USDA NRCS Conservation Innovation Grant Final Report

Date Submitted: 10/31/13

Project Name: Native understory restoration in longleaf pine ecosystems

Organization: The Longleaf Alliance

Project Background

The Range-wide Conservation Plan for Longleaf Pine identified the need for the development of a native ground cover seed market in the Southeast as a key action item for longleaf pine restoration. In reference to ground cover restoration, the Range-wide plan states "Supplies of ecologically appropriate native seed are unavailable for most longleaf pine communities and/or insufficient to meet demands for ground layer restoration or re-establishment. Further, there are no accepted standards for quality and provenance of native ground layer species."

A ready market exists for herbaceous and shrubby species native to the longleaf pine ecosystem and for wider distribution of species whose genotypes are not currently available in the Southeast. The market demand for native seed has increased dramatically due to the inclusion of native warm season grasses (NWSG) and forb plantings in USDA Farm Bill programs such as CP36, as well as region-wide restoration initiatives on public lands. In addition, the U.S. Forest Service has dedicated funding for National Forests to collect seed of ground cover plant species that are part of the longleaf pine ecosystem. Over the past several years, seed has been collected from at least five National Forests with longleaf pine habitat. Seed collections are being used for restoration, seed increase, and research projects with a range of cooperators including commercial seed companies, university extension programs, and other public agencies and non-governmental organizations. Through this project, the Longleaf Alliance aimed to build on these efforts and assist the commercial production industry with the development of locally sourced plant material suitable for use on National Forests and other public and privately managed lands that are being restored to longleaf habitat. Restoration of this community hinges on the ability of interested landowners to secure affordable and appropriate seed and/or plants with dependable techniques for species establishment on working and conservation lands.

These requirements are currently being met from Midwestern seed sources and some native partridge peas. The USFS requires National Forest System managers to utilize native species in roadside, erosion control, and wildlife food plantings and could utilize significant amounts of native seed from herbaceous species and longleaf ecosystem genotypes. The Longleaf Alliance is currently working with large seed production efforts with established seed producers such as Roundstone Seed Company and producers and researchers including Lolly Creek, International Forest Company, and JERC to develop native seed sources. The foundation for this project also includes some existing outreach materials that will be useful in promoting the use of native understory plants. For example, scientists at the JERC have produced attractive, informational,

and user-friendly publications on native legumes and bunch grasses that can be given much broader distribution across the native range of longleaf pine through this project.

Project Purpose

The purpose of this project was to increase availability of affordable native understory species of longleaf pine forests and promote increased utilization of native species of southeastern origin in ecosystem restoration.

The longleaf pine ecosystem supports one of the most biologically diverse plant communities in the world. With the decline of the ecosystem from an estimated high of 90 million acres to the current estimate of approximately 4.2 million acres, much of the native understory community has been severely impacted or lost completely. This project was designed to support a range-wide, networked effort to develop reliable, affordable native plants necessary for successful restoration of the longleaf pine ecosystem. The Longleaf Alliance has addressed understory restoration needs across the southeast through coordination and support of a range-wide understory working group; development of techniques and protocols for plant material production; sharing of information regarding successful techniques and practices to avoid; availability of research results and available practical knowledge relative to native understory restoration in longleaf forests; and identification and initiation of pilot programs in key longleaf landscapes. Additionally, through development of materials, direct contact, presentations, and inclusion in workshops and media, the project has successfully promoted the use of native species as opposed to non-native invasive and exotic plant species that can be detrimental to native ecosystems.

Project Objectives

As outlined in the project agreement, the specific objectives of the project were:

- Enhanced coordination, communication, and facilitation of activities resulting in increased understory plant material that supports longleaf ecosystem restoration.
- Development of guidelines that provide recommendations to help ensure success in use of specific understory plants in ecosystem restoration
- Development of a catalog of native seed and plant producers
- Assessment of pilot areas in important longleaf landscapes
- Identification of desirable seed and plants, initial start of seed collection, plant production, and provision of plants to interested consumers in at least 2 pilot areas
- Conduct presentations at conferences and workshops across the longleaf pine range, and Longleaf Alliance website
- Attend at least one NRCS CIG Showcase or comparable NRCS event during the period of the project agreement
- Development of fact sheet describing understory restoration techniques

Components of the grant can be divided into three basic parts: (1) Regional Coordination and Communication, (2) Pilot Focal Areas and Plant Materials Production, and (3) Outreach and Knowledge Transfer. These categories will be used to present project results.

