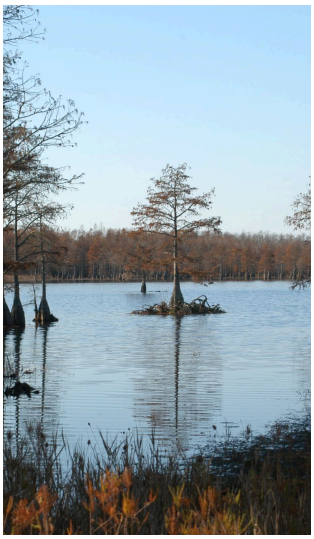
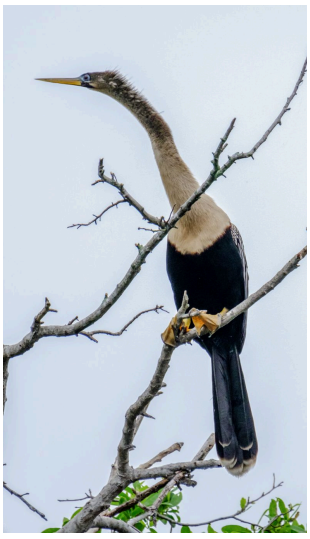





Carolina Bays Strategic Plan

North and South Carolina

2026

Writing team: Lydie Costes, Trapper Fowler, Jen Guyton, Lisa Lord, Jeffrey Marcus, Nathan Shepard, Sudie Thomas

Reviewers: L. L. Gaddy, Kristie Gianopulos, Lauren Goodman, Aubrey Greene, Jeffrey Hall, Robert Hopper, Brena Jones, Travis Kornegay, Deborah Maurer, Hervey McIver, Wes Newell, Michael Schafale

Contributing organizations:

The Nature Conservancy — Protecting nature. Preserving life.™

U.S. Fish & Wildlife Service

The Longleaf Alliance

North Carolina Natural Heritage Program — Science Guiding Conservation

Naturaland Trust

North Carolina Wildlife Resources Commission

DEQ — North Carolina Department of Environmental Quality

Coastal Conservation League

res — Resource Environmental Solutions

Photo credits: Mike Martin, Laura Gingrich, Jeff Marcus

Table of Contents

Introduction

Carolina Bays are shallow elliptical depressions found primarily in the Atlantic Coastal Plain (New Jersey to Florida). The geological origin of these features is debatable, but their presence plays an important role for biodiversity in the southeastern United States. The name Carolina Bay comes from where these geological features reach their highest concentration, which is in North Carolina and South Carolina. Most Carolina Bays are oriented northwest to southeast on their long axis and accompanied by sand rims along their southeastern and northeastern sides.

In North Carolina and South Carolina, Carolina Bays occur in different physiographic sub-regions and on different soil types, resulting in a high diversity of natural communities, plants, and animals. Clay-based Carolina Bays have a clay subsoil layer that will perch water above the surface. Many of these examples are isolated, ephemeral wetlands. Peat-based Carolina Bays are associated with organic peat soils and may contain entirely different plant and animal species. Some peat-based Carolina Bays are permanently flooded and form natural lakes.

Why Bays Matter

Carolina Bays play a crucial role in local and regional ecology and biodiversity. Clay-based bays tend to have a rich herbaceous layer and are ecological hotspots for rare plants and isolated wetland-breeding amphibians. Peat-based bays are often covered in pocosin plants like shining fetterbush (*Lyonia lucida*) and little gallberry (*Ilex glabra*). Longleaf pine communities occur on Carolina Bay sand rims, where many animal and plant species that specialize in xeric habitats occur.

Carolina Bays play a critical role as biodiversity hotspots across the Southeastern U.S. Coastal Plain. Some species' and natural community's distributions are restricted only to Carolina Bays and similar wetlands.The globally imperiled Cypress Savanna communities occur almost exclusively in them. Natural lakes and Coastal Plain Depression Swamp communities find much of their distribution in them. Most of the pocosins in South Carolina occur in Carolina Bays.

