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3 **Rangewide Conservation Plan for Longleaf Pine**

4 **Conservation Plan 2.0**

5 *Combined Draft Content for CP 2.0 Writing Team for Review*

6 *5/1/2023*

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America's Longleaf

Based on the accounts of early naturalists like William Bartram and John Muir, longleaf pine forests once dominated the landscape of what is now the Southeastern United States. From the Atlantic coastal plain of southeastern Virginia to the West Gulf Coastal Plain of Texas, these forests encompassed over 90 million acres and represented an extraordinary wealth and diversity of cultural, ecological, and socio-economic values. The tree itself, longleaf pine, literally sustained the growth of America with an abundant source of timber and naval stores. It built homes, bridges, ships, and railroads, and symbolized the bounty of natural resources that made the nation prosperous. Although longleaf pine remains a highly valuable commodity in markets today, the value of these forests runs far deeper than economics and trees. Longleaf pines and the systems they support are woven into the cultural fabric of America. Long before European colonization, generations of Native Americans sustained themselves with the natural and spiritual riches these lands offered. Throughout time, nature lovers, sportsmen, photographers, and outdoor enthusiasts have enjoyed an endless array of recreational and aesthetic pursuits tied to the abundance and splendor of these systems.

The Longleaf Imperative

When America's Longleaf Restoration Initiative (ALRI) was first formed the extent of longleaf pine forests had been greatly reduced with an estimated 3.4 million acres remaining. Through the collaborative restoration and conservation efforts of partners involved in ALRI, that downward trend has been reversed and the current data indicate that acreage of longleaf has increased to 5.2 million acres. This progress is encouraging, but there is still much work to be done to achieve the restoration goals outlined in this Plan.

The major threats facing the future sustainability of longleaf forest systems include land fragmentation, development, conversion to other land uses or vegetative types, invasive species, and exclusion of natural fire regimes. Even though significant resources are being invested to establish new longleaf stands across the region, the loss of mature stands remains a challenge. The changing landscape of the Southeast continues to impact our ability to protect existing longleaf habitats, manage forests with prescribed fire, and establish new longleaf stands.

The cumulative worth of longleaf ecosystems is great, and includes values associated with resilience to wildfires, storms, climate change, insects, and disease; maintaining intact, biodiverse landscapes for at-risk, threatened, and endangered species as well as game species; supporting national defense by providing compatible land uses near military facilities to buffer against potential conflicts with airspace, safety, noise, and smoke during training exercises; providing ecosystem services such as water quality and quantity, clean air and carbon sequestration; and providing food, materials, livelihoods, and recreation.

Well-managed, high-quality longleaf pine forests are some of the most biologically diverse ecosystems outside of the tropics. It is this ecological wealth that is the fundamental basis for all the values we attribute to longleaf pine ecosystems. From flatwoods and pocosins to sandhills and montane communities, longleaf pine systems occur in a variety of uniquely diverse ecological assemblages. Thousands of species of fungi, lichens, grasses, forbs, shrubs, trees, arthropods, amphibians, reptiles, birds, mammals, and more comprise these ecosystems, many of which are endemic to longleaf forests and found nowhere else on Earth. Coupled with the precipitous decline of this forest type, 29 species associated with longleaf are now federally listed as threatened or endangered. Strategic, science-based restoration and management efforts must continue to ensure the protection of this extraordinary biodiversity moving forward.

Conservation of resilient longleaf pine ecosystems can also provide more broad ecosystem benefits that may lessen the negative repercussions of a changing climate in the long term. Longleaf has the advantage over other southern pine species in terms of its resistance to fire, drought, insect damage, and wind. These characteristics bring great value as longer fire seasons, drought occurrence, and severe storm events become more frequent. In the face of these extreme impacts, longleaf should be presented as a better forest option for areas where it is site appropriate.

68 To realize these benefits at scale, sustainable forest management must be promoted on both public and private lands.
69 Public lands play an important role in providing long-term sustainability of ecosystem values, especially as these values
70 relate to rare species management and landscape level conservation. However, a higher percentage of existing longleaf
71 stands, as well as those sites appropriate for longleaf restoration, are privately owned. Engaging both large and small
72 private forest owners in the longleaf effort is essential for making significant progress toward the regional restoration
73 goals. Economics generally plays heavily into a forest owner's land management planning. The advantages of longleaf
74 related to both premium forest products and ecosystem services can provide the opportunity to engage more forest
75 owners that are looking to derive both income and environmental benefits from the land in longleaf restoration.

76 Significant advances have been made since the 1990s in longleaf establishment techniques, application of prescribed
77 fire, groundcover restoration methods, and mapping technologies. These developments have made a positive impact on
78 the overall success of longleaf restoration efforts to date.

79 With an increasing number of stakeholders involved in longleaf forest restoration and growing financial support for
80 longleaf-related projects, the future is bright for longleaf. More strategic allocation of restoration resources and
81 continued collaborative efforts are needed, however, to take advantage of this momentum to ensure the long-term
82 sustainability of this important forest ecosystem.

83 **America's Longleaf Restoration Initiative**

84 Community is a common thread that is woven through the story of longleaf. Whether this refers to plant or animal
85 communities, human communities that benefit from well-managed forests, or the community of partners who are
86 working together under the umbrella of America's Longleaf to bring back longleaf, this sense of community drives our
87 resolve to restore and protect longleaf ecosystems.

88 This resolve has led to the planting of over 1.6 million acres of longleaf pine forest, the prescribed burning of
89 approximately 15.3 million acres, and the long-term protection of over 325,000 acres of longleaf pine habitat since 2010.
90 In total, over 19 million acres have been positively impacted through ALRI, benefitting local economies, national
91 defense, threatened, endangered, and at-risk species, recreational opportunities, forest resiliency, wildfire risk, clean air
92 and water, carbon sequestration, and climate change mitigation. America's Longleaf now serves as a model for other
93 collaborative landscape-level initiatives, but it started out as a wide-ranging group of individuals and agencies with a
94 shared concern for the decline of the longleaf pine ecosystem. Each agency, organization, or individual was working in
95 their own silos and focused on different aspects of longleaf pine management. With the formation of the Longleaf
96 Partnership Council in 2011 and the subsequent development of Local Implementation Teams, America's Longleaf
97 developed a system for merging these separate entities into a collaborative framework that has allowed for more
98 efficient use of resources, skills, and relationships to further longleaf restoration goals. As of 2022, over 100
99 representatives and more than 55 organizations have served on the LPC, bringing diverse perspectives and expertise to
100 the table that make ALRI a true collaborative effort. The forward momentum of extensive partnerships continues with
101 many organizations prioritizing longleaf restoration and healthy fire management strategies to meet ecological, climate,
102 and community health goals. Drawing from lessons learned since the inception of the Initiative, an LPC Writing Team,
103 made up of a diverse group of partners, worked collaboratively to update the Range-wide Conservation Plan for Longleaf
104 Pine. This document serves as a working plan that guides the work of the Partnership by setting goals, objectives, and
105 recommended actions for the next 15-year period and beyond. While we are still focused on many of the actions
106 included in the original plan, some priorities have shifted over the years due to new and changing needs. We have the
107 opportunity with this update to be more strategic with our goals, to utilize innovative tools for measuring success, and
108 incorporate science-based approaches to expanding longleaf restoration across the landscape in the context of climate
109 resilience, all while bringing a wider variety of partners into the effort.

111

112

113 **Vision**

114 The vision of America’s Longleaf is to have functional, viable, longleaf pine ecosystems with the full spectrum of
115 ecological, economic, and social values inspired through a voluntary partnership of concerned, motivated organizations
116 and individuals.

117 Meeting this challenge will require the strategic coordination of science-based conservation actions among many
118 partners and sectors that influence land use, to ensure long-term sustainability and resiliency of these systems and their
119 constituent biodiversity.

120 **Plan Structure**

121 This Conservation Plan 2.0 borrows from the framework of the original Conservation Plan and is organized in the
122 following way:

- 123 • **Goals**—what implementation of the Conservation Plan is designed to achieve
- 124 • **Guiding Principles**—what approach the Initiative and Conservation Plan takes
- 125 • **Implementation**—who brings the Conservation Plan to life
- 126 • **Strategies for Longleaf Conservation**—why and how conservation actions are recommended
- 127 • **Evaluating Conservation Outcomes** – how we will assess progress towards our Goals
- 128 • **Appendices**—additional information TBD

129

Goals

When America's Longleaf Restoration Initiative launched in 2009, there were an estimated 3.4 million acres in longleaf forest types according to estimates from the USDA Forest Service's Forest Inventory and Analysis (FIA) plot data. The original Conservation Plan set a goal of increasing longleaf to 8 million acres. In 2023, we estimate the total acreage of the longleaf pine and longleaf pine/oak forest types to be approximately 5.2 million acres (see appendix X). These gains reflect the work of America's Longleaf and the growing popularity of longleaf pine as a management option for land owners and managers. This second iteration of the conservation plan guides the continued efforts to reach the goal of 8 million acres of longleaf pine.