Project Results

Regional Coordination and Communication

- Understory Coordinator position was created with the Longleaf Alliance to lead the project effort.
- Understory working group was revived to support regional coordination between states and longleaf implementation teams.
- The Understory Coordinator met with understory focused groups in North Carolina & Texas/Louisiana to encourage increase in understory activity in those areas.
- The Understory Coordinator has worked and continues to work directly with local implementation teams across the range. A point person has been identified in each group to spearhead activities and handle reporting related to understory restoration.
- The Longleaf Alliance is including regional updates from states & local implementation teams in the quarterly Longleaf Leader newsletter.

Pilot Focal Areas and Plant Materials Production

- Sites were assessed in Significant Geographic Areas across the southeast and two pilot focal areas were selected: Ft. Benning area and the Gulf Coastal Plain Ecosystem Partnership (GCPEP) landscape
- Ft. Benning Focal Area:
    - The Longleaf Alliance is working with Chattahoochee Fall Line Conservation Partnership (CFLCP)
    - Worked in conjunction with CFLCP staff to determine optimal species for collection and collected material from the Georgia Fall Line area for plug propagation (plant species collected are listed in Appendix A, Table 1.)
    - International Forest Company was contracted to grow plugs of 6 selected species for use in restoration and production planting
    - Planted grass plugs in conjunction with CFLCP and volunteers on 21 acres of The Nature Conservancy owned Ingram Tract that borders Ft. Benning. The grasses were planted at 2 different rates (1000 plugs/acre & 4000 plugs/acre) to examine minimum planting rates requirements.
    - The 6 species were also planted in a production setting at K&L Forest Nursery (private) in Buena Vista, GA (Appendix B, Image 1.). Field was planted in 2012 and fall 2013 is the second harvest season. Seed production amounts are listed in Appendix 1, Table 2.

- GCPEP Focal Area:
    - Reference sites were selected and sampled in quality sites on Blackwater River SF to determine dominant species.
    - Vegetation sampling in reference sites resulted in determination of species to use in seed production area at Nokuse Plantation (Appendix A, Table 3.)
    - Seeds were collected from within the GCPEP landscape from 6 selected species for plug propagation. Five species were hand collected and wiregrass was collected mechanically with a flail-vac seed collector. Seeds were grown into plugs to establish a seed production field at Nokuse Plantation.
    - A 30 acre production field at Nokuse Plantation was established in July 2013 (Appendix B, Image 2). This field will be used to propagate seed that will be used for restoration on Nokuse Plantation and other GCPEP partner lands.
    - Remaining bulk wiregrass seed that was not propagated for the production field will be planted during winter 2014 at Blackwater River State Forest.
- Other Seed Production Support
    - The Longleaf Alliance, in collaboration with Poarch Creek Indian Tribe and Alabama Forestry Commission, established the Hauss Nursery production field in June 2012. This planting is a collaborative project with. 173 total lbs. of PLS seed was produced by Slender Indiangrass (*Sorghastrum elliottii*) and Tall Ironweed (*Vernonia angustifolia*). (App. B, Image 3.)
    - Over the course of the project, the Longleaf Alliance worked to supply seed and/or plant material to southeastern growers. These growers include Roundstone Native Seed, Ernst Conservation Seed, International Forest Company, Crossroads Ecological Services, and Rock Springs Farm.
    - In conjunction with the Jones Ecological Research Center, the Longleaf Alliance initiated a common garden study to test seed transfer zones for understory plant species.

Outreach and Knowledge Transfer

- Resource listings
    - A Seed and Plant Supplier listing was created and is being maintained on the Longleaf Alliance website.
    - A Restoration Contractor listing was created and is being maintained on the Longleaf Alliance website.
    - A Literature database containing understory related journal articles was created on the Southern Native Plant Restoration and Seed Increase Project website.
    - A Restoration Project database listing and describing understory related restoration projects was created on the Southern Native Plant Restoration and Seed Increase Project website