Carolina Bays support a suite of high-priority species, many of which are closely tied to the hydrology and seasonal dynamics of these distinctive wetlands. A long list of rare plant species finds all or most of their population, globally or in the Carolinas, in Carolina bays. Examples include Boykin's lobelia (*Lobelia boykinii*), Canby's dropwort (*Oxypolis canbyi*), bog spicebush (*Lindera melissifolia*), branched hedge-hyssop (*Gratiola ramosa*), netted nutrush (*Scleria reticularis*), awned meadow-beauty (*Rhexia aristosa*), and white doll's-daisy (*Boltonia asteroides*). Amphibians are of particularly interest in bays: species such as the Flatwoods Salamander (*Ambystoma cingulatum*), Mabee's Salamander (*Ambystoma mabeei*), Tiger Salamander (*Ambystoma tigrinum*), Gopher Frog (*Lithobates capito*), Southern Chorus Frog (*Pseudacris nigrita*), and Ornate Chorus Frog (*Pseudacris ornata*) depend on the fish-free hydroperiods of ephemeral wetlands including bays for breeding. Reptiles like the Spotted Turtle (*Clemmys guttata*) and Chicken Turtle (*Deirochelys reticularia*) also rely on these habitats for

critical life stages. Among birds, the Prothonotary Warbler (*Protonotaria citrea*), Wood Stork (*Mycteria americana*), and various migratory waterfowl use bays as foraging or nesting sites. Bats such as the Southeastern Bat (*Myotis austroriparius*) and the Tri-colored Bat (*Perimyotis subflavus*) may forage over bays as well.

Carolina Bays with intact hydrology may play a role in flood mitigation. These intact basins exhibit potential to provide a significant quantity of flood storage during storm events, while bays that have been ditched or highly altered are unable to store as much water and instead contribute stormwater run-off to flood events (NCDEQ 2025).

A substantial portion of Carolina Bays support organic soils (histosols) and exhibit potential for long-term atmospheric CO_2 sequestration and storage in peat. The periodic fires that occur in peatlands are more likely to be severe and to lead to peat consumption within peatland bays that have been ditched and drained, so catastrophic fire prevention and carbon loss prevention represent an important role for conservation efforts. Conservation of Carolina bays is now of increased importance because these at-risk wetlands bays may lose State and Federal protection and sustain greater drainage and catastrophic fire impacts due to the US Supreme Court's Sackett decision and the North Carolina Farm Act of 2023.

As a source of fresh water, game, and edible and medicinal plants, Carolina Bays have influenced human activity for thousands of years. Archaeological and more recent historical artifacts and resources can be found on some sand rims adjacent to Bays, and Carolina Bays hold cultural significance for some communities.

The Challenge

The vast majority of Carolina Bays have been degraded or destroyed via ditching, draining, filling, fire suppression, and modification for varied land use. The lack of federal and state protections for isolated wetlands limits the resources available for conserving Bays, let alone the uplands and connectivity between Bays that are necessary for a resilient system. Furthermore, many Bay types require active management, particularly prescribed fire, vegetation control, and hydrologic restoration where necessary. Given these challenges, conservation partners came together in 2025 to spotlight the significance of Carolina Bays and create this document.

The purpose of this document is to provide a roadmap documenting the steps that are needed to sustain Carolina Bays and their associated biodiversity and cultural values for the long term. This plan covers Carolina Bays in NC and SC across all ownerships, focusing on protection, hydrologic restoration, prescribed fire, invasive control, and culturally informed stewardship. By identifying our objectives and the actions needed to achieve them, we hope that this document can motivate and direct partnership collaboration towards prioritizing Carolina Bays before these unique ecosystems disappear altogether.

Protection

Previous efforts to protect Carolina Bays have resulted in protection for a number of sites of high biodiversity value. Given the bays' critical regional ecological roles and sensitivity to negative hydrological impacts it is essential that the entirety of targeted bays be legally protected along with sufficient surrounding buffer. The challenges for adequate bay protection include lack of sufficient funding and dedicated staff for acquisitions, fragmented land ownership patterns (i.e. the basins of bays often split between multiple landowners), and lack of adequate management capacity to take on management responsibilities for newly protected bays.

Protection efforts should continue to prioritize securing sites with the highest biodiversity value, including protecting multiple examples of all the species and communities closely associated with bays. Protection should also be prioritized to secure complexes of ecologically connected Carolina Bays and other wetlands within resilient landscapes. Where applicable, protection should be prioritized for bays with cultural significance, especially those with archeological or other cultural resources present and sites identified by Native American Tribes or local communities as culturally significant. Finally, protection efforts should help to improve the hydrological and ecological function and the ease of management of existing protected bays, including securing sufficient adjacent upland habitat.

These priorities will not always align, and there will continue to be questions about whether it is better to secure a complex of connected bays within a resilient landscape that need restoration or to protect a site that still has high biodiversity and conservation values but is isolated and vulnerable. Biodiversity value must be prioritized, but not without taking into account the reality of long-term success with regards to feasibility and resiliency.

Objective 1: Identify and protect sufficient high priority bays across the landscape to sustain populations of target species and communities.

