LONGLEAF PINE RESTORATION: LEVERAGING FEDERAL LEGAL MECHANISMS FOR LANDSCAPE CONSERVATION ACROSS THE SOUTHEAST

*Wesley Peebles**

The story of who I am cannot be severed from the story of the flatwoods.[1]

INTRODUCTION

When most think of the American Southeast, it is unlikely the region's status as a biodiversity hotspot is the first thing that comes to mind. Yet the Southeast's native longleaf pine forests are just that. The longleaf pine, *Pinus palustris*, is a distinctive species, even amongst other native pines. Forming park-like forests, the longleaf historically dominated the landscape in the southern United States, providing a home to a wide array of unique species.[2]

Like much in nature, however, the longleaf forest has faced serious threats to its existence. Longleaf forests established roots and importance in the environment and society after the last ice age by adapting to frequent fire, providing food and homes under Native stewardship, and sustaining a thriving timber and naval stores industry. But the rapid anthropogenic change following European colonization led longleaf stands to decline to just 3% of their historic range by the 1990s.[3]

Longleaf pine's decline, however, has not been a death knell. Since reaching historic lows in land coverage, the concerted efforts of policymakers and communities across the Southeast have reversed the longleaf pine forest's fortunes. Understanding how the Southeast has changed course in management of longleaf pine forests is key to understanding how to further conservation efforts in both this and other important ecosystems. Thanks in part to deliberate use of law and policy to collaborate and expand conservation, longleaf forests have experienced a slowing in reduction of acres, enhancement in functionality, and ultimately an expansion in coverage throughout the Southeast.[4] Regulatory enforcement to protect imperiled species, coordination and management across government agencies, and efforts to expand voluntary conservation measures

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1. JANISSE RAY, ECOLOGY OF A CRACKER CHILDHOOD 4 (1999).

2. KENNETH W. OUTCALT & RAYMOND M. SHEFFIELD, USFS, THE LONGLEAF PINE FOREST: TRENDS AND CURRENT CONDITIONS 1 (1996), https://www.srs.fs.usda.gov/pubs/rb/rb_srs009.pdf.

3. Marianne Lavelle et al., *Longleaf Pine Restoration—A Major Climate Effort in the South—Curbs Its Ambitions to Meet Harsh Realities*, INSIDE CLIMATE NEWS (Dec. 17, 2023), https://insideclimatenews.org/news/17122023/axed-longleaf-pine-restoration-nature-based-solutions-challenges/.

4. *See generally*, AM.'S LONGLEAF RESTORATION INITIATIVE, 2023 RANGE-WIDE ACCOMPLISHMENTS (2023), https://americaslongleaf.org/media/lewpa34w/2023-accomplishment-report.pdf (describing recent efforts of partners to restore longleaf pine forests).

have all provided the tools to ensure that longleaf forests are not relics of the past. Though not all legal avenues are created equally, a survey of the many available can help provide a greater understanding of how a tool might be leveraged.

This article explores relevant background and legal systems largely at the federal level, in an effort to demonstrate trends and resources that states across the longleaf pine's range can utilize. Part I describes the longleaf pine ecosystem, its history, and unique ecological features. Part II then explores why we should engage in conservation as a normative matter, particularly at a landscape level. Part III describes legal mechanisms available for landscape conservation in the Southeast before Part IV turns to how these mechanisms are actually applied to conserve longleaf forests. Finally, this article concludes with some insights and recommendations moving forward.

I. THE LONGLEAF PINE ECOSYSTEM

The longleaf pine ecosystem (LLPE) is the name for a diverse forest system historically stretching across the southeastern United States from Virginia, south to Florida, and west to Texas.[5] The LLPE encompasses not only the many longleaf pine forests that inhabit the region, but also the broader communities of species and their interactions with other organisms and their physical environment. While longleaf pine forests "once dominated the coastal plain blanketing more than 90 million acres" of land, longleaf forests today make up just 5.2 million acres.[6] What the LLPE currently lacks in raw landmass, however, it more than makes up for in biological diversity and richness of culture. The LLPE has proved to be an enduring ecosystem, shaped by nature and people for generations. All the while, the LLPE itself has shaped nature and people in return.

A. Ecosystem and Characteristics

The LLPE is set apart from other natural landscapes due to unique ecological characteristics, notably a broad understory and historically frequent, low-intensity fires. The variety of landscapes occupied by the LLPE, importance of regular fire, and dynamic interactions between species shape the unique ecology of the ecosystem.

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5. *Longleaf Pine*, NAT'L WILDLIFE FED'N, https://www.nwf.org/Educational-Resources/Wildlife-Guide/Plants-and-Fungi/Longleaf-Pine (last visited Apr. 2, 2025).

6. Historical lows were 3.2 million acres around the turn of the century. *Longleaf Pine: A Tree for Our Time*, THE NATURE CONSERVANCY (Feb. 13, 2024), https://www.nature.org/en-us/what-we-do/our-priorities/protect-water-and-land/land-and-water-stories/longleaf-pine-restoration/.

Longleaf pine forests populate diverse physical landscapes, each providing assorted types of forests in the broader LLPE.[7] Various abiotic conditions, particularly soil type and drainage, influence the growth of the longleaf pine as well as understory composition and the broader forest community. While extant stands give a false impression that longleaf pine forests grow primarily in sandhills, "ridges of loose, porous sand," longleaf pine forests occupy many environments, including rolling hills and mountainside slopes.[8] These varying physical environments produce sub-types of forest, each with slightly different natural histories. For example, low-lying and poorly draining flatwoods often produce swampy bogs, providing habitat to rare species of orchids and carnivorous plants.[9] Meanwhile, the loose, sandy soils of the sandhills more typically support various scrub oaks, grasses, and herbaceous plants.[10] These longleaf forest sub-types thus create greater diversity for the ecosystem as a whole by supporting different plant communities and forest types.[11]

Longleaf forests depend on regular, low-intensity fires to clear out the understory and allow the system's unique assemblage of species to thrive.[12] Fire is vital for longleaf pine, both for providing satisfactory habitat

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7. These physical landscapes include "sub-types" such as the low mountain slopes in the Southern Appalachians; previously mentioned sandhills; low, rolling hills; and the flatwoods and savannas of the lowest lying lands nearer the ocean. *Habitats*, THE LONGLEAF ALL., https://longleafalliance.org/what-is-longleaf/the-ecosystem/habitats/ (last visited Apr. 2, 2025). *See also* CHRISTOPHER M. OSWALT ET AL., HISTORY AND CONDITION OF LONGLEAF PINE IN THE SOUTHERN UNITED STATES, USFS 3–4 (2012), https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs166.pdf (discussing general types of longleaf pine vegetation).

8. Today, the LLPE is associated with sandhills—not because it is the most common environment for longleaf pine forests to grow, but because most well-preserved, extant longleaf pine forests now exist on this land. *Habitats*, THE LONGLEAF ALL., https://longleafalliance.org/what-is-longleaf/the-ecosystem/habitats/ (last visited Apr. 2, 2025).

9. *Id.*

10. *Id.*

11. *Id.*

12. Jennifer H. Carey, *Fire Effects Information System: Pinus palustris*, USFS (1992), https://www.fs.usda.gov/database/feis/plants/tree/pinpal/all.html.

Carey summarizes the importance of fire in maintaining a longleaf pine dominated forest:

> With frequent fire, uneven-aged pure stands of longleaf pine form parklike savannahs. Because longleaf pine regenerates in openings created by the death of mature trees, small clusters of trees of the same age are dispersed throughout the stand. In the absence of frequent fire, longleaf pine is replaced by hardwoods and other southern pines. Loblolly pine and shortleaf pine will invade and soon dominate a site of grass-stage longleaf pine. Recruitment of longleaf pine ceases 15 years after fire. Invasion by hardwoods accelerates the decline of mature longleaf pine.

See also Built by Fire, THE LONGLEAF ALL., https://longleafalliance.org/what-is-longleaf/the-ecosystem/built-by-fire/ (last visited Mar. 13, 2024) (explaining the ecology of fires shaping the LLPE).

conditions[13] and as part of the longleaf pine's life cycle.[14] Benefits of fire also accrue to many charismatic species in the LLPE who would otherwise not have access to food and shelter provided by the open mid- and understories created by fire.[15]

The presence of and dynamic interactions between the many species that inhabit longleaf forests set the broader LLPE apart from other landscapes. Longleaf forests are "some of the world's most biologically diverse ecosystems and are home to nearly 600 plant and animal species, including 29 threatened and endangered species."[16] They are home to important game species like white-tailed deer, eastern wild turkey, and northern bobwhite quail;[17] as well as many species of concern, including the red-cockaded woodpecker, gopher tortoise, and eastern indigo snake.[18] Some areas of the LLPE contain such unique environmental conditions that they support several endemic (or nearly so) species.[19]

Biodiversity richness enables species interactions within the landscape to create the character of longleaf forests. For example, the longleaf's resinous needles (along with the many grasses and herbaceous plants that grow on the forest floor) provide kindling for frequent, low-intensity fires.[20] Because adult longleaf pine can withstand these low-intensity fires, the

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13. Longleaf pine is intolerant to shade and requires easy access to sunlight to grow. NAT'L WILDLIFE FED'N, *supra* note 5.

14. *See* Jennifer H. Carey, *Fire Effects Information System: Pinus palustris*, USFS (1992), https://www.fs.usda.gov/database/feis/plants/tree/pinpal/all.html (describing in detail the life cycle of the longleaf, noting the "germination" and "grass-stage" in particular are aided by fire).

15. David H. Van Lear et al., *History and Restoration of the Longleaf Pine-Grassland Ecosystem: Implications for Species at Risk*, 211 FOREST ECOLOGY & MGMT. 150, 155 (2005). Frequent fire also provides space for many rare plant species to thrive in the understory. *Id.*

16. *Longleaf Pine Initiative (LLPI)*, AMBROOK, https://ambrook.com/funding/longleaf-pine-initiative (Sept. 11, 2024).

17. R. KEVIN MCINTYRE ET AL., RESTORATION OF LONGLEAF PINE IN THE SOUTHERN UNITED STATES: A STATUS REPORT, USFS 297 (2018), https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs234/gtr_srs234-44.pdf.

18. THE NATURE CONSERVANCY, *supra* note 6.

19. Some examples include *Sarracenia* species (pitcher plants), Venus flytrap, St. Francis' Satyr Butterfly, Florida scrub jay, Bachman's sparrow, and flatwoods salamander. *See generally Sarracenia*, N.C. EXTENSION GARDENER, https://plants.ces.ncsu.edu/plants/sarracenia/ (last visited Apr. 23, 2025); *5 Things You Didn't Know About Venus Flytraps*, N.C. STATE UNIV.: COLL. OF NAT. RES. NEWS (Jan. 6, 2021), https://cnr.ncsu.edu/news/2021/01/five-things-about-venus-flytraps/; *St. Francis' Satyr Butterfly*, U.S. FISH & WILDLIFE SERV., https://www.fws.gov/species/saint-francis-satyr-butterfly-neonympha-mitchellii-francisci (last visited Apr. 1, 2025); *Bachman's Sparrow*, AUDUBON, https://www.audubon.org/field-guide/bird/bachmans-sparrow (last visited Apr. 1, 2024); *Flatwoods Salamander (Ambystoma cingulatum)*, SAVANNAH RIVER ECOLOGY LAB'Y, UNIV. OF GA., https://srelherp.uga.edu/salamanders/flatwoods-salamander/ (last visited Apr. 1, 2025); *Florida Scrub Jay*, FLA. FISH & WILDLIFE CONSERVATION COMM'N, https://myfwc.com/wildlifehabitats/profiles/birds/songbirds/florida-scrub-jay/ (last visited Apr. 30, 2025.

20. Benjamin O. Knapp et al., *Fire Effects on a Fire-Adapted Species: Response of Grass Stage Longleaf Pine Seedlings to Experimental Burning*, 14 FIRE ECOLOGY, no. 2, 2018, at 2, https://fireecology.springeropen.com/articles/10.1186/s42408-018-0003-y.

landscape is left with a clear understory scattered with the surviving pines.[21] Extant pines later shed additional pine needles, establishing the basis for future fire. This cyclical pattern allows for many species of grasses to repopulate unobstructed by shading hardwoods and providing kindling for future fires themselves, while also freeing space for gopher tortoises to dig burrows within exposed soils.[22] When gopher tortoises vacate their homes, these burrows then provide shelter for dozens of other species.[23]

B. History, Decline, and Future

The LLPE's decline from 90 million acres is the consequence of human influence. Factors impacting the decline of the longleaf forests range from incompatible land use, overconsumption of forest resources, lack of reforestation, and fire suppression. Only in recent decades have these factors been addressed through proactive management and allowing the LLPE to recover a portion of its former range.

The history of the modern LLPE begins a few thousand years before European settlement in the southeastern United States. After the last ice age, a history of frequent lightning and Native-induced fires helped to shape the LLPE ecosystem.[24] These fires created a "mosaic" across the landscape, leaving open patches and creating a "park-like" forest.[25] For Native people, fire was a tool "to improve wildlife habitat and create more palatable forages, drive game during hunts, make travel easier, and increase their ability to protect themselves from attack by warring tribes."[26]

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21. Knapp et al., *supra* note 20, at 2–3.

22. *See Gopher Tortoise*: Gopherus polyphemus, FLA. FISH & WILDLIFE CONSERVATION COMM'N, https://myfwc.com/wildlifehabitats/profiles/reptiles/gopher-tortoise/ (last visited Apr. 1, 2024).

23. *Id.*

24. DALE G. BROCKWAY ET AL., RESTORATION OF LONGLEAF PINE ECOSYSTEMS, USFS 8 (2006), https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs083.pdf (discussing early history of longleaf pine forests); Janet Steele, *The Story of the Longleaf Ecosystem*, CLEMSON EXTENSION FORESTRY & WILDLIFE, https://blogs.clemson.edu/fnr/2024/01/08/the-story-of-the-longleaf-ecosystem/ (last visited Apr. 20, 2025) (noting impact of both natural and human-induced fire on landscape). *See also* Van Lear et al., *supra* note 15 at 151–52 ("In all likelihood, a combination of Native American- and lightning-caused fire helped genetically fix fire-adapted characteristics in species in this ecosystem."). For years the role of Native Americans in shaping the "wild" landscape of the South the European settlers later found was discounted. *Id.* at 152. Today, recognition of the Native interplay with the landscape not only allows us to recognize the importance of fire in land management but also allows us to respect and appreciate the LLPE as a cultural object. *See generally* Van Lear et al., *supra* note 15.

25. Steele, *supra* note 24.

26. *Id.*; *see also* Van Lear et al., *supra* note 15, at 152 (detailing Native use of fire to manage the landscape).

European colonists also adopted fire as a tool. Unlike Native uses, however, colonists utilized fire to manage livestock grazing.[27] As increasing numbers of colonists immigrated to the region, many longleaf forests were cleared to provide space for agriculture. These changes in land use coincided with the forced displacement of Native people in the Southeast.

Industrial development and changing attitudes in the nineteenth and early twentieth centuries further eroded the historic range of the longleaf. By the mid-1800s, new technology and development allowed the South to become a leading producer of naval stores and lumber.[28] Production increased longleaf pine harvest and led to suppression of frequent fire. The combination of increased harvest and fire suppression often left behind denuded forestlands where longleaf pine could not effectively regenerate. Alongside continued land conversion from forest to field to support agricultural land use, the increased harvest of longleaf pine caused a decline in "virgin stands" of longleaf forest and increased competition from other tree species.[29]

Beginning in the 1930s, a new shift in the Southeast's economy occurred as paper pulp mills became locally important. Pulp mills, which chose to grow their raw lumber resources in pine plantations, did not cultivate longleaf; instead, these mills favored planting loblolly and slash pine.[30] As the century wore on, rapidly growing populations and urban sprawl exacerbated longleaf decline.[31] By "2000, the ecosystem was at a record low of 3.2 million acres, a loss of 97% across its historic range."[32]

Yet, since hitting a historic low, the LLPE has seen a revival. Over the past two-plus decades, conservation efforts increased LLPE acreage to approximately 5.2 million acres.[33] However, the same causes of the LLPE's decline remain its most serious threats.[34] Maintenance of the ecosystem's gains depends not only upon preservation, but also active conservation and restoration that expressly addresses land use.

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27. Steele, *supra* note 24.

28. *Id.*

29. CHRISTOPHER M. OSWALT ET AL., HISTORY AND CONDITION OF LONGLEAF PINE IN THE SOUTHERN UNITED STATES, USFS 6–8 (2012), https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs166.pdf.

30. *Id.*

31. Van Lear et al., *supra* note 15, at 155.

32. Steele, *supra* note 24.

33. AM.'S LONGLEAF RESTORATION INITIATIVE, RANGE-WIDE CONSERVATION PLAN FOR LONGLEAF PINE: 2025–2040 3, https://nri.tamu.edu/media/3823/conservation-plan-2025-2040-002.pdf.

34. *Cf.* Van Lear et al., *supra* note 15, at 155 ("The major threats to species of risk in the longleaf ecosystem have been and continue to be conversion to other land uses—especially to agriculture and intensively managed tree plantations, urbanization, and fire exclusion.").

II. WHY PRESERVE THE LONGLEAF PINE ECOSYSTEM?

Many rationales exist to support protecting natural landscapes, and no single approach is likely to fuel sustained conservation efforts. Protection of the LLPE can be justified by a number of theories: economic benefit, biodiversity protection, climate change resilience, cultural preservation, and so on. Further, modern science suggests that ecosystem health is tied to maintaining sufficient amounts of interconnected habitat to allow for necessary biotic and abiotic exchanges.

This Part proceeds in two Sections. Section A begins with a description of the general rationales and philosophies that help support the reasoning for conservation efforts, while noting how they fit in specifically with the goals of conserving the LLPE. No single system of thought motivates conservation, and a more complete assessment of potential drivers is vital to understanding which laws and policies may be most effective at engaging stakeholders of differing opinions. Section B ties together justifications for conservation in light of modern principles of biology and ecology. In doing so, that Section advocates for action mindful of the need for a landscape-level framework, working to expand isolated habitat and increase connectivity across broader scales to preserve biodiversity throughout the LLPE.

