

## CONSERVATION INNOVATION GRANTS

### Final Report

Grantee Name: National Wild Turkey Federation

Project Title: Natives of the Longleaf Pine Ecosystem

Agreement Number: 69-3A75-10-173

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Deliverables: Inventory the native plants within the longleaf pine understory on both managed and unmanaged longleaf pine stands that have been funded through USDA Farm Bill program efforts.

Develop an easy to use identification guide for the most common native plants within the longleaf pine understory ecosystem.

Create a "State in Transition" diagram (flow chart) for field offices based on levels of management decisions needed for longleaf pine stands to achieve a desired state of establishment.

Develop a curriculum manual that can be used to provide training to NRCS employees on establishment of longleaf pine stands and their management.

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**Executive Summary** - A summary of the activities carried out during the project, difficulties encountered, major findings, and conclusion and recommendations. The executive summary should answer these questions:

- What NRCS designated priorities were met with this grant?
  - Several NRCS priorities were met or addressed in this project. The first priority was to evaluate and to create additional materials for NRCS staff and landowners to enable them to establish and maintain optimum longleaf pine stands for the future. And to engage and increase private landowner interest in the re-establishment of the longleaf pine ecosystem.
- What were the goals of the objectives for this project?
  - The design and implementation of our project was to develop a four tier system for NRCS field offices to make proper recommendations to landowners for longleaf pine ecosystem restoration. Our approach was to look at tracts of land over a six state region to begin to develop a larger ecosystem based approach. The steps would have included:
    - To inventory the native plants within the longleaf pine understory on both managed and unmanaged longleaf pine stands that have been funded through USDA Farm Bill program efforts. This approach will permit us to develop baseline data for existing longleaf stands and to the extent that they are being managed. In return, we will be able to determine if the native plant communities are returning naturally, or do additional management practices need to be a larger part of the overall decision making process.
    - NWTF Regional Biologists and Certified Foresters will develop an easy to use identification guide for the most common native plants within the longleaf pine understory ecosystem. Plants in the key will be based on data collected from the inventory sites. The guides will be waterproof, colored and ready for use in the field. The concept of the plant identification guide resulted from comments from NRCS field staff that a tool is needed that will

assist them in identify native plant species within the longleaf pine ecosystem. We will pattern our design to look similar to the Common Roadside Invasive “A roadside field guide to showy herbaceous weeds” developed by the US Department of Transportation, Federal Highway Administration and available through NRCS Landcare office.

- Create a “State in Transition” diagram (flow chart) for field offices based on levels of management decisions needed for longleaf pine stands to achieve a desired state of establishment. This diagram will be a tool that can provide Conservationists the information needed as a field diagram to determine the stage of the planting and the steps the landowner must take in order to achieve their desired state of longleaf pine production. *Example:* A Conservationist meets with a landowner who has a 10 year old longleaf pine stand and is interested in long term timber production with a secondary interest in hunting upland game birds on the property. The “State in Transition” diagram will provide the Conservationist and landowner with the necessary management decision steps needed to achieve the desired results. The NRCS Conservationist could then work with the landowner to plan the proper conservation practices to assist in the implementation of the plan.
  - Develop a curriculum manual that can be used to provide training to NRCS employees on establishment of longleaf pine stands and their management. The manual will be developed in a format that can also be used as a baseline for the National Employee Development Center (NEDC) to incorporate as an official NEDC course. We will partner with the Longleaf Alliance on the development and expansion of existing teaching materials that are currently being utilized for the Longleaf Academies. The training materials can then be incorporated into official trainings sessions or reduced down for field days and workshops.
- What were the accomplishments?
    - There were two major accomplishment of the project. The first accomplishment was the vegetation sampling that was carried out in Alabama, Florida, Georgia and Mississippi. The second was the completion and the updates made to long leaf pine training materials by the Longleaf Alliance.