Action
1a. Map priority regions and sites for protection based on ecological priorities, landscape connectivity, and cultural resources, as feasible, using available data, existing knowledge, and expert opinions. Identify needs to fully realize protection of sites where significant investment has already occurred. Prioritize sites that protect bay complexes that contain rare and threatened species.
1b. Determine and map land ownerships within each project area and prioritize parcels for protection. Assemble information on landowners including any partners who may help make contact with them.
1c. Protect, through fee simple purchase, conservation easement, or management agreement, at least 20 viable[1] sites including uplands in each state, which have been

[1] Containing intact or restorable hydrology and the potential to restore and/or retain an intact natural vegetation community long term.

determined to be high ecological priority by experts and with sufficient potential for management and connectivity to sustain populations of representative species.
1d. Protect, through fee simple purchase, conservation easement, or management agreement, bay complexes around the high priority bays with sufficient connectivity to support viable populations of indicator species appropriate to that bay type.

Objective 2: Identify funding and expand capacity for the protection of Carolina Bays in North and South Carolina.

Action
2a. Identify federal, state, and private funding opportunities to meet identified protection priorities and share among partners.
2b. Build staff capacity for relationship-building and protection of bays.

Management and Restoration

Although each Carolina Bay is unique, these wetlands exist within landscapes that have adapted over centuries to support frequent fire. In the present day, in the absence of free ranging fires, these species and habitats require prescribed fire. In Carolina bays, fire suppression can lead to intrusion by loblolly pine, sweetgum, and invasive species, choking out rare herbs and shrubs and substantially altering the hydrology to the detriment of amphibians and other wildlife. Prescribed fire also protects communities, timber, structures, and utilities from wildfire.

Therefore, many (but not all) Carolina Bays must be managed by prescribed fire and vegetation control. In some instances, restoration of natural hydrology is needed to reverse the effects of ditching or filling. Ongoing management is essential to avoid degradation of natural communities and extirpation of species.

There is not a one-size-fits-all prescription for managing Carolina Bays. Different types of bays require different management, and indeed each individual bay is unique in its soils, hydrology, vegetative structure and composition, and management history. Management decisions must be made on a site-by-site basis, informed by landowner objectives.

The presence of priority species has direct implications for management strategies. For herpetofauna, maintaining natural hydroperiods is essential—ditching, draining, or altering water levels can eliminate breeding habitat, while restoration of historic hydrology may re-establish viable populations. For birds, especially colonial waders and migratory species, managers must consider timing of prescribed burns or water manipulation to avoid disrupting nesting or foraging. Plant communities often serve as indicators of ecological condition, guiding decisions

about fire frequency, invasive species control, and canopy management. For example, preserving open, herbaceous bay interiors favors amphibian breeding and rare wetland plants, while encroachment of woody vegetation due to fire suppression can reduce habitat suitability. Thus, species presence not only elevates conservation priority but also shapes the suite of restoration and management interventions needed to sustain the ecological integrity of Carolina Bays.

Peat soils play an important role in carbon sequestration. When fire gets into desiccated peat soils the fire can burn for weeks, releases lots of carbon, can cause significant smoke management problems, and may significantly alter plant communities and hydrology. Special care must be taken with burning in peat-based bays with specific management outcomes identified in advance.

Objective 1: Identify needs and priorities for managing Carolina Bays across the landscape

Action
1a. Compile existing literature and other information sources on best management practices and desired conditions for each bay type.
1b. Encourage and support conservation organizations that own Carolina Bays to identify and prioritize management and restoration actions for their bays.
1c. Refine priority areas and top target locations for improved management and restoration opportunities. Include both existing conservation lands held by partners and identify priority private lands/landowners.
1d. Define significant restoration and management issues and hurdles and use them to articulate the research topics that will better guide restoration and management.

Objective 2: Increase funding for the restoration and management of Carolina Bays in North and South Carolina.

Action
2a. Identify federal, state, and private funding opportunities to meet identified restoration and management needs of conservation partners that own bays.
2b. Ensure continued funding for private landowners through federal programs (i.e. Farm Bill) and other similar programs at the state or private level.

Objective 3: Improve the management and increase restoration of Carolina Bays on conserved land.

Action
3a. Identify opportunities to build shared capacity for improved management. Assess the needs and capabilities of conservation groups, agencies, and contractors.
3b. Build technical knowledge among managers and practitioners, providing technical assistance and outreach through workshops, webinars, and other outreach tools and direct technical assistance.
3c. Increase monitoring on reference and actively managed bays to inform restoration and management strategies, including: hydrology, vegetation, and rare species.
3d. Maintain Bays working group for sharing information and coordination. Build the network of partners and engage new and non-traditional partners to create additional capacity and resources for bay restoration and management.

Objective 4: Improve the management and restoration of Carolina Bays on private and tribal lands.