The original Conservation Plan characterized the condition, and by inference, management needs, of longleaf pine as belonging to one of three categories: maintain, improve, or restore. Considerable effort has gone into refining metrics of community composition and structure since then. Simple definitions of the maintain category were put forth and adopted by the LPC in 2014 (Ware et al.) and a more detailed system that included distinct definitions for different community types was published in 2016 (Nordman et al.). However, it is currently not possible to accurately delineate the acreage of longleaf pine for each of these categories. Development of a more rigorous and thorough inventory and monitoring system is needed to assess and track longleaf pine condition over time.

This work on condition class outlined above allows us to employ a more nuanced and descriptive system for this iteration of the America's Longleaf conservation plan. For consistency, we retain the original classification terminology, but crosswalk it with categories that reflect the refinement of condition class definitions.

Maintain— The goal of America's Longleaf is to have about 3 of the 8-million-acre total in good or excellent condition. The focus of this category is to maintain conditions that reflect both the forest canopy and understory conditions that currently or will provide ecosystem functions, processes, and assemblages of representative plant and animal species. Retention of forests within this condition is a priority.

Improve — The goal of America's Longleaf is to improve XX acres from fair or poor to good or excellent condition. This category will include a range of site conditions, such as degraded or fire-suppressed mature stands, to more recently established plantations, which do not have mature trees.

Restore —This category corresponds to establishment of new longleaf pine acres through either afforestation or reforestation. Almost 3 million new acres need to be established to meet the America's Longleaf goal of 8 million acres, assuming losses are stemmed. Since the original Conservation Plan was drafted, approximately 2 million new acres of longleaf have been established. Expanded efforts are needed to continue adding acreage from other land uses and forest types to meet the 8-million-acre goal.

Despite gains in overall acreage, FIA data suggests that one of the two longleaf types, the longleaf-oak forest type, has lost approximately 150,000 acres since 2010. The origin of these losses is unknown, but warrant further exploration of both causes and solutions that might stem future declines. FIA data also show that private landowners own about 63 percent of the current longleaf acreage, with federal and state agencies owning roughly 37 percent of the current acreage.

The Southeast Longleaf Ecosystem Occurrences (LEO) Geodatabase project began in 2018 and is a stand-level inventory of known longleaf pine acreage. This project is a critical foundation for beginning to understand the status of the resource in greater depth, suggested as a priority in the original conservation plan. This database represents the first systematic survey of extant longleaf pine and includes some level of information about condition for some stands. The original conservation plan identified focal areas of large aggregations of extant longleaf, called Significant Geographic Areas (SGAs). Local Implementation Teams (LITs) organized around these SGAs and defined larger landscape boundaries surrounding them in which to work (see sidebar, pg.x). LEO surveys are complete within SGA/LIT boundaries and

172 continue across the rest of the historic range. Continued refinement and investment in accounting for the amount and
173 condition of longleaf pine, such as the LEO project and its potential to serve as an ongoing monitoring framework, is
174 imperative to help us understand progress toward these goals.

175 It is important to recognize the importance of goals in addition to acreage, such as wildlife habitat, ecosystem services,
176 and climate adaptation. Investments in moving acres from Improve to Maintain are well-suited for public lands, where
177 agencies have identified restoration as a high priority, particularly to support endangered species recovery. Private lands
178 initiatives will also play a key role in achieving our goals through the conversion of other forest types to longleaf and
179 from other land uses such as agriculture.

180 **Guiding Principles**

- 183 a. **Strategic, Science-based Approach**—The success of *ALRI* hinges on a strategic, science-based approach to
184 conservation. The most current scientific information on ecological functions and services, community impacts,
185 and climate will be considered.
- 186 b. **Site-based Conservation Efforts in the Context of Sustainable Landscapes in the face of a Changing Climate**—
187 The range-wide conservation of longleaf pine ecosystems is rooted in community-led, site-specific actions that
188 contribute to resilient communities and are aligned with the Conservation Plan.
- 189 c. **Involvement by Public and Private Sectors**—The conservation of longleaf pine forests demands the combined
190 and coordinated interest and attention of public and private stakeholders and land managers.
- 191 d. **Partnerships and Collaboration**—A successful partnership will require ongoing cooperation, collaboration, and a
192 perspective that is focused on longleaf pine conservation at the range-wide level. The partners will advance an
193 inclusive approach that broadens and strengthens the partnership while also ensuring that equity is part of the
194 activities.
- 195 e. **Use the updated Conservation Plan as a Framework and Catalyst**—The original Conservation Plan was intended
196 to provide a range-wide framework for longleaf pine ecosystem conservation by identifying the most significant
197 actions to conserve these systems, and by serving as a catalyst to further conservation actions in a strategic and
198 outcome-oriented fashion. The updated 15-year Conservation Plan will serve the same role and will be
199 developed collaboratively by partners to continue the momentum and progress beyond 2025.

Conservation Plan Implementation

The goals set forth in this updated Conservation Plan remain ambitious and achieving them will require a continued acceleration of conservation activity by many parties. Implementation is being accomplished at multiple scales through voluntary collaborative efforts of partners represented on the Longleaf Partnership Council, the Federal Coordinating Committee, landowners, other agencies and organizations, private businesses, and research and extension institutions associated with longleaf efforts across the range.

Working at Multiple Scales

While action at the regional or national scale is important, most implementation of this plan will occur through grassroots local and sub-regional actions. It will require active involvement by landowners, resource managers, forestry professionals, scientists, and policymakers. This Plan envisions local teams as the leaders to implement restoration activities, conduct local inventories and assessments, establish locally based priorities, apply regional guidance and scientific developments, and involve other players important for longleaf restoration and management. The governance structure of America's Longleaf has taken on 3 different tiers which create the enabling conditions to carry out the work of the Conservation Plan. While we remain flexible and open to change as appropriate, this model is working and has remained consistent since the inception of the original Conservation Plan.

Federal Coordinating Committee

In June 2010, the Departments of Agriculture, Defense, and Interior formalized their commitment to America's Longleaf and the goal of restoring 8 million acres in a Memorandum of Understanding (MOU). This landmark agreement also established the Federal Coordinating Committee (FCC), a committee to coordinate efforts among federal agencies to restore the longleaf pine ecosystem. These Federal agencies work alongside a variety of stakeholders who are actively engaged in the restoration effort. The FCC meets at least once a year. Each agency has a longleaf restoration focused top-down plan that aligns with the ALRI's Conservation Plan. The commitment and collaboration by these agencies in this formal way provides a clear message of dedication that enables federal resources and policy to be mobilized to help achieve stated objectives of ALRI.

Longleaf Partnership Council

The Longleaf Partnership Council (LPC), established in 2011, is comprised of 33 members representing non-governmental organizations, state and federal agencies, implementation teams and other collaborative efforts, private industry, universities/research/extension, and private landowners. Its purpose is to promote effective communication and collaboration among the large number of partners working to conserve longleaf pine ecosystems across the South. It provides a forum where diverse partners can bring their different objectives, missions, responsibilities, and contributions required to make the conservation implementation efforts successful and demonstrate collective progress.

The LPC is governed by a chair, chair-elect, and past chair, with each serving a one-year term. This 3-part leadership model, along with the consistent federal partners on the leadership team, helps ensure continuity. The LPC typically meets face-to-face biannually to provide a platform for shared learning, planning, collaboration, and recognizing achievements. All are welcome at LPC meetings, but the council members have voting and decision authority. These open meetings allow transparency and engagement by multiple levels of ALRI partners.

Local Implementation Teams

Significant Geographic Areas (SGAs) were created in the original Conservation Plan as a framework for a landscape level approach to the strategic, science-based conservation of longleaf pine ecosystems and their component species. A

243 foundational premise was that, given limited resources, expertise, partners, and policy implementation should be
244 prioritized in areas with aggregations of extant longleaf ecosystems of sufficient size, integrity, protected status, and
245 connectivity potential to sustain functional landscapes and populations of target species into the future.

246
247 Local Implementation Teams (LITs) comprised of public and private landowners and managers interested in restoring
248 and maintaining longleaf forests were assembled within SGAs to accomplish the work on the ground. Each LIT has a
249 coordinator which is an essential ingredient to champion and maintain coordinated momentum. There are currently 18
250 official LITs which have individual conservation plans to prioritize actions on the ground and make best use of available
251 resources. LIT partners use an adaptive management approach to periodically re-evaluate priority areas and update
252 plans based on new opportunities. All LITs have the ability to apply for a dedicated pot of annual funding through the
253 National Fish and Wildlife Foundation (NFWF) Longleaf Landscape Stewardship Fund. This consistent funding is a key
254 driver for continued and long-term success of the partnership.