A. The Various Rationales Supporting Conservation

The most common rationales cited to support environmental protection tend to fall into three camps: (1) utilitarianism, (2) esthetic philosophy, and (3) ethical philosophy.[35]

1. Utilitarianism: The Greatest Good

The basic thrust of utilitarianism is that "the morally right action is the action that produces the most good."[36] To achieve that, utilitarianism contemplates the value of the thing in question, asking "what good does it do?"[37] It then considers the value of a given group of options against another, with the "morally right" choice as the one maximizing value for the greatest

35. Holly Doremus, *Patching the Ark: Improving Legal Protection of Biological Diversity*, 18 ECOLOGY L. Q. 265, 269 (1991). Other thinkers have divided these categories into the slightly more specific categories of (1) utilitarianism, (2) recreational and esthetic values, and (3) intrinsic, spiritual, and ethical values. REED F. NOSS & ALLEN Y. COOPERRIDER, SAVING NATURE'S LEGACY: PROTECTING AND RESTORING BIODIVERSITY 19, 21– 22 (1994).

36. *The History of Utilitarianism*, STAN. ENCYCLOPEDIA OF PHIL. (Sept. 22, 2014), https://plato.stanford.edu/entries/utilitarianism-history/.

37. *See* NOSS & COOPERRIDER, *supra* note 35, at 19 (explaining utilitarianism values).

number of people. These "greatest good" arguments that seek to advance maximum social value are commonly referenced to justify conservation, particularly by politicians and agencies.[38]

In the environmental sphere, utilitarianism considers both direct and indirect values. Direct values are those derived from the natural resource's immediate or instrumental use.[39] Direct values consider use of natural resources as crops or livestock; as medicine; as products; as raw materials; for genetic material; to promote human health and well-being; and for recreational value.[40] Indirect values encompass the less tangible, concurrent worth that flows from a natural resource.[41] Ecosystem services are a good example of an indirect value justifying natural resource conservation.[42] The ecosystem service concept contemplates the naturally occurring functions of an ecosystem in providing good to society for things like "climate control, oxygen production, removal of carbon dioxide from the atmosphere, soil generation, nutrient cycling, and purification of freshwater supplies."[43] Indirect use also contemplates incalculable benefits[44] and existence value.[45]

Utilitarianism provides much support for the protection of the LLPE. First, restoration and protection of the LLPE support direct economic use. Longleaf pine has several advantages as a forest crop. The growth of additional longleaf pine on private lands can provide direct benefits to the

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38. *See, e.g.,* Doremus, *supra* note 35, at 275 ("Utilitarian grounds have been most often cited in and to Congress as justifying a national policy of protecting biological resources . . . ."); *see* DANIEL R. WILLIAMS, USFS, POST-UTILITARIAN FORESTRY: WHAT'S PLACE GOT TO DO WITH IT? 114–123 (2002) (describing turn from a utilitarian "commodity" theory of forestry that the Forest Service practiced to a postmodern "post-utilitarian" theory of forestry that takes a more holistic view of resources), https://www.fs.usda.gov/rm/pubs_other/rmrs_2002_williams_d003.pdf.

39. NOSS & COOPERRIDER, *supra* note 35, at 19.

40. *See id.* at 19–20 (describing the medicinal value of natural resources); *see also* Doremus, *supra* note 35, at 269–71 (noting some potential direct uses of natural resources).

41. *See* NOSS & COOPERRIDER, *supra* note 35, at 20–21 (explaining indirect value); Doremus, *supra* note 35, at 272.

42. *See generally*, James Salzman et al., *Protecting Ecosystem Services: Science, Economics, and Law*, 20 STAN. ENV'T L. J. 309 (2001) (describing importance of ecosystem services).

43. Doremus, *supra* note 35, at 271.

44. Doremus describes the potential implication for utilitarianism of currently unknown values of natural resources, particularly in regard to biodiversity protection, stating "that the potential uses of many biotic resources are not yet known, both because many species have not been fully investigated and because we cannot know in advance the needs of future generations." *Id.* Therefore, utilitarians should attempt to consider value that may become important later.

45. Existence value in a conservation context considers the value people may place on natural resources simply for existing. In other words, "people may value nature not only for its actual use or for having the option of using it in the future, but also for its mere existence." Marc D. Davidson, *On the Relation Between Ecosystem Services, Intrinsic Value, Existence Value and Economic Valuation*, 95 ECOLOGICAL ECON. 171, 174 (2013) (citation omitted).

landowner through forestry and recreation.[46] For example, opportunities for hunting wildlife (particularly quail, deer, and turkey) in longleaf forests are abundant in a region where such sport is popular.[47] Second, indirect benefits in the form of ecosystem services and climate change mitigation also accrue to the landowner. The LLPE is drought and pest-resistant, withstands heavy winds, and is fire-adapted—all advantageous in light of the effects of a changing climate.[48] In addition to more easily-appreciated ecosystem services like nutrient cycling and water filtration, the LLPE is valuable as a habitat for a rich host of biodiversity.[49]

2. Esthetic Philosophy: The Power of Nature

Esthetic philosophy advocates for the protection of nature from an appreciation standpoint. An esthetic basis for environmental protection recognizes that "[m]any people find beauty in the natural world, viewing natural objects, both living and nonliving, with a sense of admiration, wonder, or awe."[50] This is perhaps the most intuitive reason for protecting natural things; because a natural landscape or its components mean something to an individual, a group, or a culture—it should be protected.

The esthetic basis for protecting the LLPE is reflected in narratives of the longleaf pine forest. In the 18th century, famed naturalist William Bartram described the region as containing "a vast forest of the most stately pine trees that can be imagined."[51] Environmental author Janisse Ray notes how the longleaf and its forests define a sense of place and home for a broader community.[52] Indeed, states themselves have weighed in, with Alabama

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46. BROCKWAY ET AL., *supra* note 24, at 24 ("The economic value of longleaf pine forests is considerable, and commercial products can be extracted from a properly functioning forest without significantly disrupting ecological processes. Longleaf pine is the most versatile of all the southern pines and provides a wide variety of products, many of which are highly valued.").

47. *Id.* at 11, 25.

48. THE NATURE CONSERVANCY, *supra* note 6; CONSERVATION RESERVE PROGRAM: LONGLEAF PINE INITIATIVE, FARM SERV. AGENCY 1–2 (2015), https://www.fsa.usda.gov/sites/default/files/documents/Longleaf_Pine_Initiative.pdf (last visited Apr. 20, 2025); Lisa J. Samuelson, et al., *Drought Tolerance of a* Pinus palustris *Plantation*, 451 FOREST ECOLOGY & MGMT no. 17557, at 1–2, 9 (2019), https://www.sciencedirect.com/science/article/pii/S0378112719311806.

49. BROCKWAY ET AL., *supra* note 24, at 25.

50. Doremus, *supra* note 35, at 271.

51. *Longleaf Pine*, LANDSCOPE AM., https://web.archive.org/web/20240807145459/http://www.landscope.org/explore/ecosystems/disappearing_landscapes/longleaf_pine/ (last visited Apr. 20, 2025).

52. One of Ray's most moving passages describes connections between herself, her family history, and the landscape.

adopting the longleaf pine as its state tree.[53] Today, countless folks find beauty and meaning in the longleaf pine forest, whether through direct interaction with the landscape or the art it produces.

3. Ethics Philosophy: Doing What Is "Right"

The final justification for environmentally protective action flows from a wider distillation of ethical philosophies.[54] These varied approaches tend to support actions following "right rules," with moral and ethical obligations supporting those rules. For example, deontology "emphasize[s] rules, principles, duties, rights, or some combination of these," to achieve environmental protection and would thus recognize a human right to a healthy environment.[55] Another example is an intrinsic value approach, in which "ethicists believe that elements of nature have intrinsic values and that these values often trump values instrumental to humans."[56] This view considers the inherent value all elements of the natural ecosystem have, either because of or regardless of humanity's connection to them.[57] Further

> I was born from people who were born from people who were born from people who were born here. The Crackers crossed the wide Altamaha into what had been Creek territory and settled the vast, fire-loving uplands of the coastal plains of southeast Georgia, surrounded by a singing forest of tall and widely space pines whose history they did not know, whose stories were untold. The memory of what they entered is scrawled on my bones, so that I carry the landscape inside like an ache. The story of who I am cannot be severed from the story of the flatwoods.

RAY, *supra* note 1.

53. *Longleaf Pine – Pinus palustrus*, UNIV. OF ALA. ARBORETUM, https://arboretum.ua.edu/whats-growing-on/longleaf-pine-pinus-palustrus/ (last visited Apr. 20, 2025).

54. *See, e.g.*, Doremus, *supra* note 54, at 273–75 (discussing ethical basis for preservation of biodiversity); NOSS & COOPERRIDER, *supra* note 35, at 22–23 (discussing intrinsic, spiritual, and ethical values supporting biodiversity protection).

55. Clare Palmer et al., *Environmental Ethics*, 39 ANN. REV. ENV'T & RES. 419, 431 (2014).

56. Bryan G. Norton, *Valuing Ecosystems*, NATURE EDUC. KNOWLEDGE (2012), https://www.nature.com/scitable/knowledge/library/valuing-ecosystems-71373110/.

57. *Id.*

examples include Aldo Leopold's famous "land ethic," [58] indigenous epistemologies,[59] and a host of spiritual and theological arguments.[60]

Many of these ethical and moral approaches would provide a sufficient basis for protection of the LLPE. A deontological approach, for example, might find an inherent environmental right to access clean, healthy, functioning ecosystems throughout the Southeast.[61] Further, charismatic species such as the red-cockaded woodpecker and gopher tortoise might serve as a means for protection of the LLPE as both species have intrinsic value to exist and persist across the landscape.[62]

4. Tying Various Approaches Together

Janisse Ray describes southern Georgia as a comparatively uninspiring landscape:

> There's nothing in south Georgia, people will tell you, except straight, lonely roads, one-horse towns, sprawling farms, and tracts of planted pines. It's flat, monotonous, used-up, hotter than hell in summer and cold enough in winter that orange trees won't grow. No

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58. Leopold's general approach is typically summed up by an oft-quoted phrase: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." ALDO LEOPOLD, A SAND COUNTY ALMANAC: AND SKETCHES HERE AND THERE 211 (2020 ed. 1949).

59. These approaches are as varied and diverse as the overall people that hold them. *See, e.g.*, Wendee Nicole, *What We Can Learn from Indigenous Communities About Conservation*, DEFS. OF WILDLIFE (Oct. 8, 2021), https://defenders.org/blog/2021/10/what-we-can-learn-indigenous-communities-about-conservation ("Many indigenous communities have a reciprocal relationship with nature, rather than viewing it as existing to serve people. That is a lesson we can learn from Indigenous peoples who know this already as part of their culture, and who are actively conserving and managing wildlife and wildlands."); *Indigenous People and Nature: A Tradition of Conservation*, U.N. ENV'T PROGRAMME (Apr. 26, 2017), https://www.unep.org/news-and-stories/story/indigenous-people-and-nature-tradition-conservation ("Their traditions and belief systems often mean that they regard nature with deep respect, and they have a strong sense of place and belonging. This sustains knowledge and ways of life that match up well with modern notions of nature conservation and the sustainable use of natural resources.").

60. *Cf.* BRYAN G. NORTON, WHY PRESERVE NATURAL VARIETY? 140–143 (1987) (noting importance of overcoming Judeo-Christian scriptural ideals promoting anthropocentrism in effectuating environmental protection).

61. *See* Simona Sacchi, et al., *Moral Reasoning and Climate Change Mitigation: The Deontological Reaction Toward the Market-Based Approach*, 38 J. ENV'T PSYCH. 252, 253 (2014), https://www.sciencedirect.com/science/article/pii/S0272494414000206. (noting that a deontological rules and moral obligations undergird many protected values such as "those pertaining to human rights or natural resources").

62. *See* Doremus, *supra* note 35, at 273 (noting people "find it easiest to emphasize and identify with individual beings and with vertebrate animals" making it easier for some species to be a rallying cry for environmentally protective action).

> mountains, no canyons, no rocky streams, no waterfalls. . . . Unless you look close, there's little majesty.[63]

But as Ray further explains, it was not always that way. In some pockets, she says, "you can see how south Georgia used to be, before all the old longleaf pine forests that were our sublimity and our majesty were cut."[64]

As a normative matter, adherents to the many systems of thought discussed would likely agree that conservation of the LLPE is a shared value. Depending on the particular strain of thought driving an individual, however, the relevant ends and means of how to advance that value may differ greatly. In other words, restoring a semblance of the "old" vision of longleaf forests Ray describes may find support from many views, but stakeholders are unlikely to share identical ideas about which laws and policies should be used, nor what amount of conservation is sufficient. This leaves the previous discussion somewhat unsettling, resulting in the question of which view should drive us.

No one idea works perfectly to justify conservation.[65] If effective protection and restoration of the LLPE is to occur, law and policy makers must engage groups of all kinds and backgrounds. To protect the health of the LLPE, there will have to be wide buy-in from stakeholders—whether public or private landowners, conservation- or extraction-minded, an individual or a community. The ability to leverage a slate of motivations to effectuate conservation is not only optimal but necessary.

As a result, the answer to the question "which view should drive us?" is whichever view or views build consensus. These philosophical justifications for conservation do not operate in a vacuum but inform which laws and policies should be selected as tools for a given community or particular landowner. Understanding the motivating values undergirding conservation efforts thus allows an advocate to make smart decisions and to work alongside stakeholders in the process.

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63. RAY, *supra* note 1, at 13.

64. *Id.* at 14.

65. Doremus, *supra* note 35, at 275 ("The different bases for preservation do not, however, necessarily justify protection of the same proportion of the total, nor of the same resources."); Norton, *supra* note 56 ("[A]s opponents try to enforce their monistic theory of value, an alternative approach, which accepts pluralism and pays attention to processes by which communities can balance and trade off among competing values, is gaining in acceptance.").

B. Protecting Landscapes

Following developments within the fields of conservation biology and ecology since the mid-twentieth century, [66] land managers and conservationists are now highly aware of the importance of maintaining habitat at a sufficient scale and with a sufficient level of productivity.[67] The growing understanding of the role of providing intact and connected lands, particularly for habitat, to protect ecological functioning has reoriented how land managers regulate landscapes. [68] This has produced coordinated conservation efforts of larger regions, and a move from protecting enclaves of pristine, isolated lands to a focus on ecosystem management across larger landscapes.[69] The shift to ecosystem management across broad regions is what this article refers to as management on a landscape scale, or landscape conservation.

One of the most-cited rationales for landscape conservation is to support biodiversity protection.[70] "Biodiversity" encompasses "the variety of life and its processes. It includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting."[71] Importantly, biodiversity exists at multiple scales, from genetic to regional.[72] A goal of biodiversity protection at a regional landscape level is to create and maintain "complete, unfragmented environmental gradients."[73] This protection goal responds to the major threat posed to biodiversity by habitat loss and fragmentation.[74] By protecting gradients, landscapes can support both a variety of life (including

66. *See* Robert B. Keiter, *Toward a National Conservation Network Act: Transforming Landscape Conservation on the Public Lands into Law*, 42 HARV. ENV'T L. REV. 61, 88–93 (2018) (discussing the growth of science in nature conservation).

67. *See id.* at 90–93 (describing "science-based movement toward ecologically-driven conservation"); Robert B. Keiter, *Beyond the Boundary Line: Constructing a Law of Ecosystem Management*, 65 U. COLO. L. REV. 293, 296–303 (1994) (discussing the importance of ecosystem management).

68. Keiter, *Beyond the Boundary Line*, *supra* note 67.

69. Keiter, *Toward a National Conservation Act*, *supra* note 66, at 62–64.

70. The literature is full of these mentions. *See e.g.*, Doremus, *supra* note 35; Matthew Shuckman, *Making the Hard Choices: A Collaborative Governance Model for the Biodiversity Context*, 79 WASH. UNIV. L. Q. 343, 349 n. 29 (2001); Gordon Steinhoff, *Restoring Nature in Protected Areas*, 5 ARIZ. J. ENV'T L. & POL'Y 302, 329–331 (2015); Robert B. Keiter, *Landscape Conservation, Wildlife Management, and the Federal Public Lands: A Primer*, 56 IDAHO L. REV. 49 (2020).

71. NOSS & COOPERRIDER, *supra* note 35, at 5.

72. *Id.* at 5–13.

73. *Id.* at 11–12.

74. The threat of habitat fragmentation is a result of two types of action: (1) "decrease in some habitat type or perhaps all natural habitat in a landscape," and (2) "apportionment of the remaining habitat into smaller, more isolated pieces." *Id.* at 51.

species that require certain micro-environments within the landscape) and life processes (such as ensuring linkages for breeding between distinct populations). Providing protections at a broad level also helps maintain biodiversity at smaller scales.

Another impetus for landscape protection is to maintain and enhance ecosystem services. The natural processes providing ecosystem services benefit both humans and the environment.[75] Actions converting land from its natural state to a "built environment"[76] (e.g., through road or housing construction) or altering land following extractive uses (e.g., through mining or timber harvesting) often negatively impact the ability of an ecosystem's natural processes to function properly. For example, an important function of forest environments is water filtration and aquifer replenishment.[77] Conversion to land uses altering the natural environment (e.g., cut for timber or developed for neighborhoods), diminish the land's ability to perform essential water filtration and aquifer recharge as impacted soils and less vegetation produce greater runoff and less soil infiltration. While acknowledging that portions of our broader environment will always be impacted by urban and agricultural uses, these same urban and agricultural lands are connected to "natural" spaces and are impacted by ecosystem services as well. Landscape-level conservation provides flexibility to balance the impacts of the built environment with necessary support for natural environments and the services they perform.

The final rationale for landscape protection is to increase resiliency to climate change. While measures to address climate change often incorporate biodiversity and ecosystem services, increasing resiliency specifically examines how climate change impacts (and exacerbates) ongoing challenges

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75. NOSS & COOPERRIDER, *supra* note 35, at 20 ("Every habitat on Earth, including urban and agricultural environments, is an ecosystem that receives and transforms energy, produces and recycles wastes, and relies on complex interactions among species to carry out these functions. But urban and agricultural ecosystems are dependent on natural ecosystems for their sustenance.").

76. The built environment may be defined as "human-made space in which people live, work, and recreate on a day-to-day basis." Lingqiang Kong, et al., *A Systematic Review of Big Data-Based Urban Sustainability Research: State-of-the-Science and Future Directions*, 273 J. CLEANER PROD. 4 (2020). In general, these are spaces that humans have altered from baseline environmental conditions to provide for social use. It includes things like buildings, neighborhoods, and cities, but is broad enough to also capture things such as parks, agricultural fields, and mines.

