The Time is Now

An Assessment of Conservation Funding Needs in North Carolina

Prepared for

The Nature Conservancy
The Trust For Public Land
The Conservation Fund

Prepared by

George Van Houtven
Kimberly Matthews
Michele Eddy
Manuel Gonzalez

RTI International
3040 E. Cornwallis Road
Research Triangle Park, NC
27709

The Time is Now
An Assessment of Conservation Funding Needs in North Carolina

March 2021

Prepared for

The Nature Conservancy
The Trust For Public Land
The Conservation Fund

Prepared by

George Van Houtven
Kimberly Matthews
Michele Eddy
Manuel Gonzalez

RTI International
3040 E. Cornwallis Road
Research Triangle Park, NC
27709

Acknowledgments
Special thanks to the many individuals who shared their valuable time, expertise, and information to assist with this report, including Caleb Abbott, Mary Lou Addor, Jessie Birckhead, Mark Bondo, Jacob Boyd, Misty Buchanan, Kevin Cherry, Walter Clark, Kyle Clark-Sutton, Amin Davis, Evan Davis, Kibri Everett, Ed Hajnos, Katie Hall, Richard Hall, Dewitt Hardee, Cameron Ingram, Jeffrey Marcus, Brian McRae, Tancred Miller, Ron Myers, John Nicholson, George Norris, and Christine Schmidt, Paramita Sinha, Nathan Yates, and Sarah Zambon.

Contents

Executive Summary

Now is the time to invest in conservation. The COVID-19 pandemic has made it abundantly clear just how much North Carolinians love being outdoors. Our state park system experienced record visitation in 2020, with more than 19.7 million visitors despite being closed for six weeks. The N.C. Wildlife Resources Commission reported a 94% increase in fishing licenses from May to December 2020 over the previous year. During the same period, hunting licenses increased by nearly 20%.

Meanwhile, outdoor recreation continues to be a vital part of the State's economy. It accounts for $28 billion per year in consumer spending and supports 260,000 jobs. A new generation of hunters, anglers and hikers is discovering North Carolina's outdoor treasures, creating the need and opportunity to invest in conservation.

Traffic jam at Raven Rock State Park in May 2020 when the state park reopened after COVID-19 shutdown.

North Carolina is the eighth fastest growing state in the USA, which puts a significant burden on our natural resources. Investing in conservation now means generations to come will have more local parks and preserves, more public lands for hunting and fishing and hiking, more streamside woodlands that reduce risk from floods, more protected areas used to enhance military readiness, and more natural assets for our rural communities to be a part of the state's growing outdoor economy.

This report reviews and summarizes the status, benefits, and opportunities for conservation in the state. Key findings include:

- **The high pace of development across the state means a growing portion of remaining natural lands, farms, and cultural sites is being lost each year.** According to recent projections, more than 2 million acres of these lands have a high probability of development in next 30 years. These lands provide many valuable benefits that will be lost if developed.
- **The state's natural lands play a vital role in flood protection.** There is growing evidence that many more areas in North Carolina are at risk of flooding than previously predicted. Measures to protect, restore, and improve the management of forests, wetlands, and farmlands in headwaters and along river corridors can be highly effective and economical ways to reduce flood risks and damages.
- **Partnering with federal agencies to conserve mission-critical lands surrounding the state's military bases will require millions in annual matching funds.** Conserving land near military bases provides exciting opportunities to protect natural lands and farms, while at the same time benefiting national defense and boosting local economies. Thousands of acres in North Carolina have already been protected for these reasons, but many more opportunities exist. Continuing to attract

the millions of dollars in federal funds needed for these projects will require matching investments by the state.

- **State agencies have identified over $300 million in future conservation needs.** The North Carolina Division of Parks and Recreation has identified more than $310 million in funding needs to acquire 134,000 acres of new lands for the state park system. Other agencies, such as the North Carolina Wildlife Resources Commission, have also identified millions more in funding needs for high value but currently unfunded conservation projects.
- **Requests and applications for state-level conservation funds continue to significantly outpace available awards each year.** From 2014 to 2019, annual requests for conservation awards from the state's three main conservation trust funds—the North Carolina Land and Water Fund, the Parks and Recreation Trust Fund, and the North Carolina Agricultural Development and Farmland Preservation Trust Fund—exceeded awards by 2 to 3 times and on average more than $50 million per year. Over the same period, requested funds from cost-share programs run by the North Carolina Department of Agriculture and Consumer Services have exceeded awards by over 5 times and almost $24 million per year.
- **Land acquisition spending by the state's conservation trust funds has declined by two-thirds since the late 2000s, while the state's population has increased by almost 1 million.** Over the last two decades, the overwhelming majority and most consistent sources of state-level funding for acquiring and protecting natural lands have been the state's conservation trust funds. However, total trust fund spending for land acquisition has declined from an average of over $80 million per year in the late 2000s to less than $35 million per year now.
- **Taking full advantage of recent increases in federal land conservation funds will require millions more in state matching funds every year.** Over the last 5 years, North Carolina has received and matched about $3 million per year in outdoor recreation grants from the federal Land and Water Conservation Fund. With the passage of the Great American Outdoors Act in 2020, the funding available from this federal program is expected to increase to $9 million per year, but receiving these funds will require an equal annual commitment from state and local sources.
- **The NC Connect Bond has helped to offset some of the decline in conservation trust fund spending, but these bond funds are almost exhausted.** Since its approval in 2016, the NC Connect Bond has provided almost $3 million per year in additional land acquisition and park funding. This has partially offset declines in conservation trust fund spending, but these funds can only be used for parks and recreation projects and are expected to be fully spent in the next 2 years. Other sources of funding are needed to fill the void.
- **Additional state funds for conservation will strengthen North Carolina's ability to take advantage of new federal funding opportunities.** For example, the Federal Emergency Management Agency's newly created Building Resilient Infrastructure and Communities Program provides matching funds to states for projects that reduce natural hazard risks, with an emphasis on projects that incorporate nature-based solutions. The Defense Community Infrastructure Pilot Program is another $50 million per year federal investment providing matching funds to support community needs around military installations, including for parks or natural lands. In 2020, the City of Jacksonville received a $1 million grant from this program to help reconstruct a recreation center that supports Camp Lejeune families.

1 Introduction

North Carolina's wealth of natural and cultural resources are vital to the state's economy and the well-being of its residents. These natural and cultural assets include over 27 million acres of natural and working lands (meaning forests, wetlands, rangelands, farms, and grasslands). They also include thousands of miles of rivers, streams, and coastline.

Together these lands and waters support a rich variety of fish and wildlife resources, provide millions of acres of parks, game lands and historic sites for outdoor recreation and cultural activities, and serve as undeveloped buffers that help protect the missions of several military installations. They also make the state a more attractive place for companies to do business.

However, this natural and cultural wealth is increasingly difficult to sustain in the face of persistent population growth and land development. The state has added 1 million residents in the last decade and that pace is continuing. The housing, roads, powerlines, and other infrastructure needed to support this growing population inevitably take the place of many of the state's remaining farms, forests, and other natural lands.

More people in the state also means greater demand for outdoor recreational resources, and this growing demand has been pushed even further by the COVID-19 pandemic. 2020 saw a major upswing in fishing and hunting license applications, and visits to the state park system reached record levels. A new generation of hunters, anglers, and hikers is discovering North Carolina's outdoor treasures.

Conservation is needed to address these growing pressures, threats, and demands. Conservation means investment in a broad set of practices designed to protect and augment the state's natural and cultural wealth in the face of development pressures, including:

- Protect and preserve natural and cultural resources in their current state, by restricting development or other activities that have the potential to degrade them,


Photo credit: NC Wildlife Federation

- Restore degraded resources, for example through reforestation, and wetland, stream, and other habitat restoration projects, and
- Enhance the benefits provided by natural and working lands, for example through improved land management practices, nature trail development, and improved access for outdoor recreation.

North Carolina has a long history of state-funded conservation efforts. In 2016, it celebrated the centennial of its state park system, which began with the creation of a state park at Mount Mitchell and now spans a quarter million acres that include 83 parks, lakes, recreation areas, natural areas, rivers, and trails. In 1947, the North Carolina Wildlife Resources Commission was established to guide conservation of the state's fish and wildlife resources. Now more than 2 million acres of public and private lands are managed by the commission for hunting, fishing, and other wildlife-associated recreation. Since 1987, the General Assembly has created multiple state-level trust funds dedicated to supporting conservation of the state's natural resources and heritage.

Now is the time to evaluate the status and future of the state's conservation efforts. The purpose of this report is to review and summarize the status, benefits, opportunities, and needs for state-level conservation investments in North Carolina. In particular it asks: to what extent is state-level funding for conservation keeping up with those needs and opportunities?

2 How Does The State Invest In Conservation?

Over the last several decades, North Carolina has developed, funded, and implemented a wide variety of programs that fund or provide incentives for land and water conservation. These programs, which are described in more detail in Section 4, generally use one or more of the following approaches to pay for or encourage conservation:

- **Land acquisition.** The most direct way to protect natural or culturally significant lands from development is by purchasing the land outright, which is often referred to as a "fee-simple" purchase. In many cases, the acquired lands become publicly owned and managed by the state, such as state parks and game lands. In other cases, the state provides financial assistance to private nonprofit conservation organizations (land trusts) or to local governments to acquire and manage natural lands.
- **Conservation easements.** This type of legal agreement separates specific property rights (i.e., those that conflict with conservation objectives) from the landowner. Typically, the owner forgoes the right to develop the land for residential or commercial purposes but otherwise retains use and oversight of the land. In many cases, working land activities such as environmentally sustainable farming and forestry are allowed to continue.
- **Restoration or enhancement projects.** In many cases, the state allocates funds to its agencies, local governments, or conservation organizations for projects that restore or enhance natural lands or ecosystems and the benefits they provide. They range from projects that restore wetland or stream ecosystems to projects that establish or improve access to outdoor recreation areas.
- **Cost-share payments for conservation practices.** To encourage private landowners and local governments to adopt land use and management practices that support conservation goals, the state often pays a portion of their costs. The types of supported practices range from the use of cover crops and reduced tillage on farmland to installation and maintenance of rain gardens in urban areas.
- **Tax incentives.** The state uses a variety of tax incentive approaches to encourage conservation. For example, in certain cases landowners can reduce their property tax liabilities or other mandatory payments in exchange for donating land to a conservation land trust, establishing conservation easements, or adopting conservation practices. In 1983, North Carolina was the first state in the country to implement a conservation tax credit. That program, however, was discontinued in 2013.

Although most of these approaches focus on improving the use and management of natural lands and farms, in most cases they also protect and enhance the state's water, wildlife, and cultural resources. For example, land acquisitions and conservation easements can be important tools for protecting sensitive wildlife habitat or areas of historic significance. One of the main benefits and objectives of agricultural and urban stormwater cost-share programs is the protection of water quality in rivers, streams, lakes, and estuaries.

All these conservation investment approaches (except tax incentives) require the direct use of state funds. These funds come from a variety of sources including general revenues, license plate fees, timber assessments, and dedicated bond issues. These state resources are also often used to leverage additional funds from private or other public sources. In other words, they either require matching commitments from private or local government sources, or they take advantage of matching funds offered by federal conservation programs. Section 4 provides details on the state's current conservation funding programs and approaches.

3 North Carolina's Natural and Cultural Resources

To assess the benefits and future needs for conservation in North Carolina, it is important to take stock of the state's current natural and cultural resource base. This section provides a brief overview and assessment of the key features and status of North Carolina's natural and working lands, water resources, and wildlife resources.

NATURAL AND WORKING LANDS

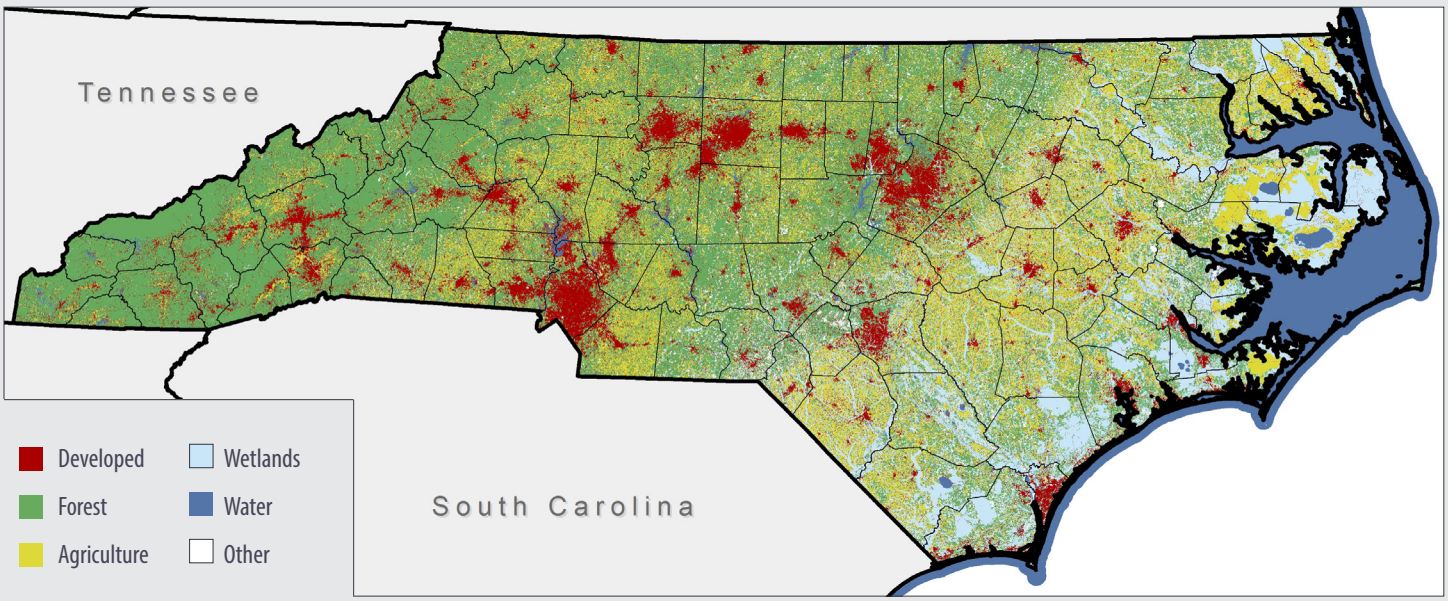
North Carolina measures roughly 31.5 million acres (almost 50,000 square miles).[1] Figures 1 and 2 show the major land uses and land cover types of the state (as of 2016).