Action
4a. Build technical knowledge among landowners, providing technical assistance and outreach through workshops, webinars, factsheets, and other outreach tools and direct technical assistance.
4b. Build capacity with local tribes and collaborate on management and restoration opportunities. Work with tribes to develop management plans and assist them in implementing culturally appropriate management.
4c. Create and maintain a list of contractors that could assist private and tribal landowners with managing their land.

Research/Surveying/Monitoring

Scientific research on Carolina Bays has provided strong ecological insights, but considerable debate and uncertainty remain in several fundamental areas.

Areas with relatively strong scientific evidence include:

1. **Hydrology** – Carolina Bays are mostly isolated, rainfall-driven seasonal wetlands; groundwater exchange varies by setting; soil properties and water balance dominate their hydrology.

2. **Ecological roles of fauna and flora** – These wetlands are biodiversity hotspots, supporting amphibians, migratory birds, and plants adapted to ephemeral hydroperiods.

3. **Vegetation dynamics and fire ecology** – Community composition and ecotonal shifts are shaped by hydroperiod and fire regimes. Clay-based bay communities, in particular, are well known for dramatic changes in plant species in response to short term climatic fluctuations, and for having many species that remain dormant in a seed bank until conditions are right for them.

Areas where research remains limited or contested include:

1. **Climate change impacts** – Few studies examine potential shifts in hydroperiods, species persistence, or groundwater recharge under climate change.

2. **Groundwater connectivity** – Subsurface interactions are suggested but poorly quantified.

3. **Land-use effects** – Long-term, landscape-scale impacts of agriculture, forestry, and urbanization are under-studied.

4. **Restoration outcomes** – Hydrologic and prescribed fire restoration show promise, but comprehensive long-term ecological data across sites are scarce.

5. **Ecosystem services and connectivity** – Carbon sequestration, nutrient cycling, and wetland connectivity remain underexplored, though broader studies on isolated wetlands point to their landscape importance.

Integrative, long-term, landscape-scale research will be key to inform conservation and adaptive management strategies. To better guide protection and management of Carolina Bays, research must move beyond individual case studies toward systematic, landscape-scale evaluation. A key priority is defining what makes a bay “best” for conservation—whether measured by intact hydrology, presence of priority species, community rarity, or resilience to surrounding land use pressures. Comprehensive classification and prioritization efforts, such as the macro-level work conducted by Chick Gaddy in South Carolina and Tim Nifong’s studies of North Carolina’s clay-based bays, provide useful models for scaling this approach. A coordinated USDA-funded initiative could update and expand these efforts across the Southeast, with a focus on county-level ranking systems that consider habitat diversity, bay size, species richness, and urban interface dynamics.

At the site level, targeted species surveys are urgently needed to establish baseline distributions of at-risk, rare, and endangered taxa. Surveys of current community conditions are also needed for many sites. These data would ensure that protection and restoration efforts are guided by

real-time knowledge of population status rather than historical assumptions. Hydrology and fire regimes also require renewed attention: soil studies, dendrochronology, and long-term monitoring could clarify natural fire return intervals, inundation patterns, and their role in sustaining bay diversity. A concise, standardized classification system—developed in collaboration with partners and informed by focus group priorities—would allow managers to evaluate bays systematically, compare across regions, and integrate results into adaptive management models. Success will depend on adequate funding, community access, and engagement of university partners, students, and citizen scientists. The Carolina Bays Focus Group could serve as a central forum for sharing new findings, collating historical records, and synthesizing ongoing restoration projects to build collective capacity for conservation.

Objective 1: Consolidate known information and define metrics for goal setting.

Action
1a. Assemble a cohesive list of bay types, reference bays, indicator species (including flora and fauna), and metrics for a viable system applicable to both states that can inform strategic goals.
1b. Conduct a comprehensive survey of North Carolina bays, as resources allow.

Objective 2: Increase surveying and monitoring efforts in Carolina Bays.

Action
2a. Survey for rare, at-risk, and listed species in bays with suitable habitat, historic records, and/or high priority sites.
2b. Conduct routine monitoring of hydrology, vegetation, and other factors in Bays that are under restoration or active management to inform future management.
2c. Engage with local communities, volunteers, and citizen science projects to bolster monitoring.

Objective 3: Increase research on Carolina Bays.

Action
3a. Identify highest priority knowledge gaps for research.
3b. Partner with research institutions to conduct studies.

Communications and Outreach

In order to successfully implement this plan, it will be necessary to effectively communicate internally with conservation partners, and externally with a variety of stakeholders. We anticipate that upon completion of this plan, the first communications task will be to ensure that conservation organizations that are stakeholders or interested in supporting or participating in bay conservation are aware of the plan, its contents, and the role they could play in supporting the goals of the plan. The next task may be outreach to conservation entities that own Carolina Bays to ensure they have the information they need to inform management of bays, and seek to understand resource needs to carry out that management.