77. *See* Ying Ouyang, et al., *Estimating Impact of Forest Land on Groundwater Recharge in a Humid Subtropical Watershed of the Lower Mississippi River Alluvial Valley*, 26 J. HYDROLOGY: REGIONAL STUDS., Oct. 2019, at 1, 11 (studying how forest land compared to agricultural land affects groundwater recharge, including filtration of water and replenishment of aquifers); Salzman, et al., *supra* note 42, at 314–15.

in managing land health.[78] With devastating impacts caused by climate change in the immediate horizon, "[i]t will often also be necessary to expand the spatial scale at which systems are managed and policies and plans are developed."[79] Preexisting natural adaptations within longleaf forests make these ecosystems more resilient to changing conditions from climate change in the Southeast. Adaptation to fire enhances landscape resiliency in a world with more frequent drought and wildfire occurrences.[80] Further, the deep, sturdy taproots of longleaf pines make these trees much more resilient to high winds than other trees, enhancing their ability to withstand more frequent or intense tropical storms and hurricanes.[81] Additional resiliency benefits include pest resistance, ability to facilitate increased water yield, habitat provision for imperiled species, and carbon sequestration—all important considerations in climate change adaptation and mitigation.[82]

III. LEGAL APPROACHES TO LANDSCAPE CONSERVATION AND PROTECTION

While the importance of the LLPE is clear, choices regarding its protection and restoration raise more complex questions. With longleaf forests depleted across the region and the threats causing their decline remaining, conservation work requires a combination of restoration, protection, and thoughtful management to ensure the ecosystem is healthy enough to provide benefits. The efforts of nonprofit and private parties are incredibly important to furthering LLPE conservation.[83] But voluntary action

78. *See* JJ Lawler et al., *Mitigation and Adaptation Strategies to Reduce Climate Vulnerabilities and Maintain Ecosystem Services*, 4 CLIMATE VULNERABILITY 315, 316 (2013) ("For example, recent studies have documented shifts in the distribution of plants and animals, advances in the timing of key ecological processes, and extinctions of wildlife populations and species that are likely linked to recent increases in temperature.") (citation omitted).

79. *Id.* at 324 ("As species move and ecosystems change, it will be necessary to think well beyond neighborhood, park, refuge, state, or even national boundaries. Planning will need to occur at multiple, integrated scales and will need to involve local, regional, and sometimes national participants.") (citations omitted).

80. Celeste Gracia & Kaia Findlay, *Resiliency to Climate Change Could Be Key in Longleaf Pine Restoration*, WUNC (Sept. 28, 2021, 7:39 PM), https://www.wunc.org/environment/2021-09-28/longleaf-pine-resiliency-restoration-climate-change-southern-north-carolina.

81. *Id.*

82. *Id.*; *see also* Lavelle et al., *supra* note 3 (describing how forest restoration advocates view restoration as a solution for storing carbon and promoting regional resiliency to climate change).

83. *See, e.g.*, Jennifer Winger, *Pine Country*, THE NATURE CONSERVANCY (Aug. 26, 2022), https://www.nature.org/en-us/magazine/magazine-articles/longleaf-pine/ ("But with less than 5% of longleaf pine forests remaining, states, the federal government and conservation groups, including The Nature Conservancy, are working to save these Southern forests—and the species that depend on them—before it's too late."); Britt Holewinski, *Restoring Longleaf Pine Forests and Keystone Species Habitat*, NAT'L FOREST FOUND., https://www.nationalforests.org/blog/restoring-longleaf-pine-forests-and-keystone-species-habitat ("Working with the US Forest Service, The Longleaf Alliance, and donors such

to provide landscape conservation alone is likely insufficient given the vast scale of the LLPE and the sheer number of stakeholders involved.

Luckily, law and policy both push and pull to provide conservation at a landscape scale. This toolbox of legal mechanisms, whether through statute, regulation, policy, or funding programs, helps "grease the wheels" and lower opportunity costs of collaboration and conservation. Legal tools supply much-needed leverage, whether by requiring action by landowners, creating an opportunity for stakeholder collaboration, or incentivizing working landowners to implement actions.

This Part examines federal law and policy mechanisms utilized for landscape-scale conservation. Section A discusses the Endangered Species Act, focusing on habitat-protective mechanisms in its regulatory scheme. Section B examines the history, role, and legal dimensions of federal public land management agencies with a significant presence in the Southeast. Finally, Section C discusses voluntary programs run by the U.S. Department of Agriculture to assist and fund private landowners engaging in conservation on private working lands.

A. The Endangered Species Act

Despite its emphasis on single-species regulation, the Endangered Species Act (ESA) has provided a major federal mechanism for land protection since Congress passed the modern iteration of the ESA in 1973.[84] Today, a species "in danger of extinction throughout all or a significant portion of its range," or likely to become so "within the foreseeable future throughout all or a significant portion of its range" is eligible for "listing" as endangered or threatened, respectively.[85] Once listed, the ESA provides a host of regulatory mechanisms for maintenance and protection of a species.

While used to protect habitat and larger environments, the ESA often falls short of directly advancing its habitat protection goals. In the ESA's declaration of purpose, Congress boldly declares that the ESA is driven to "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved . . . ."[86] Yet the individual

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as Endangered Species Chocolate, the National Forest Foundation plants longleaf pine trees, helping to restore the longleaf pine range, improve ecosystem and habitat connectivity, and help reestablish habitat for many species, including the gopher tortoise.") (last visited Apr. 24, 2025).

84. While the original version of the ESA passed by Congress in 1966 focused primarily on federal land protection for endangered species, the modern 1973 version took a more expansive view. Though it has undergone multiple revisions since passage, the main legal mechanisms remain largely the same. *See Endangered Species*, USFWS, https://www.fws.gov/program/endangered-species/about-us (last visited Apr. 20, 2025).

85. 16 U.S.C. § 1532(6), (20).

86. *Id.* § 1531(b).

species approach and mitigation mechanisms of the ESA do not always allow a proactive and coordinated approach to habitat protection.[87] Even in the most forceful of its applications, the ESA retains a reactive regulatory scheme.[88]

Despite its limitations, the ESA is a major vehicle for habitat protection. Notably, the ESA applies to both public and private lands. This broad application provides a particularly vital legal hook for private land conservation, where fewer legal requirements supporting conservation exist. This Section considers habitat-productive mechanisms provided under the ESA, including critical habitat designations, land acquisitions, and habitat conservation plans.

1. Critical Habitat Designation: Section 4

Critical habitat designations under Section 4 of the ESA provide an early mechanism for habitat conservation under the Act. Alongside listing a species as threatened or endangered, the Secretary of the Interior is directed to determine whether to designate critical habitat for the listed species.[89] The U.S. Fish and Wildlife Service (USFWS) defines critical habitat as:

> [S]pecific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection. Critical habitat may also include areas that were not occupied by the species at the time of listing but are essential to its conservation.[90]

A critical habitat designation guides decision-making by triggering the ESA consultation process if federal agency action would result in the

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87. *See* Jason Totoiu, *Building a Better State Endangered Species Act: An Integrated Approach Toward Recovery*, 40 ENV'T L. REP. NEWS & ANALYSIS 10299, 10309–10 (2010); Doremus, *supra* note 35, at 307–08 ("The species-by-species nature of the ESA requires those interested in preserving ecosystems to work through surrogate species. However, opponents of such listings criticize those who seek to list indicator species for 'misusing' the Act to achieve a purpose other than species protection.") (citations omitted).

88. NOSS & COOPERRIDER, *supra* note 35, at 26.

89. 16 U.S.C. § 1533(a)(3). Jurisdiction over terrestrial species is granted to the Secretary of the Interior (through the U.S. Fish and Wildlife Service), with marine species under the jurisdiction of the Secretary of Commerce (National Marine Fisheries Service). Therefore, this Article refers to the Secretary of the Interior for relevant ESA activity.

90. *Critical Habitat: What Is It?*, USFWS 1 (Mar. 2017), https://www.fws.gov/sites/default/files/documents/critical-habitat-fact-sheet.pdf.

destruction or adverse modification of critical habitat.[91] The consultation process, governed by Section 7 of the ESA, provides that federal agencies must ensure that agency actions do not jeopardize the existence of threatened or endangered species nor result in the adverse modification of their habitat.[92] Section 7 consultation presents an opportunity for federal agencies to ensure actions taken within their discretion do not contribute to species decline.[93]

Critical habitat designations, however, are limited in scope. First, designations affect only federal and federally-funded or -permitted activities.[94] Second, though many species-focused factors are considered in potential designations, [95] so are the economic impacts of habitat designation.[96] This is in contrast to the listing process, in which the wildlife agency *may not* consider economic impacts of listing a species.[97] Finally, critical habitat designations are limited to "the geographical area occupied by the species,"[98] and in most circumstances, "shall not include the entire geographical area which can be occupied" by the listed species.[99] Therefore, while designations expand the scope of activities falling under the ESA's reach, actual effects may vary.[100]

2. Acquisition of Lands: Section 5

ESA Section 5 provides another statutory mechanism for landscape conservation with the Secretary of the Interior "authorized to acquire by purchase, donation, or otherwise, lands, waters, or interest therein . . . ."[101]

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91. *Critical Habitat: What Is It?*, USFWS 1 (Mar. 2017), https://www.fws.gov/sites/default/files/documents/critical-habitat-fact-sheet.pdf; 16 U.S.C. § 1536(a).

92. 16 U.S.C. § 1536(a)(2).

93. *See ESA Section 7 Consultation*, USFWS, https://www.fws.gov/service/esa-section-7-consultation (last visited Apr. 20, 2025) (explaining Section 7's authority, project development process, and legal justification).

94. USFWS, *Critical Habitat: What Is It?*, *supra* note 90, at 1.

95. *See id.* at 1–2 (arguing that the consideration process for critical habitat designation should contemplate species specific information).

96. *Id.* at 2 ("The Service is required to consider potential economic impacts, as well as any other benefits or impacts of designating critical habitat—and may exclude an area if the benefits of excluding it outweigh the benefits of including it unless that would result in the extinction of the species.").

97. *Compare* 16 U.S.C. § 1533(a)(1) (not listing economics as a consideration for listing) *with id.* § 1533(b)(2) (noting economic impact may be considered in habitat designation).

98. *See* 16 U.S.C. § 1532(5).

99. *See* Weyerhaeuser v. U.S. Fish & Wildlife Serv., 586 U.S. 19–21 (2018) (defining the scope of "habitat" under ESA).

100. *Cf.* Ya-Wei Li, *When Does Critical Habitat Designation Benefit Species Recovery?*, CTR. FOR GROWTH & OPPORTUNITY, UTAH ST. UNIV. (2020), https://www.thecgo.org/research/when-does-critical-habitat-designation-benefit-species-recovery/.

101. 16 U.S.C. § 1534(a)(2).

Funding is provided through the Land and Water Conservation Fund.[102] While Section 5 is not the primary driver of ESA protections, it does provide a method to acquire outright federal ownership interests in land to support the recovery of listed species.[103]

3. Prohibitions and Permits: Sections 9 and 10

The so-called "take prohibition" and exceptions provide the final mechanisms for habitat protection under the ESA, in Sections 9 and 10, respectively. Section 9 of the ESA provides that it is "unlawful for any person . . . [to] take any such species within the United States or the territorial seas . . . ."[104] Federal regulations define "take" broadly to encompass many activities negatively impacting listed species.[105] Unlike provisions of the ESA that apply only to federal agencies and actions, the Section 9 take prohibition applies to public and private parties alike.[106] This blanket application can thus restrict private landowner action when a listed species is present.

Lest the freedom of the private landowner become too stifled, however, Section 10 of the ESA provides an "incidental take permit" exception. Section 10 provides that "[t]he Secretary may permit, and under such terms and conditions as he shall prescribe . . . any taking otherwise prohibited by [Section 9's take prohibition] if such taking is *incidental to, and not the purpose of*, the carrying out of an otherwise lawful activity."[107] In order to

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102. 16 U.S.C. § 1534(b); *About LWCF*, LAND & WATER CONSERVATION FUND COAL., https://lwcfcoalition.org/about-lwcf (last visited Apr. 20, 2025).

103. It is important to note that the "interest therein" language in the statute gives the appropriate federal agency (either the USFWS or the Department of Commerce's National Marine Fisheries Service) the ability to acquire "lesser" real property interests, such as conservation easements. 16 U.S.C. § 1534(a)(2); *see, e.g.*, *Recovery Land Acquisition Grants*, USFWS, https://www.fws.gov/service/recovery-land-acquisition-grants.

104. 16 U.S.C. § 1538(a)(1)(B). Note that this take prohibition applies only to listed animal species. *Id.* However, a similar statutory provision applies to plant species. *Id.* § 1538(a)(2).

105. Take is defined to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Id.* § 1532(19). 50 C.F.R. § 17.3 ("Harm in the definition of 'take' in the Act means an act which actually kills or injures wildlife. Such act may *include significant habitat modification or degradation where it actually kills or injures wildlife* by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.") (emphasis added).

106. *Compare* 16 U.S.C. § 1536 (requiring federal agencies to engage in consultation) *with id.* § 1538(a) (establishing no "person," including private and public actors as defined in 16 U.S.C. § 1532(13), may engage in take of species).

107. 16 U.S.C. § 1539(a)(1)(B) (emphasis added).

receive an incidental take permit, the landowner must first obtain approval of a conservation plan,[108] referred to as a "habitat conservation plan" (HCP).[109]

HCPs, which often plan for governance of broader areas, are a valuable tool for achieving conservation throughout a landscape.[110] HCPs outline conservation actions a landowner will take in order to obtain an incidental take permit and avoid liability under the ESA.[111] For an HCP to be approved, it must satisfy several statutory requirements that justify grant of an incidental take permit to the applicant. Satisfaction requires an HCP include impacts from the incidental taking, steps the applicant will take to reduce action impacts on listed species, and alternatives to proposed actions and explanations for the proposed choice.[112] Notably, an HCP may also include any additional measures that "the Secretary may require as being necessary or appropriate . . . ."[113] The fact-specific nature of an incidental take permit application and the formation of an HCP ensure targeted efforts to implement conservation for affected species. Further, discretion statutorily delegated to the Secretary of the Interior in adding permit conditions allows for flexibility in achieving conservation goals to protect listed species. If the HCP is deemed sufficient and statutory requirements are met,[114] the agency may issue an incidental take permit making the HCP plan legally binding.

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108. 16 U.S.C. § 1539(a)(2).

109. BRIAN J. MACGOWAN, CONSERVING ENDANGERED AND THREATENED SPECIES ON PRIVATE LAND, PURDUE UNIV. DEP'T OF FORESTRY & NAT. RES. & USFWS 7 (2001), https://www.extension.purdue.edu/extmedia/FNR/FNR-172.pdf.

110. In fact, some habitat conservation plans have even been designed to cover lands and actions across an entire state. *See Georgia Red-Cockaded Woodpecker Safe Harbor Program*, LAND CONSERVATION ASSISTANCE NETWORK, https://www.landcan.org/local-resources/Georgia-Redcockaded-Woodpecker-Safe-Harbor-Program/39923/ (last visited Apr. 20, 2025) ("In 1999, Georgia DNR developed the nation's first statewide Red-cockaded Woodpecker Habitat Conservation Plan to provide management options for private landowners.").

111. Note that HCPs are not themselves legally binding, but are made binding through the grant of an incidental take permit. *Habitat Conservation Plans*, USFWS, https://www.fws.gov/service/habitat-conservation-plans (last visited Apr. 20, 2025).

112. 16 U.S.C. § 1539(a)(2)(A).

113. *Id.* § 1539(a)(2)(A)(iv).

114. The Secretary must find, with regard to the application and HCP and after public comment; (i) the taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the plan will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and (v) the measures, if any, required under subparagraph (A)(iv) will be met; and he has received such other assurances as he may require that the plan will be implemented, the Secretary shall issue the permit. The permit shall contain such terms and conditions as the Secretary deems necessary or appropriate to carry out the purposes of this paragraph, including, but not limited to, such reporting requirements as the Secretary deems necessary for determining whether such terms and conditions are being complied with.

Id. § 1539(a)(2)(B).

The Safe Harbor Agreement (SHA) is a newer option utilized to avoid potential ESA liability for landowners. An SHA "is a voluntary agreement involving private or other non-federal property owners whose actions contribute to the recovery of species listed as endangered or threatened under the Endangered Species Act . . . ."[115] In exchange for conservation, private property owners receive assurances from the USFWS that if landowners fulfill obligations within their SHA, the USFWS will not require additional or different management activities without their consent.[116] The advantage of an SHA, then, is encouraging proactive land management that provides a "net conservation benefit"[117] in exchange for regulatory certainty. The structure of SHAs thus addresses a perverse incentive under the ESA. Without an SHA, a landowner might take actions that degrade land condition to avoid attracting listed species and thus falling under the regulatory scope of the ESA. With an SHA, however, a landowner can engage in actions to improve the health of their land while potentially attracting listed species while also being insured by the terms of the SHA from taking on greater regulatory responsibilities.

Neither HCPs nor SHAs are immune from criticism, however. HCPs (and Section 10 of the ESA) can allow intentional habitat degradation. SHAs, meanwhile, are temporary and allow landowners to return enrolled lands to the original condition they were in when the SHA began.[118] Both HCPs and SHAs, however, do provide major footholds for conservation. Both ensure conservation actions are legally enforceable on the lands they apply to. Given that both apply to private, non-federal lands—where many listed species live—they are also vital to broader landscape conservation goals by drawing private lands into the fold.

B. Federal Public Lands in the Southeast

Federal public lands throughout the Southeast play a key role in landscape conservation, despite making up nowhere near the mass of public lands in the western United States.[119] Managed in part by various agency

115. *Safe Harbor Agreements*, USFWS, https://www.fws.gov/service/safe-harbor-agreements (last visited Apr. 20, 2025).

116. *Id.*

117. MACGOWAN, *supra* note 109, at 5. While there is no set time period for the duration of an SHA, the length is set prior to implementation and must be long enough to achieve "net conservation benefit." *Id.*

118. USFWS, *Safe Harbor Agreements*, *supra* note 115.

119. *See* AM.'S LONGLEAF RESTORATION INITIATIVE, 2023 RANGE-WIDE ACCOMPLISHMENTS, *supra* note 4, at 4 (noting importance of public lands throughout Southeast in advancing conservation of

mandates to provide habitat for species and natural ecosystem functionality, these public lands provide a "core" for conservation efforts regionally. That is, in an effort to protect biodiversity, provide for ecosystem services, and increase resilience to climate change through the protection and restoration of the LLPE, federal public lands provide strongholds from which to build out.