Almost 87 percent of the state is natural and working lands. Natural lands include unmanaged forests, wetlands, and shrub/grasslands. When combined with managed forests (working lands), these areas account for about 20.5 million acres. Agricultural lands (also working lands), including cropland and pasture, cover an additional 6.9 million acres. Most of the wetlands (including woody wetlands, which are sometimes also classified as forest) are found in the eastern (coastal plain) part of the state, whereas forests dominate the western (mountain) region. Agricultural lands are scattered across the state but are most common in the coastal plain.

High and low density developed lands—that is, urban and suburban areas—accounted for roughly 11 percent of the state's surface area in 2016; however, this percentage continues to grow. The main concentrations of developed land are in the central (Piedmont) region, including the Raleigh-Durham-Chapel Hill (Triangle) area, the Charlotte-Mecklenburg County area, and Greensboro/Winston-Salem/High Point (Piedmont Triad) areas, and along the I-40 corridor extending west to Asheville.

Although most (88 percent) natural and working lands in North Carolina are privately owned, roughly 5 million acres are currently protected and managed for conservation. The federal government owns and manages 2.7

Figure 1. Land Use/Land Cover Map of North Carolina (2016).



Source: Dewitz, J., 2019, National Land Cover Database (NLCD) 2016 Products: U.S. Geological Survey data release, https://doi.org/10.5066/P96HHBIE.

1 Dewitz, J., 2019, National Land Cover Database (NLCD) 2016 Products: U.S. Geological Survey data release, https://doi.org/10.5066/P96HHBIE.

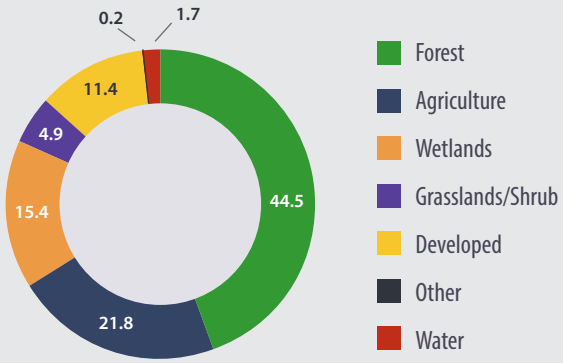
million acres, including 4 national parks and seashores, 4 national forests, and 12 natural wildlife refuges.[2] As shown in Figure 3, most of these federal lands are in the eastern- and westernmost portions of the state. Those owned and protected by the state cover more than 1.4 million acres, including 65 state game lands and 83 state parks, recreation areas, natural areas, and other park units.[3]

WATER RESOURCES

North Carolina has more than 12,000 miles of estuarine shoreline, 35,000 miles of rivers and streams, and nearly 1,500 lakes and reservoirs of 10 acres or more. These waters support a range of human uses, such as drinking water and recreation, and provide a wide variety of aquatic ecosystems.

As more people move into North Carolina, these resources are increasingly impacted by water pollution and water quality impairments. To track these impairments, the state conducts assessments and maintains a list of streams, rivers, and other waterbodies that do not meet established water quality standards. The most recent list includes about 7 percent (over 2,600 miles) of the state's rivers and streams and over 570,000 acres of impaired waters.[4]

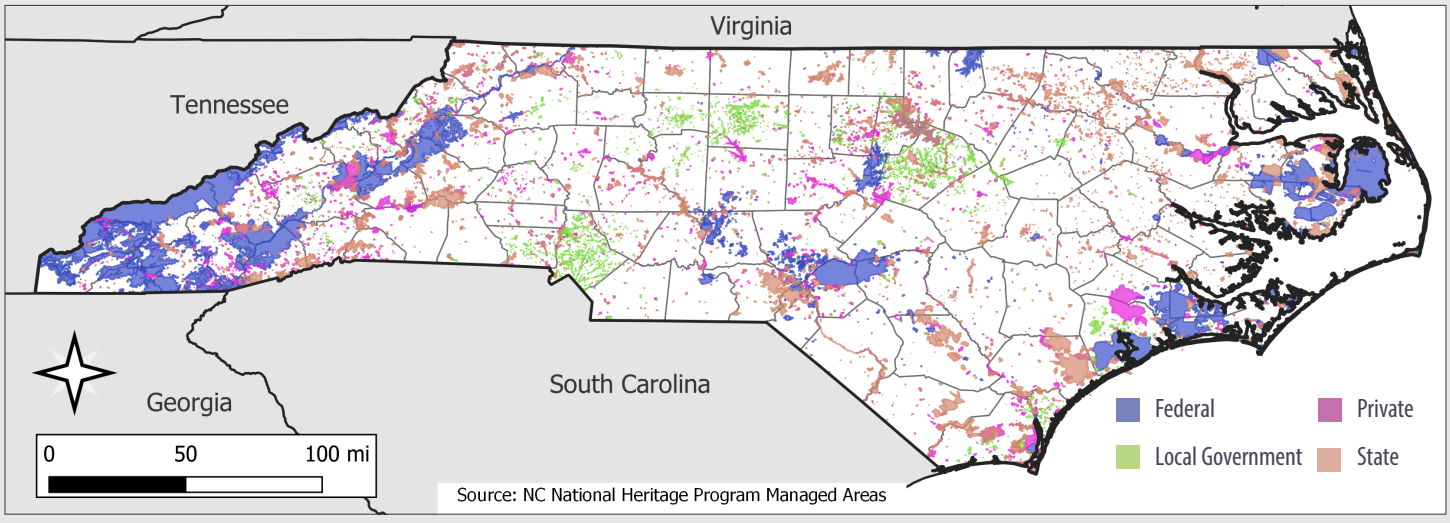
Figure 2. Percentage Breakdown of Land Use in North Carolina (2016).



Source: Dewitz, J., 2019, National Land Cover Database (NLCD) 2016 Products: U.S. Geological Survey data release, https://doi.org/10.5066/P96HHBIE.

One of the main sources of water quality degradation in North Carolina is runoff from urban, suburban, and agricultural lands. The runoff contains pollutants such as sediments, nutrients (nitrogen and phosphorus), and certain metals, that can be naturally occurring or human-caused

Figure 3. Currently Protected Lands In North Carolina, By Management Type



Source: Natural Heritage Program

2 https://www.nps.gov/state/nc/index.htm; North Carolina Natural Heritage Program. 2019. Natural Heritage Program 2019 Biennial Report, p.15; https://fas.org/sgp/crs/misc/R42346.pdf

3 https://www.ncparks.gov/more-about-us/about-state-parks-system/components

4 http://pulse.ncpolicywatch.org/2019/01/17/more-than-1200-new-miles-of-nc-rivers-streams-proposed-for-impaired-waters-list/#sthash.PCsuGsaW.dpbs

Falls Lake provides drinking water for Raleigh. Protecting the state's drinking water resources is crucial to the future.

and can harm ecosystems, human health, and the visual appearance of surface waters.

Many conservation measures on natural and working lands offer effective strategies for protecting water quality by controlling and filtering runoff. For example, maintaining and protecting streamside forests and vegetation or installing natural systems to capture stormwater help to remove pollutants from runoff.

WILDLIFE RESOURCES

Due in part to its size and geographic diversity, ranging from the coastal plains to the Appalachian Mountains (including the highest elevations east of the Mississippi River), North Carolina is home to a variety of natural habitats, ecosystems, and animal species. The state's wildlife includes a diverse collection of birds, mammals, fish, reptiles, and amphibians. Many of these species are vital for popular outdoor recreational activities including fishing and hunting. Other species are lesser known and appreciated by the public but play a significant role in preserving the state's natural biodiversity.

Regrettably, many of these natural systems and species are under threat from the combined effects of land development (which shrinks and fragments natural habitats), population growth, air and water pollution, and climate change. North Carolina currently is home to almost 70 animal species considered endangered by federal or state authorities, over 60 species designated as threatened, and another 128 listed as species of special concern by the state.

To preserve and protect these species and their habitats, the North Carolina Wildlife Resources Commission has identified almost 20 natural community types, ranging from high elevation habitats and spruce-fir forests in the West to peatlands and maritime forests in the East, as priorities for conservation. These communities were selected based on a combination of the level of threat they face and the unique benefits they provide to wildlife.[5]

5 North Carolina Wildlife Resources Commission. 2012. Conservation recommendations for priority terrestrial wildlife species and habitats in North Carolina. Raleigh, NC.

4 State-Funded Conservation Programs

North Carolina has a long history of investing in conservation. Over the last several decades, state-level support for conservation has been financed through a combination of dedicated revenue streams, bond issues, annual legislative appropriations, and tax incentives. These funding streams have helped establish multiple conservation trust funds, grants, and cost-share programs, which are then typically used to leverage additional funding from a variety of public and private sector sources. Funding partners for conservation include federal and local governments, private landowners, businesses, donors (over 20 nonprofit land trusts operate in the state), and several other conservation organizations.

In recent years, the main sources of state-level funding for conservation have been the three trust funds summarized in Table 2. These trust funds are further described in the following sections, along with additional information on the state's other conservation programs.

NORTH CAROLINA LAND AND WATER FUND (NCLWF)

NCLWF was established by the General Assembly in 1996 as the Clean Water Management Trust Fund (CWMTF). The trust fund's original focus was on projects to protect and improve water quality in surface waters across the state and to create a network of riparian buffers and greenways. In 2013, its scope was expanded to include (1) acquiring lands with ecological diversity and cultural or historical value, and (2) protecting lands with high natural, cultural, or military value.

Table 1. Summary of the State-Financed Conservation Trust Funds

	NORTH CAROLINA LAND AND WATER FUND (NCLWF)	PARKS AND RECREATION TRUST FUND (PARTF)	AGRICULTURAL DEVELOPMENT AND FARMLAND PRESERVATION (ADFP) TRUST FUND
Origins	Established by the General Assembly in 1996 as the Clean Water Management Fund (CWMTF)	Established by the General Assembly in 1994	Established by the General Assembly in 2005
Responsible Agency	Department of Natural and Cultural Resources – Division of Land and Water Stewardship	Department of Natural and Cultural Resources – Division of Parks and Recreation	Department of Agriculture and Consumer Services
Objectives	Fund projects to • protect and improve water quality in surface waters • create a network of riparian buffers and greenways • protect lands with high natural, cultural, and military value	Funding for • improvement projects for the state's park system • matching grants for local park and recreation projects • public access improvement projects at state beaches	Support preservation of the state's working farmlands and agricultural economy through grants to county governments and nonprofit organizations.
Eligible Projects	• Land acquisition • Conservation easements • Stream restoration • Innovative stormwater management • Planning and inter-agency coordination	• Land acquisition for state parks • Improvements to state park facilities • Creation or improvement of local parks and recreation areas • Beach access improvement	• Conservation easements on working agricultural, horticultural, or forest lands • Agricultural plans
Funding Source	• Annual state appropriations • Dedicated revenues from license plate fees	• Annual state appropriations • Dedicated revenues from license plate fees	• Annual state appropriations
Approximate Average Annual Spending Over The Past 5 Years	**$25 million**	**$20 million**	**$6 million**

Each year, NCLWF receives its funding from legislative appropriations and from dedicated revenues from automobile license plate fees. Since 1996 it has directly funded over $1 billion in land, water, and cultural conservation projects and has leveraged an additional $1.7 billion in funding from various federal, state, local, and private-sector partners. In the last 5 years, it has provided an average of nearly $25 million per year in conservation project funding.

The program is administered by the Department of Natural and Cultural Resources (DCR), which reviews, awards, and monitors conservation projects across the state. The main types of eligible projects include

- Land acquisitions
- Conservation easements for water quality protection
- Stream restoration and innovative stormwater management projects
- Planning and inter-agency coordination activities focused on water quality protection and improvement

PARKS AND RECREATION TRUST FUND (PARTF)

PARTF was established by the General Assembly in 1994. Its main objectives are to finance improvements in the state's park system, provide matching grants for local park and recreation projects, and fund public access projects at state beaches. It is part of the North Carolina Division of Parks and Recreation (DPR) and is administered by a nine-member appointed board that selects and allocates funds for eligible projects.

Since its inception, PARTF has directly funded $200 million in local park and recreation projects and has leveraged over $400 million in matching funds to more than 400 local governments across the state, which have used the program to establish or improve parks for their citizens. In the last 5 years, it has provided an average of almost $6 million per year in local park and recreation project funding. It has also provided roughly $13 million per year for land acquisitions and capital improvements at state parks and $1 million per year for beach access projects.

PARTF is funded by an annual appropriation from the state legislature and revenue from personalized license plates. These funds are allocated with 65 percent for land acquisitions and facility upgrades at state parks, 30 percent for local government grants to improve parks and recreation areas, and 5 percent for improving access to coastal and estuarine beaches.

AGRICULTURAL DEVELOPMENT AND FARMLAND PRESERVATION (ADFP) TRUST FUND

The ADFP Trust Fund was established by the General Assembly in 2005. Its objective is to preserve the state's agricultural economy through grants to county governments and nonprofit organizations. By preserving farmland, the trust fund also preserves scenic landscapes for the state's tourism industry and protects the environment.

The trust fund provides grants for the purchase of agricultural conservation easements on family farms. A property must be privately owned and actively used for agriculture, horticulture, or forestry to be eligible for a conservation easement. The trust fund also provides grants to farming communities for the development of agricultural plans designed to help maintain or enhance small, family-owned farms and the local farm economy.