In order to catalyze action from external stakeholders - whether improved public policy, commitment of funding, or action taken by private landowners to protect and restore bays - it may be beneficial to increase awareness of, and appreciation for, Carolina Bays among the general public. However, specific outcomes will require outreach targeted to particular audiences in strategic locations, with messages tailored to encourage the desired outcomes. Ultimately, we think that the bulk of the Communications and Outreach effort for this plan should be for these targeted audiences, and should be done in coordination with (and in service of) the Protection, Management, and Research objectives articulated above.

Objective 1: Improve public awareness and perception of bays.

Action
1a. Create a web presence to educate the public about the importance of bays. Highlight bay ecosystem services, ecology, origins, and cultural value.
1b. Host and attend strategic public events to raise awareness about bays and their importance.

Objective 2: Encourage private landowners to take action in protecting, restoring, and managing the bays under their ownership.

Action
2a. Create documents to communicate the benefits of bays, available resources, and important contacts, and share with target landowners.
2b. Provide outreach events targeting private landowners with bays to connect them with opportunities for restoration, management, and protection.

Objective 3: Advocate for better management of bays by public agencies and other conservation partners.

Action
3a. Provide learning opportunities for partners through recurring meetings, field tours, and compilation of resources. Create an internal platform for sharing resources. Emphasize tools and case studies that address concerns around burning bays and demonstrate outcomes.
3b. Encourage partners with bays in their ownership to prioritize management.

Objective 4: Improve public policy around funding, regulations, and land use to benefit bay conservation.

Action
4a. Create resources explaining the benefits of bays and other wetlands geared towards policy decision makers.
4b. Identify target interest groups to collaborate with beyond the existing partnership.
4c. Identify whether an existing partnership has resources for needed advocacy and if not, seek support.
4d. Identify policy changes that would positively benefit bays and disseminate priorities to lobbyists.

Objective 5: Improve awareness of culturally important sites, protect cultural resources, and facilitate greater cultural connection to bays.

Action
5a. Consult with local tribes and communities regarding the cultural significance of bays and engage in opportunities for collaboration.
5b. Work with local tribes and communities to establish best practices for archeological surveys.
5c. Increase the use of community science and native and indigenous knowledge.

References

Barton, C. D., Andrews, D. M., and Kolka, R. K. 2008. Evaluating hydroperiod response in restored Carolina bay wetlands using soil physicochemical properties. Restor. Ecol., 16 (4), pp. 668-677, 10.1111/j.1526-100X.2008.00480.x

Bennett, S. H. & Nelson, J. B. (1991). Distribution and status of Carolina Bays in South Carolina. SC Wildlife & Marine Resources Department. https://www.dnr.sc.gov/wildlife/docs/CarolinaBaysStudy.pdf

Brooks, M.J., Taylor, B.E., and Ivester, A.H. 2010. Carolina Bays: time capsules of culture and climate change. Southeast Archaeol 29:146–163.

De Steven, D. and M. Toner: 1997. Gradient analysis and classification of Carolina bay vegetation: a framework for bay wetlands conservation and restoration. U.S.D.A. Forest Service, Savannah River Forest Station, New Ellenton, SC, USA.

Gaddy, L. L. and Gaddy, L. L. III. 2025. An Inventory of Carolina Bays and Isolated Wetlands on Private Lands in the Coastal Plain of South Carolina. USDA Unpublished Report. Columbia, SC.

Johnson, D. W. 1942. The origin of the Carolina Bays. New York, Columbia U. Press.

Kirkman, K. L., Drew, M. B., West, L. T., and Blood, E. R. 1998. Ecotone characterization between upland longleaf pine/wiregrass stands and seasonally-ponded isolated wetlands. Wetlands 18:346–64.

Kirkman, K. L., Goebel, P. C., West, L., Drew, M. B., and Palik, B. J. 2000. Depressional wetland vegetation types: a question of plant community development. Wetlands 20:373–85.

Kirkman K. L., Lide, R. F., Wein, G., and Sharitz, R.R. 1996. Vegetation changes and land-use legacies of depression wetlands of the western coastal plain of South Carolina: 1951–1992. Wetlands 16 (4): 564-576. https://doi.org/10.1007/bf03161347

Laliberte, L., Luken, J. O., Hutchens Jr., J. J., and Godwin, K. S. (2007). The Ecological Boundaries Of Six Carolina Bays: Community Composition And Ecotone Distribution. Vol 24. No. 4, pp. 873-883

Leibowitz, S. G. 2003. Isolated wetlands and their functions: an ecological perspective. Wetlands 23(3):517-531.