255 *[Insert Latest LIT map including SGAs and historic range]*

256 Strategic Priorities and Actions Plans

257 In 2013, America’s Longleaf introduced Strategic Priorities and Actions (SPA) documents to be created every 3 years by
258 assessing progress, new research and data, challenges, and opportunities. This review has provided critical evaluation of
259 existing work and allows for adjustment and communication of updated strategies and actions as needed for the
260 partnership at large. For the next 15 years, we envision creating 5-year SPA Plans, with the first 5-year SPA Plan to
261 follow the latest 2022-2024 document. The SPA Plans will be designed to provide a more focused look at short-term
262 activities needed to advance the goals and objectives of the Conservation Plan 2.0. More specifically, the purpose of SPA
263 Plans will be to:

- 264 • Identify strategic priorities and recommend actions needed over the next five years that continue ALRI’s
265 progress toward the restoration goals in the Conservation Plan.
- 266 • Integrate the latest technology, science, and knowledge into our landscape-scale approach.
- 267 • Provide mechanisms and metrics to track, measure, and demonstrate progress toward these goals.
- 268 • Provide outreach information describing ALRI’s accomplishments to LPC members and other interested parties.
- 269 • Affirm and potentially expand the roles and contributions of current LPC members and supporters.
- 270 • Identify opportunities to engage additional partners in the longleaf conservation effort as well as opportunities
271 to align with and leverage complementary conservation efforts beyond ALRI.

272 Funding Structures

273 The success of America’s Longleaf depends on consistent funding to drive the work across all scales. Collaborative
274 funding from current and future partner organizations is vital to invest in priorities to support boots on the ground
275 restoration activities. The National Fish and Wildlife Foundation and the Longleaf Landscape Stewardship Fund since
276 2012 has awarded over 40 organizations more than \$57 Million in funding. We are thankful for the investments from
277 Federal partners, private foundations, and others that have generated over X Million acres of accomplishments since
278 20XX. To achieve our goals, the initiative must grow and diversify our funding sources now and into the future to secure
279 resources for implementation, and address policy, capacity, or other priority actions.

Public Lands Strategy

Issues, Opportunities, and Challenges:

Public lands continue to offer significant opportunities to contribute to landscape-scale conservation for longleaf. Inventories currently show that an estimated 37 percent of the existing acres in longleaf forest types are public lands (USDA Forest Service 2023); expanded restoration opportunities continue to exist on many of these lands but are not always explicitly targeted in management plans. Increased capacity for training and staffing continues to be a priority to enable public land managers to more effectively manage lands suitable for longleaf.

Many publicly owned land tracts are administered by different agencies and are somewhat fragmented, of insufficient size to fully contribute to restoration goals, or inefficient to manage at landscape scales. However, partners have been successful in connecting and building upon “core” public lands through interagency collaboration, the purchase of key additional lands from willing sellers, and establishment of conservation easements through public or private efforts. However, more collaboration and integration between public lands, private lands, and Local Implementation Teams are needed to further these successes in the future.

A multi-agency effort was defined and adopted through the 2009 Range-wide Conservation Plan for Longleaf Pine (Conservation Plan) to implement management actions necessary to achieve and accelerate conservation practices in a targeted, landscape approach. Public lands are identified as “core” areas for Significant Geographic Areas and continue to offer opportunities for making substantial gains in longleaf conservation. These opportunities exist within National Forests, Department of Defense lands, State Forests and Wildlife Management Areas, National Wildlife Refuges, and other public lands.

In 2017, a Public Lands Task Force was assembled to explore the potential for increasing longleaf restoration on public lands. The US Forest Service (USFS) responded by conducting an in-depth analysis to determine its 1) existing acres of longleaf; 2) acres with a minor component of longleaf; and 3) acres with the biological potential for longleaf (where longleaf should be). From this process came the Million Acre Challenge, a commitment by USFS to put one million additional National Forest System acres “on the path” to longleaf restoration based on specified criteria. Other public agencies have been exploring similar processes to look for additional opportunities to restore longleaf. As demonstrated through the Public Lands Task Force, restoration on suitable public lands has accelerated but needs to continue to be prioritized and appropriately funded under site specific management plans. These areas will need to be collaboratively managed to maximize accomplishments and landscape-scale benefits. Public lands have also served as important demonstration areas for longleaf conservation and showcase opportunities for private land managers.

Since the 2009 Conservation Plan, agency programs for fire suppression, prescribed burning, wildlife habitat, imperiled species management (to include at-risk, threatened, and endangered species), timber management, and plant ecology have become more integrated, with inclusive planning and program delivery accounting for the interrelated nature of land management. However, opportunities still exist to better integrate and align programs to achieve common desired conditions, gain efficiencies, and improve program delivery within longleaf forests. Integrated programs are now reflecting a commonly defined set of desired conditions on a landscape or site, and execution of these programs benefits from careful budget development to support the necessary conservation efforts.

Many of the existing longleaf forests with intact groundcover occur on public lands. These areas provide important ecological values and can serve as seed sources for understory plant material and source populations of wildlife species like Red-cockaded Woodpeckers and gopher tortoises. Areas with intact groundcover continue to need inventory and

324 management to maintain their values and serve as sources of plants and animals for restoration.

325
326 Federal and state agencies play an important role in inspiring collaboration among partners and bringing coordinated
327 conservation to the ground. For example, most detailed inventory, implementation, and monitoring will occur at the
328 Significant Geographic Area level through stakeholder groups working collaboratively.

329
330 **Objective A** Land management agencies (local, state, federal) support longleaf conservation on public lands and invest in
331 appropriate management structures to accomplish work consistent with their mission.

332
333 **Key Recommendations**

- 334 1. Integrate public lands programs to prioritize and support longleaf conservation, particularly in fire and smoke
335 management, tree planting, forest management, nursery operations, and invasive species control.
- 336 2. Prioritize land management and conservation actions at a landscape-scale that build resilient corridors, support
337 and recover imperiled species, provide ecosystem services, reduce wildfire risk, enhance recreational
338 opportunities, and increase resilience to climate change.
- 339 3. Continue to assess and quantify acres of longleaf that exist on public lands and seek additional opportunities for
340 restoration where suitable and appropriate.
- 341 4. Consider the use of silvicultural practices to convert existing mixed stands with a minor manageable component
342 of longleaf to longleaf-dominant.
- 343 5. Expand training for resource professionals in management and restoration techniques for longleaf.
- 344 6. Prioritize the identification, inventory, and maintenance of forests with intact groundcover, especially high-
345 quality groundcover sites for seed collection.
- 346 7. Support increased public land and easement acquisitions from willing sellers, especially where such acquisitions
347 would enable management at the landscape level.

348
349 **Objective B** Public land managers and local representatives in Significant Geographic Areas play a leadership role in
350 implementing collaborative planning and management of longleaf at the landscape scale.

351
352 **Key Recommendations**

- 353 1. Continue to support Local Implementation Teams under America's Longleaf as a structure and mechanism to
354 guide restoration through public/private coordination within Significant Geographic Areas.
- 355 2. Work with federal agencies at the regional and/or national level to support increased and improved cooperation
356 and coordination for planning and management. Amend policies or authorities to allow management activities
357 across jurisdictional boundaries by public and private parties.

358
359 **Objective C** Land management agencies (local, state, Federal), longleaf partners, policymakers, and the general public
360 understand the importance and role of public lands to longleaf restoration and the associated cultural, ecological,
361 economic, and social values.

362
363 **Key Recommendations**

- 364 1. Continue implementation of the Communications Plan to maintain and build awareness and institutional and
365 financial support needed to support longleaf restoration and management on public lands.
- 366 2. Maintain and create new communications materials and tools to secure the necessary engagement and support
367 from a range of key external and internal decision-makers and allies.

368
369 USDA Forest Service, Forest Inventory and Analysis Program, Thu, 02 Feb 2023 16:49:15 GMT. Forest Inventory

DRAFT

Private Lands Strategy

Issues, Opportunities, and Challenges:

Issues

Privately owned lands account for approximately 86% of all forested land in the South and represent the greatest opportunity to achieve the plan's acreage goal. Private forest owners can be divided into two groups, small forest owners, sometimes called family forest owners, and large forest owners. Large forest owners range from individuals to institutions, including publicly owned Real Estate Investment Trusts (REITs), Timber Management Investment Organizations (TIMOs), and families. The development of the Private Lands Strategy is focused primarily on small forest owners because they own approximately two-thirds of these forested lands. Small forest owners also generally have more flexibility to make land use changes. This means more opportunities and quicker timelines to restore or improve longleaf pine stands. However, this also means more opportunities to quickly lose longleaf acres. Meanwhile, large private forest owners including REITs and TIMOs offer large landscape-scale opportunities for ecosystem restoration. Southern forests are considered the wood basket of North America, and planted loblolly pine stands contribute significantly to the region's ability to produce raw material for traditional wood products. Yet, advances in longleaf pine genetics, improved growth and yield tables, and an understanding that on some sites longleaf can compete with loblolly, or slash, pine in terms of growth, coupled with varying objectives of ownership and use of innovative conservation strategies, make longleaf a very viable option on an increasing number of privately held acres.