Due to the land use history and decline of longleaf throughout the Southeast, the lands containing intact longleaf forests tend to be publicly held. Whether through federal efforts to purchase deforested, degraded lands and rebuild forest resources, or through acquisition of intact virgin forests, the federal government maintains some of the best examples of extant longleaf forests. Given the importance of (1) having enough land to sustain ecosystem functioning and (2) providing interconnectivity amongst separate areas of habitat, federal public lands provide a focal point for conservation efforts.

1. National Forests

Eastern national forests got off to a slower start than their western cousins. Nationally, executive action created the precursors of modern national forests as "forest reserves."[120] Following these initial forest reserves, legislative action from Congress in the nineteenth century establishing forest reserves was largely limited to the West, where larger blocks of forestland remained intact and held by the United States.[121] Increasing land degradation and growing political concern for conservation, however, led to a push to acquire federally-owned forests in the East.[122] The result was the beginning

longleaf forests); CAROL HARDY VINCENT & LAURA A. HANSON, CONG. RSCH. SERV., R42346, FEDERAL LAND OWNERSHIP: OVERVIEW AND DATA 7–9, 20 (2020) (listing federal public lands acreage by state).

120. WILLIAM E. SHANDS & ROBERT G. HEALY, THE LANDS NOBODY WANTED 10–11 (1977). Forest reserves were public lands withdrawn and designated by the President under the Forest Reserve Act of 1891. *See Our History*, USFS, https://www.fs.usda.gov/learn/our-history (last visited Mar. 27, 2025) (describing the creation of forest reserves).

121. Patterns of settlement throughout the early history of the United States as well as a larger population in the East led to the decline of suitable forestlands in the East. By the advent of the "conservation era" in the late nineteenth century, much of the East's forests had disappeared. SHANDS & HEALY, *supra* note 120, at 9–10. Concern the West would follow the same trends as the East led to the first "forest reserves" action in the West. *Id.* at 10–11.

122. *See generally id.* at 3–17 (describing political developments preceding and establishing eastern national forests).

of federal action to acquire national forests in the East in the early twentieth century.[123]

The Weeks Act of 1911 emerged as the early major piece of legislation governing eastern national forests.[124] Building on the political capital of the decade prior, the Weeks Act gave the federal government the authority to acquire private lands for national forest purposes, particularly for the protection of stream flows.[125] Eastern national forests were not the "pristine" lands protected in the West. Rather, the building of national forests in the East contemplated purchasing poor-quality lands to drive forest acquisition. This was especially true in the aftermath of the Great Depression when farmers were forced to abandon their lands.[126] Over time, a combination of human management and natural functions restored the degraded lands, creating fuller, healthier forests.[127]

Laws governing national forest management reflect the growing trend of "environmental awareness" in management from the late nineteenth century to the present day.[128] One of the earliest relevant laws that provided a management mandate for the Forest Service (USFS) was the Organic Act of 1897. The Organic Act established the two main purposes for those early national forests: "securing favorable conditions of water flows, and to furnish a continuous supply of timber . . . ."[129] In 1960, Congress built on the Organic Act by passing the Multiple Use and Sustained Yield Act, or MUSYA, to provide "national forests are established and shall be administered for

123. Some of those earliest actions included: (1) Congress directing the Secretary of Agriculture to investigate forest conditions in Southern Appalachia in western North Carolina and nearby states in 1900; (2) Secretary (of Agriculture) James Wilson providing a report advocating for the establishment of a Southern Appalachian forest reserve in 1901; (3) Monongahela River flooding in 1907 leading to growing political pressure to establish forests in the East to address land degradation; and (4) West Virginia's legislature passing legislation permitting the United States to purchase lands for its national forest creation in 1909. SHANDS & HEALY, *supra* note 120, at 13–15.

124. Weeks Act of 1911, Pub. L. No. 61-435, 36 Stat. 961, https://www.loc.gov/item/llsl-v36/.

125. *Id.*; Lincoln Bramwell, *1911 Weeks Act: The Legislation that Nationalised the US Forest Service*, 30 J. ENERGY & NAT. RES. L. 325, 333–35 (2012).

126. *Protection and Restoration*, FOREST HIST. SOC'Y, https://foresthistory.org/research-explore/us-forest-service-history/policy-and-law/the-weeks-act/protection-and-restoration/ (last visited Apr. 11, 2025); SHANDS & HEALY, *supra* note 120, at 16.

127. SHANDS & HEALY, *supra* note 120, at 3("Some of this rehabilitation resulted from the federal investment in replanting, fire protection, and timber-stand improvement. Some can be attributed to the remarkable, if brief, efforts of the Civilian Conservation Corps. Most was simply a function of time and nature's healing processes."); JOHN D. LESHY, OUR COMMON GROUND: A HISTORY OF AMERICA'S PUBLIC LAND 343 (2022) ("By 1933, about 4.5 million acres in the East and South had been acquired, much of it cutover land where forests would be restored.").

128. The overall trend to management has been one generally marking the following contours: reservation of forest lands, timber harvesting, environmental consciousness. JOHN D. LESHY ET AL., COGGINS & WILKINSON'S FEDERAL PUBLIC LAND AND NATURAL RESOURCES LAW 711–13 (8th ed. 2022).

129. 16 U.S.C. § 475.

outdoor recreation, range, timber, watershed, and *wildlife and fish purposes*." [130] The additional uses would be "supplemental to" those established by the Organic Act,[131] and national forests would be managed according to principles of multiple use and sustained yield.[132]

Notably, the Multiple Use and Sustained Yield Act's multiple-use mandate broadened the scope of expected management requirements of the USFS beyond timber production.[133] The Multiple Use and Sustained Yield Act required "management of . . . resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people . . . ."[134] Consideration was to be "given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest output."[135]

The National Forest Management Act of 1976, or NFMA, elevated concern for conservation and ecology within the management practice of the USFS.[136] Today, the USFS implements most substantive requirements of the National Forest Management Act through its forest plans.[137] The National Forest Management Act directs the Secretary of Agriculture to "achieve integrated consideration of physical, biological, economic, and other sciences."[138] This provision is a benefit for achieving conservation-oriented management, as national forests have the legal flexibility to engage in ecologically-focused projects. Therefore, though making up a small portion of landmass, southeastern national forests provide flexible laboratories for

130. 16 U.S.C. § 528 (emphasis added).

131. *Id.*

132. *See id.* § 529 ("The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the national forests for multiple use and sustained yield of the several products and services obtained therefrom.").

133. Sandra B. Zellmer & Robert L. Glicksman, *A Critical 21st Century Role for Public Land Management: Conserving 30% of the Nation's Lands and Waters Beyond 2030*, 54 ARIZ. ST. L. J. 1313, 1336 (2022) ("Sustained yields of timber, watershed protection, and other uses listed in MUSYA remain key to forest management, but wildlife conservation and ecological values were elevated in NFMA.").

134. 16 U.S.C. § 531(a).

135. *Id.*

136. Sandra Zellmer et al., *Restoring Beavers to Enhance Ecological Integrity in National Forest Planning*, 33 NAT. RES. & ENV'T 43, 43 (2019) ("NFMA 'requires Forest Service Planners to treat the wildlife resource as a controlling, co-equal factor in forest management and, in particular, as a substantive limitation on timber production.'") (quoting Charles F. Wilkinson & H. Michael Anderson, *Land Use Source Planning in the National Forests*, 64 OR. L. REV. 1, 296 (1985)).

137. Projects authorized by the USFS must comply with the provisions of the national forest's applicable forest plan. LESHY ET AL., *supra* note 128, at 725.

138. 16 U.S.C. § 1604(b).

protecting and enhancing longleaf forests (and others) as a resource.[139] This provides a toehold for expanding the LLPE into surrounding private lands.

Congress has also granted authority to acquire and exchange lands to the USFS.[140] The Weeks Act grants the Secretary of Agriculture general authority to acquire national forest lands for watershed protection and lumber production.[141] Beyond this general power, the USFS may also acquire new lands through more narrow means. The USFS may obtain corridors on non-federal lands to national forests,[142] exchange lands within the boundary of a national forest,[143] and accept donations for national forest purposes.[144] Additional acquisition authority granted by Congress allow for special purpose land acquisitions in addition to the primary authorities of the USFS discussed.[145] Today, the federal government is not actively in the business of purchasing large blocks of non-public lands for incorporation into national forests. Despite this, building on important holdings for various purposes, including for landscape conservation, is still viable under the law. Indeed, the history of eastern national forests makes clear the importance of degraded land acquisition, restoration, and conservation by public land managers.

Due to the historical requirement that southeastern national forests be cobbled together from private lands and donations, the boundaries of eastern national forests often encompass patches of private lands.[146] For consolidated habitat and connectivity throughout the forest to be best realized, land managers either have to constrain or direct private activity or work toward "infill" within the boundaries of the forest.

Regardless, eastern national forests today make up a large portion of federal public lands in the Southeast. In the USFS Southern Region, thirteen states now have national forest lands, with many located in the longleaf

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139. CAROL HARDY VINCENT & LAURA A. HANSON, CONG. RSCH. SERV., R42346, FEDERAL LAND OWNERSHIP: OVERVIEW AND DATA 9–10, 20 (2020) (showing national forest acreage by state). Lavelle et al., *supra* note 3 (describing longleaf pine forest restoration ongoing in Tuskegee National Forest).

140. *See generally*, CAROL HARDY VINCENT ET AL., CONG. RSCH. SERV., RL34273, FEDERAL LAND OWNERSHIP: ACQUISITION AND DISPOSAL AUTHORITIES 6–7 (2023) (describing USFS land acquisition authority).

141. 16 U.S.C. § 515.

142. 43 U.S.C. § 1715(a).

143. *Id.* § 1716(a).

144. Clarke-McNary Act, 16 U.S.C. § 569.

145. CAROL HARDY VINCENT ET AL., CONG. RSCH. SERV., RL34273, FEDERAL LAND OWNERSHIP: ACQUISITION AND DISPOSAL AUTHORITIES 6 (2023) (discussing authority granted to the Secretary of Agriculture to acquire lands for endangered species under ESA § 5, lands within or near designated wilderness areas, Wild and Scenic River corridors, and segments of designated National Trails).

146. *See* SHANDS & HEALY, *supra* note 120, at 13–18 (describing process of stitching together eastern national forests).

forest's historical range.[147] National forest management for environmental benefits means that forest planning and resulting regulations offer serious opportunities for conservation.

2. National Wildlife Refuges

The history of the National Wildlife Refuge System (NWRS) is long and winding. The NWRS grew from the broader conservation movement of the early twentieth century.[148] President Theodore Roosevelt established the very first unit of what would become the NWRS at Pelican Island in Florida.[149] From that time, special designations of public lands for wildlife grew; however, these designations were not very coordinated until the 1930s. Reflecting modern science of the era, policy during the Franklin D. Roosevelt Administration "shifted from the Pelican Island-era concern of protecting a few rich sites of wildlife habitat to maintaining a series of connected, stepping-stone habitats that birds could use in their migrations."[150] During this time, President Franklin D. Roosevelt issued a proclamation to reflect this change: in 1940, the various units were given the common title of national wildlife refuges.[151]

Inspired by the growing environmental movement and scientific developments, Congress adopted a management scheme for the wildlife refuges in the 1960s, in part to help endangered species recover.[152]

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147. The Southern region (defined as the states of Virginia, North Carolina, South Carolina, Tennessee, Kentucky, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Oklahoma and Texas) contains 30 national forests. Those are, by state, Sam Houston (Tex.); Davy Crockett (Tex.); Angelina (Tex.); Sabine (Tex.); Ouachita (Ark. & Okla.); Ozark-St. Francis (Ark.); Holly Springs (Miss.); Delta (Miss.); Tombigbee (Miss.); Bienville (Miss.); Homochitto (Miss.); De Soto (Miss.); Kisatchie (La.); William B. Bankhead (Ala.); Talladega (Ala.); Tuskegee (Ala.); Conecuh (Ala.); Apalachicola (Fla.); Osceola (Fla.); Ocala (Fla.); Chattahoochee-Oconee (Ga.); Francis Marion and Sumter (S.C.); Cherokee (Tenn.); Nantahala (N.C.); Pisgah (N.C.); Uwharrie (N.C.); Croatan (N.C.); George Washington and Jefferson (Va. & Ky.); Daniel Boone (Ky.); Land Between the Lakes (Ky. & Tenn.). *Southern Region*, U.S. FOREST SERV., https://www.fs.usda.gov/r08 (last visited May 1, 2025).

148. Robert L. Fischman, *The Significance of National Wildlife Refuges in the Development of U.S. Conservation Policy*, 21 J. LAND USE 1, 10–11 (2005).

149. *Pelican Island Nation Wildlife Refuge*, USFWS, https://www.fws.gov/refuge/pelican-island (last visited Apr. 7, 2025) ("[I]n 1903, President Theodore Roosevelt's executive order designated the island as the nation's first national wildlife refuge for the protection of nesting birds.").

150. Fischman, *supra* note 148, at 11–12.

151. *Id.* at 12 & n.65 (citing Proclamation No. 2416, 5 Fed. Reg. 2677 (July 30, 1940), and in 54 Stat. 2717 (1940)).

152. *Id.* at 12–13; *see also id.* at 14 (showing that one major benefit of the era's science-driven legal and policy reforms was the introduction and application of island biogeography theory to wildlife refuge management). No matter how important the isolated habitat protected was, or how the refuge itself was managed, species would still have threats without linkage between refuge habitat and other habitat lands. *Id.*

Throughout the 1970s and 1980s, management schemes on the wildlife refuges lagged behind the updates to other federal public lands, and uses incompatible with the protection of wildlife abounded.[153] Congress alleviated frustrations with management by passing the National Wildlife System Refuge Improvement Act (Refuge Improvement Act) in 1997.[154] The Refuge Improvement Act transformed the management ability for the nation's wildlife refuges, giving a clear, shared mandate of managing the refuges for the benefit of wildlife.[155]

Today, the USFWS has a clear dominant-use policy directing the agency to manage the NWRS for conservation purposes. The Refuge Improvement Act "gave the [US]FWS a clear-cut . . . conservation mission, prioritized wildlife-dependent recreation among permitted uses, mandated comprehensive conservation planning, and established a progressive ecological management standard."[156] As a part of this mission, the Refuge Improvement Act also included the sweeping requirement that "the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans . . . ."[157] Since passage of the Refuge Improvement Act, the USFWS implemented this mandate to focus on scientific management, including through policy recognizing fragmentation as undesirable for promoting wildlife health and requiring managers to focus on external threats to refuges.[158]

Acquiring additional NWRS lands is possible through a variety of legal mechanisms. The major lever for acquisition is the Migratory Bird Conservation Act of 1929.[159] This Act establishes a process in which the Secretary of the Interior may recommend certain lands "necessary for the conservation of migratory birds" to a commission after consultation with

153. Fischman, *supra* note 148, at 15–16.

154. *Id.* at 16.

155. *Id.*

156. Keiter, *Toward a National Conservation Act*, *supra* note 66, at 71 (quoting 16 U.S.C. § 668dd(a)(4)(B)).

157. 16 U.S.C. § 668dd(a)(4)(B). Scholars describe this mandate as "the most ecological standard in all of U.S. public land law." Fischman, *supra* note 148, at 17.

158. *See* Fishman, *supra* note 148, at 17 (citing Final Compatibility Policy Pursuant to the National Wildlife Refuge System Improvement Act of 1997, 65 Fed. Reg. 62,484, 62,486 (U.S. Fish & Wildlife Serv. Oct. 18, 2000) ("[A] 2000 Service policy finds incompatible those uses that reasonably may be anticipated to cause habitat fragmentation.")); *see also id.* at 18 (citing Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. 3,810, 3,811 (USFWS Jan. 16, 2001) ("External threats are those sources of degradation that originate from actions that occur outside of the refuge boundary.")).

159. *See generally* CAROL HARDY VINCENT ET AL., CONG. RSCH. SERV., RL 34273, FEDERAL LAND OWNERSHIP: ACQUISITION AND DISPOSAL AUTHORITIES 7 (2023) (discussing USFWS land acquisition authority).

state and local government officials.[160] If the state has enacted a consent statute approving federal acquisition, the Secretary may then acquire these conservation lands.[161] Much like the USFS, the USFWS may also acquire lands through donation.[162] Acquisition authority is frequently utilized thanks to the funding provided expressly to expand migratory bird refuges. The Migratory Bird Conservation Fund, established by the Migratory Bird and Conservation Stamp Act (commonly referred to as the Duck Stamp Act), has provided funding for the "location, ascertainment, and acquisition of suitable areas for migratory bird refuges," through the sale of Duck Stamps and taxes on ammunition and arms.[163] These authorities enable the NWRS to maintain its goals by targeting valuable habitats for wildlife, increasing connectivity across an entire region or landscape.

The main drawback of the NWRS is its small size. The NWRS lacks the large footprint of other public lands systems and receives "the smallest per acre appropriations."[164] Further, individual units were created in response to crises and external factors, leading to a somewhat haphazard formation of the system as a whole.[165]

The uniqueness of the NWRS, however, is also its greatest strength—a robust ecologically focused management mandate. The ability to advance wildlife conservation makes NWRS units important factors for landscape conservation. USFWS policies not only require the refuges to be managed in an ecologically sound manner, but also that refuge managers examine how their refuge fits into conservation efforts at a broader scale.[166] Steady funding (through the Duck Stamp Act) and proactive focus on wildlife conservation efforts make expansion of the NWRS more probable than in other federal land systems. Today, 17 units of the NWRS are within the LLPE.[167]

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160. 16 U.S.C. §§ 715a, 715c.

161. *See id.* § 715f ("No deed or instrument of conveyance in fee shall be accepted by the Secretary of the Interior under this subchapter unless the State in which the area lies shall have consented by law to the acquisition.").

162. *Id.* § 715d.

163. *Id.* § 718d(b)(2); CAROL HARDY VINCENT ET AL., CONG. RSCH. SERV., RL 34273, FEDERAL LAND OWNERSHIP: ACQUISITION AND DISPOSAL AUTHORITIES 7 (2023) (quoting 16 U.S.C. § 718(b)).