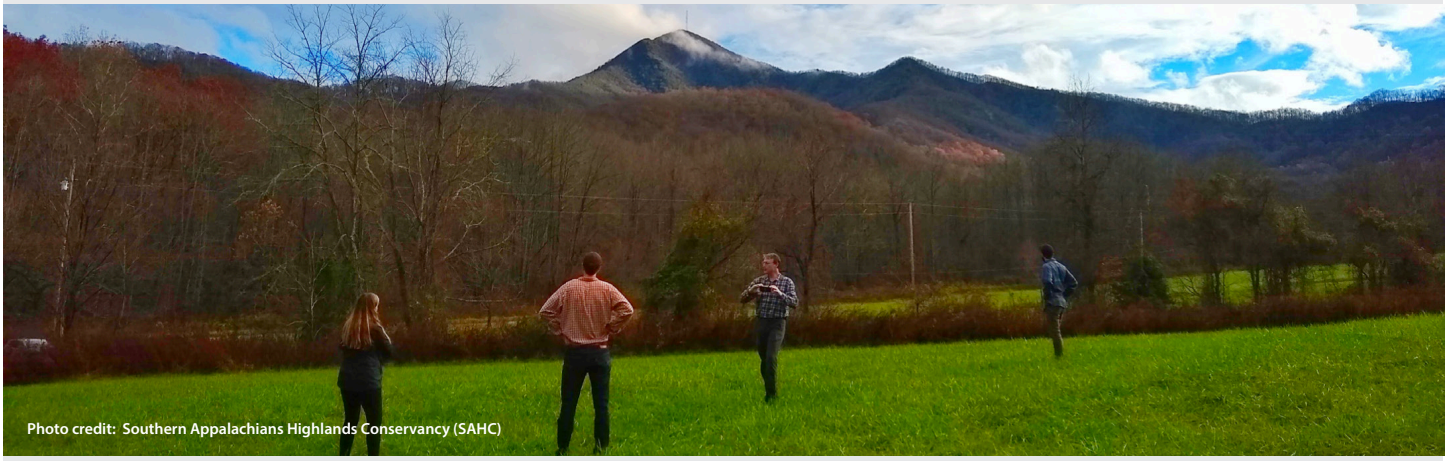
Funded by annual state appropriations, the ADFP Trust Fund has awarded over $50 million in grants for easements, agricultural plans, and development projects and has over 40,000 farmland acres with recorded or under-contract easements. It has also leveraged an additional $100 million in matching funds. It is administered by the North Carolina Department of Agriculture and Consumer Services (DA&CS), which uses an advisory committee to review and recommend projects for funding. In the last 5 years, it has averaged more than $6 million per year in awarded projects.

CONSERVATION IN ACTION

North Carolina's Newest State Park: Preserving an Iconic View, Key Economic Driver, Natural Wonderland

Outstanding scenery and outdoor recreation are key to Western North Carolina's economy. That's why the North Carolina General Assembly created Pisgah View Ranch State Park in Buncombe County. Generations of North Carolinians have vacationed at the historic ranch, which has been owned by the same family since the 1790's. Now all North Carolinians will get to enjoy its rich forests, scenic campgrounds and trails, and miles of ridgeline, all in the shadow of Mount Pisgah, one of the most iconic peaks of the Eastern United States. The property is also part of an important wildlife corridor for black bear and deer that use the ridgeline, which connects to Pisgah National Forest near Mount Pisgah.

The State has contracted to purchase the 1,600-acre tract over five years at a cost of $18 million. Thanks to a combination of funds from the N.C. Parks and Recreation Trust Fund, the federal Land and Water Conservation Fund, and private philanthropy, half that money has been raised. But if the State defaults on the five-year purchase plan, the owner may well pull out, and the project will fail.



Pisgah Ranch View.

CONNECT NC BOND

In 2016, voters approved a $2 billion general obligation bond program, known as the Connect NC Bond. The bond supports a wide variety of state programs including $75 million for the state park system. The bond projects include about $11 million for 1,900 acres in land acquisitions at eight state parks and natural areas and for the Mountains-to-Sea Trail. The remaining funds are for expansions and upgrades of recreational and educational facilities at parks across the state.

Although the Connect NC Bond provides a substantial boost for recreation and parklands, one of its main limitations for conservation purposes is that its funds can only be used by the state park system. Other land acquisitions and conservation projects are not eligible. Moreover, it offers a finite pool of funds, which are expected to be fully spent by early 2023.

LAND MANAGEMENT COST-SHARE PROGRAMS

The DA&CS funds several cost-share programs that offer incentives to private landowners to adopt land management practices that protect the state's water, soil, and forest resources.

The Division of Soil & Water Conservation oversees three of these voluntary, incentive-based conservation programs. Each program supports best management practices (BMPs) designed to meet its goals. The programs typically provide 75% in cost-share assistance to landowners for the installation of approved BMPs. Each year the programs receive and review applications and make awards based on the annual appropriation from the legislature. Over the last 5 years, they have provided an average of $5.3 million in annual cost-share funding. The three cost-share programs are:

- The **Agriculture Cost-Share Program (ACSP)** was authorized by the General Assembly in 1983 to encourage farming practices that reduce pollutant runoff from agricultural lands and protect water quality in the state's rivers, streams, and estuaries. Now operating in all 100 counties, ACSP provides cost-share funding to farmers for approved agricultural BMPs.
- The **Community Conservation Assistance Program (CCAP)** was established in 2006 to protect the state's water quality by reducing pollutant runoff from developed lands not directly involved in agricultural production. It currently provides cost-share assistance to landowners for non-agricultural BMPs ranging from stream restoration projects to the closing of abandoned wells. Eligible recipients include homeowners, businesses, schools, parks, and publicly owned lands.
- The **Agricultural Water Resources Assistance Program (AgWRAP)** was authorized in 2011 to assist farmers with improving water use efficiency, water availability, and water storage through implementation of multiple BMPs, ranging from agricultural pond upgrades to advanced irrigation systems. The objective of the program is to reduce competition for and conserve water resources, in part to help the agricultural sector to prepare for and withstand future droughts.
- The **North Carolina Forest Service (NCFS)** operates the Forest Development Program (FDP), which since 1997 has helped landowners plant, manage, and improve forests on up to 100 acres of land. Landowners are typically reimbursed for 30 to 40 percent of the per-acre cost of specific practices, as long as they have an NCFS-approved forest management plan and agree to maintain the forest stand for at least 10 years. The program is primarily funded by a special assessment paid on timber harvests from private forest lands in North Carolina. Over the last 5 years, FDP has provided an average of almost $2.2 million in annual cost-share funding to private landowners.

OTHER AGENCY-FUNDED PROGRAMS

The North Carolina Department of Environmental Quality (DEQ) manages several important environmental programs that advance conservation objectives in the state. Four programs that specifically fund conservation projects using state funds[6] are:

North Carolina Water Resources Development Grant (WRDG) Program. This program is administered by the Division of Water Resources and provides funding to local governments to develop water resources projects. These funds can also be used as the cost-share for federal grants. The types of projects funded by the grant program include stream restoration, water management (stormwater and flood control), and water-based recreation (greenways, boardwalks, paddle access). The General Assembly requires a 50 percent match on each grant. Since 2016, grant funding from this program has averaged roughly $2.5 million per year.

Resilient Coastal Communities Program. This program was launched in October 2020 to help local governments prepare for and reduce the impacts of climate change and future natural disasters. Initially

6 Through its Division of Mitigation Services and its North Carolina Stewardship Program, DEQ also restores streams, wetlands, and forested buffers and manages conservation easements across the state; however, these projects are conducted to offset natural resource losses from development and transportation projects in other parts of the state and are funded through in-lieu fees paid by those projects. They are not designed to provide a net increase in nature conservation.

the program is focusing on communities in 20 coastal counties to assist with community engagement, risk and vulnerability assessments, and project planning. Future phases will help communities with design and implementation of projects including conservation and restoration of natural lands.

Coastal Management Beach & Waterfront Access Program. This program is administered by the Division of Coastal Management and provides matching grants to local governments for projects that improve pedestrian access to beaches and waterways. Funding comes from the PARTF. The types of projects funded include parking areas, restrooms, dune crossovers, and piers. Funds can also be used to help acquire lands for access sites or to revitalize urban waterfronts. Since 2013, program funding has averaged approximately $1.2 million per year.

Coastal Habitat Enhancement Programs. The Division of Marine Fisheries funds projects that support sustainable fisheries through habitat creation. These programs include the Artificial Reef Program, which creates and monitors artificial reefs to attract fish and shellfish; the Oyster Sanctuary Program, which protects certain oyster reefs from harvest; and the Cultch Planting Program, which creates new oyster habitat. Combined funding for these programs has averaged almost $2.5 million per year over the last 5 years.

The North Carolina Wildlife Resources Commission (WRC) also plays a vital conservation role, particularly for protecting and restoring habitat for both game and nongame species across the state. For example, through its Game Lands Program, it manages over 2 million acres of public and private lands for public hunting, trapping, fishing, and other wildlife-associated recreation. The program has been one of the main beneficiaries of the NCLWF and CWMTF, whose funding has accounted for roughly half of the $600 million in total land acquisition spending for game lands in the state.

Foraging bobwhite quail

WRC also partners with, receives, and leverages significant funding from the U.S. Fish and Wildlife Service (FWS), through multiple initiatives under the Wildlife and Sportfish Restoration Program's federal–state partnership. These conservation programs and funding are described in the next section of this report.

The North Carolina Department of Justice (NCDOJ) manages the **Environmental Enhancement Grant (EEG)** program. Through a settlement with Smithfield Foods, the program funds projects that preserve and enhance the state's natural resources, such as wetland restoration, land acquisition, stormwater remediation, stream stabilization, and buffer installations. Projects located in eastern North Carolina and those related to the swine industry are prioritized. Since its inception in 2002, EEG has awarded over $25 million in grant funds and conserved over 23,000 acres, much of which has been converted to public lands. The grant funds are often used to leverage additional conservation funding. Due to ongoing litigation over the use of Smithfield funds, no EEG awards were made in 2017–2019.[7] Although more than $3.5 million in grants were distributed in 2020, continuing court challenges could result in another significant drop in EEG funding, even before the program is set to expire in 2025.[8]

7 https://www.coastalreview.org/2020/03/coastal-environmental-projects-get-funding/

8 https://www.fayobserver.com/story/news/2020/12/23/fight-over-smithfield-funds-could-endanger-north-carolina-environmental-projects/3956723001/

5 Federal–State Partnerships for Funding Conservation

The federal government provides substantial funding for conservation programs across the country with most federal funds requiring matching or cost-share funds. Over the last several decades, North Carolina has significantly benefited from these partnerships and matching programs, especially by using conservation trust fund resources to meet federal matching requirements.

The following sections summarize three federal–state programs. To take full advantage of these federal conservation funds, some of which are projected to increase in the future, North Carolina will need to increase its commitment of state matching funds.

THE LAND AND WATER CONSERVATION FUND (LWCF)

LWCF was established by Congress in 1963 to protect and improve public outdoor parks and recreation areas, including those on federal, state, and local lands and waters. At the federal level, the fund is managed by the National Park Service in the U.S Department of the Interior (DOI).

LWCF supports multiple conservation programs; however, it is the "stateside program" that provides matching grants to state, local, and tribal governments for land acquisition and improvements at parks and recreation sites. At the state-level in North Carolina, LWCF is managed and coordinated by the DCR.

Since 1965 the LWCF program has provided almost $90 million in matching grants to North Carolina, with about 60 percent distributed to local governments and 40 percent to state parks.[9] These grants have funded more than 900 state and local park projects and been used to acquire more than 40,000 acres in park lands.

In recent years, the main sources of North Carolina's matching funds for the LWCF have been the state's trust funds. With the signing of the 2020 Great American Outdoors Act, annual federal funding for the stateside program is expected to roughly double (see Section 8 for additional details). As a result, there will be an increasing need for the state to provide matching dollars through the trust funds and other funding sources.

WILDLIFE AND SPORT FISH RESTORATION (WSFR) PROGRAM

The U.S. FWS manages a suite of programs, collectively referred to as WSFR, that fund partnerships with state agencies to support conservation, restoration, and management of fish and wildlife resources. The North Carolina WRC is the state partner managing these programs, which generally require a minimum of 25% in non-federal matching funds.

Some of the main programs used for land acquisitions and recreational access include:

- **Wildlife Restoration (Pittman-Robertson) Program.** This program provides funding to states for wildlife restoration projects, with a focus on supporting hunting and other wildlife-associated activities. The types of projects eligible for funding include restoration, conservation, and management of wildlife for public benefit and providing public access for hunting or other wildlife-oriented recreation.
- **Sport Fish Restoration (Dingell-Johnson) Program.** This program provides funding to states for fish restoration and management projects, with a focus on supporting recreational fishing. Eligible projects include those that restore, conserve, enhance, or stock sport fish populations or that provide public access for recreational fishing.

9 This amount does not include almost $150 million in direct LWCF funding for protecting federal lands (e.g., national parks, forests, and wildlife refuges) in North Carolina.

- **State Wildlife Grants.** This program provides grants to state wildlife agencies. Focusing especially on wildlife species that are not hunted or fished, it supports the development and implementation of programs benefiting sensitive and imperiled wildlife and their habitats. Eligible projects are mainly for conservation actions identified in each approved State Wildlife Action Plan.
- **Cooperative Endangered Species Conservation Fund.** Since 1998, a portion of LWCF has been allocated for this program.[10] Managed by the FWS, the fund provides grants through section 6 of the Endangered Species Act to state wildlife agencies, primarily to assist in developing conservation programs for endangered and threatened species on non-federal lands. Projects eligible for funding include land acquisitions and habitat protection and restoration projects.
- **National Coastal Wetlands Conservation Grant Program.** Through this program, FWS annually provides grants of up to $1 million to coastal and Great Lakes states, as well as U.S. territories to protect, restore, and enhance coastal wetland ecosystems and associated uplands. The grants are funded through the Sport Fish Restoration and Boating Trust Fund.