The Private Lands Strategy is a crucial component of the plan because the actions by private forest owners affect most of the other plan strategies. While private lands represent the greatest opportunity, the conservation actions on their lands are inherently voluntary. Because their actions are voluntary, it is incumbent that small private forest owners are aware of the range of benefits that a healthy longleaf pine ecosystem provides beyond merchantable timber, as well as the challenges to restoring and maintaining longleaf. Similarly, before pursuing large private landowner projects it is important to understand the scope and scale of the potential outcomes, as well as the fiduciary constraints and corporate responsibilities.

Since ALRI began reporting annual accomplishments in 2010, private lands have accounted for approximately xx% of the newly established acres. This rate of establishment on private lands will need to increase over the next 15 years to achieve the Plan's acreage goal. An increase in the rate of establishment means that many thousands of previously uninvolved landowners will need to become new participants. A key component of these new participants will need to be historically underserved forest landowners. Engaging new participants often requires multiple points of engagement by longleaf pine practitioners, including meeting with prospective landowners, education about longleaf pine ecosystems, technical assistance with developing a forest management plan, and financial assistance to implement the restoration work. Unfortunately, healthy longleaf pine ecosystems don't start right after the seedlings are planted. They also require periodic maintenance to fully achieve their potential. It is the broad range of potential ecosystem services with longleaf which makes it a prime candidate for restoration. Whether it is for high-quality timber, native wildlife habitat, recreational opportunities, protecting water supply, natural beauty, or something else the landowner values, presenting all the benefits and drawbacks to planting longleaf need to be shared during the outreach, education, and technical assistance engagement points.

Investments in longleaf pine are shared by both the family forest owners and the agencies, or organizations, that may be assisting them. Because this investment has both upfront costs and long-term maintenance costs, selecting where to invest is critical to the success of the Plan. The most successful efforts occur when the landowner has favorable site conditions and is committed to managing their longleaf pine trees and herbaceous understory as a longleaf pine ecosystem. For the agencies and organizations which provide technical and financial assistance, they need to prioritize where they invest their limited funding and incentivize specific management actions that will deliver the greatest

415 conservation benefits. A complementary approach for long-term maintenance is to invest in the community-led
416 organizations that promote self-sustaining healthy longleaf pine ecosystems without future financial support. For
417 example, learn-and-burn workshops bring together experts in the field of prescribed burning and community members
418 to teach them how to safely return fire to their property. The geographic priorities for longleaf pine across the range are
419 focused on the areas adjacent to existing high-quality stands (e.g., state and national forests, military installations) and
420 the ecological corridors connecting these stands.

421 Opportunities

422 Since the original plan was developed in 2009, ALRI has grown substantially and with it so have the opportunities
423 provided by the partners to support small private forest owners. Support by partners comes in three general forms:
424 education about longleaf pine ecosystems, technical assistance in planning and managing longleaf pine, and financial
425 assistance to help cover some of the cost to implement conservation practices. One of the strengths of the partnership
426 is that support to small private forest owners can come from a variety of sources including federal agencies, state
427 agencies, non-governmental organizations, granting programs, and dedicated individuals who care about longleaf pine
428 ecosystems. Matching an individual or family with the right type of support for them takes a concerted effort by all the
429 longleaf practitioners. Large forest landowners are generally not eligible for the same technical and financial assistance
430 as small forest owners. However, the opportunity for large forest landowners to deliver conservation benefits across a
431 large landscape with a single agreement highlights the need to explore innovative collaborative approaches.

432 One of the main sources of support for small private forest owners comes from USDA and the programs under Farm Bill
433 authorities. Since 2009, the scope of these programs and the agencies providing support has grown. The Natural
434 Resources Conservation Service (NRCS) coordinates voluntary programs for technical and financial assistance to restore
435 and maintain longleaf pine through the Longleaf Pine Initiative (LLPI) and Working Lands for Wildlife (WLFW) -- including
436 gopher tortoise, Louisiana pine snake, and northern bobwhite quail – under the Environmental Quality Incentives
437 Program (EQIP) and Conservation Stewardship Program (CSP). Additionally, NRCS funds landscape-scale projects that
438 may benefit longleaf pine on private lands through the Regional Conservation Partnership Program (RCPP) and Joint
439 Chiefs’ Landscape Restoration Partnership with the U.S. Forest Service (USFS). NRCS also provides an option for
440 conservation easements through the Healthy Forest Reserve Program (HRFP) and Agricultural Conservation Easement
441 Program (ACEP). The Farm Services Agency (FSA) supports longleaf pine on private lands through their Conservation
442 Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP). USFS supports longleaf pine on private
443 lands through their State, Tribal, and Private Forestry (STPF) Program.

444 Outside of the Farm Bill program, Department of Defense (DOD) supports longleaf pine projects on private lands
445 through their Sentinel Landscape and Readiness and Environmental Protection Integration (REPI) programs. These
446 programs help private landowners maintain natural areas around military installations. U.S. Fish and Wildlife Service
447 (USFWS) supports private landowners through their Partners for Fish and Wildlife Program. The National Fish and
448 Wildlife Foundation (NFWF) supports many different types of longleaf pine projects across the range by leveraging
449 federal and non-federal funding through a granting program called the Longleaf Landscape Stewardship Fund. Both
450 USFWS and NFWF also dedicate some funding to specifically improve habitat for federally listed threatened and
451 endangered species to support their recovery (e.g., red-cockaded woodpecker). And there are countless other technical
452 and financial assistance programs from states, municipalities, non-governmental organizations, and individuals.

453 Challenges

454 While tremendous accomplishments have been made on private lands since 2009, there still exist many challenges to
455 reaching the Plan goals. Land ownership dynamics are often overlooked in relation to implementing conservation
456 programs but are critical to getting work done. As land is bought and sold, or passed down from generation to
457 generation, the maintenance of, or connection to, the land may erode. In the case of heirs’ property, the situation could

458 be so complicated that the eligibility for federal assistance may be confusing, or the decision-making process too
459 contentious for long-term planning. When land parcels with prime restoration potential are owned by absentee
460 landowners it is difficult to even conduct outreach. Similarly, absentee landowners may not implement the necessary
461 maintenance practices after restoration and the condition of the longleaf deteriorates.

462 As discussed previously, the costs to restore and maintain longleaf pine ecosystems have been rising. In the more
463 remote places across the range contractors may not be willing to take on the work if the parcel is too small to be
464 economical. In other places contractors may not be available to carry out the necessary work or there may be a lack of
465 forestry professionals to even develop a sound forest management plan. Even when a landowner has a forest
466 management plan and the resources to carry out the work, there may be a lack of available seedlings for planting. Or
467 when the time comes, there may not be the specialty market for them to sell their high-quality timber. Additional
468 investments by agencies and organizations to overcome these challenges could include increased incentives to support
469 conservation practices, training new forestry professionals, or developing novel approaches to community-led
470 collaboratives.

471 The changing climate poses another challenge to all forest managers. Whether it is more catastrophic high wind events,
472 too much or too little precipitation, intense heat, swarms of insects, or new plant diseases, each challenge needs to be
473 faced. Longleaf pine is more resilient than other southern pine species to many of these threats, but restoration and
474 maintenance activities should be prioritized in strategic locations that deliver the greatest benefits. Furthermore, the
475 seedlings used for planting need to be selected to deliver the highest quality timber, wildlife habitat, and resilience to
476 the changing climate.

477 **Objective A** Financial assistance to small private forest owners is prioritized in strategic locations and incentivize the
478 long-term maintenance and improvement of healthy longleaf pine ecosystems.

479 **Key Recommendations**

- 480 1. Prioritize financial assistance to private forest owners in locations that have existing site conditions most
481 suitable for restoration, can support desirable plant or wildlife species, will be managed in the long-term as high-
482 functioning longleaf pine ecosystems, or connect two or more established high-functioning longleaf pine stands.
- 483 2. Incentivize management practices, such as prescribed burning, to support the long-term maintenance of healthy
484 longleaf stands to private forest owners.
- 485 3. Provide incentives to private forest owners to keep healthy mature longleaf stands on their property rather than
486 clearcut.
- 487 4. Offer flexibility in financial assistance programs (e.g., planting densities, supplemental understory plantings)
488 when the individual objectives would contribute to the long-term goals.
- 489 5. Encourage coordination between financial assistance and other incentive programs to offer alternatives to
490 private forest owners seeking to restore longleaf pine (e.g., Farm Bill programs vs. private carbon markets).
491 [Action Integration – economics and markets]

492 **Objective B** Expand outreach and education to small private forest owners and forestry service providers on the
493 importance of longleaf pine ecosystems in the region.

494 **Key Recommendations**

- 495 1. Encourage engagement between locally led organizations (e.g., local implementation teams (LITs)) and private
496 forest owners. [Action Integration – plan implementation]
- 497 2. Share information with landowners on the range of benefits and tradeoffs of restoring longleaf pine. [Action
498 Integration – climate resilience]

3. Promote private forest owner participation in management activities and peer-to-peer knowledge sharing (e.g., learn-and-burn workshops, prescribed burn associations).
4. Strategically focus outreach efforts on geographic places (e.g., regional corridors) identified as key to supporting the Conservation Plan goals. [Action Integration – longleaf restoration]
5. Continue to improve upon an inclusive approach to provide equitable delivery of outreach and education to historically underserved family forest owners.
6. Support and share research and development to provide landowners the best available scientific information pertinent to family forest owners (e.g., growth and yield studies, tree improvement).
7. Gather and share information with private forest owners about the other ecosystem services provided by healthy longleaf pine stands (e.g., biodiversity, water use efficiency, pollinators, amphibian habitat).