164. Fischman, *supra* note 148, at 2.

165. *Id.* at 3 ("Units were created in response to crises, personal preferences of high-ranking officials (and legislators), funding availability, social program priorities, donations, and, of course, wildlife needs.").

166. The managing directive of USFWS with the NWRS is that "nature reserves need to be interconnected" and the "mission of the refuge system" is "to serve as a 'national network' of lands and waters to sustain plants and animals." *Id.* at 16.

167. The national wildlife refuges (NWRs) in the historic range of the LLPE include the following units: Caddo Lake, Cameron Prairie, Mountain Longleaf, St. Marks, Lower Suwannee, Merritt Island, Okefenokee, Harris Neck, Savannah, Ernest F. Hollings Ace Basin, Santee, Waccamaw, Carolina Sandhills, Pee Dee, Cedar Island, Swanquarter, and Alligator River. *National Wildlife Refuge System*,

3. Defense Installations

Many of the Department of Defense (DoD) installations in the Southeast were established as military training bases around the outbreaks of World Wars I and II.[168] The government often sited installation locations for their unique geographic characteristics to best train for military operations.[169] From the start, the national defense interests of the installations were intimately tied to the local landscapes. The South was found particularly desirable for sparsely populated areas unlikely to be as negatively impacted by military operations.[170] The federal government purchased private lands, often cheaply, from local landowners to create these installations.[171]

Though not often considered bastions of conservation, military installations—particularly in the Southeast—provide some of the best-protected habitats across the landscape. For example, one critically

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U.S. FISH & WILDLIFE SERV., https://www.fws.gov/program/national-wildlife-refuge-system (last visited May 1, 2025).

168. *See, e.g.*, *Fort Stewart*, MILITARY ONESOURCE, https://installations.militaryonesource.mil/in-depth-overview/fort-stewart (last visited Apr. 7, 2025) ("Fort Stewart traces its history back to November 1940, when the Anti-Aircraft Artillery Training Center was officially designated as Camp Stewart . . . . "); *History*, U.S. ARMY FORT EISENHOWER, (last visited Apr. 7, 2025) ("Camp Gordon [the original designation for Fort Eisenhower], named for Confederate Lieutenant General John Brown Gordon, was activated for infantry and armor training during World War II."); *Fort Liberty History*, U.S. ARMY FORT LIBERTY, https://web.archive.org/web/20230827101733/https://home.army.mil/liberty/about/fort-liberty-history (last visited Apr. 7, 2025) ("Consequently, Camp Bragg came into existence on Sept. 4, 1918 as an artillery training center."); Beryl I. Diamond, *Fort Moore*, NEW GA. ENCYCLOPEDIA, https://www.georgiaencyclopedia.org/articles/government-politics/fort-moore/ (Sept. 21, 2023) ("At the entry of the United States into World War I (1917–18), government officials recognized that Fort Sill was not large enough to accommodate the training of both the infantry and the artillery units housed there. . . . Because of its climate, terrain, and transportation outlets, Columbus, Georgia, was chosen to house the new school.").

169. *Fort Liberty History*, *supra* note 168 ("In 1918, the Chief of Field Artillery General William J. Snow, seeking an area with suitable terrain, adequate water, rail facilities, access to a port (via Lower Little River), low population density and a climate for year-round training, decided the area now known as Fort Liberty met all the desired criteria.").

170. *Id.*

171. Fort Bragg provides an example:

> At the beginning of World War I, only 7% of the land was occupied. The population consisted of approximately 170 landowners and several hundred tenant farmers. The War Department began purchasing the lands in 1918 and continued until 1923, for the initial 50,000 acres. Some lands were leased prior to purchasing. During the first year of its existence, $6 million was spent in purchasing land, and any structures on the parcels, and erecting cantonments for six artillery brigades.

Id. Fort Moore's story is similar. *A Brief History of Fort Benning*, U.S. U.S. ARMY FORT BENNING, https://www.benning.army.mil/infantry/magazine/issues/2018/JUL-SEP/PDF/12)BenningHistory_txt.pdf (last visited Apr. 7, 2025) ("Since the Bussey Plantation satisfied his requirements, [COL Henry E.] Eames sought—and obtained—War Department approval to locate the boundaries of the reservation practically as he chose. Action then began to acquire the property, including the large frame house which now serves as the home of the commanding general.").

endangered butterfly species, the St. Francis' Satyr Butterfly (*Neonympha mitchellii francisci*) is found exclusively within the bounds of Fort Bragg (formerly Fort Liberty)[172] in North Carolina, in part due to the preservation of natural characteristics.[173] Thanks to a marriage of goals that serve both national defense and conservation concerns, these lands perform an outsized role in longleaf forest conservation.

Legally, conservation management on DoD lands is largely carried out by the Sikes Act.[174] The Sikes Act requires DoD "to provide for the conservation and rehabilitation of natural resources on military reservations" through the preparation of an Integrated Natural Resource Management Plan for their installations.[175] These resource plans are prepared in coordination with USFWS and state wildlife agencies, and solidify actions to benefit ecosystem enhancement and military operations.[176] Each Integrated Natural Resource Management Plan is evaluated through an in-depth review by the federal and state wildlife management agencies at least once every five years.[177] Although subordinated to national security and military training when in conflict, these plans place affirmative requirements for conservation on applicable DoD installations.[178]

The DoD is also a partner in the Sentinel Landscapes Program.[179] Founded in 2013 through a partnership of the Department of Agriculture (USDA), DoD, and Department of the Interior, the Sentinel Landscapes Program mirrors the goals of Integrated Natural Resource Management Plans—blending military and conservation priorities in a strategic plan.[180]

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172. The North Carolina fort now called Fort Bragg, was originally named for a Confederate general Braxton Bragg. The fort was renamed to Fort Liberty in 2023 before being renamed again as Fort Bragg, this time for Private Roland L. Bragg in early 2025. Chris Cameron, *Fort Liberty Renamed Fort Bragg, Fulfilling a Trump Campaign Promise*, N.Y. TIMES (Mar. 7, 2025), https://www.nytimes.com/2025/03/07/us/politics/fort-liberty-renamed-bragg.html.

173. *Saint Francis' Satyr Butterfly*, USFWS, https://fws.gov/species/saint-francis-satyr-butterfly-neonympha-mitchellii-francisci (last visited Apr. 21, 2025).

174. 16 U.S.C. § 670a.

175. Keiter, *Toward a National Conservation Act*, *supra* note 66, at 82.

176. *Military Lands Conservation*, USFWS, https://www.fws.gov/program/military-lands-conservation/what-we-do (last visited Apr. 7, 2025); *Integrated Natural Resources Management Plans (INRMPs)*, USFWS, https://www.fws.gov/service/integrated-natural-resources-management-plans-inrmps (last visited Apr. 7, 2025).

177. *Integrated Natural Resources Management Plans (INRMPs)*, USFWS, https://www.fws.gov/service/integrated-natural-resources-management-plans-inrmps (last visited Apr. 7, 2025).

178. *See* 16 U.S.C. § 670a(b) (providing for various wildlife and natural resource protections).

179. Congress codified the program in statute at 10 U.S.C. § 2693.

180. *The Sentinel Landscapes Partnership*, USDA, DOD & DOI, https://sentinellandscapes.org/ (last visited Apr. 6, 2025) ("[T]he partnership aligns the objectives of the U.S. Department of Agriculture, Department of Defense, and Department of the Interior to strengthen military readiness, conserve natural resources, bolster agricultural and forestry economies, increase public access to outdoor recreation, and enhance landscape resilience.").

Focused on providing "[n]atural open space and sustainably managed working lands used for farming, ranching and forestry," the Sentinel Landscapes Program provides economic opportunity, conservation achievements, and critical buffers for military activity on bases.[181]

Both programs provide strategic advantages for conservation of the LLPE. With their focus on conservation management of DoD lands, Integrated Natural Resource Management Plans help military bases provide core habitat in otherwise highly impacted landscapes. The relative lack of land development lends DoD installations high utility for imperiled species and ecosystems. The Sentinel Landscapes Program builds on those core DoD lands by putting into place buffers and helping to provide potential connections between the base and surrounding pockets of habitat across the landscape.

C. Farm Bill and USDA Programs

A majority of direct conservation action by the federal government on private lands is done through implementing Farm Bill-funded voluntary USDA programs.[182] The Farm Bill USDA programs are direct, voluntary incentives that require a private landowner to seek assistance.[183] These types of programs, often informally referred to as "carrot" approaches, contrast the "sticks" most traditional environmental regulatory schemes impose. The USDA's Natural Resource Conservation Service (NRCS) administers a majority of these programs, with a few handled by the Farm Service Agency.[184] Congress passed the most recent Farm Bill in 2018,[185] and extended its provisions most recently in 2024.[186]

Justifications for voluntary conservation programs, like those in the Farm Bill, include proactive management to avoid regulatory expectations and the necessity of bringing private lands into the conservation fold. USDA generally favors advancing voluntary practices to address environmental ills

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181. *Landscapes*, USDA, DOD & DOI, https://sentinellandscapes.org/landscapes/ (last visited Feb. 21, 2024).

182. Arthur Middleton et al., *The Role of Private Lands in Conserving Yellowstone's Wildlife in the Twenty-First Century*, 22 WYO. L. REV. 237, 282–83 (2022) ("Most of the federal government's human and financial capacity to deliver voluntary conservation on private lands sits in the U.S. Department of Agriculture (USDA), and is authorized and funded through the Farm Bill, an omnibus piece of legislation that Congress updates every four to six years, most recently through the Agriculture Improvement Act of 2018.").

183. *Id.* at 282–83.

184. *Id.* at 283.

185. Agriculture Improvement Act of 2018, Pub. L. 115-334, 132 Stat. 4490 (2018).

186. American Relief Act, 2025, Pub. L. 118-158, 138 Stat. 1722; *Farm Bill Home*, FARM SERV. AGENCY, U.S. DEP'T OF AG., https://www.fsa.usda.gov/tools/informational/farm-bill (last visited May 1, 2025).

without the involvement of traditional regulatory schemes.[187] Farm Bill programs can be divided into roughly five categories based on their goals and methods of implementing conservation. These categories, explained in greater detail below, include (1) technical assistance, (2) working lands programs, (3) land retirement programs, (4) easements, and (5) other programs targeting specific conservation goals.

1. Conservation Technical Assistance

The first category of Farm Bill incentives is the provision of technical assistance.[188] Conservation technical assistance is agency aid provided to farmers, ranchers, and forestland owners who opt to conserve and restore parts of their lands.[189] Landowners opting into the program work with the NRCS to create a conservation plan and apply for funding to install and carry out that plan.[190] Many uses qualify landowners to receive conservation technical assistance.[191] Most purposes supported by technical assistance would help support landscape conservation practices by enhancing ecological functioning and providing additional wildlife habitat on private lands.

2. Working Lands

The second category of Farm Bill incentives are working lands conservation programs, which allow a qualifying landowner to continue using lands while also engaging in conservation.[192] Landowners qualifying for these programs receive the conservation planning and technical assistance

187. *See* MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 16 (2019) (explaining the rationale for voluntary conservation practices).

188. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, §§ 2502, 2821(e), 132 Stat. 4579, 4603 (2018) (codified at 16 U.S.C. § 3842).

189. *Conservation Technical Assistance*, NRCS, https://www.nrcs.usda.gov/getting-assistance/conservation-technical-assistance (last visited Feb. 14, 2024).

190. *Id.*

191. Qualifying purposes include the following: reduction of soil loss from erosion; solving soil, water quality, water conservation, air quality, and agricultural waste management problems; reduction of potential damage caused by excess water and sedimentation or drought; enhancement of fish and wildlife habitat; improvement of long-term land sustainability; and assisting others in facilitating changes to land use to protect natural resources and sustainability values. FISCAL YEAR 2009 EXPLANATORY NOTES, NAT. RES. CONSERVATION SERV. 18-2 (2008).

192. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 5 (2019).

described above, while also receiving financial support from the federal government to engage in affirmative conservation agreed to in contract.[193]

The landscape conservation benefits of working lands programs flow from decreasing the negative effects of land use. Tempering negative impacts to the land helps reduce fragmentation and enables the land to provide functional wildlife habitat. Working lands programs do not prevent landowners from engaging in activities that may adversely impact healthy, intact longleaf forests. The ability to obtain federal funds while continuing use of land for agricultural or forestry purposes in these programs does, however, have potential to draw more private landowners into the conservation fold. By tailoring conservation goals with the needs of a particular landowner, working lands programs can create new opportunities to link and expand conservation across a region by meeting landowners where they are.

The two major working lands programs are the Environmental Quality Incentives Program and the Conservation Stewardship Program. The Environmental Quality Incentives Program,[194] or EQIP, allows landowners who utilize working lands to enter contractual plans with the government to alleviate environmental problems arising from working uses of the land.[195] This program provides financial and technical assistance for implementing mitigation practices approved by USDA and is legally enforceable.[196]

The Conservation Stewardship Program,[197] or CSP, is more proactive than the Environmental Quality Incentives Program. It provides financial and technical assistance to qualified landowners to not only maintain conditions on their land but to improve conservation and adopt additional conservation-minded activities.[198] For a contract to be approved, activities required of the landowner in the Conservation Stewardship Program must "meet or exceed a stewardship threshold" for identified resource concerns on the land.[199] In its current form, the Conservation Stewardship Program enrollment may be

193. For example, a rancher may receive funding to vegetate and maintain a riparian buffer around streams utilized by their cattle. *See id.* (describing funds for the installation and maintenance of conservation-friendly management practices).

194. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle C, §§ 2301–2306, 132 Stat. 4555 (2018) (codified at 16 U.S.C. 3939aa *et seq.*).

195. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 6 (2019).

196. *Id.*

197. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle C, §§ 2301, 2308, 132 Stat. 4551, 4565 (codified at 16 U.S.C. § 3839aa-22).

198. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 6 (2019).

199. *Id.*

renewed, but contract renewal requires landowners to complete new applications to continue after their initial participation period lapses.[200]

3. Land Retirement

The third type of Farm Bill incentives are land retirement programs, which authorize USDA to pay private landowners to retire their lands and allow recovery from resource-intensive use.[201] These initiatives depart from the goals of working lands programs by focusing on land use changes, as opposed to mitigation or conservation activity alongside continuing land use.

Land retirement programs go a step further than working lands programs by expressly requiring less consumptive uses to advance conservation on enrolled lands.[202] While these actions are temporary, the opportunity for re-enrollment and the affirmative actions of landowners to create habitat and improve environmental quality help to provide valuable linkages across the landscape on private lands.

The Conservation Reserve Program,[203] or CRP, provides funds to landowners to remove lands from production for a set period, typically ten to fifteen years.[204] The goals of removing lands from production are to improve water quality, reduce erosion, and preserve wildlife habitat.[205] The program represents a major, longstanding player in the land retirement programs carried out by USDA agencies.[206] Enrollment is divided into three options: General, Grassland, and Continuous—each with its own process for acceptance.[207]

The Conservation Reserve Enhancement Program,[208] or CREP, is an adjunct program to the Conservation Reserve Program. The Conservation

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200. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 6 (2019).

201. *Id.* at 2.

202. *Id.*

203. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle B, § 2201, 132 Stat. 4530 (2018) (codified at 16 U.S.C. § 3831).

204. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 2 (2019).

205. *Id.*

206. CRP was originally authorized by the 1985 Farm Bill and has been a staple since. *Id.*

207. *See id.* at 2–4 ("General enrollment provides an opportunity for landowners to enroll in CRP through a nationwide competition during a specific period of time. Continuous enrollment is designed to enroll the most environmentally desirable land into CRP through specific conservation practices or resource needs. Unlike general enrollment, under continuous enrollment, land is typically enrolled at any time and is not subject to competitive bidding."); *Conservation Reserve Program*, FARM SERV. AGENCY, https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index (last visited Apr. 14, 2025).

208. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle B, § 2202, 132 Stat. 4534 (2018) (codified at 16 U.S.C. § 3831a).

Reserve Enhancement Program authorizes USDA to enter agreements with states and non-governmental organizations targeting project areas with continuous enrollment contracts.[209] This program's purpose is to prioritize conservation on particularly valuable lands by using greater incentives than most other Conservation Reserve Program-enrolled landowners receive.[210]

Additional programs exist for more specialized circumstances, and, in some cases, may be utilized concurrently with the Conservation Reserve Program.[211] First is the Farmable Wetlands Program.[212] This program works within the Conservation Reserve Program to enroll farmable wetlands or wetlands that have been converted into farmlands to be retired in exchange for financial incentives.[213] Second is CLEAR30,[214] which is devoted to enrolling Conservation Reserve Program lands into thirty-year contracts that work to protect and improve water quality.[215] Lastly is the Soil Health and Income Protection Pilot,[216] which is a pilot program designed to remove impacted farmlands from production in favor of planting cover crops.[217] Each of these programs has likely limited application to restoration and protection of the LLPE, but in special cases may be combined with traditional Conservation Reserve Program enrollment to further incentivize conservation activity for qualifying landowners.

4. Easements

Easement programs are the fourth type of Farm Bill incentives and can be powerful tools for conservation.[218] A conservation easement, the type of

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209. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 4 (2019).

210. *Id.*

211. *Id.* at 4–5 (describing other specific programs exist under the CRP).

212. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle B, § 2203, 132 Stat. 4538 (2018) (codified at 16 U.S.C. § 3831b).

213. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 4 (2019).

214. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle B, § 2204, 132 Stat. 4538 (2018) (codified at 16 U.S.C. § 3831c).

215. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 5 (2019).

216. Agriculture Improvement Act of 2018, Pub. L. 115-334,title II, subtitle B, § 2204, 132 Stat. 4538 (2018) (codified at 16 U.S.C. § 3831c).

217. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 5 (2019).