- Protocols/Publications/Guides
    - "Keys to Successfully Establishing Longleaf Understory" trifold brochure was developed and is currently at the printer. Printed copies of the brochure will be made available to NRCS for distribution. (Image of front & back panels in Appendix 2, Image 4)
    - NRCS Plant Guides were developed for 4 longleaf understory species: Slender Indiangrass (*Sorghastrum elliottii*), Tall Ironweed (*Vernonia angustifolia*), Hairy Lespedeza (*Lespedeza hirta*), and Anise-scented Goldenrod (*Solidago odora*). These guides are currently under review by NRCS.
- Presentations/Outreach
    - 9 Non-LLA presentations were given across the southeast to a variety of audiences.
    - 16 understory presentations were given at Longleaf Alliance landowner workshops or Longleaf Academies
    - Developed, organized, and led 5 Longleaf Academy: Understory 201 courses for a total of 91 attendees at 3 different locations (2 GA, and 3 AL)
    - 3 University guest lectures: UF-Milton, UGA Ecology Conservation Series, and UGA "Conserving Native Plants" course
    - Presented 1 understory related webinar: Basics of Longleaf Understory Establishment and Enhancement
    - Organized and moderated the Understory Restoration session at the 9th Regional LLA Conference in Nacogdoches, TX
    - Presented at 4 NRCS workshops (2 FL Landowner LL workshops – Marianna & Ebro; 2 NRCS Pollinator Workshops in AL – Cullman & Troy)
    - Organized and presented at the Alabama NRCS Understory training workshop.
- Demonstration plantings
    - Johnson-Gjerstad State Forest
        - 6 species of grasses and 7 species of forbs were planted by seed in a demonstration area in April 2012 at Johnson-Gjerstad State Forest in Baldwin County, AL.
    - Urban demonstration planting along the Beltline Trail in Atlanta, GA
        - Longleaf pines were planted in December 2012 and understory grass species were planted in May 2013. (Appendix 2, Image 5)

<u>Project Impact and Future Plans</u>

The mission of The Longleaf Alliance is to ensure a sustainable future for the longleaf pine ecosystem through partnerships, landowner assistance and science-based education and outreach. Since the inception of the Alliance in 1995, knowledge of and interest in restoring and maintaining the longleaf ecosystem has increased dramatically. The longleaf ecosystem is more than just pine trees. It's all of the organisms that inhabit this system that once dominated the landscape here in the southeast. The understory is key to restoring the function to the system. A longleaf pine forest with high quality

understory has the potential to benefit dozens of species of greatest conservation need. Restoration of fire/and or native plants is cited as a key component of the strategy for conserving longleaf pine uplands in the State Wildlife Action Plans of all nine states within the longleaf pine range. Many key wildlife species, such as gopher tortoises, red cockaded woodpeckers, Bachman's sparrow, and bobwhite quail, require early successional longleaf habitat that is maintained by frequent fires. Herbaceous ground cover species, especially perennial bunch grasses, are necessary to fuel the fires needed to maintain a functioning ecosystem.

This project has been effective at supporting a regional network of partners that are working to restore understory habitat across the range of longleaf pine. This group of partners is advancing technologies associated with production of locally sourced plant and seed material, achieving on the ground restoration results, and reaching out to private landowners and other interested parties to share resources and information on successful restoration approaches.

An important aspect of plant material development is developing guidelines for seed transfer within the southeastern United States. Ongoing work that is being done to examine these proposed zones will result in recommendations that will enable restoration professionals to use ecotypes of native understory species that will be most successful in their geographic areas. The goal is to facilitate increased long-term survival of plantings where longleaf ecosystems are being restored. This increase in survival will allow for quicker reintroduction of prescribed fire and ultimately provide benefit for all organisms that inhabit this community.

This burgeoning component of longleaf restoration continues to grow with increased interest from private landowners, agencies, and other organizations. As a result of the funding provided by this Conservation Innovation Grant, longleaf understory restoration activities and markets for native seed and plant production are thriving because of the increase in coordinated partnerships, support of plant material development, technical assistance provided, and promotion of local ecotype plants in restoration across the region.

APPENDIX 1

Table 1. List of species selected for seed collection in Chattahoochee Fall Line Conservation Partnership Area.

Common Name	**Scientific Name**
Gopherweed	*Baptisia lanceolata*
Hairy Lespedeza	*Lespedeza hirta*
Little Bluestem	*Schizachyrium scoparium*
Anise Scented Goldenrod	*Solidago odora*
Yellow Indiangrass	*Sorghastrum nutans*
Lopsided Indiangrass	*Sorghastrum secundum*
Pineywoods Dropseed	*Sporobolus junceus*

Table 2. 2012 K&L production field seed harvest amounts

Common Name	**Scientific Name**	**Pounds of PLS Seed Produced**
Yellow Indiangrass	*Sorghastrum nutans*	7.30 lbs.
Little Bluestem	*Schizachyrium scoparium*	42.0 lbs.
Anise Scented Goldenrod	*Solidago odora*	6.80 lbs.
Hairy Lespedeza	*Lespedeza hirta*	0.30 lb.
Pineywoods Dropseed	*Sporobolus junceus*	3.1 lbs.

Table 3. List of species planted in 30 acre production field at Nokuse Plantation in Florida.