Lide, R. Meentemeyer, V, Pinder III, J, and Beatty, L. 1995. Hydrology of a Carolina bay located on the upper coastal plain of western South Carolina. Wetlands 15: 47–57.

Marton, J. M., Creed, I. F., Lewis, D. B., Lane, C. R., Basu, N. B., Cohen, M. J., & Craft, C. B. 2015. Geographically isolated wetlands are important biogeochemical reactors on the landscape. BioScience 65: 408-418. doi:10.1093/biosci/biv009

Marton, J. M., Fennessy, M. S., and Craft, C. B. 2014. Functional Differences between natural and restored wetlands in the glaciated interior plains. Journal of Environmental Quality, 43: 409–417.

McElfish, J. M., Kihslinger, R. L., and Nichols, S. 2008. Setting buffer sizes for wetlands. National Wetlands Newsletter 30(2): 6-10,17.

Mitchell, R.J., Liu, Y., O'Brien, J. J., Elliott, K. J., Starr, G., Miniat, C. F., & Hiers, J. K. (2014). Future climate and fire interactions in the southeastern region of the United States. Forest Ecol. Manage. https://www.srs.fs.usda.gov/pubs/ja/2014/ja_2014_mitchell_001.pdf

Moritz, C. M., Vepraskas, M. J., and Ricker, M. C. 2023. A rapid approach for ecological assessments in Carolina Bay wetlands that were previously converted to agriculture. Frontiers in Forests and Global Change, 6. https://doi.org/10.3389/ffgc.2023.1148935

Nifong, T. D. 1982. The "Clay Subsoil" Carolina Bays of North Carolina. Department of Botany, University of North Carolina.

Nifong, T. D. 1998. An ecosystematic analysis of Carolina Bays in the coastal plain of the Carolinas. Ph.D. Thesis, Department of Biology, University of North Carolina at Chapel Hill.

North Carolina Department of Environmental Quality (NCDEQ). 2025. Final Study Report: Evaluation of Carolina Bays for Flood Mitigation. N.C. Division of Mitigation Services, 1652 Mail Service Center, Raleigh, NC 27699-1652

Phillips, P. J., and Shedlock, A. J.1993. Hydrology and chemistry of groundwater and seasonal ponds in the Atlantic Coastal Plain in Delaware, USA. Journal of Hydrology 141: 157-178.

Prouty W. 1952. Carolina bays and their origin. Geologic Society of America Bulletin 63: 167–224.

Ross, T. E. (1987). A comprehensive bibliography of the Carolina Bays literature. The Journal of the Elisha Mitchell Scientific Society, 103(1), pp.28-42. http://defendgaia.org/bobk/cbaybib.html

Sackett, S. S. 1975. Scheduling prescribed burns for hazard reduction in the southeast. Journal of Forestry/March 1975. 143-147 5p.

Schafale, M. Classification of the Natural Communities of North Carolina. In Fourth Approximation; Natural Heritage Program:Raleigh, NC, USA, 2023.

Sharitz, R. 2003. Carolina bay wetlands: unique habitats of the southeastern United States. Wetlands 23: 550–562.

Sun, G., Callahan, T., Pyzoha, J., and Trettin, C. 2006. Modeling the climatic and subsurface stratigraphy controls on the hydrology of a Carolina bay wetland in South Carolina, USA. Wetlands 26: 567–580.

Sun, G., Callahan, T., Pyzoha, J. E., Trettin, C. C., and Amatya, D. M. 2004. Modeling the Hydrologic Processes of a Depressional Forested Wetland in South Carolina, U.S.A. Pp.331-332, In Proc. of Abstracts and Papers (on CD-ROM) of the 6th International Conf. on Hydro-Science and Engineering, Brisbane, Australia, May 31-June 03, 2004, eds. M.S. Altinakar, S.S.Y. Wang, K.P. Holz and M. Kawahara.