218. Sarah A. Brown et al., *Conservation Easements: A Tool for Preserving Wildlife Habitat on Private Lands*, WILDLIFE SOC. BULLETIN, June 2023, at 1, 2 ("In the United States, there is an important role for private land conservation particularly in the eastern states, where a significant portion of land is privately owned. . . . Conservation easements are one mechanism for protecting private lands."); *cf.* Middleton et al., *supra* note 182, at 288 ("While easements are certainly important in limiting habitat loss, other tools are better suited to promoting specific management practices.").

easement discussed here, is an agreement between a landowner and an approved easement holder in which the landowner agrees to certain restrictions on land use.[219] Conservation easement agreement restrictions are permanent and may be enforced in perpetuity, including against a subsequent landowner.[220] The purpose of imposing these restrictions is to limit activity that would degrade the health of the land, thus providing conservation benefits to the public.[221] In exchange for imposing restrictions, a landowner typically receives an incentive, usually in the form of tax benefits. [222]

Farm Bill easement programs leverage federal funding to provide additional incentives to implement a conservation easement.[223] If leveraged to target ideal lands, conservation easements can bring high-value habitat on private lands into the regional conservation fold. A potential concern, however, is that easements must be carefully drafted to maintain adaptive management and flexibility for conservation over time.[224]

The Agricultural Conservation Easements Program,[225] or ACEP, is an agriculturally-focused easement program funded by the Farm Bill.[226] The Agricultural Conservation Easements Program provides financial and technical assistance for two types of easements.[227] The first type of easements are agricultural land easements. [228] These easements restrict land to agricultural use, thus preventing more intensive land uses.[229] Second, are wetland reserve easements,[230] meant to restore wetlands impacted by farming

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219. Brown et al., *supra* note 218, at 1, 2.

220. *Id.* at 2.

221. *Id.* at 3.

222. *Id.* at 2, 4. *See also* 26 U.S.C. § 170(b)(1)(E) (describing statutory requirements for federal tax deductions for qualified conservation contributions, e.g., conservation easements).

223. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 8 (2019) ("Easement programs impose a permanent land-use restriction that is voluntarily placed on the land in exchange for a government payment.").

224. Middleton et al., *supra* note 182, at 288 ("The benefits of conservation easements to wildlife should be considered in the context of the specific terms of individual easements, but the range of terms and specificity in agreements makes any comprehensive assessment challenging at this time.").

225. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle F, §§ 2601–2605, 132 Stat. 4585 (2018).

226. Additional funds were provided by the 2021 Inflation Reduction Act. *See Agricultural Conservation Easement Program*, NRCS, https://www.nrcs.usda.gov/programs-initiatives/acep-agricultural-conservation-easement-program (last visited Apr. 14, 2025).

227. *Id.*

228. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle F, § 2603, 132 Stat. 4586 (2018) (codified at 16 U.S.C. § 3865b).

229. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 8 (2019)

230. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle F, § 2604, 132 Stat. 4589 (2018) (codified at 16 U.S.C. § 3865c).

activity.[231] Both private and tribal lands may be enrolled in the Agricultural Conservation Easements Program.[232]

The Healthy Forests Reserve Program,[233] or HFRP, is a USDA program administered by the NRCS. The Healthy Forests Reserve Program allows private and tribal land enrollment in contractual periods, temporary easements, or traditional permanent conservation easements to protect and enhance forest ecosystems.[234] In addition to financial incentives, these programs may also provide some regulatory certainty around ESA regulations and restrictions, much like SHAs.[235]

5. Other Programs

A final set of Farm Bill programs targeting narrower conservation goals, such as conservation of a given species or a particular type of ecosystem, are also available. The Regional Conservation Partnership Program,[236] or RCPP, "is a partner-driven approach to conservation that funds solutions to natural resource challenges on agricultural land."[237] By aligning interests between public and private entities, the Regional Conservation Partnership Program funds direct conservation activities by farmers, ranchers, and forest landowners through land management practices, land rentals, and easements.[238] Funding is divided evenly between two pools: state or multistate projects, and critical conservation areas.[239] Designated critical conservation areas have particular utility in advancing landscape conservation activity by leveraging planning at a regional scale, which pursues goals at a larger scale than any individual conservation project.[240]

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231. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 8 (2019).

232. NRCS, *Agricultural Conservation Easement Program*, *supra* note 226.

233. Agriculture Improvement Act of 2018, Pub. L. 115-334, title VIII, § 8407(a)(1), 132 Stat. 4845 (2018) (codified at 16 U.S.C. § 6571).

234. *See Healthy Forests Reserve Program*, NRCS, https://www.nrcs.usda.gov/programs-initiatives/hfrp-healthy-forests-reserve-program (last visited Apr. 14, 2025) ("HFRP provides landowners with 10-year restoration agreements and 30-year or permanent easements for specific conservation actions. For acreage owned by an American Indian tribe, there is an additional enrollment option of a 30-year contract.").

235. *Id.* ("Some landowners may avoid regulatory restrictions under the Endangered Species Act by restoring or improving habitat on their land for a specified period of time.").

236. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle G, §§ 2701–07, 132 Stat. 4592 (2018) (codified at 16 U.S.C. § 3871 *et seq*.).

237. *Regional Conservation Partnership Program*, NRCS, https://www.nrcs.usda.gov/programs-initiatives/rcpp-regional-conservation-partnership-program (last visited Apr. 14, 2025).

238. *Id.*

239. *Id.*

240. *Id.*

The Working Lands for Wildlife (WLFW) is a framework for NRCS partners and other entities, especially the USFWS, to work with private landowners to preserve habitat for imperiled species.[241] USDA developed the WLFW program as an expansion of the Sage Grouse Initiative, created to protect greater sage grouse habitat and prevent the species' listing.[242] Species protected in this program tend to be listed species, but may also be those in danger of listing.[243] Landowners voluntarily partner under this program and agree to make and maintain habitat improvements on their land through NRCS conservation programs.[244] Agreements under WLFW typically last for fifteen to thirty years and provide some of the same regulatory security as SHAs do.[245]

IV. ACTIONS TAKEN TOWARD CONSERVATION OF THE LONGLEAF PINE ECOSYSTEM

Conservation activities across the Southeast have been essential to ensuring the overall health and longevity of the LLPE. Since the historic decline in acreage of longleaf pine forests across the LLPE around the late 1990s, restoration and protection activities have been vital in reversing the downward trend.[246] Today, nearly 5.2 million acres of longleaf forest exist across the southeastern United States.[247]

Legal mechanisms and opportunities serve to further conservation efforts of the LLPE, both as a backstop and as tools to achieve further conservation across the landscape. Nearly all of the federal legal mechanisms discussed have been leveraged to increase the reach of conservation efforts across the LLPE. Whether to increase habitat for the species, provide for ecosystem functioning, or simply enhance the direct benefits the landowner derives from the land, longleaf pine forest conservation efforts appear to have

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241. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 16 (2019); *Working Lands for Wildlife*, NRCS, https://www.nrcs.usda.gov/programs-initiatives/working-lands-for-wildlife (last visited Apr. 22, 2025). The WLFW program was codified in the 2018 Farm Bill. Agriculture Improvement Act of 2018, Pub. L. 115-334, title II, subtitle D, § 2407, 132 Stat. 4573 (2018) (codified at 16 U.S.C. § 1531).

242. Middleton et al., *supra* note 182, at 293.

243. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 16 (2019).

244. SUPPORTING AMERICA'S WORKING LANDS, NRCS 9 (2021), https://www.nrcs.usda.gov/sites/default/files/2022-10/FINAL_WLFW_March_10-2021_0.pdf.

245. MEGAN STUBBS, CONG. RSCH. SERV., R45698, AGRICULTURAL CONSERVATION IN THE 2018 FARM BILL 16 & n.25 (2019).

246. *See generally* AM.'S LONGLEAF RESTORATION INITIATIVE, 2023 RANGE-WIDE ACCOMPLISHMENTS, *supra* note 4 and accompanying text.

247. THE NATURE CONSERVANCY, *supra* note 6.

reversed the decline of this unique ecosystem.[248] This Part considers conservation actions accomplished across the LLPE with identified tools before turning to future considerations in the conclusion.

A. Public Lands & Longleaf Pine Forest: Providing Core Lands in Landscape Network

Public lands across the Southeast provide an incredible opportunity to advance LLPE landscape conservation. First, public lands are important banks for existing longleaf forests. An estimated 37% of extant longleaf forests are located on either federal or state public lands.[249] Advancing conservation throughout southeastern federal public lands has created a "core lands" function and strongholds of viable habitat.[250] That is, these public lands provide "islands" of functioning longleaf forest, making up the center of a push to expand efforts and restore the landscape. Though these public lands are often somewhat fragmented themselves, agencies and their 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 the establishment of conservation easements through public or private efforts."[251]

Second, there are many management opportunities to promote ecosystem values and conservation activity on public lands.[252] Federal agencies in the Southeast have favored restoration-oriented activities on public lands to further their land-use goals.[253] For example, the DoD has many landholdings within the historic LLPE range, including Eglin Air Force Base in Florida.[254]

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248. *See generally* AM.'S LONGLEAF RESTORATION INITIATIVE, 2023 RANGE-WIDE ACCOMPLISHMENTS, *supra* note 4 and accompanying text.

249. AM.'S LONGLEAF RESTORATION INITIATIVE, RANGE-WIDE CONSERVATION PLAN, *supra* note 33, at 12.

250. *Id.* at 12–13.

251. *Id.* at 13.

252. *See, e.g.*, Jeff M. Matthews et al., *Restoration of Longleaf Pine in the Southern Region of the U.S. Forest Service: An Overview of the Million-Acre Challenge* in PROCEEDINGS OF THE 20TH BIENNIAL SOUTHERN SILVICULTURAL RESEARCH CONFERENCE 114–17 (Don C. Bragg et al. eds., 2020), https://www.fs.usda.gov/research/treesearch/61574 (describing the "Million Acre Challenge" of the USFS to restore an additional million acres of longleaf forest).

253. BROCKWAY ET AL., *supra* note 24, at 22 ("Restoration activities are taking place on almost all other Federal and State lands that have longleaf pine or sites suitable for its establishment.").

254. *See Operation Reforest: Restoring Eglin Air Force Base*, ARBOR DAY FOUND. (Feb. 12, 2025), https://www.arborday.org/perspectives/operation-reforest-restoring-eglin-air-force-base ("Eglin is the largest Air Force base in the world, spanning nearly 500,000 acres of the Florida Panhandle — roughly half of which is covered by diverse and ancient forest lands. In fact, Eglin houses the world's largest contiguous acreage of old-growth longleaf pine, which was once the primary tree species found across more than 80 million acres in the southeastern United States. Today, those trees cover less than

Today, use of the land for military training operations is mutually beneficial, as frequent fires from those operations maintains necessary conditions for mature longleaf pine.[255] However, the Base also contained a large area of forest that had developed a hardwood midstory.[256] Beginning in 1993, land managers on the Base began an intensive restoration program on that portion of land, utilizing not only fire, but also mechanical and herbicidal treatments to restore the landscape to longleaf forest.[257]

These two benefits flow from the management responsibilities and authorities of public land management agencies. The qualities of public lands generally, regardless of management agency, tend to provide more accommodating opportunities for longleaf forest conservation than private lands.[258] The management mandates of these agencies provide flexibility in advancing conservation. For example, the most recent forest plan of the Francis Marion National Forest in South Carolina includes provisions for ecosystem protection and restoration, with an eye to longleaf forest within the national forest.[259]

Serious conservation action has also been completed through federal agency collaboration. One major action to advance LLPE conservation was in a Memorandum of Understanding between DoD, USDA, and Department of the Interior.[260] This agreement affirmed the commitment of these executive departments to advance longleaf conservation,[261] while also establishing a "Federal Coordinating Committee" to coordinate activity amongst the departments.[262] The Memorandum commits the departments and

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two million acres."); W.D. Boyer, *Longleaf Pine*, USFS, https://www.srs.fs.usda.gov/pubs/misc/ag_654/volume_1/pinus/palustris.htm (showing natural range of longleaf pine).

255. BROCKWAY ET AL., *supra* note 24, at 22.

256. *Id.*

257. *Id.*

258. Public land managers have greater ability to engage in prescribed fire and management that allows longleaf to reach maturity at forty to fifty years. Further, land ownership does not change over time, allowing for consistency in management on public lands as opposed to private lands. All of these factors are beneficial for longleaf forest management and restoration. *Id.* at 15.

259. *See generally*, FINAL REVISED LAND MANAGEMENT PLAN: FRANCIS MARION NATIONAL FOREST, USFS (2017), https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd530182.pdf (noting that the Forest Service has developed a detailed land management plan for USDA and USFS to follow to protect Francis Marion's restored longleaf pine ecosystems).

260. AM.'S LONGLEAF RESTORATION INITIATIVE, RANGE-WIDE CONSERVATION PLAN, *supra* note 33, at 9.

261. *Memorandum of Understanding Among the Department of Agriculture, Department of Defense, and Department of the Interior*, at 1, June 28, 2010, https://www.repi.mil/Portals/44/Documents/Resources/Signed_MOU_on_LLP.pdf [hereinafter MOU].

262. AM.'S LONGLEAF RESTORATION INITIATIVE, RANGE-WIDE CONSERVATION PLAN, *supra* note 33, at 9.

agencies within them to a host of guiding principles,[263] as well as to maintain, improve, and restore longleaf forests on their respective lands.[264]

Federal managers have also built on the "core lands" function of public lands, expanding efforts at restoration onto surrounding private lands.[265] The Sentinel Landscapes Partnership prioritizes expansion of longleaf forest restoration beyond the borders of participating DoD installations out into the surrounding community.[266] By utilizing funding to incentivize private landowners to increase activities that are supportive of the LLPE's viability, the Partnership achieves both conservation and national security purposes.

Despite successes, three limitations exist: (1) fragmentation of public lands from private inholdings; (2) expanding conservation onto surrounding private lands to achieve landscape conservation goals; and (3) providing funding.[267] Fragmentation concerns are common on federal lands throughout the Southeast. Though agencies have authority to acquire certain lands via exchange, this is often costly and time-consuming.[268] Further, federal efforts to engage private landowners in conservation is largely voluntary, apart from enforcing the ESA.[269] Finally, funding concerns are always a question for land management agencies, both for management of public lands themselves and when providing land management assistance to adjacent private landowners.[270]

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263. Those principles include: Strategic, Science-based Approach; Site-based Conservation Efforts in the Context of Sustainable Landscapes; Involvement by Public and Private Sectors; Involvement by Public and Private Sectors; Partnerships and Collaboration; and Use the Conservation Plan as a Framework and Catalyst. MOU, *supra* note 261 261, at 1–2.

264. *Id.* at 3.

265. *See The Sentinel Landscapes Partnership*, USDA, https://sentinellandscapes.org/ ("We empower landowners and managers to implement sustainable land management practices that have ecological, economic, and national defense benefits. We accomplish this by providing connections with voluntary state and federal assistance programs that meet their individual needs.") (last visited Apr. 23, 2025).

266. *See e.g.*, *Georgia Sentinel Landscape*, U.S. DEP'T OF AG., U.S. DEP'T OF DEF. & U.S. DEP'T OF THE INTERIOR, https://sentinellandscapes.org/landscapes/georgia/ (last visited May 1, 2025) (noting the program encompasses "large swaths of longleaf pine forests").

267. *See* AM.'S LONGLEAF RESTORATION INITIATIVE, RANGE-WIDE CONSERVATION PLAN, *supra* note 33, at 13 ("Many publicly owned land tracts . . . can be somewhat fragmented, of insufficient size to contribute to overall restoration goals, or inefficient to manage at a landscape scale.").

268. *See* USFS, A GUIDE TO LAND EXCHANGES ON NATIONAL FOREST LANDS, https://www.ntc.blm.gov/krc/system/files?file=legacy/uploads/23110/The%20Guide%20to%20Land%20Exchanges.pdf ("Land exchanges can be effective tools because the Forest Service has very limited authority to sell lands and limited funds for acquiring key tracts. Exchanges have become more costly and take multiple years to complete due to increased regulatory requirements in recent years. The National Forests receive many more land exchange proposals than it has the resources to accomplish.").

269. *See* Keiter66, *Toward a National Conservation Network Act*, *supra* note 66, at 107–10 (discussing options for private land conservation).

270. AM.'S LONGLEAF RESTORATION INITIATIVE, RANGE-WIDE CONSERVATION PLAN, *supra* note 33, at 13.

The ideal path forward involves allocating serious funding to land management agencies for conservation activities and creating mechanisms for purchasing key public lands. Though the political opportunities for large-scale federal land acquisition are low, where any opportunity exists, acquisition provides a powerful tool to create connectivity between isolated patches of public lands. Where the authority and political will do not exist, continued expansion of voluntary programs, such as leasing and easements on adjacent lands, helps provide similar functions. In sum, it is vitally important Congress continues to fund land management agencies and promote landscape conservation in yearly appropriations.

B. Longleaf Pine & the Endangered Species Act: Red-Cockaded Woodpecker Case Study

One of the most charismatic federally-listed species that calls the LLPE home is the red-cockaded woodpecker, *Picoides borealis*.[271] The red-cockaded woodpecker—the only woodpecker species to excavate its nest cavities in living pine trees—thrived historically across the pine forests of the southeastern United States.[272] The woodpecker requires large expanses of "open, mature, frequently burned pine stands," like those of the fire-managed longleaf pine forest, in order to forage without a dense ground story and to allow the requisite pines to reach maturity for nest cavities.[273] Major threats include habitat loss through deforestation, urbanization and incompatible forestry practices, as well as the compounding issue of habitat fragmentation and population isolation.[274] Recovery has historically focused on conservation on federal lands, with supplemental activities conducted on private lands, especially where connectivity of populations was otherwise unachievable.[275]

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271. The red-cockaded woodpecker, listed as endangered since 1973, was recently downlisted to threatened in October of 2024. *Interior Department Announces Downlisting of Red-Cockaded Woodpecker from Endangered to Threatened*, USFWS (Oct. 24, 2024), https://www.fws.gov/press-release/2024-10/downlisting-red-cockaded-woodpecker-endangered-threatened.

272. *Georgia Partners in Flight*, GA. DEP'T NAT. RES., https://georgiawildlife.com/conservation/birds#red-cockaded-woodpecker-conservation (last visited Apr. 23, 2025).

273. *Id.* ("Sufficient foraging habitat has been defined as a minimum of 3000 square feet basal area of pines at least 10 inches in diameter nearby and contiguous to the cavity trees.").

274. *Id.*

275. *See* Availability of a Draft Combined Environmental Assessment and Habitat Conservation Plan, Preliminary Finding of No Significant Impact, and Notice of Receipt of an Application for an Incidental Take Permit by Plum Creek Timber Company for Forest Management and Timber Harvest on Plum Creek Lands in Arkansas and Louisiana, 66 Fed. Reg. 19792 (Apr. 17, 2001), https://www.govinfo.gov/content/pkg/FR-2001-04-17/pdf/01-9454.pdf [hereinafter Plum Creek HCP].