Over the last 5 years, the federal government has provided North Carolina with an average of more than $23 million per year in conservation funding through these programs. North Carolina has provided matching funds of roughly $8 million per year, through a combination of state dollars (including from the trust funds and EEG program) and contributions from private-sector partners.

NATIONAL DEFENSE PROGRAMS

In recent years, the U.S. Department of Defense, along with partner federal and state agencies, has increasingly devoted resources to land conservation in areas surrounding military facilities. Land conservation is a tool to protect military lands from encroachment of land uses that could limit or otherwise jeopardize training and testing on military lands. Military lands were established away from large population centers, but over time communities and lands surrounding military installations have grown and increased development.

Soldiers training on conservation lands adjoining Fort Bragg.

10 Also receives funds from through the U.S. Treasury from certain fines, penalties, and property forfeiture proceeds.

Preserving Longleaf Pine Forest, Protecting Fort Bragg, and Providing Public Lands for all to Enjoy

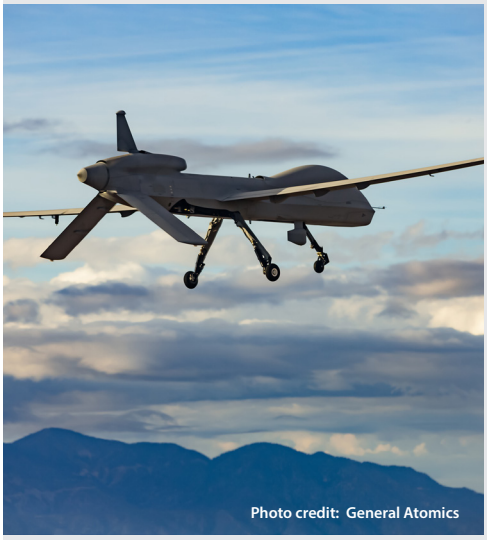
The Nature Conservancy and the Army have worked together over the past two decades to protect more than 23,000 acres near Fort Bragg. This conservation is great for the environment – longleaf pine forest is one of the world's most significant habitats. It is also important for national security. Keeping longleaf pine forest development-free ensures that training at the world's largest military base can continue, unimpeded by incompatible development on adjoining land.

Longleaf pine forest in the gap between Fort Bragg and Camp Mackall.

This effort has also added to public lands in the Sandhills for all to enjoy. To date, the Conservancy has transferred 7,495 acres to the N.C. Wildlife Resources Commission to become state game lands. Another 4,107 acres were transferred to the N.C. Division of Parks and Recreation to become Carvers Creek State Park. The Conservancy also owns and manages a number of preserves in the region. Today hunters, hikers, and nature lovers are reaping the benefits of this conservation.

Red-cockaded woodpecker.

More than 18 miles of base boundary have been protected through this effort. But, there is still critical work to be done. Today, as the military increases its use of large unmanned drones, the Conservancy and the Department of Defense are focusing on land that lies between Fort Bragg and Camp Mackall. Conserving property in that gap will ensure that the Army can fly its Gray Eagle drone from Camp Mackall, where it is stored, to Fort Bragg. There are several large tracts of land in this area. Keeping them free of development will preserve the flight path for the Gray Eagle and protect habitat for the federally endangered Red-cockaded woodpecker and a variety of other plants and animals. It will also add land to Sandhills Game Land.



Gray Eagle.

The Conservancy estimates that it will cost about $19 million to purchase this land, with the Army providing about half of the cost. As in many instances, the Department of Defense provides significant funding for land conservation, but those federal dollars require a local match. Unfortunately, with the current level of funding from the North Carolina Land and Water Fund, it will take years to complete this project. In the meantime, unless more matching funds are committed to the project, this land could be sold and developed – hurting both nature and the military's mission.

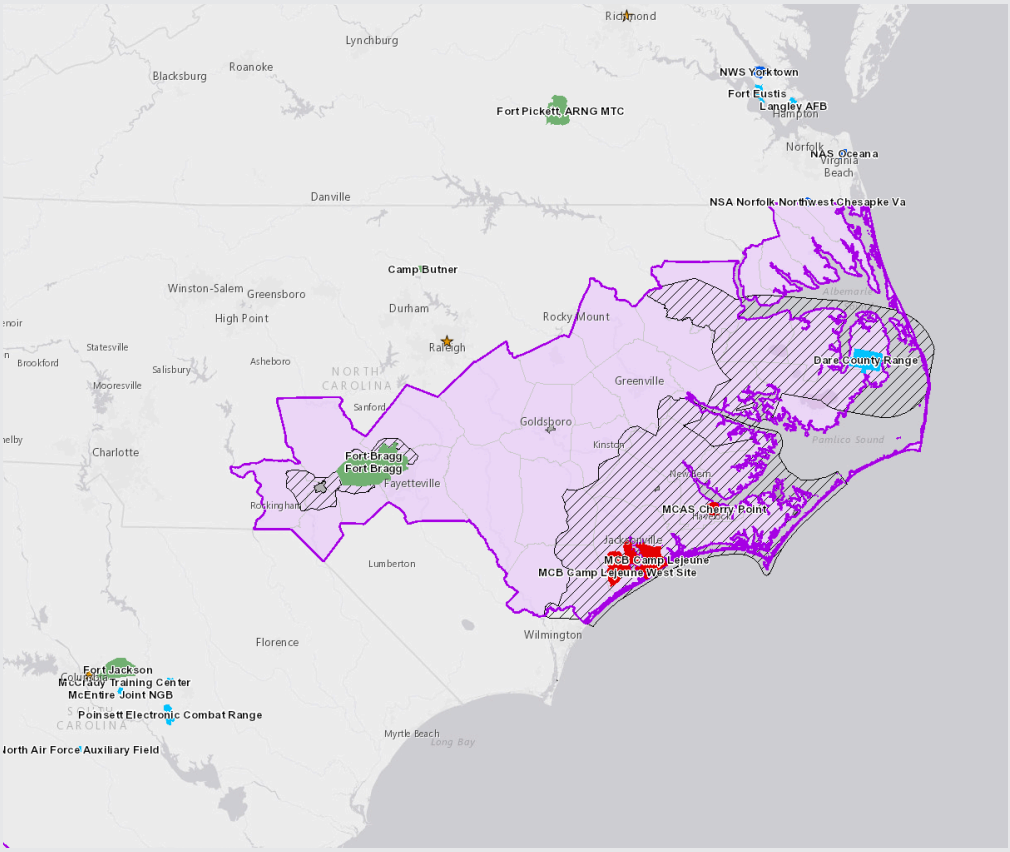
Readiness and Environmental Protection Integration (REPI) Program

REPI facilitates cost-sharing agreements between the military, other federal agencies, state and local governments, and private conservation organizations for land conservation efforts near military ranges and installations. REPI was authorized in 2002 when Congress enacted 10 U.S.C. S2684a to address challenges caused by population growth and development near military lands. This program helps protect the military's ability to accomplish its mission by maintaining land uses that do not conflict with national defense needs, while also benefiting agricultural lands, wildlife habitats, and rural communities. North Carolina's six military installations (shown in Figure 4) provide over 500,000 jobs, and the military is the state's second largest economic driver. Through 2019, North Carolina received roughly $51.5 million in REPI and $47.4 million in other military funding for land conservation. When combined with $82.3 million in partner contributions, the result has been the protection of more than 71,000 acres of land. Partner contributions include matching funds from other federal, state and local agencies, the NCLWF, land conservancies, and other nongovernmental organizations.

Eastern North Carolina Sentinel Landscape Partnership

The Sentinel Landscape Partnership was developed by REPI to make it easier to combine and leverage funds from multiple federal programs. The partnership implements programs with benefits to both agriculture and military partners, the top two economic sectors in North Carolina. The Sentinel Landscape Partnership was formed in 2013 through a Memorandum of Understanding between the U.S. Departments of Defense

Figure 4. Map of Eastern North Carolina Sentinel Landscape and Military Installations.



(DOD), Agriculture (USDA), and Interior (DOI), and was affirmed in statute under the 2018 National Defense Authorization Act. Sentinel Landscapes are defined as areas in which natural and working lands such as agriculture, forestry, and wetlands are well positioned to protect military installation from incompatible land use. Eastern North Carolina is one of the seven locations recognized as a Sentinel Landscape. The Eastern North Carolina Sentinel Landscape (shown in purple in Figure 4) spans 11 million acres across a 33-county region and includes six key military installations and ranges: Fort Bragg, Dare County Bombing Range, Marine Corps Base Camp Lejeune, Marine Corps Air Stations Cherry Point and New River, and Seymour Johnson Air Force Base.

The Sentinel Landscape Partnership brings together stakeholders from federal agencies, state and local governments, nongovernment organizations, and private landowners near military installations to implement conservation programs or sustainable management practices. The North Carolina Sentinel Landscape Committee coordinates the program and includes members from the DA&CS, WRC, DCR, Military and Veteran Affairs, and North Carolina State University.

Between 2015 and 2019, the Eastern North Carolina Sentinel Landscape Partnership has protected approximately 138,600 acres and enrolled more than 770,000 acres in conservation programs. In addition to land acquisition and protection, the partnership coordinated an agreement with the DA&CS and the USDA Natural Resources Conservation Service (NRCS) to consolidate and shorten the process for creating conservation easements. The partnership is also exploring different financial mechanisms for land acquisitions.

Defense Community Infrastructure Pilot Program

In 2020, Congress established this new program administered by DOD, which allocates $50 million per year to address infrastructure deficits near military facilities. The program is designed to support community needs around military installations and housing. The goal is to enhance the quality of life, resilience, or military value for families of service members. Eligible projects include parks, trails, and natural lands, and they also require at least a one-to-one match. For example, the City of Jacksonville received a $1 million grant from this program to help reconstruct a recreation center supporting Camp Lejeune families in 2020.

6 Threats to North Carolina's Natural Resources

The continuing need and demand for conservation in North Carolina are driven by several factors, many of which are putting increasing pressure on the state's natural and cultural resources.

POPULATION GROWTH

North Carolina's steadily growing population places increasing demands on the state's natural resources, while making it increasingly difficult to protect and improve environmental quality. Over the last decade, North Carolina has added almost 1 million people. Its average growth rate over this period of almost 1 percent per year ranks 12th among all states.

While the state's population growth has been fairly steady over time, this growth has varied considerably across counties. For example, more than half of growth has occurred in six predominantly urban counties. Meanwhile, 31 mostly rural counties have experienced declines in population.

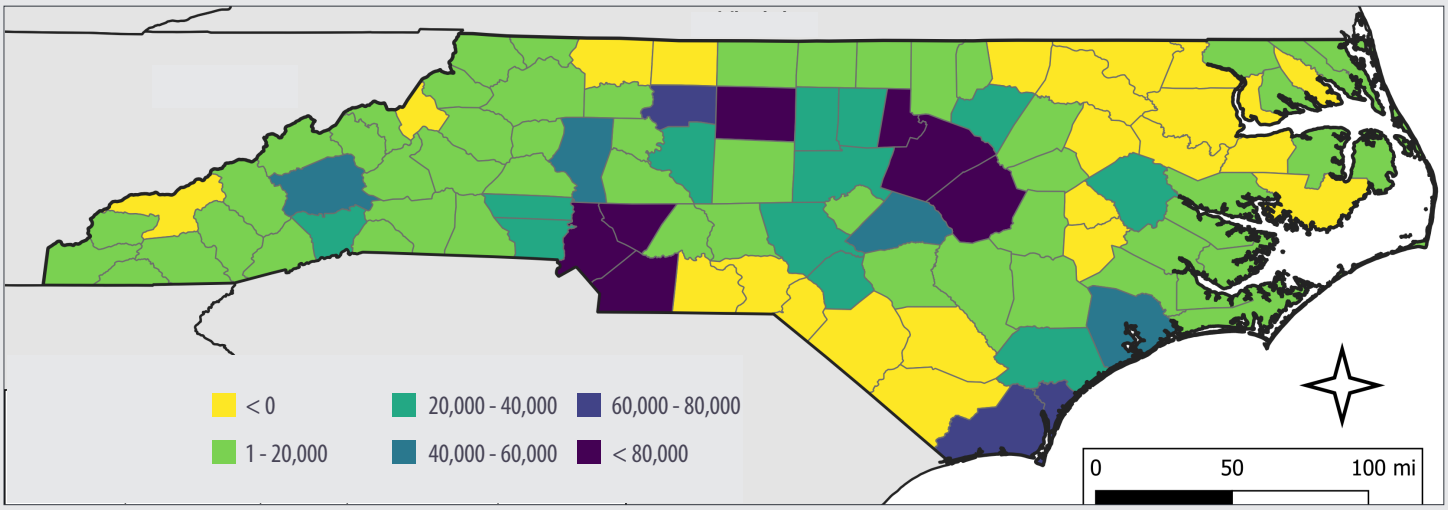
Over the next 20 years the rate and pattern of growth are expected to be similar to the last decade. Overall annual growth rates are projected to average about 1 percent per year. As shown in Figure 5, it is expected that the largest growth will be concentrated in urban counties in central North Carolina. In addition, the population will continue to age and become more diverse, with older adults and people of color accounting for ever larger portions of the population.

DEVELOPMENT OF NATURAL AND AGRICULTURAL LAND

As the state's population grows, natural and agricultural lands are increasingly being developed for residential and commercial use. Although land development can support the growing population and economy, it can come at a high cost to areas with unique or important natural or heritage value (see next section for details).