- Were the goals of the objectives met? If not, what were the barriers to completion?
  - The goals of the above objectives were not met due to variables that were both internal and external of the project. Vegetation sampling was completed in 4 of the 6 six targeted states (Alabama, Florida, Georgia, and Mississippi). Identification guides and state in transition guides were not completed in conjunction with the project. And, the curriculum manual was updated by the Longleaf Alliance in conjunction with the project and has been used in local and regional training through Longleaf Alliance training opportunities for both the public and private industry.
- Was the project completed on time? If not, what were the reasons for extending the timeframe?
  - The project was not completed on time and a no cost extension was granted to the NWTF. Project completion was delayed by NWTF staff transitions and by the quick pace of other longleaf pine management and restoration educational and technical assistance programs. Even with the no cost extension the NWTF was unable to complete the project as outlined.
- Who are the customers that benefit from this grant?
  - Since the projects vegetation guide and state in transition publication was not created as anticipated the customers for this project reverts back to natural resource professionals and away from private landowners. Originally the customers were established as private landowners that were requesting both technical and financial assistance associated with longleaf pine management and restoration across the historical range of longleaf pine.
- Were funds spent as anticipated? If not, describe major changes in the budget.
  - Funds were not spent as anticipated. Funds were spent only for the vegetation sampling and some project management oversight. No funds associated with the plant identification or the state in transition objectives was expended. Matching contributions associated with educational field days and from the Longleaf Alliance exceeded the projected matching ration in the project proposal. Paperwork has been submitted to deobligate the balance of the project. A total of \$36,815.00

of expenses were encumbered throughout the project with \$40,134.84 of match being contributed.

- What methods were employed to demonstrate alternative technology in this project?
  - There were no methods that were employed to demonstrate alternative technology in this project.
- What were the quantifiable physical results from this project?
  - Quantifiable results can be found in the raw data of the vegetation sampling sites found in Alabama, Florida, Georgia and Mississippi
- What were the economic results?
  - There were no documented economic results associated with the project.
- Are there Federal, State and local programs that may be used to implement this project?
  - Federal, state and local programs associated with longleaf pine management could utilize all the vegetation sampling data to broaden and to confirm information associated with plant succession in managed and unmanaged longleaf pine stands. Vegetation sample sites could be used for control sites for new monitoring projects or for further evaluation.
- What are the major recommendations resulting from this project?
  - Recommendations from this project are limited due to the incomplete status of the project. This project has provided some baseline information, but was outpaced by longleaf conservation efforts. Longleaf pine conservation efforts have flourished since this project was developed and executed and led to the complexity of the project execution.

**Introduction:** The Introduction should set the stage for the discussion that follows. The Introduction and some of the following sections will expand on material that was condensed in the Executive Summary. At a minimum, include the following items:

- A brief overview of the project: who, what, where, when and how (key personnel and a description of their qualifications)

- Longleaf pine forests once covered over 90 million acres from West Virginia to Texas. Today less than 3% of this original forest remains. Efforts to restore longleaf forests have gained momentum and significant progress has been made, but still remains a mere shadow of the original ecosystem.

The longleaf literally helped build our fledgling nation. First, the forests were a worldwide source of naval stores gum, pitch and other products necessary to keep wooden boats of the day afloat. Then, when used as a source of lumber it was prized for its straight grain, lack of knots and rot resistance. It was used to build many cities, including Savannah and Williamsburg. More recently, longleaf forests have been cleared for more intensive agriculture and human development.

The longleaf pine ecosystem is one of the most ecologically diverse in the world and is home to some of the most rare and unique plants and animals in North America. Nearly 300 plant species are known to exist in longleaf forests. In some portions of mature healthy longleaf forests, up to 140 different kinds of plants can be found in an area smaller than 1 acre and 40 different species in a single square yard. Longleaf forests have 26 species from the Federal Endangered Species List as part of its ecosystem, including the red-cockaded woodpecker, gopher tortoise and roughleaf loosestrife.