The ESA does not require that private landowners take affirmative action to improve conservation outcomes for listed species such as the red-cockaded woodpecker, only that they avoid further harm in the form of a "take" of the species.[276] The "take" prohibition limits negative impact on the species, including by avoiding habitat destruction adversely affecting the species.[277] The following two subsections explore how Habitat Conservation Plans (HCPs) and Safe Harbor Agreements (SHAs) under the ESA provide conservation incentives for interested landowners affected by red-cockaded woodpecker presence by providing "shields" against the enforcing wildlife agency's regulatory action.

1. Habitat Conservation Plans

HCPs are plans required to accompany an application for an incidental take permit.[278] In exchange for implementation of conservation measures benefitting a listed species, parties covered under an HCP receive insulation from the ESA's prohibition on the take of listed species.[279] One example of a private HCP for protection of the red-cockaded woodpecker is a plan proposed by Jack Primus, L.P. in South Carolina.[280] In this case, landowners proposed to sell a 996-acre tract of land just north of North Charleston for development, but the land contained two active clusters of red-cockaded woodpeckers. [281] The nearest known populations of red-cockaded woodpeckers were located miles away on the Francis Marion National Forest and on private lands adjacent to the Jack Primus Tract, at Medway Plantation.[282] Because development of the tract would potentially "result in death of, or harm to, any remaining [red-cockaded woodpeckers] through the loss of nesting and foraging habitat," the landowners had to apply for an incidental take plan.[283] Here, the solution was fairly simple—the adjacent parcel of land (the Medway Plantation) had been placed in a conservation easement that protected, in part, intact portions of longleaf forest.[284] To ensure the health of the population of woodpeckers located in the area, the

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276. *See* 16 U.S.C. § 1538(a)(1) (highlighting activities that the ESA prohibits).

277. *See* MACGOWAN, *supra* note 109, at 3 (discussing the ESA and HCPs).

278. *See id.* at 7 (explaining HCPs).

279. *Id.*

280. Availability of an Environmental Assessment and Receipt of an Application Submitted by Jack Primus Partners, L.P. for an Incidental Take Permit for Red-cockaded Woodpeckers in Association with the Sale and Development of a Property in Berkeley County, South Carolina, 60 Fed. Reg. 39418 (Aug. 2, 1995) [hereinafter Jack Primus HCP].

281. *Id.*

282. *Id.*

283. *Id.*

284. *Id.* at 39418–19.

HCP called for "six clusters with artificial starts and cavities on suitable habitat" to be located on the easement.[285] These clusters were then to be subject to ongoing monitoring.[286] In other words, the HCP required landowners to maintain a suitable number of trees for breeding pairs of red-cockaded woodpeckers on protected lands adjacent to those subject to development, subject to ongoing monitoring.

A similar example is the HCP implemented by Plum Creek Timber Company, Inc.[287] This case involved the management of nearly 261,000 acres of commercial forestlands in Arkansas and Louisiana.[288] Though red-cockaded woodpeckers prefer longleaf pine for nesting, they will tolerate other types of pine stands, such as "loblolly, pond, slash, shortleaf, and Virginia pine stands."[289] What is good for the red-cockaded woodpecker, however, is not always best for the commercial forest manager. The presence of 26 active woodpecker clusters on the Plum Creek land meant commercial forestry operations might produce an incidental take of the red-cockaded woodpecker, requiring an incidental take plan.[290] In response, Plum Creek proposed to create a 3,069-acre conservation area, translocating the 11 active clusters located outside the bounds of the conservation area.[291] The proposed conservation area, which was adjacent to two national wildlife refuges, was thought to "provid[e] demographic support."[292] The incidental take plan's duration was set at 30 years, and "would authorize take of up to 11 Red-cockaded woodpecker groups outside the [conservation area] incidental to timber management activities, plus incidental take of any clusters in excess of conservation obligation within the [conservation area]."[293] Maintenance of habitat and pairs exceeding that outlined within the agreement could produce mitigation credits that Plum Creek could trade with other operators.[294]

Both examples demonstrate the general contours of a generic HCP. A private landowner wishes to conduct a lawful use of their land, but that use would negatively impact a listed species. In order to avoid liability for the "take" of that species, the landowner must apply for an incidental take plan

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285. Clusters are the "aggregate of cavity trees used by a breeding group" of red-cockaded woodpeckers. Jack Primus HCP, *supra* note 280, at 39418–19.

286. *Id.* at 39419.

287. Plum Creek HCP, *supra* note 275, at 19792.

288. *Id.*

289. *Id.* at 19793.

290. *Id.*

291. *Id.*

292. *Id.*

293. Plum Creek HCP, *supra* note 275, at 19793.

294. *Id.* The possibility of mitigation credits is an example of a conservation term that may be implemented at the discretion of the Secretary of the Interior (through the U.S. Fish & Wildlife Service) provided in 16 U.S.C. § 1539(a)(2)(A)(iv).

requiring an HCP to offset the impact of their actions. The HCP then provides for responsive conservation activities on private lands, such as the Jack Primus installation on an adjacent conservation easement or the Plum Creek conservation area.[295]

These examples also highlight, however, some criticisms of HCPs generally as applied to red-cockaded woodpeckers in the LLPE. First, HCPs and incidental take plans are licenses to develop. Here, Jack Primus developed a portion of land that had living pairs of red-cockaded woodpeckers, removing potential habitat for future pairs of woodpeckers. Of course, the HCP supported conservation of affected red-cockaded woodpeckers generally but did not create any new habitat. This species-level focus does not reflect the ESA's strong language affirming that ecosystem protection is the ESA's primary concern.[296] Second, once terms are set, there are limited opportunities to modify an HCP for greater or modified conservation on HCP-covered lands. On public lands, land managers are free to adapt to changing conditions and may generally exceed the ESA's required protections, whereas HCPs need only satisfy Section 10 of the ESA.[297] Landowners, then, only have the incentive to abide by the minimum requirements contained within an HCP, with little reason to create additional ecosystem benefits for listed species. For example, if Plum Creek's conservation area proves a hot spot for red-cockaded woodpeckers, the landowners must only protect the woodpeckers covered by the HCP.[298]

Ultimately, if the goal is to provide red-cockaded woodpeckers with a functioning habitat and connectivity between populations, the reactive and less flexible nature of HCPs may be only an "okay" fit. Although incredibly important mitigation tools, HCPs fall short of the full protection and restoration necessary to support LLPE recovery. Further, the species-specific

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295. Jack Primus HCP, *supra* note 280, at 39418–19; Plum Creek HCP, *supra* note 275, at 19792.

296. *See* 16 U.S.C. § 1531(b) (showing that Congress used strong language to describe the ESA's purpose).

297. *Compare* 16 U.S.C. §§ 1604(g)(3)(B) (requiring USFS to develop measures to "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area" in forest plans) *and* 668dd(a)(4)(A) (requiring USFWS to "provide for the conservation of fish, wildlife, and plants, and their habitats" within the refuge system) *with id.* § 1539(a)(2)(C) (requiring only that a landowner comply with the terms of the HCP, which are made binding through an incidental take permit).

298. The important caveat here is that an ITP places a limit on incidental take, meaning insulation from regulation under the ESA may be removed if the action unduly affects an imperiled species. *See* 50 C.F.R. § 17.22 (c)(9) (outlining criteria for permit revocation).

focus limits an HCP's ability to consider the broader LLPE and ecological interactions at play.[299]

2. Safe Harbor Agreements

SHAs are voluntary agreements that provide landowners with assurance against further regulatory requirements from a wildlife agency in exchange for implementation of conservation on the landowner's property.[300] The primary objective of the East Texas Pineywoods SHA is to "encourage voluntary [red-cockaded woodpecker] habitat restoration or enhancement activities."[301] The SHA incentivizes entry into cooperative agreements between private landowners and the Texas Parks & Wildlife Department and Texas Forest Service by releasing landowners from additional ESA liability beyond what exists when entering the cooperative agreement.[302] The plan encompasses the southeastern portion of the Pineywoods ecoregion in Texas, which includes all or part of 22 counties.[303] The program prevents distorted incentives from destroying conservation opportunities on private lands. Landowners with red-cockaded woodpeckers who might take action that would prevent woodpeckers from nesting on their land are protected under "safe harbor" from additional ESA regulatory obligations if they take action to foster red-cockaded woodpeckers on their property.[304] Landowner actions preventing nesting may include "harvesting their timber sooner than they would have otherwise, allowing hardwood midstory to encroach on open pine forests, eliminating potential cavity trees, [or] destroying abandoned clusters."[305]

On the whole, SHAs appear to be a net benefit for red-cockaded woodpeckers. As the East Texas Pineywoods SHA demonstrates, SHAs are

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299. For example, concern for the red-cockaded woodpecker may result in protection of intact longleaf pine that has trickle-down effects for other species and ecological processes in the LLPE, but it may not. An HCP may simply focus on protection of bird numbers alone by increasing nesting cavities and translocating populations. The flexibility to meet the needs of listed species also means that the broader landscape is not always a winner.

300. *Safe Harbor Agreements*, USFWS, https://www.fws.gov/service/safe-harbor-agreements (last visited Apr. 6, 2025) (explaining SHAs).

301. RED-COCKADED WOODPECKER HABITAT CONSERVATION PLAN STEERING COMM., REGIONAL HABITAT CONSERVATION PLAN FOR THE RED-COCKADED WOODPECKER ON PRIVATE LAND IN THE EAST TEXAS PINEYWOODS 3 (1997), https://ecos.fws.gov/docs/plan_documents/tsha/tsha_2366.pdf.

302. *Id.* at 6.

303. *Id.* at 7

304. *Id.* at 6.

305. *Id.*

affirmative incentives for conservation, not mitigation techniques.[306] Even if the worst is realized and a landowner reverts their land to baseline conditions (thus undoing conservation progress), the landowner provided conservation that would not otherwise have been implemented.[307] Given that the woodpeckers would have to be relocated and would benefit from conservation activity during landowner coverage under an SHA, there is a possible net benefit.[308]

SHAs, however, are temporary,[309] and the conservation benefits they produce may be as well. Though better than taking no action, SHAs—like HCPs—fall short of introducing enforceable restoration of lands and protection of longleaf forests (i.e., landscapes) specifically.[310] While participation in an SHA, such as the East Texas SHA for RCWs, *might* produce tangible benefits through the protection of mature longleaf pine forests, this is not a guarantee. Further, because the plan relies on incentives, entering an SHA is wholly voluntary on the part of a landowner.[311]

306. RED-COCKADED WOODPECKER HABITAT CONSERVATION PLAN STEERING COMM., *supra* note 301, at 3 ("The 'safe harbor' program is unique because it offers landowners an *incentive* to provide habitat for threatened or endangered species, in advance of any specific activity that may harm the species. Conversely, standard habitat conservation plans are typically designed to offset or 'mitigate' some adverse impact to endangered species.").

307. The plan specifically addresses this point.

> Even if all the landowners who participate in the program eventually drop out, their responsibility to maintain their [red-cockaded woodpecker] baseline will mean, at the very least, a return to the same circumstances that would have existed without the plan. Even in this worst-case scenario, the program will have had the potential to provide interim benefits in the form of population and demographic maintenance throughout its duration.

Id. at 8.

308. The Plan also argues that even where take is possible, it is not assured. *Id.* at 8. Even when the landowner is released from the obligations of an SHA, that does not mean they will immediately (or possibly ever) return the land to baseline conditions. *Id.*

309. *See* 50 C.F.R. § 17.22 (detailing regulatory requirements for permit duration and renewal); SAFE HARBOR AGREEMENTS FOR LANDOWNERS, U.S. FISH & WILDLIFE SERV. 2 (2017), https://www.fws.gov/sites/default/files/documents/safe-harbor-agreements-fact-sheet.pdf ("The SHA can be renewed for as long as the property landowner and the FWS mutually agree. If the landowner does not renew the agreement, the assurances tied to the Enhancement of Survival Permit expire.").

310. *Cf.* N.C. WILDLIFE RES. COMM'N & U.S. FISH & WILDLIFE SERV., NORTH CAROLINA STATE-WIDE RED-COCKADED WOODPECKER SAFE HARBOR AGREEMENT 11–12 (2006), https://www.ncwildlife.gov/nc-sha-final-march-2006pdf/download?attachment (describing certain affirmative measures landowners *could* take to satisfy the SHA and restore and protect intact longleaf pine forests such as prescribed fire, forest management, and hardwood midstory control in addition to species-specific measures).

311. RED-COCKADED WOODPECKER HABITAT CONSERVATION PLAN STEERING COMM., *supra* note 301, at 3.

C. Farm Bill & USDA Programs: Reforesting Private Lands & Protecting Wildlife

This Section explores two major avenues that exist to support the LLPE's protection and restoration. First, Working Land for Wildlife (WLFW) programs support conservation by leveraging USDA Farm Bill programs and funding to avoid ESA implications. Second, independent, voluntary engagement by private landowners (particularly farmers and foresters) supports conservation with Farm Bill-funded programs. Both efforts seek to include private stakeholders in coordinated conservation efforts by providing financial and technical support.

1. Working Lands for Wildlife

WLFW represents one of the most targeted, direct federal funding applications to enhance conservation on private lands to improve the health of an entire landscape. In the LLPE, the NRCS operates two relevant WLFW programs: one for the northern bobwhite quail and one for the gopher tortoise.[312] Both programs leverage Farm Bill programing and funding to target private lands for conservation while advancing land health and creating economic incentives for landowners. WLFW selected the gopher tortoise and northern bobwhite not only due to declining population numbers, but also due to their unique role within the ecosystem and the effects flowing from conservation to increase and strengthen the stability of their populations.[313]

The WLFW northern bobwhite program focuses on the restoration of grassland and savanna habitats throughout the eastern United States, including the longleaf pine savannas of the Southeast.[314] While the northern bobwhite has not been threatened with ESA action like many other species covered by a WLFW program, their numbers have declined by over 80% in the past 30 years.[315] This decline mirrors a parallel loss in coverage of

312. *See generally* NAT. RES. CONSERVATION SERV. & WORKING LANDS FOR WILDLIFE, GOPHER TORTOISE: FY 2020–2024 IMPLEMENTATION STRATEGY (establishing a four-year conservation strategy for the gopher tortoise) [hereinafter WLFW GOPHER TORTOISE STRATEGY]; *see also* NAT. RES. CONSERVATION SERV. & WORKING LANDS FOR WILDLIFE, NORTHERN BOBWHITE, GRASSLANDS, AND SAVANNAS: A FRAMEWORK FOR CONSERVATION ACTION (establishing a conservation strategy for northern bobwhite, grasslands, and savannas) [hereinafter WLFW NORTHERN BOBWHITE FRAMEWORK].

313. For example, bobwhite quail are edge species and require "a variety of cover types during their annual life cycle to meet daily needs." WLFW NORTHERN BOBWHITE FRAMEWORK, *supra* note 312, at 5. Meanwhile, movement, feeding, and nesting behaviors of the gopher tortoise depend on a thinner overstory and forest floor. WLFW GOPHER TORTOISE STRATEGY, *supra* note 312, at 3.

314. WLFW NORTHERN BOBWHITE FRAMEWORK, *supra* note 312, at 1.

315. *Id.* at 5.

grasslands and savannas across the northern bobwhite's range.[316] The role of the northern bobwhite as an "indicator species"[317] means that "success in saving bobwhite can translate into success in saving other species, especially grassland birds."[318] Further, implementation of this program "could result in collateral benefits to many and varied agriculture industries . . . ."[319] Benefits to wildlife and landowners flow from the restoration of functioning longleaf forest.[320] Land conversion in the Southeast, especially conversion from pine savannas to monoculture commercial pine forests, has driven much of the decline in northern bobwhite populations.[321] Restoring lands can improve both biodiversity and timber quality. Further, as with all WLFW programs, the partnership between the NRCS and USFWS provides both improvement to species populations and regulatory certainty to landowners.[322]

Management actions in the northern bobwhite program throughout the Southeast focus mostly on the implementation of prescribed burns and timber thinning.[323] Burning and thinning "creates space that maximizes growth of high-quality timber while benefiting bobwhite, gopher tortoise, and other wildlife."[324] Most funding for the northern bobwhite program is provided by the Farm Bill's Environmental Quality Incentives Program funds.[325] However, the NRCS recognizes that the implementation of the Agricultural Conservation Easement Program and the Conservation Stewardship Program has the potential to expand future conservation efforts in some states.[326]

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316. WLFW NORTHERN BOBWHITE FRAMEWORK, *supra* note 312, at 5.

317. Indicator species are those "which can provide information on ecological changes and give early warning signals regarding ecosystem processes in site-specific conditions due to their sensitive reactions to them." *Indicator Species*, NASA EARTHDATA, https://earthdata.nasa.gov/topics/biosphere/indicator-species (last visited Mar. 30, 2025). In other words, in the case of bobwhite quail, their growth or decline may function as a sort of shorthand for the health of the overall ecosystem. Healthier, robust quail populations throughout a region can provide greater evidence that ecological processes and ecosystem functioning are similarly healthier and more robust.

318. WLFW NORTHERN BOBWHITE FRAMEWORK, *supra* note 312, at 4.

319. *Id.* at 6.

320. *See, e.g.*, *id.* at 28–33 (describing various benefits to wildlife, agriculture, and the climate).

321. *Id.* at 5.

322. *Working Lands for Wildlife*, NAT'L RES. CONSERVATION SERV., USDA, https://www.nrcs.usda.gov/programs-initiatives/working-lands-for-wildlife (last visited Mar. 27, 2024) (explaining that the Natural Resources Conservation Service and the U.S. Fish and Wildlife Service partner "to provide regulatory predictability under the Endangered Species Act," which in turn gives landowners "peace of mind that no matter the legal status of a species, they can keep their working lands working with an NRCS conservation plan in place").

323. WLFW NORTHERN BOBWHITE FRAMEWORK, *supra* note 312, at 12. *See also id*. at 24 (noting that Southeast Region landowners most frequently engage in prescribed burning as compared to other conservation activities).

324. *Id.* at 24.

325. *Id.* at 20.

326. *Id.* at 25.