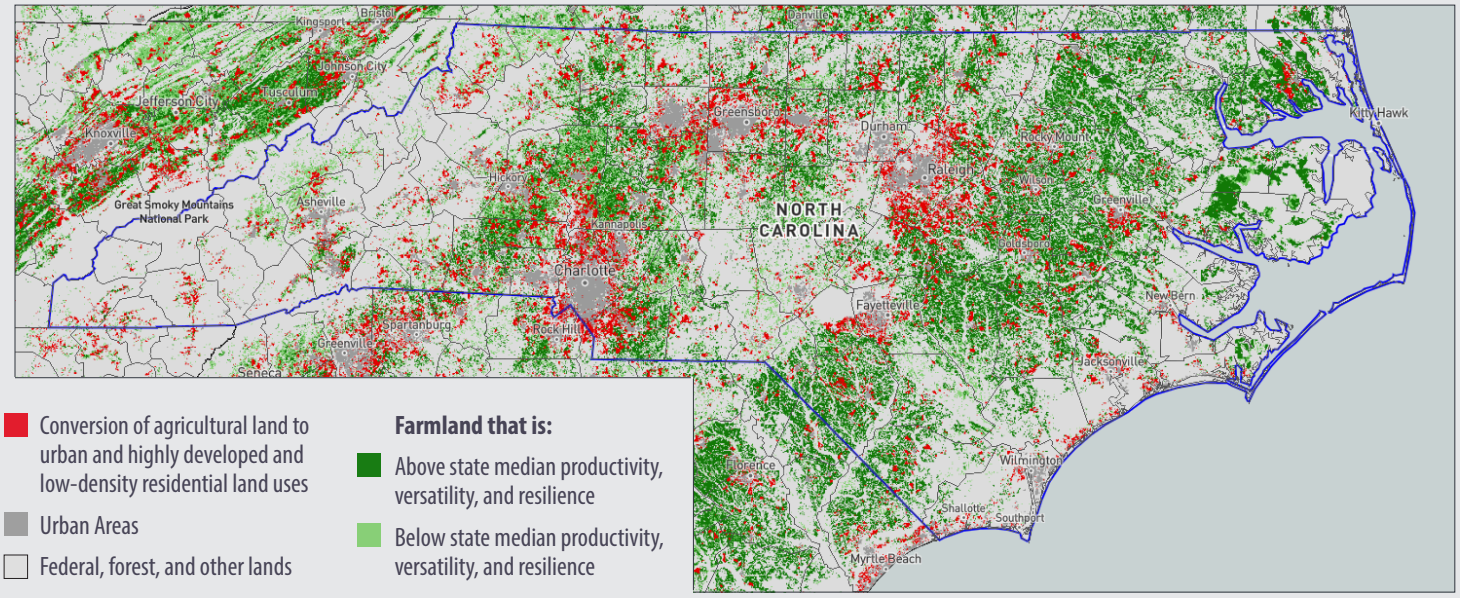
From 2001 to 2016, more than 730,000 acres of agricultural land, including cropland, pastureland, and woodland associated with farms, were developed for other use.[11] More than 20 percent of this conversion was to high-density urban land use. As shown in Figure 6, land conversion occurred across the state, but it was concentrated in the central Piedmont region of the state.

Figure 5. Projected Population Growth by County, 2020–2039



11 Freedgood, J., M. Hunter, J. Dempsey, & A. Sorensen. 2020. Farms Under Threat: The State of the States. Washington, DC: American Farmland Trust.

Figure 6. Conversion of Farmland in North Carolina, 2006-2016.



Source: American Farmland Trust: https://csp-fut.appspot.com/

This general pattern of land use change is expected to continue in the coming decades. To estimate the extent and effect of these changes on natural and working lands in North Carolina, one can combine spatial projections from an urban growth model[12] with the land use/cover data for 2016. The results are shown in Figure 7. This map shows the areas with the highest estimated probability (greater than 95 percent) of being developed by 2030 (in red) and by 2050 (in yellow).

Comparing projected future land development with current land use indicates that more than 1.5 million acres of current natural lands (e.g., forest, wetland, grassland) have a high probability of development by 2050. Over 750,000 acres of current agricultural land (cropland and pasture) are similarly at high risk of development.

To further evaluate the potential loss of high-valued natural areas due to future development, it is also useful to compare the projected development areas with areas containing high natural diversity. The ecological richness of these areas makes them priorities for conservation. To identify these priority areas, we used data from the North Carolina Natural Heritage Program (NHP). NHP maintains an inventory of the natural areas in the state, which are evaluated based on "the occurrences of rare plant and animal species, rare or high quality natural communities, and special animal habitats, collectively termed the elements of natural diversity...[and] represent the program's estimates of the best locations for supporting natural diversity in the state…."[13] These areas are assigned priority ratings to indicate their importance for conservation.

Based on this data comparison, we find that over 21,000 acres of the NHP's most highly rated natural lands (i.e., rated as exceptional, very high, or high importance for conservation) are also at high risk of development. Another 6,100 acres rated as moderate or general importance are also at high risk of development.

CLIMATE CHANGE AND FLOODING

Climate change is already affecting North Carolina, through rising seas, stronger storms, and warmer temperatures. As global temperatures continue to rise, the

12 Terando A.J., J. Costanza, C. Belyea, R.R. Dunn, A. McKerrow, & J.A. Collazo. 2014 The Southern Megalopolis: Using the Past to Predict the Future of Urban Sprawl in the Southeast U.S. PLoS ONE 9(7): e102261. doi:10.1371/journal.pone.0102261

13 North Carolina Natural Heritage Program. 2019. Natural Heritage Program 2019 Biennial Report. p.27

state is likely to be increasingly impacted by these and other climate hazards and weather extremes, including more frequent and severe storms, more intense droughts, and more days with extreme heat. In addition to threatening the health and well-being of North Carolina's residents, these changes will place growing stress on the state's nature, wildlife, and ecosystems.

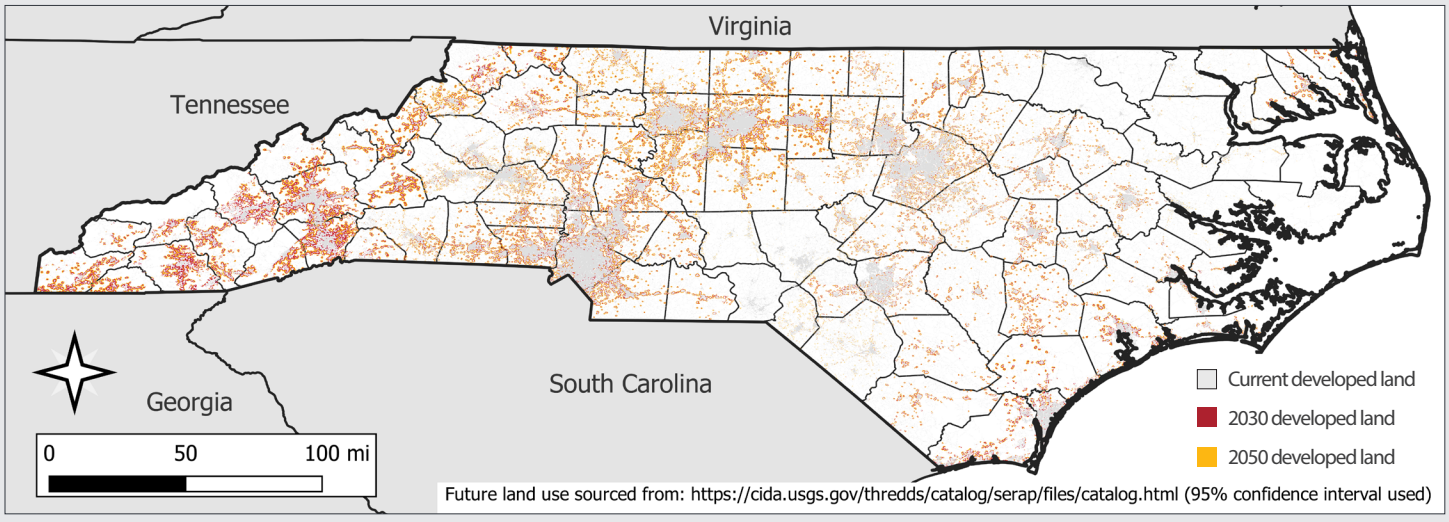
There is also growing evidence from recent hurricanes and through advanced flood mapping and modeling techniques that many more areas in North Carolina are at risk of flooding than previously predicted. Recent studies have found that (1) state-mapped flood hazard zones (based on Federal Emergency Management Agency [FEMA] flood mapping) significantly underestimate the extent of hurricane-related flood exposures[14] and (2) almost twice as many properties face a 1% annual risk of flooding than predicted by FEMA.[15] These higher risks affect both coastal and inland areas and are very likely to grow as the climate continues to change.

Fortunately, conservation activities can help protect North Carolina's natural and working lands and its terrestrial and aquatic ecosystems by strengthening their resilience to climate change. Protecting biodiversity on natural lands can help ecosystems reduce their vulnerability to extreme events and other climate-related stresses, including the spread of non-native invasive species.[16] For example, restoring pocosin peatlands in eastern North Carolina by rewetting their soils makes them less vulnerable to wildfire.

Much of Wilmington was under water after Hurricane Florence pelted the area with record rainfall.

Preservation, restoration, and enhancement of natural lands and ecosystems can also help to protect state residents and businesses against climate-related damages. For instance, protecting and restoring wetlands is an important strategy for capturing rainwater and limiting downstream flooding. Several other examples of climate-related benefits provided by land conservation are discussed in the next section.

Figure 7. Current and Future Projected Developed Lands in North Carolina



14 Schaffer-Smith, D., S.W. Myint, R.L. Muenich, D. Tong, & J.E. DeMeester. 2020. Repeated hurricanes reveal risks and opportunities for social-ecological resilience to flooding and water quality problems. Environmental Science & Technology, 54(12), 7194-7204.

15 First Street Foundation. 2020. The First National Flood Risk Assessment Defining America's Growing Risk

16 Thompson, I., B. Mackey, S. McNulty, & A. Mosseler. 2009. Forest Resilience, Biodiversity, and Climate Change. A synthesis of the biodiversity/resilience/stability relationship in forest ecosystems. Secretariat of the Convention on Biological Diversity, Montreal. Technical Series no. 43, 67 pages

7 Benefits of Conservation in North Carolina

Natural and working lands (and waters) across the state provide a wide variety of benefits, ranging from outdoor recreation to flood protection and cultural preservation. In many instances, they provide multiple benefits. Previous work by The Trust for Public Land found that every $1 invested by state funding programs in North Carolina returns $4 in natural goods and services value, including benefits like water quality protection, flood control, wildlife habitat, air pollution removal, and carbon sequestration. In addition, these investments safeguarded critical industries such as forest products, farming, defense, outdoor recreation, and tourism.[17] This section provides an overview of the different types and magnitudes of these benefits, which are key factors in evaluating and prioritizing areas for conservation.

OUTDOOR RECREATION

Arguably the most common and highly valued use of the state's natural lands and waters is for outdoor recreation and appreciation of nature. More than 55 percent of North Carolinians participate in outdoor recreation activities, with the most popular activities including visiting beaches, lakes and parks, walking, hiking, and fishing.[22, 23]

These activities are supported by the state's more than 3.5 million acres of federal, state, and local park lands and water that are available for outdoor recreation.[23] North Carolina is home to four national parks and seashores, with annual visitation of more than 30 million.[24] They include the Blue Ridge Parkway and the Great Smoky Mountain National Park, which rank as the second and third most visited national park units in the country. North Carolina's state park system includes more than 80 parks, recreation areas, natural areas, lakes, rivers, and trails that together cover a quarter million acres. The state's game land system has more than 2 million acres of public and private for wildlife-associated recreation.

Outdoor recreation also plays a key role in the state's economy. It generates $28.0 billion in consumer spending

The state's natural and working lands are the backbone of its natural resource-based economy.

- **The agriculture, food, and natural fiber industries together generate over $80 billion in annual income, accounting for over 15 percent the state's gross domestic product.[18]**
- **The forestry, wood, and paper industries contribute roughly $10 billion per year.[16]**
- **Together, these agriculture and forestry-related sectors account for roughly 730,000 jobs or roughly 17 percent of the state's total employment.[16]**
- **Federal military spending, including for the five bases covering roughly 240,000 acres of land in the state, contributes over $11 billion to the state's economy and supports about 10 percent of the state's employment.[19]**
- **The state's coastal resources support almost $100 million in annual income and 3,500 jobs related to commercial fishing.[20]**
- **The state's outdoor recreation economy accounts for $28 billion per year in consumer spending and supports 260,000 jobs.[21]**

17 The Trust for Public Land. 2011. North Carolina's Return on the Investment in Land Conservation.

18 https://cals.ncsu.edu/agricultural-and-resource-economics/wp-content/uploads/sites/12/2019/05/agribusiness2019Brochure.pdf

19 |https://edpnc.com/wp-content/uploads/2019/04/Defense-Brochure-2019-Web.pdf

20 North Carolina Division of Marine Fisheries. (n.d.). Fisheries Economics. http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=33372974&name=DLFE-141808.pdf

21 https://outdoorindustry.org/wp-content/uploads/2017/07/OIA_RecEcoState_NC.pdf

22 Outdoor Industry Association. 2020. North Carolina Fact Sheet.

23 North Carolina Department of Natural and Cultural Resources. 2020, May. North Carolina Outdoor Recreation Plan, 2020 – 2025. Division of Parks and Recreation.