Objective C Expand the scope and scale of technical assistance to small private forest owners interested in longleaf pine conservation.

Key Recommendations

1. Encourage the development of forest management plans that consider the range of landowner objectives and contribute to the Conservation Plan goals.
2. Engage with forestry professionals (e.g., certified, registered, licensed, and consulting foresters) about the benefits and tradeoffs of longleaf pine when writing forest management plans.
3. Emphasize long-term maintenance of longleaf pine ecosystems with prescribed burning in forest management plans. [Action Integration – fire management]
4. Develop and share technical guidance on management alternatives (e.g., mechanical vs chemical) with associated cost estimates for forest owners planning to restore, improve, and maintain longleaf pine stands.
5. Promote long-term estate planning for family forest owners that support the Conservation Plan goals (e.g., carbon sequestration).

Objective D Coordinate longleaf pine restoration goals with other federal, state, and local government strategic planning processes.

Key Recommendations

1. Encourage stakeholders to participate on their NRCS State Technical Committee, related subcommittees, or local work groups.
2. Coordinate interagency development and messaging about policy, recommendations, and cost structures.
3. Assess, update, and promote the role of longleaf pine ecosystems in the respective state planning documents (e.g., Forest Plan, Wildlife Plan, climate plan, and water resources plan).
4. Coordinate inter-state planning with regional goals and logistics (e.g., nursery capacity to produce seedlings).
5. Facilitate cross-boundary demonstration site visits on public lands (e.g., national forests) to show landowners what can and is being done to restore healthy longleaf pine ecosystems. [Action Integration]
6. Provide on-boarding learning opportunities for new staff at partner agencies to facilitate knowledge sharing about this plan.

Objective E The use of conservation easements are maximized to preserve longleaf pine investments for long-term protections.

Key Recommendations

1. Provide information to private landowners on the options available for conservation easements (e.g., maintain an up-to-date listing of options based on geographic location).

- 540 2. Engage with large private forest owners to develop innovative conservation easements to support working lands
541 and advance plan goals.
- 542 3. Encourage land trusts, government agencies, and other easement entities to consider prioritizing restored
543 longleaf pine ecosystems.
- 544 4. Provide outreach to specific small private forest owners with high functioning longleaf pine stands about the
545 availability and benefits of a conservation easement.
- 546 5. Enhance funding opportunities within the Farm Bill or other legislative programs nationally or locally within
547 states that provide funding for conservation easement programs.

548 **Objective F** Develop new approaches to encourage participation by large private forest landowners in helping to achieve
549 plan goals.

550 **Key Recommendations**

- 551 1. Actively coordinate plan recommendations and actions with large private landowners.
- 552 2. Coordinate restoration efforts on large and small private lands to address geographic priorities (e.g., corridors,
553 high value locations) and better support local wood product markets.
- 554
- 555

Economic and Market-Based Financial Strategy

Issues, Opportunities, and Challenges

Longleaf pine forests provide landowners and managers with a variety of economic opportunities, and among all southern yellow pines, longleaf forests best combine economic and environmental benefits. Because many of the environmental benefits, such as wildlife habitat, water quality and quantity, and carbon sequestration, accrue with time, longer rotation lengths can be made more feasible with the production of premium economic products. When managed properly, longleaf pine excels in the production of premium products compared to competing southern yellow pines, and the strength and yield of timber products also improve significantly beyond age 40. Longleaf can and does end up in every commodity market locally available to other southern pines including pulpwood, chip-n-saw, or conventional sawtimber.

Early in stand management, premium products may include longleaf pine straw, which can be managed ecologically to preserve desirable understory or intensively to maximize income. Longleaf pine straw can command a premium price because of its durability and ability to retain a desirable color longer. For wood products, the greater strength, heavier weight, and higher durability of longleaf make it preferred for premium load-bearing products such as poles, pilings, flooring, and MSR lumber.

Better markets are needed in many parts of the longleaf range for older wood. Because of an increasing surplus of timber and insufficient market demand, lumber prices have become decoupled from stumpage prices paid to landowners. A highly experienced and connected professional forester can sometimes negotiate a better price for premium wood where markets exist for premium products. There is also a need for improved marketing to buyers and end users to articulate the benefits of older stands, simultaneously providing both economic and environmental benefits.

The wood pellet industry continues to expand in the southern U.S. Pellet or biomass production creates a new opportunity for longleaf stand management, enabling the removal of low-grade hardwood and offsite pine competing with longleaf. Having a market for thinning material changes a cost into an opportunity and is a potentially significant development for landowners and longleaf restoration.

The most significant development in the wood industry is the rapid expansion of mass timber (GluLam, cross laminated timber, etc.) use in the South as a replacement for steel and concrete construction. This is driven by the massive advantage of long-term sequestration of renewable carbon in long-lasting wood construction. While the bulk of the lumber used will be loblolly, rising pine lumber consumption benefits the whole industry including forest landowners. Targeted outreach to builders and architects could potentially lead to an increase not only in mass timber products but also in longleaf pine products for their beautiful aesthetic qualities. Today, longleaf lumber often goes offshore for cabinetry, as do other premium-grade logs.

Payments to landowners for ecosystem services are emerging through a variety of public and private market financing mechanisms and private and corporate investments. Optimizing longleaf forest management to fulfill several co-benefits is ideal, and will realize the greatest benefits to society in lieu of maximizing one benefit over others. Biodiversity credits are largely conceptual but growing. Other ecosystem service markets have increased significantly over the last decade. Water markets have developed or are developing in several local watersheds across the southeast. Carbon offset programs have experienced the largest growth with several programs and term lengths available to landowners. A trend to watch is the increasing choice to own forests for their carbon value, as opposed to renting carbon through temporary agreements with forest landowners. Many corporations have developed sustainability goals, referred to as environmental, social, and governance (ESG) goals, and longleaf forests can help meet many of those objectives.

599 Local communities can benefit from their close association with longleaf forests through enhanced real estate and
600 recreational values, and lower wildfire, windstorm, insect, and disease risks. Niche markets offer other opportunities for
601 specialty products like honey, wildcrafting, and ecotourism opportunities. Silvopasture systems are being tested and
602 research is ongoing to inform and promote combined longleaf and forage production. Training of consulting and service
603 foresters in these specialty markets continues to be expanded.
604

605 Land ownership and landowner demographics continue to change, as do their objectives in owning land, increasingly
606 towards recreation and wildlife, or as a retreat. There continues to be a need to understand current and emerging
607 landowner objectives and goals, and to engage with their needs for economic return, particularly of those with large
608 ownerships in Significant Geographic Areas. Landowners continue to face economic barriers in longleaf as with other
609 forest management. The lack of strong market competition in many locations means landowners must work with the
610 market they can reach. These valuable stands generally require greater investment to establish, higher management
611 costs, particularly with fire, and longer investment horizons to recover these costs. Carrying these costs must be offset
612 by early or periodic income and stacking multiple income streams through time. Specialty and emerging markets,
613 coupled with public and/or private payments to enhance public benefits, can offer economic returns to overcome
614 management costs.
615

616 *Climate change and its associated impacts are addressed in the Climate Resiliency Strategy section of this Conservation Plan.*
617

618 **Objective A** An understanding of economic opportunities and markets and forest landowners' current needs and
619 interests are promoted.
620

621 **Key Recommendations**

- 622 1. Provide relevant and current information on market opportunities and economic incentives through outreach to
623 communities of interest, foresters, consulting foresters, resource service providers, land managers, and
624 landowners.
- 625 2. Continue studies and research to understand financial-based markets and the economic interests of landowners
626 and communities that are key to sustaining longleaf restoration.
- 627 3. Develop risk avoidance analysis for longleaf resiliency (wildfire, insects and diseases, windstorms) and alternate
628 silvicultural treatments.
629

630 **Objective B** Economic opportunities for all landowners, communities, and society to longleaf forest products and new
631 markets are developed or enhanced.
632

633 **Key Recommendations**

- 634 1. Assist in the development of new ecosystem service markets and markets to produce premium longleaf products.
- 635 2. Promote the development, acceptance, and use of ecosystem market payments or conservation banking
636 instruments for longleaf forests and their associated values.
- 637 3. Promote the development, acceptance, and application of new economic models that incentivize longleaf
638 restoration at landscape scales and models that can capture public-private ventures, cross multiple ownerships,
639 and provide longer-term stability to restoration.
- 640 4. Assess developing and emerging industries, their impacts on longleaf restoration, and opportunities to make
641 them more compatible with longleaf restoration.
- 642 5. Remove barriers to market access for all landowners. Provide increased assistance and resources to underserved
643 and minority landowners to better access economic markets.