Common Name	**Scientific Name**
Wiregrass	*Aristida stricta*
Splitbeard Bluestem	*Andropogon ternarius*
Shortleaf Blazing Star	*Liatris tenuifolia*
Anise Scented Goldenrod	*Solidago odora*
Lopsided Indiangrass	*Sorghastrum secundum*
Pineywoods Dropseed	*Sporobolus junceus*

APPENDIX 2

Image 1. K&L Forest Nursery production area in Buena Vista, GA

Image 2. 30 acre production field at Nokuse Plantation

Image 3. Hauss Nursery production field in Atmore, AL

Image 4. Front & back panel of trifold “Keys to Successfully Establishing Longleaf Understory” brochure.

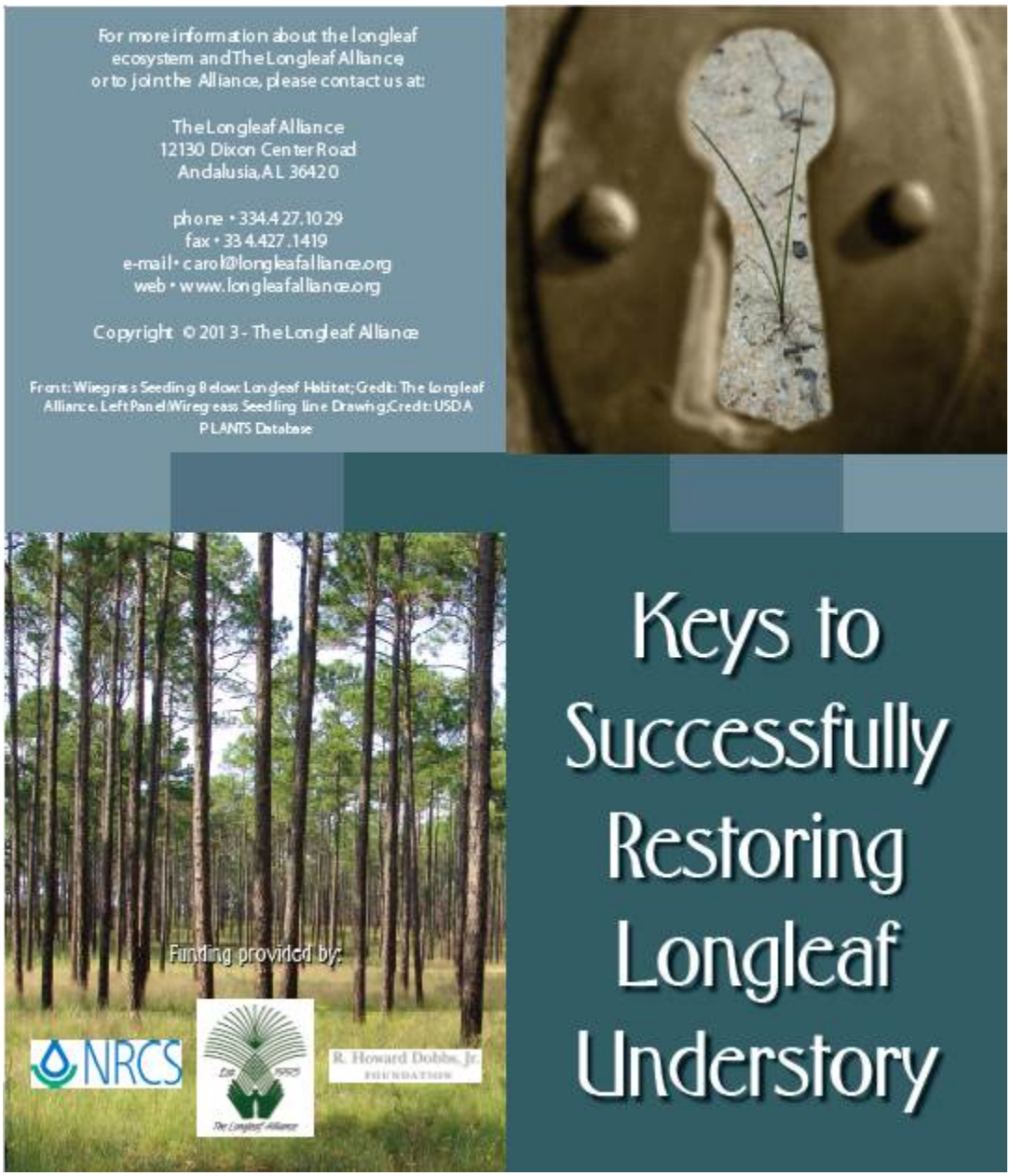

Image 5. Volunteers planting native grasses in the Longleaf Pine habitat demonstration planting on the Beltline Trail in Atlanta, GA.