24 https://irma.nps.gov/STATS/Reports/Park/GRSM

Paddling at Merchants Millpond State Park.

annually, which supports 260,000 direct jobs with an associated $8.3 billion in wages and salaries while generating $1.3 billion in state and local tax revenue. Outdoor recreation generates more in consumer spending than the financial services and insurance industry ($24.9 billion).[22]

Access to outdoor recreation is also critical to the tourism industry. A recent survey found that 20 percent of overnight tourists visited a beach, 17 percent of out-of-state visitors participated in rural sightseeing, and 9 percent visited a state park, monument, or recreation area, with additional visitors reporting that they viewed wildlife, hiked or went backpacking, fished, visited national parks, or participated in other nature-based activities.[22]

Outdoor recreation is also essential for the health and well-being of the state's residents. Among the many reasons North Carolina residents place a high value on outdoor recreation, the most commonly cited benefits include relaxation, being close to nature, spending time with friends and family, and getting exercise, with the added benefit that it is either free or affordable.[23] These views are consistent with extensive research findings showing that outdoor recreation and contact with nature improves both physical and mental health, as well as offering important opportunities for education and civic engagement while contributing to reductions in crime and anti-social behavior.[25]

The COVID crisis has also created a surge in demand for outdoor recreation. For example, although the pandemic forced most state parks to close for six weeks, the park system experienced record visitation in 2020. It recorded more than 19.7 million visitors, breaking the old record by more than 400,000 visits. A new generation of hunters, anglers, and hikers is discovering North Carolina's outdoor treasures, creating the need and opportunity to invest in conservation. The WRC reported a 94% increase in fishing license applications from May to December 2020 over the previous year. During the same period, hunting license applications increased by nearly 20%. Similar upswings in demand for outdoor recreation have also been observed in more densely populated areas.[26]

Prioritizing future conservation efforts will require comparing expected recreation benefits across multiple sites and regions. Although proximity to population centers is important, recreation benefits can also depend on other demographic factors. In particular, the benefits offered by recreation sites may depend on their accessibility for underserved populations, including for people of color and low-income communities in both urban and rural areas.[27]

25 Eigenschenk, B., A. Thomann, M. McClure, L. Davies, M. Gregory, U. Dettweiler, & E. Inglés. 2019. Benefits of outdoor sports for society. A systematic literature review and reflections on evidence. International Journal of Environmental Research and Public Health, 16(6), p.937.

26 https://outdoorindustry.org/article/increase-outdoor-activities-due-covid-19/

27 Rowland-Shea, J., S. Doshi, S. Edberg, & R. Fanger. 2020, July. The Nature Gap: Confronting Racial and Economic Disparities in the Destruction and Protection of Nature in America. Center for American Progress.

Tuckertown Game Lands: Ensuring Piedmont Hunters Have Ready Access to Game Lands While Also Protecting Drinking Water

The COVID-19 shutdown made it clear that more people want to get outside and hunt. Hunting licenses issued in North Carolina from May to December 2020 increased by 20 percent compared to the previous year. To meet this growing demand, it is particularly important to provide easily accessible game lands for people living in the Piedmont because the game lands network in this region is not as strong as in the mountains or the coastal plain. For years, hunters have flocked to the Tuckertown Game Lands in Davidson and Montgomery counties. Although owned by Alcoa, this Piedmont tract has been enrolled in the state game lands program for several years. But its private ownership has left the land in danger of being developed.

Fortunately, Alcoa has agreed to sell 2,424 acres of these rare Piedmont game lands to the NC Wildlife Resources Commission, as part of relicensing its hydroelectric dams on the Yadkin River. This sale will ensure that the land, which represent 7.5% of the State's total Piedmont game lands, is permanently protected for hunting and other recreational uses. Eighty percent of North Carolinians live within 100 miles of the property. This acquisition will also protect 31 miles of undeveloped shoreline on Tuckertown Lake, which is part of the Yadkin/Pee Dee River basin. More than 1.7 million people rely on this basin for their drinking water.

But the clock is ticking. Permanent protection of Tuckertown Game Lands will only become reality if the State can close the deal, with its $8.5 million price tag, by September 2021. That is why Three Rivers Land Trust, the NC Wildlife Federation, The Conservation Fund, and many others are working with the Wildlife Resources Commission to raise the public and private funds necessary to secure the property and maintain public access to its game lands and recreational waters.

Game Lands and hunting are an important part of North Carolina's cultural heritage. Providing game lands accessible to all parts of the state is important, not only because they meet a vital outdoor recreational need, but also because they provide other benefits such as protecting drinking water.

Bald Mountain from Newsome Bluff.

Protecting marshes likes this one on the Alligator River makes coastal areas more resilient to rising seas and increased storms.

FLOOD PROTECTION

Another widely recognized benefit of land conservation is that it plays a vital role in reducing or avoiding flood-related damages. First, preventing development of natural lands within a flood-prone area (e.g., within a 100-year floodplain) directly prevents future property damages from occurring.[28] Second, by maintaining, restoring, or enhancing natural land cover (either in or outside the floodplain), conservation promotes natural processes for capturing and infiltrating rainfall. In this way, it protects down-slope and downstream areas by reducing the overland flow of floodwaters. Third, in coastal areas, natural lands such as marshes and dunes offer flood protection by blocking or reducing the size and force of ocean waves during tropical storms.

In all three cases, benefits can occur through avoided damages to buildings, structures, and other properties, by protecting human health and safety, and by reducing the costs of emergency response.

The magnitude of these flood protection benefits varies widely across natural lands, depending heavily on the locations and characteristics of potentially affected downstream populations, properties, and ecosystems. For example, a recent study of two small urban areas in Virginia and Maryland found that the average annual benefits of forest cover compared to hard surfaces, ranged from less than $15 per acre to over $100 per acre in avoided flood damages to downstream buildings.[29]

As previously described, flood exposure from large storms in North Carolina is substantially larger than previously estimated. In the coming decades, continuing climate change will further expand these flood-prone areas and increase the flood protection benefits offered by land conservation. According to the North Carolina Climate Science Report (NCCSR)[30], sea level rise is expected to accelerate, strong storms are likely to increase in frequency and severity, and flooding will be increasingly common and widespread across the state. These changes mean that thousands more acres in coastal and inland areas will be at risk of flooding, and therefore in need of protections offered by conservation.[31]

BENEFITS TO LOCAL ECONOMIES

Conservation investments play a significant role in sustaining and growing local economies. There is particularly strong evidence that parklands offering outdoor recreation opportunities provide a strong boost to local economies. For example:

- Local and regional park spending in North Carolina in 2017 supported more than 27,000 jobs and boosted economic output in the state by over $3.2 billion.[32]
- On average, every $1 million invested in parks and recreation infrastructure contributes to about 20 additional jobs.[33]
- Outdoor recreation amenities generate more local visitor spending, attract and retain employees and new investments, and increase property values.[34]

28 Kousky, C., S.M. Olmstead, M.A. Walls, & M. Macauley. 2013. Strategically placing green infrastructure: cost-effective land conservation in the floodplain. Environmental Science & Technology, 47(8), 3563-3570.

29 Van Houtven, G., M. Crouch, M. Eddy, M., J. Carlston & S. Colley. 2020. Ecosystem Services Project: Quantification of the Value of Green Infrastructure Hazard Mitigation Related to Flooding. Prepared for the Chesapeake Bay Trust.

30 Kunkel, K. E., Easterling, D. R., & Ballinger, A. (2020). North Carolina Climate Science Report. https://ncics.org/wp-content/uploads/2020/06/NC_Climate_Science_Report_FullReport_Final_revised_May2020.pdf

31 First Street Foundation. 2020. The First National Flood Risk Assessment Defining America's Growing Risk.

32 Center for Regional Analysis, George Mason University. 2020, April. The Economic Impacts of Local Parks: An Examination of the Economic Impacts of Local and Regional Park Agency Spending on the United States Economy Prepared for The National Recreation and Park Association.

33 The Trust for Public Lands. 2010. Return on Investment from the Land and Water Conservation Fund.

34 Lawson, M. 2019, February 19. How Outdoor Recreation Supports Rural Economic Development. Headwaters Economics.

Several studies conducted across the United States have examined the effects of natural land and open space preservation on local economic performance by looking at different measures of local economic impact. Overall, these studies find evidence of a wide variety of positive effects, including on (1) local employment due to public and private land protections (particularly when protection occurred in more rural areas),[35] (2) population, income, and property values in small communities as a result of public forestland protections,[36] and (3) the number of establishments and jobs near areas designated as national monuments.[39] A recent review and synthesis of 33 U.S. studies found that property values were on average 8% to 10% higher for residences adjacent to natural parks. For larger parks, this price premium was even greater and extended to more distant properties.[37]

Nearly 15 million people visited the Blue Ridge Parkway in 2019.

Investments to restore and enhance natural and working lands and water resources have also been shown to produce important economic dividends. For example, a recent national study estimated that for each $1 million spent on economic sectors directly associated with these types of conservation activities between 17 and 31 jobs are supported.[38] In North Carolina, an analysis of reforestation efforts through the Forest Development Program (FDP) found that $4.2 million in restoration spending in 2012 increased total output in the state by three times that amount (almost $13 million) and created almost 200 additional jobs.[39]

Programs focused on ecological restoration, including wetland and stream restoration, affect surrounding land and property values, but the effects vary in both size and direction. In North Carolina, an analysis of aquatic restoration projects in the Triangle region (Raleigh-Durham-Chapel Hill) found positive effects on local land values, but not for parcels closest to the projects.[40]

WATER QUALITY PROTECTION

Natural lands are also essential for protecting water quality for rivers, streams, lakes, estuaries, and groundwater across the state. In addition to preventing floods by capturing and infiltrating rainwater, forests, wetlands, and grasslands control soil erosion, and they prevent pollutants from entering waterways or seeping into groundwater. Without these controls, pollutants like sediment, nitrogen, and phosphorus can reduce oxygen levels in water, block sunlight, and disrupt aquatic ecosystems, which can also lead to harmful algae blooms and fish kills.

Conserving lands in their natural state is critical for avoiding these types of water quality impairments. That is why protecting and restoring land, particularly along waterways, is a key element of the state's strategy for improving water quality in impaired waters such as Jordan Lake and Falls Lake.[41]

Estimates of the water quality protection benefits offered by land conservation depend on the types of land and waters affected and the ways people use the affected waterbodies. For instance, an analysis of land conservation in North Carolina's Catawba River Basin examined

35 Sims, K.R., J.R. Thompson, S.R. Meyer, C. Nolte, & J.S. Plisinski. 2019. Assessing the local economic impacts of land protection. Conservation Biology, 33(5), 1035-1044.

36 Chen, Y., D.J. Lewis, & B. Weber. 2016. Conservation land amenities and regional economies: A postmatching difference-in-differences analysis of the Northwest Forest Plan. Journal of Regional Science, 56(3), 373-394.

37 Crompton, J.L. & S. Nicholls. 2020. Impact on property values of distance to parks and open spaces: An update of US studies in the new millennium. Journal of Leisure Research, 51(2), 127-146.

38 Peltier, H. 2020. Employment Impacts of Conservation Spending. Boston University, Pardee School of Global Studies.

39 Koesbandana, S. 2017. Analysis of Forest Development Program Impacts on North Carolina's Economy in 2012.

40 Kaza, N., & T.K. BenDor. 2013. The land value impacts of wetland restoration. Journal of Environmental Management, 127, 289-299.

41 https://deq.nc.gov/about/divisions/water-resources/water-planning/nonpoint-source-planning/jordan-lake-nutrient; https://deq.nc.gov/about/divisions/water-resources/water-planning/nonpoint-source-planning/falls-lake-nutrient-strategy

how controlling sediment erosion would benefit drinking water utilities by reducing their treatment costs. It also estimated benefits for recreators and lakeshore residents by improving the clarity of lake water. The estimated benefits per conserved acre ranged from less than $1,000 per acre to over $10,000 per acre.[42]

MILITARY TRAINING AND PREPAREDNESS

North Carolina is home to five military installations, which support roughly 10 percent of the state's employment and almost 13 percent of the state's gross state product.[43] The Department of Defense manages more than 400,000 acres in North Carolina to support training, testing, and operations. Military installations were originally built away from population centers. However, as the population has grown, development has increased near military installations, which jeopardizes their ability to adequately prepare to defend our country. Natural or working lands are needed around and near these military lands to allow training and testing activities that may generate noise, smoke, and dust. Natural lands such as forests and wetlands and working lands such as agricultural and pine plantations protect valuable airspace, ranges, and installations needed for training and testing demands now and in the future. The military is the second largest economic driver in North Carolina. Therefore, protecting military lands from development pressures benefits the state. In addition, the protected lands provide important animal habitat and recreational opportunities such as hunting.

AIR QUALITY PROTECTION

Forests and other natural lands also improve air quality. This is important because air pollution is a significant issue across the state, contributing to premature deaths, nonfatal heart attacks, aggravated asthma, and lost days of work and school.[44] Trees filter and remove pollutants such as soot, ground-level ozone, nitrogen dioxide, and sulfur dioxide from the air we breathe. Through this process, they protect human health from the harms caused by air pollution.

The health-related benefits provided by forests vary across North Carolina, depending mainly on the level of air pollution and the number of people exposed to the pollutants. Consequently, the largest health benefits per forest acre occur in urban and suburban areas, where pollution levels and exposures are relatively high. Comparing county-level estimates across the state, the average annual benefits range from less than $5 per forest acre in rural western counties like Avery and Watauga to more than $300 per acre in Mecklenburg County (i.e., Charlotte).[45]

In addition to reducing air pollution, tree cover reduces air temperatures during periods of high heat.[46,47] Trees do this by providing shade, deflecting radiation from the sun, and adding moisture to the air, particularly in urban areas where hard surfaces absorb and retain heat.[48] The resulting conditions are better for residents' health and well-being.

HABITAT AND BIODIVERSITY PROTECTION

North Carolina's natural lands and waters, as well as many of its working agricultural lands, provide essential habitat for its many fish, wildlife, and plant species. In addition to providing key support for wildlife-associated recreation, they provide critical natural infrastructure for protecting the biodiversity of the state's ecosystems.

Some of the key benefits of conserving these lands and

42 Eddy, M., G. Van Houtven, B. Lord, K. van Werkhoven, J. Serago, & S. Kovach. 2019. Quantifying the potential benefits of land conservation on water supply to optimize return on investments. Prepared for the Water Research Foundation.