The WLFW gopher tortoise program provides similar benefits and opportunities but focuses on the gopher tortoise as a LLPE "keystone species."[327] The life cycle and behavior of the gopher tortoise require conditions supporting healthy longleaf forests, which in turn supply ecosystem and biodiversity benefits across the landscape. The benefits of participation in the WLFW gopher tortoise program are similar to the northern bobwhite program in improving wildlife and ecosystem health, timber production, and reducing the risk of additional regulation.[328] The last point is perhaps the most salient for the gopher tortoise—an October 2022 decision by the USFWS determined listing the gopher tortoise as threatened throughout most of its range was not warranted.[329] Conservation action achieved through the WLFW program helps ensure that additional listing of the gopher tortoise will not occur, a major selling point for the program.[330]

Implementation and funding for the WLFW gopher tortoise program are very similar to that of the bobwhite quail program. Prescribed burns are the major conservation practice, constituting 76% of the program's practice goals.[331] Funding is provided through Farm Bill programs, chiefly the Environmental Quality Incentives Program, with implementation assistance provided by Conservation Technical Assistance.[332] NRCS notes, however, in its most recent gopher tortoise plan, that landowners "may sign up for multiple programs to achieve their goals," including the NRCS's Longleaf Pine Initiative, Conservation Stewardship Program, and Regional Conservation Partnerships Program.[333]

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327. Keystone species are those which "enable other species to survive, occupying a key role in the ecosystem they are part of." Jatinder Sidhu & Madeleine North, *What Are Keystone Species, and Why do They Matter?*, WORLD ECON. F. (Nov. 28, 2024), https://www.weforum.org/stories/2024/11/what-is-a-keystone-species/. These species help to define the landscape and have a fairly outsized influence on their environment relative to other species. *Id*. For example, the gopher tortoise is vital to the ecosystem due to their burrows providing shelter to over 360 other species. WLFW GOPHER TORTOISE STRATEGY, *supra* note 312, at 3.

328. WLFW GOPHER TORTOISE STRATEGY, *supra* note 312, at 4–5.

329. Specifically, listing was not warranted for the eastern portion of the gopher tortoise's range (Florida, Georgia, South Carolina, and most of Alabama). *Gopher Tortoise*, NAT. RES. CONSERVATION SERV., https://www.nrcs.usda.gov/programs-initiatives/working-lands-for-wildlife/gopher-tortoise (last visited Apr. 3, 2024). The gopher tortoise remains listed as threatened in the western portion of its range (part of Alabama, Mississippi, and Louisiana). *Id*. This action follows the work of WLFW's actions to "conserve or create more than 278,000 acres of longleaf pine forests" since 2012. *Id*.

330. *See id.* ("NRCS continues to work with FWS and other partners to support landowners in restoring sufficient habitat to make expanded federal listing unnecessary, and to provide regulatory peace of mind for land management actions in areas where the species is already listed.").

331. WLFW GOPHER TORTOISE STRATEGY, *supra* note 312, at 9. Timber thinning is the second most emphasized goal, with a target of 9%. *Id*.

332. *Id.* at 11.

333. *Id.*

The unique habitat requirements of both the northern bobwhite and gopher tortoise make these species particularly valuable in simplifying the task of LLPE conservation.[334] Because both species' life histories require landscapes characteristic of longleaf forests, landowners must conserve functioning land to conserve the species. Active conservation of land health that supports species viability puts to rest many of the problems of the single-species focus of the ESA, common for listed species.[335] Because of the vast amounts of private land throughout the Southeast, conservation on a landscape scale would be impossible without the benefit of interested private landowners.[336] WLFW capitalizes on the need to engage private landowners as partners in regional conservation efforts by using both carrots and sticks. Not only does WLFW provide funding to landowners, but the program also leverages the potential that regulatory requirements may kick in absent action to affect valuable conservation.

However, the northern bobwhite and gopher tortoise programs suffer from drawbacks of WLFW programs generally. WLFW programs remain voluntary for landowners,[337] and funding requires favorable politics.[338] Further, long-term management may be limited through this program. Private landowners bind themselves to conservation efforts, but often only for a set period.[339] Management opportunities on these private lands must, at the very least, look toward long-term goals to "lock in" conservation if the opportunities are to persist.

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334. *See, e.g.*, WLFW GOPHER TORTOISE STRATEGY, *supra* note 312, at 2 ("Wildlife experts agree that the fate of the gopher tortoise is linked to habitat quality, and efforts to conserve habitat on private lands will be critical to its continued survival.").

335. *See* WLFW NORTHERN BOBWHITE FRAMEWORK, *supra* note 312, at 4 (explaining that, although conservation triage once was controversial, "triage approaches that invest in critical landscapes and wildlife communities are now considered a commonsense approach to the practical problem of limited funds and staffing within the conservation agencies and larger partnerships").

336. *Id*. at 1 (The WLFW Areawide Planning Team shared: "We can't buy or regulate our way to healthy landscapes as the financial and social costs are too high. Therefore our challenge is to build shared visions with landowners and industries to identify conservation approaches that are palatable to those controlling the land throughout most of the U.S.").

337. WLFW NORTHERN BOBWHITE FRAMEWORK, *supra* note 312, at 4.

338. *See* Maya C. Miller, *As Congress Feuds over Farm Bill, Growers Are 'Stuck in Limbo'*, N.Y. TIMES (Nov. 27, 2024), https://www.nytimes.com/2024/11/27/us/politics/farm-bill-congress.html. While the program's dual focus of providing benefits to landowners *and* wildlife (while focusing on charismatic species as flagbearers) appears to be politically palatable now, there is always the possibility that will not continue long-term.

339. *See, e.g.*, WLFW NORTHERN BOBWHITE FRAMEWORK, *supra* note 312, at 25 (noting temporary Conservation Stewardship Program is more heavily used than permanent Agricultural Conservation Easement Program).

2. Longleaf Pine Initiative & Other Targeted Programs

The Longleaf Pine Initiative provides a direct route to LLPE conservation by focusing the NRCS's efforts to work with agricultural producers and conservation partners in restoring forests across its range.[340] Since the program's inception in 2010, "NRCS has helped producers restore more than 870,000 acres on private lands."[341] The Longleaf Pine Initiative works through the provision of financial and technical assistance to private landowners to identify and implement conservation practices.[342] The Initiative not only reforests lands but also helps owners to maintain and improve forests through prescribed burns and other techniques.[343] Notably, the Longleaf Pine Initiative leverages Farm Bill funding to target private lands near the "core public lands" across the Southeast; these actions increase forest density and habitat connectivity across the range of the LLPE.[344] Both the Conservation Stewardship Program and the Conservation Reserve Program support the efforts of the NRCS's Longleaf Pine Initiative.[345]

Other USDA-allied programs focus on the restoration of longleaf pine, including the Virginia Longleaf Pine State Acres for Wildlife Enhancement (SAFE). The Virginia Longleaf Pine SAFE represents a partnership between USDA and Virginia Department of Forestry to enroll agricultural land in Virginia in a program to "re-establish longleaf pine stands at densities that will provide critical habitat . . . ."[346] The SAFE program, which focuses on the northern range of the LLPE where some of the greatest decline in existing longleaf forest has occurred, is a unique application of the Conservation

340. *Longleaf Pine Initiative*, NRCS, https://www.nrcs.usda.gov/programs-initiatives/longleaf-pine-initiative (last visited Apr. 3, 2024).

341. *Id.*

342. *Id.*

343. *Id.*

344. *Id.* ("LLPI targets efforts in priority counties because of their favorable growing conditions and value in connecting existing stands of longleaf pine. . . . These targeted areas are usually located in the vicinity of a military installation, a national forest, national wildlife refuge, state forest or heritage reserve.").

345. *See* NAT. RES. CONSERVATION SERV., CONSERVATION STEWARDSHIP PROGRAM: LANDSCAPE CONSERVATION INITIATIVES LONGLEAF PINE INITIATIVE (LLPI), https://www.nrcs.usda.gov/sites/default/files/2022-10/CSP_LLPI.pdf (last visited Apr. 22, 2025) ("The CSP LLPI encourages forest landowners to address priority resource concerns . . . in a comprehensive manner by undertaking additional conservation activities, and by improving, maintaining, and managing existing conservation activities."). FARM SERV. AGENCY, CONSERVATION RESERVE PROGRAM: LONGLEAF PINE INITIATIVE 1, https://www.fsa.usda.gov/sites/default/files/documents/Longleaf_Pine_Initiative.pdf (last visited Apr. 22, 2025).

346. FARM SERV. AGENCY, VIRGINIA LONGLEAF PINE SAFE 1 (2023), https://www.fsa.usda.gov/sites/default/files/documents/state_acres_for_wildlife_enhancement_virginia_longleaf_pine_safe.pdf. Landowners are compensated for participation "with annual per acre rental payments, cost-share to assist with habitat establishment expenses, and in some cases additional monetary incentives." *Id*. at 2.

Reserve Program.[347] SAFE works "to identify the wildlife species, the vegetative cover that provides habitat for the target species, and the location in the state where the habitat is needed."[348] This enables individuals in the program to focus on where habitat is most critically needed on private lands. Landowners implement conservation efforts by complying with a conservation plan developed with the assistance of the NRCS.[349]

Both the Longleaf Pine Initiative and SAFE represent targeted efforts toward conservation in applying Farm Bill funding. It is undeniable that these types of programs have produced tangible benefits for restoration. Yet, while participation in these programs has been promising, there may also be a ceiling for participation. While the programs mentioned have helped reverse declining acres of longleaf pine forests, efforts are voluntary and dependent on funding as an incentive for landowner participation. As opposed to WLFW, these programs rely on "carrots" and lack the regulatory "stick" of mandatory and enforceable standards, like those in the ESA, to push landowners toward participation. At a certain point, the reach of these incentives, especially without a legally enforceable requirement on the horizon, may become limited. Long-term maintenance of the LLPE's conservation may require creative environmental solutions with mandatory and legally enforceable standards.

CONCLUSION

The path to protection and restoration of the LLPE has been marked by collaborative efforts between the government, nonprofits, and the private sector; public and private landowners; and voluntary and compelled actors. Underlying it all are legal mechanisms providing for enforcement and opportunity in conservation. While voluntary collaboration is a vital part of protection and restoration, the law also plays an important role in bolstering and expanding conservation opportunities.

Although the law can further opportunities for conservation, not all methods are equal in impact. Depending on the exigencies of a particular location or time, costs may be allocated differently, and capital may be stretched further by utilizing a particular method over another. Adaptability and flexibility in management and a willingness to pursue new or previously

347. FARM SERV. AGENCY, VIRGINIA LONGLEAF PINE SAFE 1 (2023), https://www.fsa.usda.gov/sites/default/files/documents/state_acres_for_wildlife_enhancement_virginia_longleaf_pine_safe.pdf.

348. *Id.*

349. *Id.*

disfavored methods to achieve conservation goals will be required to restore the LLPE to a fraction of its former majesty.

Acknowledging that land management requirements (particularly for conservation on a landscape scale) require flexibility over time to adapt to new and ongoing challenges, a snapshot of where efforts are currently can provide insights for longleaf forest restoration moving forward. Given the altered trajectory of the longleaf forest's fortunes, with a growth of nearly 2 million acres in only the past few decades, it is clear that efforts to conserve longleaf forests are working. As with any system, however, these gains are not guaranteed and will face ongoing challenges, burdened by changing threats and conditions. For all of these reasons, targeted legal strategies to effect conservation throughout the LLPE can draw on a few insights.

A. Insights

Collaboration is key. Legal efforts to protect the LLPE employ mechanisms that reduce obstacles to collaboration, information sharing, and decision-making among stakeholders. These efforts have been particularly valuable at bridging the divide between interested nonprofits and government actors on one side and private landowners on the other. Meanwhile, instruments such as the Memorandum of Understanding between federal government departments and agencies advance longleaf forest conservation at the federal government level. In each case, collaboration brings a few commonalities that allow for conservation advancements.

The first commonality is resource sharing. Collaboration, especially when backed by legal mechanisms and enforceable provisions, is an important tool for conservationists to lower opportunity costs. For the LLPE, *so much* of the land is in private hands that a complete "public lands solution" using only public lands to enable conservation across the region would be impractical, if not impossible. The same could also be said, however, of relying on altruism by private landowners to implement conservation. Collaborative programs help "reallocate" resources: the government obtains security in land stewardship, and the private landowner obtains resources in the form of funding and technical support.

The second commonality is a greater exchange of information. Because land ownership is fragmented and landowners and land managers have varying motivations, promoting a freer flow of information can help form stronger relationships between stakeholders, making conservation more efficient. With the need for action informed by science, politics, and the law, as well as the need for collaboration between public and private landowners,

greater information sharing can help provide opportunities to make smarter decisions and avoid increased costs.

Public lands provide a vast array of benefits absent in private land conservation. Not only do public land managers have affirmative conservation mandates and greater flexibility in carrying them out, but they also benefit from stability in management over time. Public lands, however, can also provide a broader conservation benefit beyond their borders. The ability of public lands to provide a base for conservation efforts to build upon is essential to linking lands of varying ownership and quality throughout the landscape. Connection and importance to the network of land conservation throughout the Southeast make public lands vital bulwarks in times of threats and important drivers of action in times of opportunity. The law provides not only enforceable standards for public land managers but also the flexibility to think creatively and proactively about how to advance conservation.

There are a few limitations to focusing on advancing conservation through public land ownership. Most importantly, public lands alone are not sufficient to achieve the goal of rehabilitating a functional LLPE from its all-time low. The history of the ESA bears this point out, with the pre-1973 version of the act falling short of rehabilitating imperiled species on publicly-owned and -managed habitat. The lack of ability for public lands to provide for all necessary environmental processes and wildlife habitat is an even more acute concern in the Southeast, where public lands are far fewer, and fragmentation is more common. Of course, the drawbacks may be mitigated if the acquisition focuses on high-value and politically-feasible land acquisitions, namely high-value conservation lands adjacent to or within current public land boundaries for which agencies have the funds and ability to acquire.

Incentives are easier to mobilize but do not provide as many guarantees. For landscape conservation efforts, particularly throughout the LLPE, incentive-based voluntary conservation programs abound. These programs are incredibly important for advancing longleaf forest conservation on private lands. A few benefits appear to accompany these programs. First, funding is more easily mobilized at the federal level by targeting working lands and private conservation in the Farm Bill. The regular nature of the Farm Bill and its inclusion of a host of interests make it perhaps easier to include (and increase) conservation efforts over time. Second, the wide array of incentives available means that these voluntary legal programs cast a wide net, furthering the potential reach of conservation. From permanent protections enshrined in conservation easements to temporary measures, such as mitigation funding and technical assistance, voluntary programs can be tailored to the needs of the particular landowner and their land. Finally, in

the absence of a program affirmatively enforcing regulatory conservation, voluntary programs that provide legal mechanisms for the implementation of conservation can produce a net benefit that would otherwise be unobtainable.

B. Recommendations

Congress and federal agencies should continue to provide legal and regulatory frameworks for collaboration and communication that bind the government and require public input. The law must prioritize forming working relationships among agencies and interested parties. Whether at a high level, such as with the Memorandum of Understanding amongst federal executive departments, or at a more localized level, through collaborative agreements between the NRCS and a farmer, these types of relationships provide a strong basis for conservation efforts that produce real results. The ease with which the law can provide for these types of working relationships (particularly as it relies on executive agencies developing policy and private landowners voluntarily entering agreements) makes them more politically palatable and thus more effective at mobilizing action.

Government investments should focus on acquiring title to high-value private lands (or interests in those lands) for public ownership and management. The outsized role that public lands can play in advancing landscape conservation makes targeted, informed expansion of those holdings a highly desirable goal. The history of eastern public lands, particularly in the Southeast, is a history of acquisition followed by restoration and management for conservation. Building on this history can help to advance conservation efforts well into the future, as these lands can be managed under legal mandates that advance environmental health.

The recommendation to build upon current public land holdings is not without caveats, however. It would be impractical, as mentioned above, to rely solely on public lands to advance conservation efforts. Additional acquisitions and expansions of public lands would likely be small and require efforts to carefully target the most important lands. For example, work to infill national forest lands where fragmented or to carefully target pockets of high-value wildlife habitat for inclusion within the refuge system may be most realistic and beneficial.

Stakeholders should continue efforts that advance conservation activities on working lands. Landscape conservation in the Southeast must cast a wide net. This is in part due to the large amount of private land in the region and to the economic and social necessities of stakeholders who rely on those lands. When conservation can be framed as more than protection and preservation and expressly made to include additional practices such as

mitigation, enhancement, and restoration, a greater number of lands can be incorporated into the landscape conservation fold. A greater number of people engaging in more beneficial land use practices provides not only for net conservation benefits but can also help change the political dialogue about the role and place of conservation within the region.

The federal government should provide funding and assistance to private landowners to encourage conservation, while prioritizing uniformity and compliance with requirements. Voluntary private landowner conservation programs are essential to the landscape-scale conservation of the LLPE. With so much land across the region held by private landowners, it would be impossible to create the necessary linkage and functional habitat across the landscape without their involvement. These funding programs provide a win-win for private landowners and conservationists: private landowners receive funding that helps them conduct their business and improve the health of their land, while conservationists receive the benefit of enforceable limitations and affirmative conservation practices. With a new Farm Bill due for passage and renewed at regular intervals, it is also quite possible to achieve consistency in targeting private lands.

Congress should bolster laws that provide regulatory enforcement for habitat conservation. While the ESA is a powerful legal vehicle, its focus on single-species conservation limits the lengths to which the USFWS may utilize it as a tool to protect large swaths of ecosystems. Without an affirmative mandate to protect habitat specifically, its protection will remain, at best, a peripheral goal. While federal regulation of land use is often decried as politically impractical, changing conditions, especially in the face of climate change, may warrant an effort to provide greater control over land use through legislation and regulation. Especially when combined with voluntary efforts, some of the sting of enforcement may be taken out if used mostly as a regulatory "floor."

Regulators should continue to rely on the ESA as a backstop to prevent the most egregious reductions in intact and functioning habitat across the landscape. Under the current system, the ESA performs an incredibly valuable role as a backstop against wholesale habitat destruction. The strength of the ESA's legal mandates and its general acceptance as a scheme (having been in effect in a similar form for 50 years) means that reliance on it as a tool is fairly sound. Expansion and aggressive use, however, are not politically assured and could limit the strength of the ESA's application for affirmative landscape conservation efforts.

Regardless of the particular path to landscape conservation chosen for the LLPE, it is clear that the use of a variety of methods across the region has produced results in the previous few decades. Continual engagement and

flexibility will be necessary to ensure continued gains into the future, but the goal is surely worth the effort. By leveraging and pushing the law to provide for conservation goals as well, these efforts can be made easier to implement and more likely to produce net benefits across the LLPE. In doing so, conservationists can work to protect the environment, heritage, and health of the Southeast.