Maintaining and increasing this biodiversity will not be accomplished without hands on efforts. In fact, longleaf ecosystems require considerable effort to restore and are only maintained through the frequent use of prescribed burning. The result is a unique situation where timber production, game management and biodiversity conservation are not only compatible, but mutually beneficial.

In 2008, America's Longleaf Regional Working Group prepared a conservation plan that represented the first ever effort to frame conservation activities across the entire range of longleaf pine ecosystems. The Restoration Conservation Plan was developed with review and input of more than 100 resource professionals and is intended to guide efforts by participating agencies, organizations and individuals in the future. The plan's guiding principles outline key strategies for restoring longleaf pine ecosystems, including the restoration of both the longleaf pine and the system's underlying native

vegetation. NRCS and NWTF were both major contributors towards the development of this plan and our Conservation Innovation Grant is one step towards implementation of the components in the overall ecosystem based approach.

The Project Manager originally was the NWTF Forester, Gary Burger, who had 18 years of experience as a Registered Forester, managing and restoring longleaf pine ecosystems. And was the project manager of the NWTF's longleaf pine restoration grants that helped NWTF and its cooperating partners to restore nearly 11,000 acres of longleaf across the southeastern United States. The success of NWTF's longleaf pine restoration program has led to further funding over the years aimed at restoring another 10,000 acres across the historical range and providing technical assistance to private landowners. The ability to more completely incorporate native understory restoration into these already successful efforts would be a direct result of this proposed project.

At two points during the project we experienced changes in project management, which has ultimately compounded project delivery and execution. During that time of transition project management responsibility transitioned from the aforementioned Gary Burger to Dave Wilson (NWTF Stewardship Coordinator) to Mark Hatfield, Director of Finance Administration.

- Project goals and objectives (including those designated in the NRCS grant request).
  - Our project objectives include four major components that take a multi-state approach to implementing a portion of the America's Longleaf Restoration Conservation Plan. The components are:
    - Select 10 sites in each of the 6 selected states to inventory the plant understory of both managed and unmanaged longleaf pine stands. Sites will be monitored will be different aged stands on private lands that have been participants in USDA Farm Bill programs.
    - Create a field ready, waterproof colored plant identification guide to assist NRCS field staff and landowners to identify desirable native longleaf pine understory plants.

- Formulate a “State in Transition” diagram that can assist landowners and field staff to make wise management decisions throughout the longleaf pine forest development stages.
  - Develop a curriculum manual that can be used to provide training to NRCS employees on establishment of longleaf pine stands and their management. We will partner with the Longleaf Alliance on the development and expansion of existing teaching materials that are currently being utilized for the Longleaf Academies.
- The six states we selected include: North Carolina, Mississippi, Georgia, Alabama, South Carolina and Florida; and all are within the native range of the Longleaf Pine ecosystem. (*See table 1 for inventory estimates*) Each of the six states will have 10 sample locations distributed throughout the state to showcase a broad range of local ecosystems.
- Business or academic relationships that facilitated the project, including leveraging (both direct and in-kind support).
  - No business or academic relationships were facilitated by the project outside of additional conversations with the Longleaf Alliance and existing partners.

**Background:** Describe the factors that lead to the development of this project. Include:

- What is the problem the project was intended to address?
  - It is estimated that 3.1 million acres in longleaf forest types remain of the original 90 million acres. 60% of this remaining land is in private ownership. Longleaf pine ecosystems were once incredibly vast. From the Atlantic coastal plain to Texas, this system encompassed much of the North American landscape. Fragmentation, unsustainable harvest, conversion to other land uses and vegetation types, invasive species and exclusion of natural fire regimes have cumulatively resulted in alarming declines in the extent, condition and future sustainability of this system. The loss of 97% of the longleaf forests is a stunning change in the landscape, even compared to the highly publicized loss of the world’s tropical rain forest.

Today’s remnants of the longleaf pine forests are some of the most biologically diverse ecosystems outside of the tropics. Over 140 species of vascular plants can be found in a 1,000 meter square area, with as many as 40-50 different plant species in one square meter. One hundred and seventy of the 290 known



reptiles and amphibians occurring in the southeast are found in the longleaf ecosystem, with 30 reptiles and amphibians that are indigenous to the longleaf pine system. Coupled with the extensive decline of this forest type, 30 of these species are federally listed as endangered or are candidates for listing.