644
645
646

6. Maintain or expand incentive programs for landowners to support the implementation or initiation of longleaf restoration on their land.

DRAFT

Prescribed Fire Management Strategy

Issues, Opportunities, and Challenges:

Fire is one of the most essential ecological processes of longleaf ecosystems. Its many benefits include scarifying and enriching soils, promoting seed germination, reducing vegetative competition, controlling insects and disease, diversifying forest structure, enhancing wildlife habitat, moderating fuel loads, and diminishing the potential for catastrophic events. Nature and humans have a long history of shaping the longleaf ecosystem and its ecological processes through fire. Longleaf pine was historically maintained by frequent fire (every 1-5 years on average) from both natural and Native American ignitions and burned at large scales across an unfragmented landscape. But today, the Southeast is fragmented, and various land use changes have altered natural fire patterns. Due to these changes, prescribed fire is an even more important tool for managing the forest. Applying appropriate fire regimes in longleaf forests at site and landscape scales is essential in achieving the goals of this Conservation Plan. In addition, broader application of prescribed fire can lessen wildfire threats, and thus reduce the burden on states and localities to provide wildfire protection to private landowners.

We continue to build upon our understanding of the role of fire in our communities and on our landscapes. The effort to restore healthy forests through prescribed fire will require a combination of science and traditional fire knowledge (i.e., fire-related knowledge, beliefs, and practices that have been developed and applied on specific landscapes for specific purposes by long time inhabitants). While the science of prescribed fire is well understood, applying traditional fire knowledge on a landscape that is largely owned by diverse private landowners will require a long-term approach.

Restoring natural fire regimes at scale involves many challenges. Some are regulatory in nature such as the need to address air quality. Other challenges, including the lack of capacity to conduct burns, applying fire in the growing season, or burning in an increasingly urban and fragmented landscape where landowner objectives vary, are more practical in nature. Increasing temperatures and changes in the climate are narrowing the opportunities to conduct burns. Even more fundamentally, a lack of public understanding of the positive role of fire is widespread. Neither the essential, ecological role of fire nor the tradeoffs between prescribed fire smoke and wildfires are universally recognized. In order to meet the goals of this Conservation Plan, each of these challenges must be addressed and solutions found to allow the expanded use of prescribed fire.

States are required by the federal Clean Air Act to prepare air quality plans called State Implementation Plans (SIPs). The SIP includes the regulations and actions that the State decides are necessary to protect air quality. Under federal and state standards, states evaluate and establish limits on air emissions from many sources including power plants, industrial sources and automobiles. There are currently no federal regulations that directly limit the use of prescribed fire. However, smoke from wildland and prescribed fire contains significant levels of particulate matter and other pollutants which may impact air quality. Therefore, states may evaluate the air quality impacts of current and projected future prescribed burning activities and will decide if limitations are needed.

In some areas and situations, smoke management issues may restrict prescribed burning. To minimize the air quality and human health impacts of prescribed fire smoke, it is important that air quality agencies, fire managers, and land managers communicate and collaborate regarding burn management practices, expectations, and processes for gathering and sharing information. The U.S. Environmental Protection Agency's (EPA) 2016 Exceptional Events Rule encourages prescribed burn practitioners to use basic smoke management practices (BSMPs) or to follow state-specific Smoke Management Programs (SMPs). The goals of BSMPs and SMPs are to allow fire to function in its natural role in maintaining healthy wildland ecosystems, while also protecting public health and welfare by mitigating the impacts of air pollutant emissions on air quality and visibility.

688 Estimates of the condition of existing longleaf communities with desired, fire-maintained, ecological conditions, in
689 addition to a current inventory of the existing longleaf acreage, are needed to plan, implement, and monitor goals for
690 fire under this Conservation Plan. These types of inventories are also essential for addressing the potential air quality
691 impacts discussed above.

692 Restoring fire use is inexpensive as compared to other treatment methods, however, costs can still be prohibitive for
693 some. Financial incentives for landowners are lacking in most federal and state programs to help offset repeated
694 prescribed fire treatment costs. For most private landowners, the repeated costs of applying fire at the frequency
695 required to maintain longleaf ecosystem condition are not recovered until a traditional timber harvest is conducted well
696 into the future. While the social and ecological services provided by private landowners who apply fire management are
697 significant, not enough is being done to incentivize these treatments and address the costs borne by these landowners.

698 Liability for escaped fires and smoke is a great concern for many fire practitioners in the longleaf range. Many states
699 have no system to manage liability exposure from an escaped prescribed fire. Specific legislation exists in some states to
700 provide fire management service providers, either public or private, some protection from liability, provided those
701 service providers are trained, certified, and conduct their activities in accordance with acceptable standards. This
702 legislation has not been widely tested in courts.

703 A shortage of prescribed burning practitioners and services exists in the South. The capacity to conduct prescribed
704 burning rests mostly with the federal and state agencies and select NGO's. Although private family forest owners and
705 managers may conduct their own burning, the necessary training and experience can be difficult for them to obtain.
706 Consultants and other service providers are not numerous and/or not trained for application of prescribed fire to
707 achieve restoration/maintenance goals. They too are faced with obtaining liability insurance that is often prohibitively
708 expensive. Opportunities may exist to increase capacity to conduct prescribed burning by expanding ecoregional fire
709 management strike teams and organizing local fire management cooperatives. Community-based cooperatives such as
710 Prescribed Burn Associations can play a vital role in both applying prescribed fire and education to the larger
711 community.

712 Increasing the acreage of longleaf that is maintained by fire is not only a matter of increasing practitioners and
713 resources, but also increasing the ability to burn larger acreage, burn within embedded natural communities (such as
714 isolated wetlands) over time, and take advantage of good fire weather conditions year-round. Strategically developing
715 fire plans over time can include growing season and night-time burning when feasible, and increasing the acreage
716 burned with the same resources by reducing fuel loads, eliminating interior fire breaks, using innovative ignition
717 techniques, and taking advantage of wildfire.

718 While control of wildfire is a major effort of federal, state, and local entities, their strategies often fail
719 explicitly to address the relationship of wildfire control and prescribed burning. Furthermore, prescribed
720 burning services offered by state agencies are often limited by budget constraints. Assessments of capacity
721 and funding for wildfire control offer opportunities to leverage resources and provide for more integrated
722 planning to achieve multiple objectives, and to better integrate wildfire suppression and application of
723 prescribed burning.

724 **Objective A** There is ample private landowner and institutional capacity for prescribed burning, particularly in
725 Significant Geographic Areas, to maintain, improve, or restore longleaf.

726 **Key Recommendations**

- 727 1. Increase training and services to facilitate private landowners' ability to apply prescribed fire treatments.
- 728 2. Leverage wildland fire control resources to expand planning and application of prescribed fire.

- 729 3. Expand the prescribed fire workforce, particularly in wildland-urban interface areas that need additional technical
730 assistance and community planning.
731 4. Provide landowners with access to a list of available contractors who are certified burn managers within their
732 state.

734 **Objective B** Social awareness and economic incentives are increased for prescribed fire, particularly in Significant
735 Geographic Areas.

736 **Key Recommendations**

- 737 1. Increase economic incentives for private landowners to conduct burning at the appropriate scale and frequency.
738 2. Build strong partnerships to advance prescribed fire implementation at a sustainable fire return
739 interval across the longleaf range.
740 3. Investigate the increased use of smoke models or other tools to expand burn windows, including growing season
741 and night burning considerations, where applicable.
742 4. Advance awareness of frequent fire's benefits and influence in shaping and sustaining native ecosystems
743 through education and outreach. Build upon "messaging campaigns" designed to increase understanding,
744 acceptance, and application of prescribed fire.
745 5. Work cooperatively with the U.S. EPA and state air quality agencies to facilitate using prescribed fire to its fullest
746 extent while complying with state air quality laws.
747 6. Encourage the use of basic smoke management practices by prescribed burners.
748 7. Identify appropriate changes in federal, state, and local laws and policies (including liability) needed to address
749 constraints or impediments in the application of prescribed fire.
750 8. Ensure coordination and collaboration at the regional, state, and local levels to implement this Prescribed Fire
751 Management Strategy.
752

753 **Objective C** The level, location, and capacity to apply prescribed fire continues to be tracked in longleaf ecosystems.

754 **Key Recommendations**

- 755 1. Use tracking systems and mapping to assist with prioritization of fire implementation needs.
756 2. Encourage and provide support for states to track where and when agencies, organizations, and
757 individuals have burned to collect consistent burn data.
758

759

760

Climate Resilience and Co-benefits Strategy

761 Description

762 In a region shaped by fires, hurricanes, floods, and droughts—longleaf is a species built to thrive in harsh and variable
763 environments. Restoring the ecosystem on the landscape is an ecologically and economically significant strategy for
764 preparing southern forests and the human communities that depend on those forests for a challenging climate future.

