and cash and/or in-kind matching can only be incurred after a formal grant award is made by the U.S. Fish and Wildlife Service and a grant agreement is executed by and between the Arkansas Game and

Budget and match questions may be addressed to

[Matthew Warriner](#)
Federal Aid Coordinator

Detailed Budget Narrative

Salaries SWG \$15000 ANHC/TNC Match \$15000 Total \$30,000

Allison Fowler, Field Ecologist, The Nature Conservancy, will provide approximately 120 days (0.46 FTE) for overall project management, supervision, implementation, monitoring, and reporting. A prescribed burn crew of 7 crew members will provide approximately 7 days (\$2250/day) for implementing habitat treatments (prescribed burning, midstory/overstory reduction). Additional staff, including Director of Conservation Science and Terrestrial Ecologist, will provide technical support as needed. Salaries include fringe benefits and some overtime may be required.

Supplies SWG \$1,750 ANHC/TNC Match \$1,750 Total \$3,500

Supplies include fuel for drip torches and chainsaws, batteries, monitoring equipment, various implements for cane transplant, herbicide, and water and food supplies for field crews.

Travel SWG \$3000 ANHC/TNC Match \$3000 Total \$6000

Travel expenses include mileage reimbursement at 0.55 cents per mile for travel to and from the field site. It also includes costs for travel to meetings and presentation expenses.

Other SWG \$250 ANHC/TNC Match \$250 Total \$500

Other expenses includes providing occupancy, communication services, and training opportunities to support a prescribed burn crew.

Indirect Costs SWG \$4,600 ANHC/TNC Match \$4,600 Total \$9,200

The Nature Conservancy has a current negotiated indirect cost rate of 23% that is accepted by the US Fish and Wildlife Service.

**Nonprofit Organization
Indirect Cost Negotiation Agreement**

EIN #: 53-0242652

Organization:

The Nature Conservancy
4245 North Fairfax Drive, Suite 100
Arlington, Virginia 22203-1606

Date: August 13, 2008

**Report No(s) .: 08-A-682(07F)
08-A-683(09P)**

Filing Ref.:
Last Negotiation Agreement
dated July 24, 2007

The indirect cost rates contained herein are for use on grants, contracts, and other agreements with the Federal Government to which 2 CFR 230 (OMB Circular A-122) applies, subject to the limitations in Section II.A. of this agreement. The rates are negotiated by the U.S. Department of the Interior, National Business Center, and the subject organization in accordance with the authority contained in 2 CFR 230.

Section I: Rates

Page 1 of 2

Type	Effective Period		Rate	Locations	Applicable To
	From	To			
Final	07/01/06	06/30/07	23.28% 1/	All	All Programs
Fixed Carryforward	07/01/08	06/30/09	23.28% 1/	All	All Programs

Fringe Benefit Rates

Final	07/01/06	06/30/07	40.00% 2/	All	Regular Fringes
Final	07/01/06	06/30/07	12.00% 3/	All	Short-Term Fringes
Final	07/01/06	06/30/07	12.00% 4/	All	Foreign Fringes
Provisional	07/01/08	06/30/09	41.00% 2/	All	Regular Fringes
Provisional	07/01/08	06/30/09	12.00% 3/	All	Short-Term Fringes
Provisional	07/01/08	06/30/09	13.00% 4/	All	Foreign Fringes

1/ **Base:** Total direct costs, less external transfers, the value of land sold or donated to government agencies and other conservation organizations. Equipment costs valued between \$5,000 and \$50,000 are included in the base limited to the first year of capitalization. **All subawards, regardless of dollar amounts, are included in the base.**

Note: TNC has agreed to make all reasonable efforts to implement the exclusion of the portion of subawards in excess of \$25,000 subject to a new system implementation in the FY 2011 rate negotiation.

2/ **Base:** Total salaries and wages for regular employees.

3/ **Base:** Total salaries and wages for short-term employees.

4/ **Base:** Total salaries and wages for foreign employees.

Note: The foreign fringes rate is applicable to benefits that are paid centrally by TNC's headquarters. Additional benefits are paid locally by TNC's foreign locations which are charged directly to government awards.

Treatment of fringe benefits: Fringe benefits applicable to direct salaries and wages are treated as direct costs; fringe benefits applicable to indirect salaries and wages are treated as indirect costs.