Mutual interdependencies notwithstanding, the sustainability of all longleaf systems are ultimately dependent on fire. Longleaf pine simply cannot be sustained without periodic fire. And without longleaf pine, there can be no longleaf pine ecosystem. The sustainability of many other plant and animal species associated with systems is dependent on fire too.

The cumulative worth of longleaf ecosystems simply cannot be measured, but certainly has to be exceptional. It includes values associated with buffering against disastrous wildfires and storms; maintaining intact undeveloped landscapes; cleaning and filtering surface and ground water; sequestering carbon, providing food, materials, and livelihoods.

We have to continue to provide resources to NRCS field staff to increase landowner education on the importance of longleaf preservation and how vital longleaf pine establishment and management is for our future.

- A brief account of previous attempts to solve the problem.
  - There have been numerous attempts to increase the availability of educational materials for private landowners throughout the range of longleaf pine since the inception of this project and the pace of those efforts have compounded the delivery, development, and implementation of this project. The development of Longleaf Implementation Teams is one example on how information is being distilled down to local levels to address limiting factors. The continued conversation on the establishment and development of stronger timber markets has been critical to help drive longleaf pine restoration and management. Finally the increase emphasis by NRCS, USFWS, USFS, State Wildlife Agencies, State Forest Agencies and numerous private groups have focused on longleaf pine restoration and management thus setting a precedent for future activities.
- What agriculture or environmental sector could benefit by this project?
  - Both the agriculture and forestry sector could benefit from this project.
- What natural resource issues are addressed?

- Longleaf pine management and restoration are specifically addressed by this project and secondarily native ecosystem restoration efforts would be addressed by either the confirmation or increased knowledge gained through the vegetation sampling.
- The negative effects of the problem on the environment, the community, or the producer's economic welfare.
  - There are no negative effects on the environment, the community or on the producer.

**Review of methods:** Describe the physical and analytic activities of the project. Include:

- Explain what is innovative about the project, in terms of the equipment used, the management process employed, changes in timing, or anything about the project that makes it different from standard practice.
  - Innovation of the project was the proposed development of the new materials, but no materials were developed as a result of the project.
- Compare the innovative portions of the project to existing practices to show differences in labor input, materials input, economic input and return, changes in production, or changes in the fate and transport of pollutants.
  - Not applicable to this project
- If part of the project revolves around marketing an alternative product (example: composted manure), describe how the potential market was analyzed, economic projections, and any actual marketing activity that took place.
  - No marketing efforts or alternative products were developed or implemented throughout the course of the project.
- Describe what the producer had to do differently to accommodate the project, in terms of labor, maintenance, obtaining materials, feeding, milking, pasturage, cropping, or any other operation adjustments.
  - This project did not address producers or their activities
- Include a schedule of events that shows when components were built or installed, the period of time that data was collected, and any adverse events such as storms or equipment failure that affected the project.

- Not applicable to this project
- Include maps, diagrams, and other material that shows the location of the project, location of equipment and facilities, environmentally sensitive areas, etc.
  - No maps are included in this report due to file size
- Summarize what worked, what didn't work, and why. It is important to know if parts failed or processes did not behave as expected, or maintenance was different than expected, in order to assess future projects.
  - Not applicable
- What would be done differently in this project if it were started today?
  - This project would not be applicable in today's environment due to the increase in conversation and activity associated with longleaf pine management and restoration.