765

766 *Resilience*

767 Forest resilience is considered the ability of a forest stand to “bounce back” after being affected by a stressor. Longleaf
768 pine trees are resistant in a healthy forest, and the management practices of prescribed fire help strengthen the
769 resilience of the forest stand. Intensive forestry practices and fire suppression over the past century have enabled
770 loblolly and slash pine to displace longleaf pine and become the preferred and promoted southern pine species of the
771 forest industry. While these species will continue to be the foundation of the forest industry of the southeast, research
772 over the past decade suggests longleaf can outperform loblolly and slash pine in certain environmental stress conditions
773 that may become more frequent over time. The traits of longleaf to those stressors include the following:

774

775 a) Drought Tolerance. Climate models for the Southeast predict higher temperatures and intensification of the water
776 cycle, meaning more periods of intense rain and flooding as well as dry periods with more intense drought. Mature
777 longleaf have greater drought tolerance than other southern yellow pines.

778

779 b) Fire Tolerance. Higher air temperatures combined with more intense drought create conditions favorable for more
780 wildfires. Longleaf pine seedlings and mature trees are significantly more fire tolerant than loblolly and slash pine. Fire
781 tolerance is two-fold. The tree is more tolerant, and the way we apply fire and manage the stand adds to the degree of
782 tolerance and risk reduction.

783

784 c) Wind Resilience. Modeling by NOAA predicts that anthropogenic warming will intensify tropical storms in the Atlantic,
785 with an even larger percentage increase in the destructive potential per storm. Studies have demonstrated longleaf can
786 experience reduced rates of mortality and damage in comparison to slash and loblolly pine as in the examples of
787 Hurricane Katrina and Hurricane Hugo. (Gresham et al. 1991; Johnsen et al. 2009).

788

789 d) Insect and Disease Resistance. When trees become stressed, they are more susceptible to attacks by insects and
790 pathogens. The southern pine beetle (SPB) is the most destructive insect pest of southern pines. Warmer winters have
791 resulted in increased year-to-year survivorship of SPB, and widespread outbreaks have had devastating impacts on
792 forest industry and native pine systems. Research suggests that longleaf pine’s copious resin production enables greater
793 resistance to SPB and other boring beetles than loblolly and slash pine (Frankel et al. 2012).

794

794 *Co-benefits*

795 Lower basal areas that are characteristic of longleaf pine savannas and woodlands have lower evapotranspiration rates
796 than densely stocked pine plantations, resulting in greater water yield (defined as the difference between precipitation
797 and evapotranspiration) (Sun et al. 2015). Modeling studies of a pine-dominated watershed in central Florida suggest
798 management of longleaf pine savanna at a scale of 60,000 acres can yield tens of millions more gallons of water per day
799 than planted pine stands (McLaughlin 2013). For localities where water availability is a concern shifting forest
800 management towards longleaf pine savanna holds potential as a water-conservation strategy.

801

802 As a species, longleaf pine has attributes that make it a good candidate for long-term carbon sequestration projects. It is

803 longer lived than other pines and grows more vigorously later in its lifespan (Kush et al 2004). Longleaf likely sequesters
804 carbon from the atmosphere at the same rate as other pines, however prescribed burning transfers some carbon that
805 would otherwise partially work into soils back to the atmosphere. Longleaf stands managed for lower basal area do
806 result in trade-offs between carbon sequestration and conservation goals (Martin et al 2015; Puhlick et al 2022). The
807 carbon “cost” of longleaf savanna management, at least when compared to unthinned longleaf, is a 20% reduction of
808 carbon stocks over a rotation (Gonzalez-Benecke 2015, Martin et al. 2015). Ultimately, a strength of longleaf is that it is
809 a resilient, low risk carbon store with many co-benefits, even if it does not build or hold carbon stocks at the highest
810 possible rates. Given the greater resilience and co-benefits highlighted here, longleaf pine forests may be regarded as
811 providing a more secure and valuable carbon credit compared to other forest types.
812

813 These traits, combined with longleaf forests’ habitat value, make it a prime solution to mitigate the global climate and
814 biodiversity crisis in southeastern US forests.
815

816 *Carbon markets and biomass are addressed in the Economic and Market-Based Financial Strategy section of this Conservation Plan.*
817

818 **Objective A** The effects of climate change on the longleaf pine ecosystem as well as the role longleaf restoration can play in
819 mitigating climate change or adapting to such change is better understood.
820

821 **Key Recommendations**

- 822 1. Promote more extensive scientific study of the potential effects of climate change on the longleaf ecosystem, including
823 the tree species, plants and animals, and ecosystem function.
- 824 2. Promote further study of the contributions that longleaf restoration and management could play in carbon
825 sequestration and adaptation to climate change. Such study should include development of a standardized carbon
826 accounting system and baseline inventories for longleaf systems to promote marketing and crediting of longleaf
827 sequestration efforts.
- 828 3. Promote further study of the potential climate change impacts from the increased level of prescribed burning
829 done to restore and maintain healthy longleaf ecosystems.
- 830 4. Promote further study to gain a better understanding of the climate change impacts of frequent fire
831 management versus catastrophic wildfires.
- 832 5. Review and understand the most current Climate Forestry reporting from agencies.
833

834 **Objective B** A long-term vision of the beneficial role that longleaf forests play in ecosystem health and adaptation is well
835 understood in the face of a changing climate.
836

837 **Key Recommendations**

- 838 1. Promote the resilience and co-benefits of longleaf pine forests.
- 839 2. Monitor federal legislative proposals to assess opportunities (as well as possible constraints) presented to
840 private landowners and the landscape-level initiative to restore longleaf.
- 841 3. Understand which corporations align with ALRI goals and incorporate as champions/supporters of longleaf
842 restoration and management when appropriate.
- 843 4. Provide consistent messaging and resources regarding the resilience, co-benefits, and adaptation value of
844 longleaf forests.
845

846 *References: (For awareness during review process. Will be largely removed or relocated for final Plan)*

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Longleaf Reforestation Strategy

Issues, Opportunities, and Challenges

Reaching the longleaf acreage goals set forth in this Conservation Plan is contingent on the successful reforestation (or afforestation) on an additional 2.8 M acres of land across the range, restoring or enhancing groundcover along with trees, and managing and conserving existing longleaf forests with an eye on maintaining ecosystem function. This approach employs techniques that maximize survival and growth of the trees, maintain the species rich groundcover layer to support biodiversity and prescribed fire, and ensure that the forests thrive over a long period of time so as to fully realize their ecosystem benefits. The societal benefits of restoring healthy longleaf forests include economic and environmental benefits partially recognized today, and greater resilience for a more challenging world ahead.

Communications, technical assistance, and demonstration of best practices are key tools that can be used to ensure long-term restoration success. Inventories of demonstration and reference sites as well as contact information are needed to assist landowners and technical service providers with learning opportunities. By working with policy makers to expand cost-share programs, making landowners aware of available assistance, and providing training to those that are providing restoration services could make this component of restoration more accessible to those in need.

Range-wide restoration of longleaf pine is a high priority for dozens of federal, state, industry, and non-governmental organization (NGO) partners, but progress is currently limited by every aspect of the reforestation pipeline. These limitations arise from the very starting point, from cone production through collection, and then in seed extraction, processing, and storage, carrying over into nursery capacity and production. In addition, longleaf pine tree improvement is foundational to our ability to produce high quality, well-adapted seedling selections. Quality and quantity limitations directly impact site preparation and planting decisions. Addressing bottlenecks at each step of the supply chain will accelerate the restoration of this imperiled species and the unmatched diversity of its ecosystems.

Restoring longleaf is typically more expensive than other southern pines and that cost difference can be a stumbling block in engaging private landowners. Because of the higher price tag, incentives play heavily into land management decisions for private landowners, and the financial assistance programs that support longleaf restoration and management practices are crucial to continuing success. Policy makers have the opportunity to maintain or expand these programs in tandem with the expansion of tree production capacity. These programs can be improved to be better aligned with tree nursery and silvicultural practice schedules to increase landowner engagement and in turn boost nursery production confidence.

Besides providing essential fuels for prescribed fire management, understory communities in longleaf forests provide a number of ecosystem services impacting biodiversity, water quality, soil health, and carbon storage. Cost of seed, access to appropriate seed and plant material, limited technical capacity for implementing groundcover restoration continue to be restrictions for landowners that are interested in restoring this important component though.

Through either commercial seed producers or through wild seed collections, supplies of ecologically appropriate native seed are increasingly available for most longleaf pine communities across the range. To expand this even further and working within SGAs, Local Implementation Teams have the opportunity to work cooperatively to share collected seed supplies, seed harvesters, and planting equipment.

High quality groundcover sites that are suitable for seed collection are limited and can only supply a small portion of the needed seed for restoration. Borrowing from agricultural practices such as those that are used for production of food

915 crops, partners across the range have cultivated native seed production fields to meet seed collection needs.
916 Strategically converting former agricultural or otherwise disturbed sites to this use could be an effective strategy in
917 ensuring appropriate seed availability within priority landscapes.

918 **Objective A** Increased awareness and involvement among resource managers and landowners in efforts to manage and
919 restore functioning longleaf forest systems.