43 Levy, J. 2015. 2015 Economic Impact of the Military on North Carolina (nc.gov). North Carolina Department of Commerce and the North Carolina Military Affairs Commission. https://files.nc.gov/nccommerce/documents/LEAD/Industry-Reports/2015EconomicImpactoftheMilitaryonNorthCarolina.pdf.

44 U.S. Environmental Protection Agency, "Benefits Mapping and Analysis Program: How BenMAP-CE Estimates the Health and Economic Effects of Air Pollution," https://www.epa.gov/benmap/ how-benmap-ce-estimates-health-and-economic-effectsair-pollution

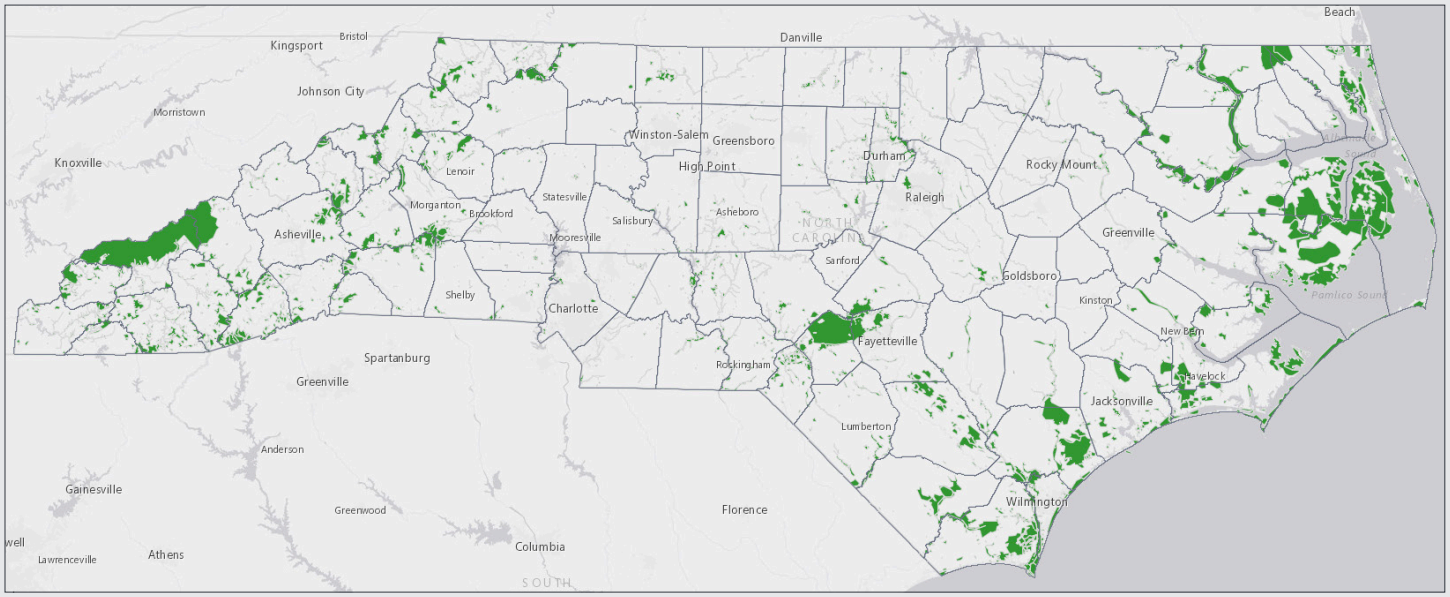
45 These estimates are based on county-level results generated with the U.S. Forest Service's i-Tree Model (Nowak, 2019). Nowak, D.J. 2019. Understanding i-Tree: Summary of Programs and Methods. U.S. Forest Service Report. https://www.itreetools.org/documents/650/Understanding_i-Tree.gtr_nrs200.pdf

46 Bowler, D.E., L. Buyung-Ali, T.M. Knight, & A.S. Pulin. 2010. Urban greening to cool towns and cities: A systematic review of the empirical evidence. Landscape and Urban Planning, 97(3), 147-155.

47 Sinha, P., R.C. Coville, S. Hirabayashi, B. Lima, T.A. Endreny, & D.J. Nowak. (In review). Urban Tree Cover Saves Lives from Extreme Heat.

48 https://www.epa.gov/green-infrastructure/reduce-urban-heat-island-effect.

Figure 8. Priority Natural Areas in North Carolina



Source: North Carolina National Heritage Program[51]

waters are (1) they help to prevent rare or endangered species from extinction, and (2) they protect currently common species, such as black bear and brook trout, from becoming rare or endangered. Avoiding the extinction of any species is vital because it can prevent the disruption or even collapse of broader natural ecosystems on which people rely. Avoiding the decline of individual species is also critical because it helps to maintain genetic diversity within the species, which may help with surviving changing conditions and stressors.[49]

As previously discussed in Section 6, the NHP maintains an inventory of natural areas with high biodiversity or habitat value. This inventory identifies over 3 million acres that either contain rare plant or animal species, rare or high quality natural communities, or special animal habitats.[50] The distribution of these areas across the state is shown in Figure 8 (in green), with the highest concentrations found in the western mountain and eastern coastal regions.

CARBON STORAGE AND SEQUESTRATION

Through their ability to store carbon in trees, plants, and soils, North Carolina's natural and working lands play an important role in moderating the release of greenhouse gas (GHG) emissions that cause climate change. For instance, in recent years, North Carolina has emitted the equivalent of about 150 million metric tons of carbon dioxide (CO2) per year or about 2% of the U.S. total. Most of these emissions are the result of electricity generation, motor vehicle use, and industrial production. At the same time, however, the state's forests, natural lands, and agricultural lands have been absorbing (sequestering) about 34 million tons of CO2 per year, due mainly to growing forest stocks and wood production. In other words, they have been offsetting roughly a quarter of the state's annual GHG emissions.[52]

Consequently, land conservation reduces future damages from climate change by preserving existing carbon storage. For example, the state's forest lands currently store

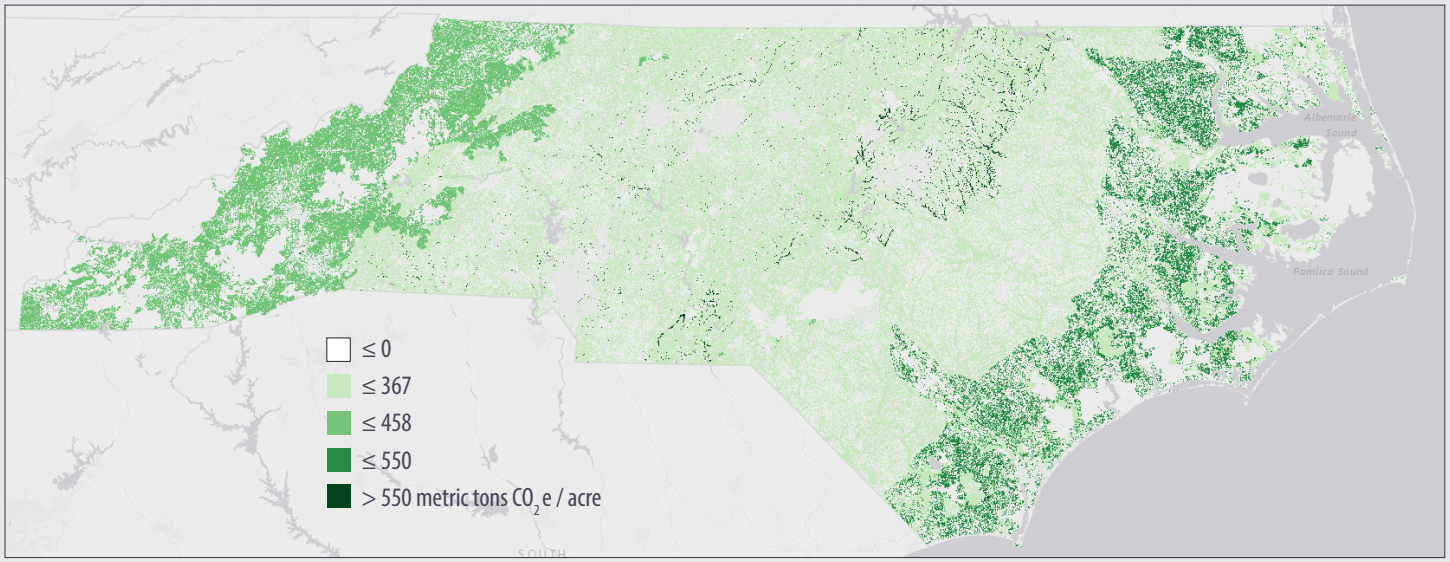
49 North Carolina Wildlife Resources Commission. 2015. North Carolina Wildlife Action Plan. Raleigh, NC.

50 North Carolina Natural Heritage Program. 2019. Natural Heritage Program 2019 Biennial Report. p.27

51 https://www.nconemap.gov/maps/edit?content=NC%3A%3Anorth-carolina-natural-heritage-program-natural-areas&layer=0

52 U.S. Environmental Protection Agency. 2020. Report on the Environment. https://www.epa.gov/report-environment

Figure 9. Storage of Carbon in North Carolina Forest Lands (Metric Tons of CO_2 Equivalents Per Acre)



Source: Warnell, K., C. Jaffe, & L. Olander. n.d. Natural and Working Lands in North Carolina https://storymaps.arcgis.com/collections/2154ab2816674f7d8c7429fe87f48830?item=1

the equivalent of roughly 5.5 billion tons of CO_2. This is about 300 tons of CO_2 per acre, which is equivalent to the amount of CO_2 released by 65 cars each year.[53] As shown in Figure 9, the per-acre storage is highest in the eastern coastal plain, along river corridors in the Piedmont region, and in many parts of the Mountain region.[54]

When forest land is developed, a portion of its stored carbon is released into the atmosphere, which contributes to climate change. On average, each additional ton of CO2 released to the atmosphere today causes roughly $40 in future climate-related damages.[55] Based on this estimate, a recent analysis of land conservation in North Carolina's Catawba River watershed estimated that protecting forest land from development would provide between $2,300 and $6,000 per acre in total carbon storage benefits.[46] Conservation in the form of land restoration, including reforestation and grassland restoration projects, can also provide important and cost-effective carbon sequestration benefits.

CULTURAL PRESERVATION

In addition to protecting the many beneficial natural processes and attributes offered by natural and working lands, land conservation also protects areas of cultural and historical significance. These areas are used to commemorate key historic periods and events and to celebrate and recognize the state's cultural diversity. Lands with high heritage value include, for example, properties surrounding historic homes and buildings, historic event sites, archeological sites, and battlefields, as well as surrounding lands that protect the sites and preserve their historic appearance and scenery. Such sites often serve as tourist attractions, bringing economic benefit to the area as well. Lands connected to cultural and historic sites can be at relatively high risk of development because they are often located in more populated areas.[56]

53 https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle

54 Warnell, K., C. Jaffe, & L. Olander. n.d. Natural and Working Lands in North Carolina. https://storymaps.arcgis.com/collections/2154ab2816674f7d8c7429fe87f48830?item=1

55 U.S. Government, Interagency Working Group on Social Cost of Carbon. 2013. Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis—Under Executive Order 12866. Washington, DC.

56 Communication with Kevin Cherry, Deputy Secretary NCR, December, 2020.

8 How Is State Funding Keeping up with Conservation Needs and Opportunities?

As discussed in the preceding sections of this report, North Carolina uses and has access to a wide variety of programs for investing in conservation. This section takes a closer look at how total state-level funding for conservation through these programs is keeping up with the needs, opportunities, and demands for conservation across the state.

TRENDS IN LAND ACQUISITION AND CONSERVATION EASEMENT PURCHASES

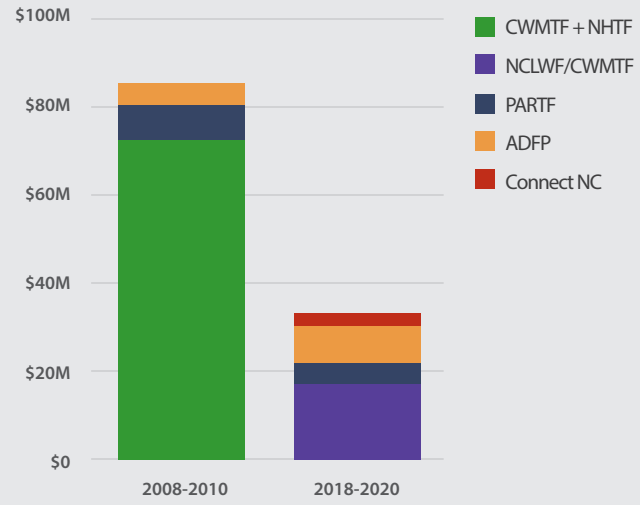
Over the last two decades, the main state-level sources of funding for the acquisition and protection of natural lands have been the state's conservation trust funds: CWMTF, ADFP, PARTF, NCLWF, and the National Heritage Trust Fund (NHTF). In 2013, the NHTF was folded into the CWMTF, and in 2019 the CWMTF was renamed the NCLWF. Since 2016, the other main source has been the Connect NC Bond.

To understand how state-level funding has been keeping up with the state's conservation needs, it is useful to begin by examining how funding has changed over time. Figure 10 compares land acquisition and conservation easement spending between two 3-year periods: 2008–2010 and 2018–2020. In both cases, the reported land acquisition expenditures are primarily fee-simple land purchases, but also include purchases of land easements through the ADFP.[57]

Annual trust fund spending in the last three years for land acquisition has been significantly less than it was in the previous decade. Over 2008–2010, average annual spending exceeded $80 million per year, whereas in 2018–2020, it was less than $35 million per year. In other words, adjusting for price inflation, trust fund spending has decreased by almost two-thirds (65%) in 10 years.