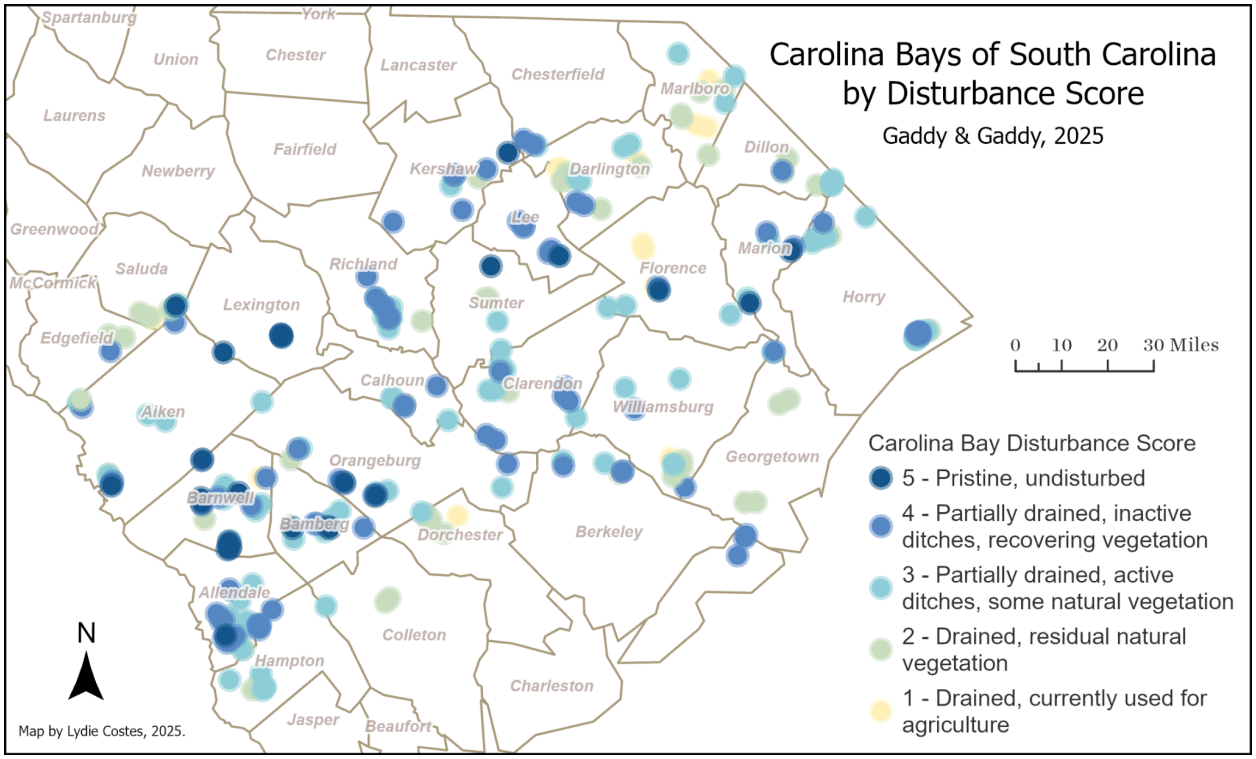
Tiner, R. W., 2003. Geographically isolated wetlands of the United States. Wetlands 23(3):494-516. https://doi.org/10.1672/0277-5212(2003)023[0494:GIWOTU]2.0.CO;2