920 **Key Recommendations**

- 921 1. Provide technical assistance, outreach, and training that emphasize the importance of using an ecosystem
922 approach to longleaf establishment and management. Specifically address best management practices needed
923 for maintaining forest health, retaining quality groundcover, and controlling invasive species.
- 924 2. Provide technical assistance and outreach to landowners and land managers in guiding the maintenance of
925 existing high-quality longleaf forests as to avoid continued loss of habitat.
- 926 3. Establish new and utilize existing demonstration areas that serve as reference sites for longleaf restoration
927 projects.
- 928 4. Promote the use of compatible practices in production of both timber and non-timber forest products (e.g pine
929 straw) that can support ecosystem function while delivering economic benefits to the landowner.
- 930 5. Promote longleaf for reforestation following disaster-related events and work with funding agencies to offer
931 more incentives to offset expensive costs of cleanup.
- 932 6. Utilize communication and outreach tools to market the advantages of the longleaf ecosystem with the goal of
933 attracting more landowners to choose longleaf over less resilient pine species.
- 934 7. Support workforce development for critical restoration contractors (i.e., planting crews, prescribed fire
935 applicators, site prep contractors.)

936 **Objective B** Tree seedling quality and quantity are substantially increased to meet the planting goals of the Conservation
937 Plan while ensuring that financial assistance and incentives for landowners, agency, and private sectors are maintained
938 or increased.

939 **Key Recommendations**

- 940 1. Leverage public/private partnerships to build nursery capacity and confidence.
- 941 2. Maintain or expand financial assistance programs that incentivize private landowners to restore longleaf.
- 942 3. Expand longleaf tree seedling production capacity in the public and private sectors.
- 943 4. Improve the genetic quality of longleaf seed and seedlings produced for restoration through the implementation
944 of a Longleaf Tree Improvement Program.
- 945 5. Increase seed production capacity (e.g., maintain existing and establish future seed orchards, update seed
946 collection equipment, and ensure availability of multiple dedicated contractors for wild collections)
- 947 6. Increase capacity and locations for seed processing & storage.
- 948 7. Increase skilled workforce capacity in public and private sectors for all stages of the reforestation pipeline.
- 949 8. Identify and utilize appropriate private lands for longleaf seed collection.

951 **Objective C** Native groundcover seed and plant material production capacity is expanded and supported to meet
952 increased demand for affordable, diverse, and ecologically appropriate materials for restoration. Information is
953 communicated to landowners, managers, and agencies to promote the importance of groundcover restoration in
954 longleaf management.

955 **Key Recommendations**

- 956 1. Provide communication on the values, benefits, and estimated cost of restoring the native groundcover in
957 longleaf pine forests targeting landowners and policy makers.
- 958 2. Expand financial assistance programs to provide greater support for groundcover restoration on private lands.
- 959 3. Support the further development of a native groundcover seed market by promoting commercial seed
960 producers that are growing plant materials from longleaf ecoregions (ecotype seed.)
- 961 4. Establish Seed Co-ops to identify and share needs, monitor collection areas, share collecting and planting
962 equipment, and manage the distribution of seed collection in priority landscapes.
- 963 5. Establish seed collection fields in areas such as former agricultural lands or powerline rights-of-ways that can
964 improve efficiencies for native species seed collection.
- 965 6. Provide technical assistance and outreach to educate landowners, managers, and contractors on best
966 management practices for groundcover collection and planting.
- 967 7. Coordinate with nurseries to expand capacity for growing groundcover plant materials for restoration.
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Evaluating Conservation Outcomes

A careful evaluation of the Conservation Plan’s progress and outcomes is necessary to determine if the initiative’s conservation actions are being successfully implemented and if ecological goals are being met. This review supports more informed management and decision-making at all levels of America’s Longleaf. It is also vital to telling our story and securing resources for the future. The following sections detail the strategies, objectives, and key recommendations to evaluate progress toward achieving the goals identified in the Conservation Plan. The evaluation strategies include:

Understanding our Baseline

An important challenge for ALRI has been the lack of consistent range-wide data on existing longleaf forests and their condition. The historic range is immense and ongoing forestry practices change forest stand dynamics constantly. Without accurate data, it is difficult to understand baseline conditions and measure success at large scales. However, lack of data shouldn’t paralyze a collaborative but instead, inspire a method to collect it. Forest Inventory Analysis (FIA) data was a key source of information during the inception of ALRI and continues to be a valuable and consistent resource to estimate the extent of longleaf. Fortunately, a focus on developing innovative new tools and data products in recent years has bolstered our ability to understand our baselines and strategic priorities. Through leveraging tools such as the Southeast Longleaf Ecosystem Occurrence Geodatabase (LEO) and Southeast FireMap, America’s Longleaf was able to develop a Longleaf Sustainability Analysis (see Appendix X), which is a longleaf ecosystem-centric spatial analysis designed to facilitate the strategic, transparent, and evidence-based identification of the “right work” in the “right places” across the historic range of longleaf pine. We also recognize future progress and envision technology and new remotely sensed tools will enhance or even replace our efforts to measure extent and condition of this ever-changing longleaf landscape over the next 15 years.

Objective A An updated methodology is investigated and implemented for assessing extent of current longleaf pine ecosystem rangewide.

Key Recommendations

1. Work with FIA to improve estimates of longleaf pine ecosystem acreage.

Objective B Measures are integrated into conservation outcomes for the ALRI condition class metrics (Maintain, Improve, Restore) of longleaf pine at both the stand/site/landscape and programmatic levels through a collaborative approach.

Key Recommendations

1. Establish a methodology to monitor condition class metrics using LEO database.
2. Identify the most important monitoring and research questions for The Longleaf Sustainability Analysis (and potential future iterations) and invest resources to ensure prioritization of the “right work” in the “right places”.
3. Support an increase in adequate funding levels for monitoring by all land managing agencies.

Objective C Conservation outcomes are evaluated for all key recommendations identified in the Conservation Plan, where appropriate.

Key Recommendations

1. Identify measures for all appropriate key recommendations developed in this Conservation Plan and integrate monitoring into Annual Accomplishment Reporting and 5-Year Strategic Priorities and Actions Plans.

Monitoring Acreage Goals

As a next step to Understanding our Baseline, we also need to track progress and change. Based on FIA data, we recognize that losses are occurring across that range, but the root and scale of these losses are not yet known. A better understanding of losses and gains may lead to changes in strategies and key recommendations. Updates and monitoring with tools like FIA, LEO, and remote sensing products could answer our questions and help us track progress towards our Goals.

Objective D Improved methodology for tracking progress towards ALRI extent and condition class Goals.

Key Recommendations

1. Collaborate with FIA as a partner to improve longleaf ecosystem monitoring.
2. Develop a field survey sampling system for LEO to measure change.
3. Invest in new technologies to better understand where change is occurring and why.

Annual Accomplishment Reporting

To measure success, ALRI has developed an annual approach to collecting metric data from LITs, states, and agency staff. This approach has been adapted over the years to improve accuracy and ease of assembly. The primary metrics for ALRI include acres of longleaf established (planted), longleaf gained through silviculture, prescribed burning accomplished, maintenance activities, and longleaf protected via easements or acquisition. Although time consuming and complex, this annual assembly of metrics is incredibly important to help evaluate progress, steer future work, and provide accountability for resources dedicated to ALRI.

Objective E Longleaf accomplishment data are tracked annually across the range.

Key Recommendations

1. Collect Partner Accomplishment Data and produce annual Accomplishment Report.

Nontraditional Metrics

While not measured as a unit of success for ALRI, there are other factors that could be considered as metrics for a successful collaboration such as partner engagement, landowner and community engagement and support, and climate mitigation. These could include different scales of work (local, statewide, regional) and number of engaged partner organizations. As of 2023 over 115 representatives and 60 organizations have served on the Longleaf Partnership Council, bringing diverse perspectives and expertise to the table that make ALRI a true collaborative effort. Another unit of success is the number of partners/organizations with changed behavior through engagement in ALRI. Some examples include: USFS tracking longleaf restoration across forestlands and their commitment to increasing acreage (million-acre challenge), and Resource Management Services taking extra steps to protect and manage longleaf through the Coastal Headwaters Project in partnership with The Conservation Fund.

ALRI partners assemble people metrics, which include, number of landowners with changed behavior (i.e. created forest management plan for longleaf, utilized a cost share program), number of people reached (participated in educational meetings, trainings, or technical assistance), number of people targeted (those landowners who receive mailings or are targeted through social media), and number of jobs created. Potential future metrics could include factors tied to climate mitigation and Longleaf For All such as carbon storage, wildfire reduction, water quantity and/or quality, and underserved landowners supported through technical and financial assistance programs.

Objective F Nontraditional Metrics are integrated into ALRI monitoring and planning efforts.

049 **Key Recommendations**

- 050 1. Evaluate metrics to be tracked through annual accomplishment reporting and SPA Plans and include
051 nontraditional metrics where appropriate and achievable.

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