Treatment of paid absences: (a) For employees paid on TNC's U.S. payroll, the costs of vacation, holiday and sick leave pay are included in the organization's fringe benefit rate and are not included in the direct cost of salaries and wages. Claims for direct salaries and wages must exclude those amounts paid or accrued to employees for periods when they are on vacation, holiday or sick leave. Other paid absences are billed directly. (b) For employees paid on local payrolls in other country programs, paid absences are billed directly.

Section II: General

A. Limitations: Use of the rates contained in this agreement is subject to any applicable statutory limitations. Acceptance of the rates agreed to herein is predicated upon these conditions: (1) no costs other than those incurred by the subject organization were included in its indirect cost rate proposal, (2) all such costs are the legal obligations of the grantee/contractor, (3) similar types of costs have been accorded consistent treatment, and (4) the same costs that have been treated as indirect costs have not been claimed as direct costs (for example, supplies can be charged directly to a program or activity as long as these costs are not part of the supply costs included in the indirect cost pool for central administration).

B. Audit: All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based will be compensated for in a subsequent negotiation.

C. Changes: The rates contained in this agreement are based on the organizational structure and the accounting system in effect at the time the proposal was submitted. Changes in organizational structure, or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rates in this agreement, require the prior approval of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowance.

D. Fixed Carryforward Rate: The fixed carryforward rate is based on an estimate of the costs that will be incurred during the period for which the rate applies. When the actual costs for such periods have been determined, an adjustment will be made to the rate for future periods, if necessary, to compensate for the difference between the costs used to establish the fixed rate and the actual costs.

E. Agency Notification: Copies of this document may be provided to other federal offices as a means of notifying them of the agreement contained herein.

F. Record Keeping: Organizations must maintain accounting records that demonstrate that each type of cost has been treated consistently either as a direct cost or an indirect cost. Records pertaining to the costs of program administration, such as salaries, travel, and related costs, should be kept on an annual basis.

G. Reimbursement Ceilings: Grantee/contractor program agreements providing for ceilings on indirect cost rates or reimbursement amounts are subject to the ceilings stipulated in the contract or grant agreements. If the ceiling rate is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.

H. Use of Other Rates: If any federal programs are reimbursing indirect costs to this grantee/contractor by a measure other than the approved rates in this agreement, the grantee/contractor should credit such costs to the affected programs, and the approved rate should be used to identify the maximum amount of indirect cost allocable to these programs.

I. **Central Service Costs:** Where central service costs are estimated for the calculation of indirect cost rates, adjustments will be made to reflect the difference between provisional and final amounts.

J. **Other:**

1. The purpose of an indirect cost rate is to facilitate the allocation and billing of indirect costs. Approval of the indirect cost rate does not mean that an organization can recover more than the actual costs of a particular program or activity.

2. Programs received or initiated by the organization subsequent to the negotiation of this agreement are subject to the approved indirect cost rate if the programs receive administrative support from the indirect cost pool. It should be noted that this could result in an adjustment to a future rate.

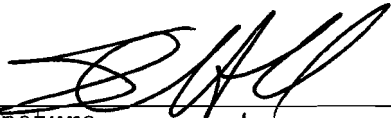
3. New indirect cost proposals are necessary to obtain approved indirect cost rates for future fiscal or calendar years. The proposals are due in our office 6 months prior to the beginning of the year to which the proposed rates will apply.

Section III: Acceptance

Listed below are the signatures of acceptance for this agreement:

By the Nonprofit Organization:

By the Cognizant Federal Government Agency:

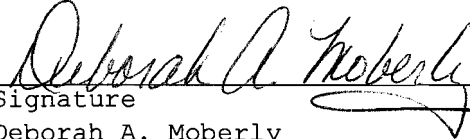
 /s/

Signature _____

Name (Type or Print) Stephen C. Howell

Title Chief Financial & Administrative Officer

Date 8/11/08

 /s/

Signature _____

Name Deborah A. Moberly

Title Indirect Cost Coordinator
Indirect Cost Services

Agency U.S. Department of the Interior
National Business Center

Date August 13, 2008

Negotiated by Elena Chan

Telephone (916) 566-7111