***Discussion of quality assurance:*** Describe the steps taken to ensure that data from the project are valid. Include:

- Project site description: characteristics of the site, sample locations, rationale for locations, map.
  - NWTF proposed to inventory longleaf pine 10 sites in each of the 6 selected states (NC, MS, GA, AL, SC, FL) within the native range of longleaf pine. The focus was to accurately inventory the understory plant community of both managed and unmanaged longleaf pine stands to determine if the natural plant communities were returning to a desired state. The inventory would assist in determining if NRCS field staff need to incorporate additional management decisions when working with landowners to establish longleaf on their land. Each of the sites were selected from a list of Farm Bill participants provided by NRCS and FSA field staff. By utilizing the agencies it will ensure program consistency and historical accuracy. No map was included do to file size.
- Sampling design. Include the precision level of measurements, completeness (will data be sufficient), how samples and measurements truly represent what is occurring, and comparability (can the project situation be compared to real-life situations).

- In order to inventory the understory plant communities NWTF selected 10 sites per state for a total of 40 sampling locations throughout Alabama, Florida, Georgia, and Mississippi. Sites inventoried consisted of established longleaf pine stands that were funded through EQIP, WHIP or CRP funding. We obtained a wide range of age distribution within the longleaf ecosystem and selected up to 2 sites per state that were on public land.
- Sampling procedures: Describe collection methods, collection frequency, equipment used, volume or amounts sampled, and how samples are handled, stored, and transported.
  - The inventory process included conducting random systematic point sampling looking at: % vertical structure using a 2.5m density board (Nudds 1977) and herbaceous species composition using modification of the loop procedure 10-pin point frame (Cook and Stubbendieck 1986). Other inventory techniques may also be considered as part of the project.
- Custody procedures: Describe chain-of-custody procedures for samples and data.
  - No custody procedures were necessary.
- Calibration: What, if any, field equipment will require calibration & how will it be done.
  - No calibration of field equipment was necessary.
- Sample analysis, quality control: Cite analytical procedures to be used in the field or laboratory, sub-sampling or sample preparation, units of measure to be used. Describe limits of detection.
  - No sample analysis was completed during this project
- Describe quality control processes.
  - Training was provided to all the National Wild Turkey Federation foresters and biologists that conducted vegetation sampling. The training provided was performed by leading botanists, and field biologists in respective states and included field trips and field identification tours. Current field guides and publications were utilized to confirm identification of both common and uncommon plants.

- Discuss data reduction, analysis, review, and reporting: How raw data is converted and presented, who reviewed it, and how the final presentation was derived.
  - Raw data was left in the raw format and no analysis was performed on the data once it was collected from the field.

**Findings:** Enumerate the physical and economic findings of the project. Show how the findings did or did not support the goals of the project.

- There were no physical or economic findings associated with this project. The project was to complete vegetation sampling and to increase technical assistance materials and information for private landowners.

**Conclusions and recommendations:** Summarize the conclusions to be drawn from the project, recommend how the technology should be studied further, how it should be brought into common usage, or why the technology is deemed not useful. If the technology is recommended for common usage, include an operation and maintenance recommendations. Identify the next steps in bringing this technology to the field.

- This project was not geared to technology or technology advancement for longleaf pine management and restoration. This project was strictly outlined and developed to increase landowner education resources thus no recommendations can be made as it relates to the technology that should be studied or evaluated in the future.

**Appendices:** Place in the appendices any of the following items that the Final Project Report contains:

- Raw data;
  - Was not submitted with this report due to file size
- Laboratory reports;
  - There were no laboratory results
- Description of testing methods;
  - No testing was completed during the project
- Specifications for manufactured equipment or parts;
  - No manufactured equipment or parts were created or utilized during this project

- Process flow charts;
  - No process or flow charts were created from this project
- References;
  - Reference examples were not included due to file size
- Budget information;
  - Budget information has previously been reported in the body of this report
- Survey results;
  - No surveys were completed during this project
- Maps;
  - Maps were not include in this report due to file size
- Worksheets;
  - Worksheets and raw data were not included in this report due to file size
- Public meeting minutes;
  - No public meeting were held in association with this project
- Publication lists; and
  - No publications or other reports were generated from information gathered from this report
- Any other supporting information not essential to the main body of the report.
  - No other supporting information is associated with this project.