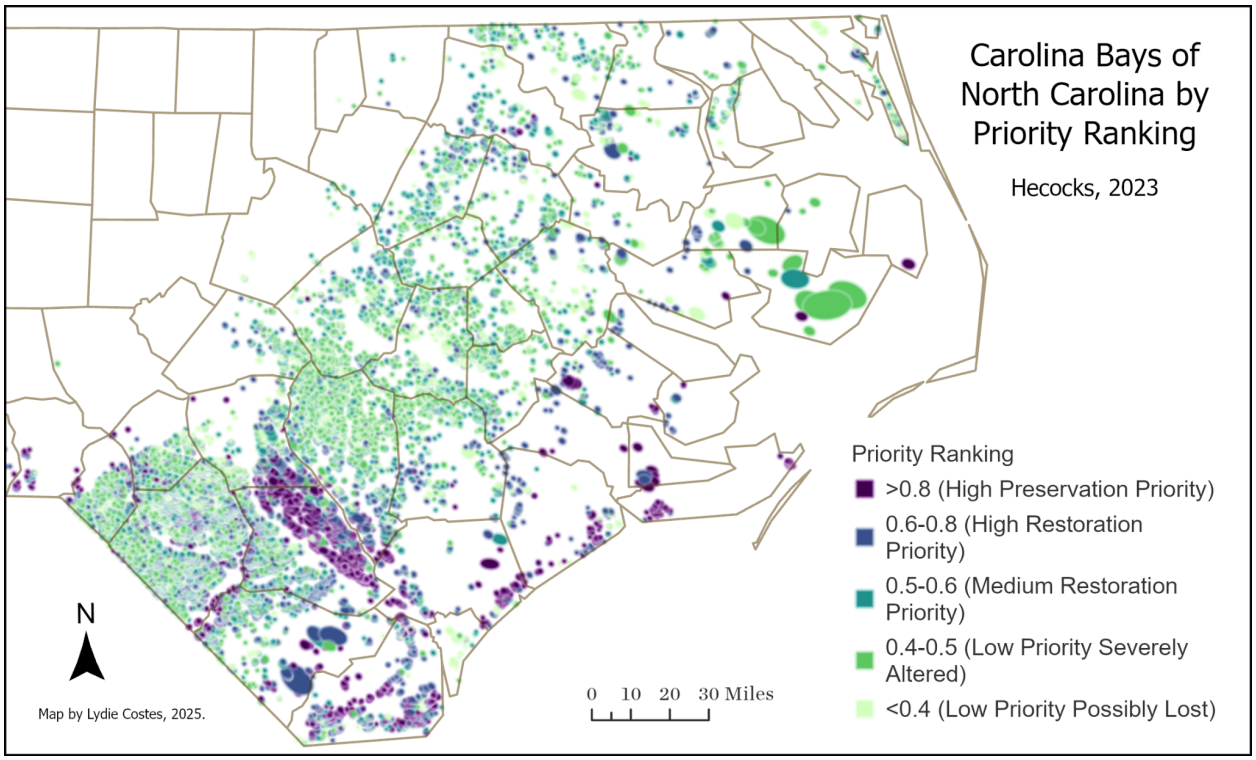
Appendices

Appendix A: Glossary of Terms

- **Carolina bay**: An elliptical depressional wetland found in the Atlantic Coastal Plain.
- **Ecosystem Services**: The various benefits that humans derive from ecosystems.
- **Ephemeral Wetland**: An area that temporarily holds water and dries periodically. Ephemeral wetlands are inherently isolated wetlands.
- **Dormant Season Burn**: A prescribed fire conducted after autumn leaf-fall and before spring green-up, while most plants are dormant.
- **Growing Season Burn**: A prescribed fire conducted while warm-season herbaceous plants are actively growing, from spring green-up until autumn leaf-fall.
- **Hydroperiod**: The period of time during which a wetland is covered by water.
- **Invasive Species**: A species that is non-native to a given area and that presents a threat to the native ecology and/or humans via economics or health. Not all non-native species are invasive.
- **Isolated Wetland**: A wetland lacking obvious surface connections to other water bodies; may be ephemeral or permanently wet, and can exhibit subsurface connectivity.
- **Native Species**: A species that is indigenous to a given area, having evolved there naturally over millennia.
- **Non-Native/Exotic Species**: A species that originated elsewhere and has been introduced to a given area.
- **NC/SC Carolina Bays Working Group**: A network of conservation partners working together to increase or improve the protection, restoration, management, and research on Carolina bays.
- **Prescribed Burn/Fire**: The practice of intentionally setting a fire to change the assemblage of vegetation and decaying material in a given area. Prescribed burns provide many benefits, including improved ecological health and reduced risk of wildfire.
- **Prescribed Burn Association (PBA)**: A community-based organization focused on increasing prescribed fire on private lands and empowering private landowners to conduct burns on their land.
- **Smoke-Sensitive Area (SSA)**: An area where smoke could unduly adversely affect public safety, whether due to visibility, health, or human welfare.
- **Wildfire**: An unplanned and uncontrolled fire occurring in a natural area.

Appendix B: Geographical Prioritization





Priority regions in each state

In South Carolina, priority bays for protection have been determined by Gaddy & Gaddy's (2025) report on privately-owned bays. The highest priority sites in their report are described as pristine or near-pristine and vary in terms of hydrology, soils, and vegetative communities. Top priorities for restoration and management among already protected bays warrant separate consideration.

North Carolina's last comprehensive reports on bays were the survey focused on peat-filled bays and the better known survey of lay-based bays conducted by Tim Nifong in the 1980's. However, county natural area inventories have revisited these sites and provide a more current picture of the most significant bays and of their communities and rare species. These data are compiled and prioritized along with other sites in the program's biennial protection plans and online natural areas data. Highest protection priorities to date have been determined by reviewing these data in conversation with partners about the intersection of ecological priority and feasibility for protection and management. For specifics, please see the 2030 Carolina Bays Priorities, available through the Carolina Bays Working Group upon request. Because the county natural area inventories were conducted over a period of years, some of the sites need new surveys to determine their current state. Additionally, all such surveys are limited by permission of landowners to visit the sites. Since most bays are privately owned, there are promising sites for which too little is known.

A weighted overlay analysis conducted by Sarah Hecocks (2023) utilizes geospatial data layers to assign scores to bays based on factors such as land cover, climate resiliency, predicted distributions of rare amphibians, and proximity to managed areas. Though these scores do not reflect the entirety of a bay's quality or attributes, they may be used as a starting point to identify further sites of interest. The dataset is available by request from The Nature Conservancy.