The biggest drop in funding has been associated with CWMTF (and by extension NHTF and NCLWF). In 2008–2010, CWMTF and NHTF together accounted for

Figure 10. Comparison of Annual State-Level Land Acquisition and Conservation Easement Spending in 2008–2010 and 2018–2020.



over $70 million per year in land conservation purchases. By 2018–2020, it had dropped to roughly $17 million (for CWMTF/NCLWF), a 76 percent decline. In comparison, PARTF declined by 41 percent and ADFP increased by 73 percent between the two periods.

In recent years, the Connect NC funds used for state park land acquisitions have partially offset the decline in trust fund expenditures. Since spending from the bond funds began in 2017, annual land purchases have averaged about $2.8 million per year. However, this rate of spending has still been less than 10 percent of annual trust fund spending. Also, as previously discussed in Section 4, one key limitation of the Connect NC for conservation purposes is that its funds can only be used by the state park system. Other land acquisitions and conservation projects are not eligible. Moreover, it offers a finite pool of funds, which are expected to be fully spent by early 2023.

A summary of more recent year-to-year variation in state-level land acquisition spending for conservation from the trust funds and Connect NC is shown in Figure 11. Since 2013, overall spending peaked in 2018 at about $36 million and has since declined by almost 25 percent

57 All dollar values are adjusted for price inflation and represent 2020 dollars.

to roughly $27 million in 2020.[58] Funding from NCLWF reached a maximum in 2016 at almost $25 million and accounted for roughly 75 percent of total spending that year. Since then, it declined to less than $14 million in 2020, when it accounted for about half of the total land acquisition spending. The decline in NCLWF spending since 2016 has been partially offset by Connect NC funds and conservation easement purchases through ADFP, especially in 2019 when the ADFP spending spiked at over $12 million.

TRENDS IN OTHER CONSERVATION INVESTMENTS

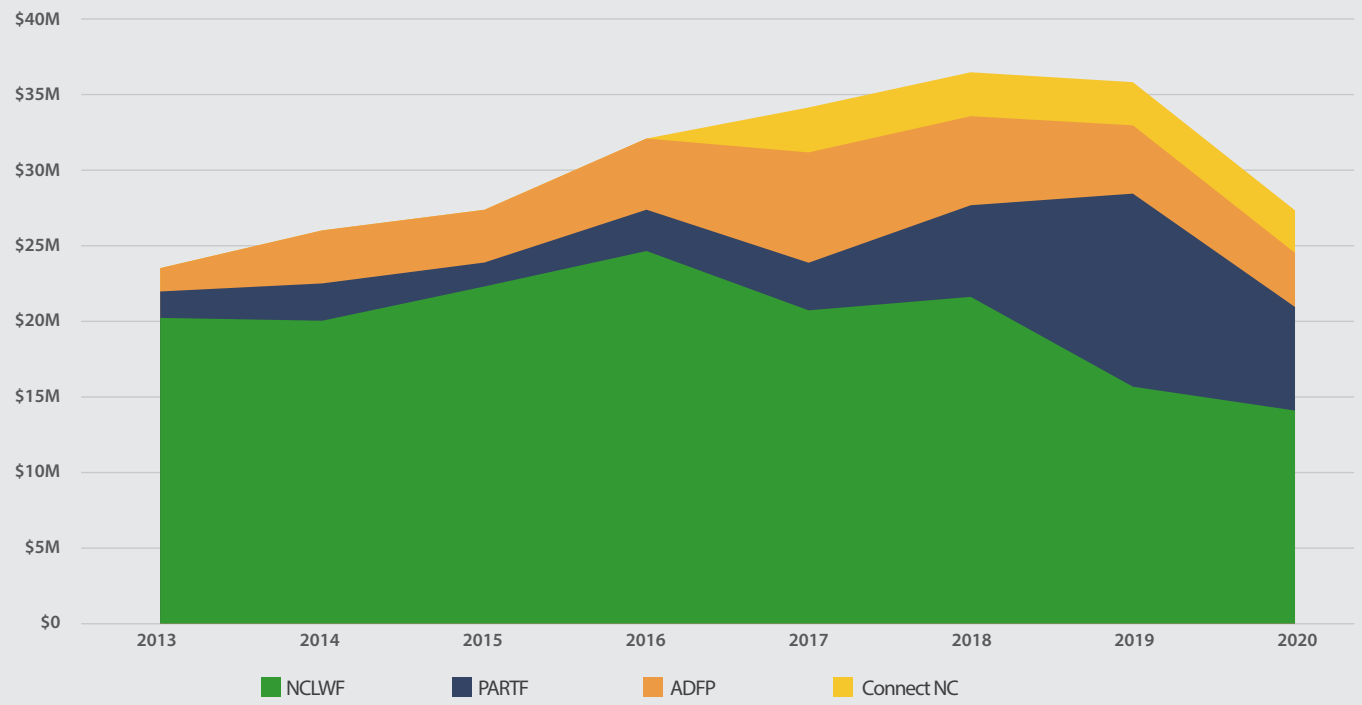
Figure 12 illustrates the trends in conservation spending through other state programs since 2013. The three bottom layers represent the portions of the trust fund programs that are not specifically used for land acquisitions or conservation easements—such as stream restoration and innovative stormwater projects awarded from NCLWF/CWMTF and the local park and beach access projects funded by PARTF. Although combined spending from these programs has varied since 2013, it has declined by about one-third—from roughly $16 million to $10 million—in the last four years.

Spending on the DA&CS cost-share programs—ACSP, CCAP, AgWRAP, and FDP—and DEQ's programs has also varied from over time ($11–$15 million), but has shown no overall decline.

LEVERAGING TRUST FUNDS DOLLARS THROUGH MATCHING FUNDS

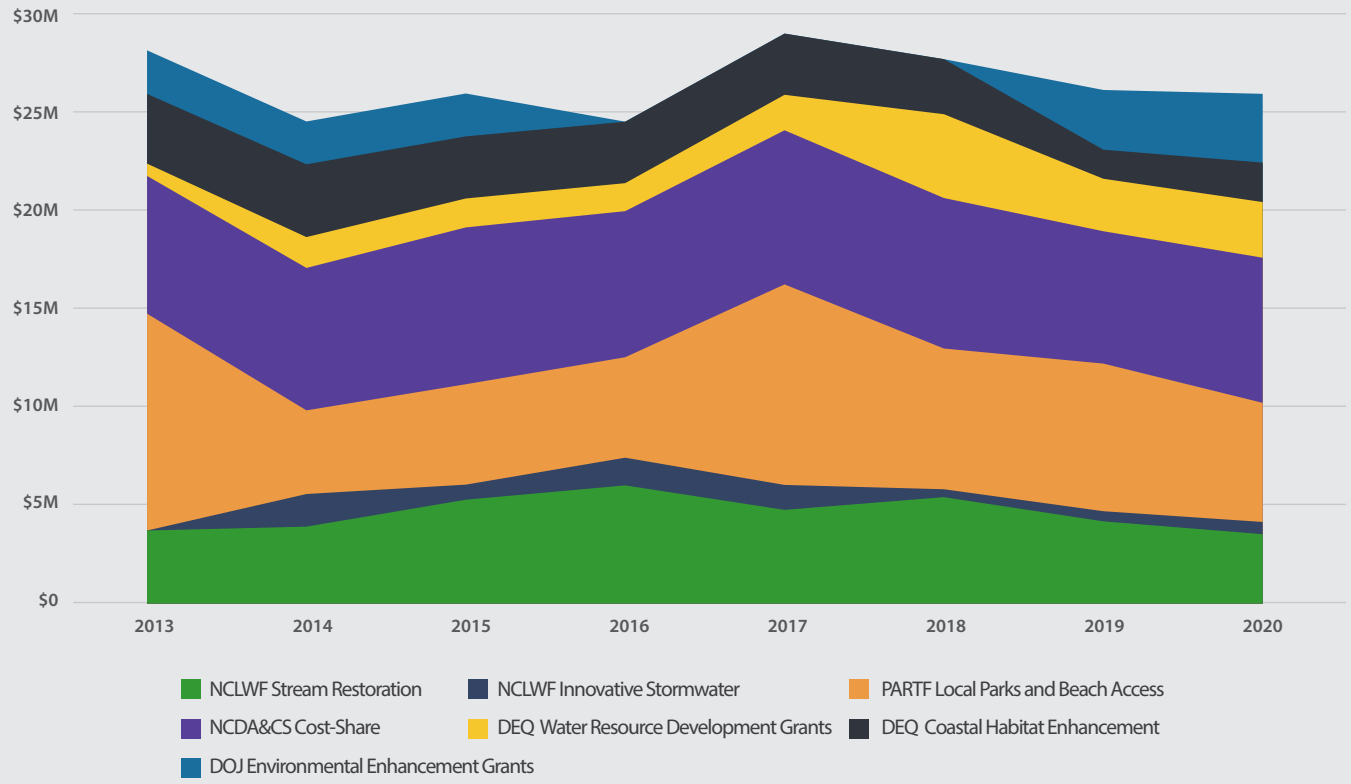
State funds address critical needs for conservation in North Carolina, not only by directly financing projects, but also by leveraging additional funds from other public and private sources. In many instances, matching funds from these other sources result in total conservation investments that are two or three times the state's contribution.

Figure 11. Annual Land Acquisition and Conservation Easement Spending in 2013–2020.



58 2020 data for NCLWF are best estimates based on program projections.

Figure 12. Annual State-Level Spending on Other Conservation Activities 2013–2020.



For example, Figure 13 shows the relationship between total annual awards made from 2013 to 2020 by the three trust funds—NCLWF, PARTF[59], and ADFP—with total matching funds received for the awarded projects. The ratio of matched to awarded funds ranges from roughly 1.4 in 2014 to almost 2 in 2019. The year-to-year variation shown in the figure suggests that even small percentage changes in state-level awards can result in comparatively large swings in matching funds.

UNMET DEMAND FOR STATE-LEVEL CONSERVATION FUNDING (REQUESTED VS. AWARDED PROJECTS)

One important indicator of the need for state-level conservation funds is the amount of project funding requested each year through the various state programs. More specifically, how do the requested amounts compare with awarded dollars?

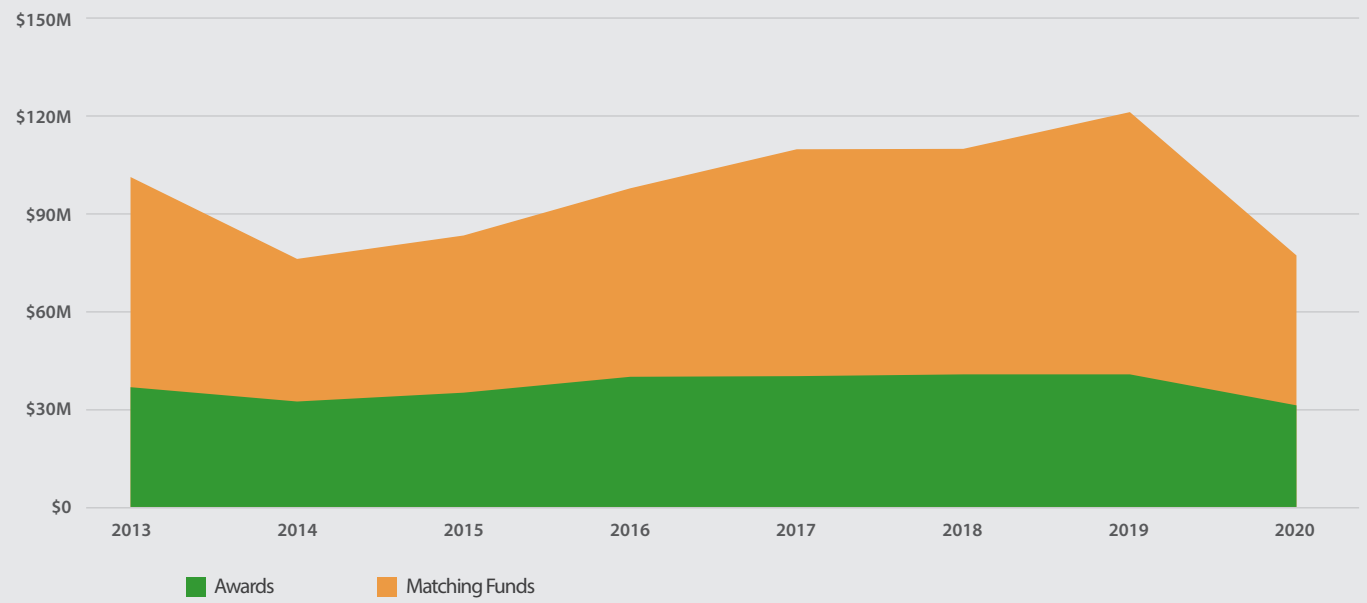
For one perspective on this request-vs.-award indicator, Figure 14 compares total annual awards made from 2013 to 2019 by the three trust funds (i.e., the same amounts as shown in the bottom layer of Figure 13) with total requested project funds each year. On average, the requested annual dollars are almost 2.5 times and over $50 million per year greater than awarded dollars.

For a second perspective, Figure 14 also compares total annual awarded and requested funding from the DA&CS cost-share programs.[60] In this case, from 2013 to 2019, the requested annual dollars are on average over 5 times and almost $24 million per year greater than awarded dollars.

Similar differences between requested and awarded funds

59 The PARTF dollars do not include spending on state park land acquisitions.

Figure 13. Comparison of Annual Trust Fund Awards and Matching Dollars



can be seen in other programs. For example, from 2016 to 2020, applications for WRDG funds have been 30 percent greater than awards.

Although these differences between requested and awarded funds provide important insights into the unmet need for conservation funding in North Carolina, it is also important to recognize their limitations. First, a failure to receive funding may indicate deficiencies in some of the proposed conservation projects. Second, the unmet need may be less than indicated if projects that are not awarded one year are awarded in subsequent years. Finally, the difference between requested and awarded dollars may also underestimate unmet conservation needs, to the extent that announced funding limits for the programs may discourage some sponsors of potentially valuable projects from applying for funding.

REPORTED CONSERVATION NEEDS BY STATE AGENCIES

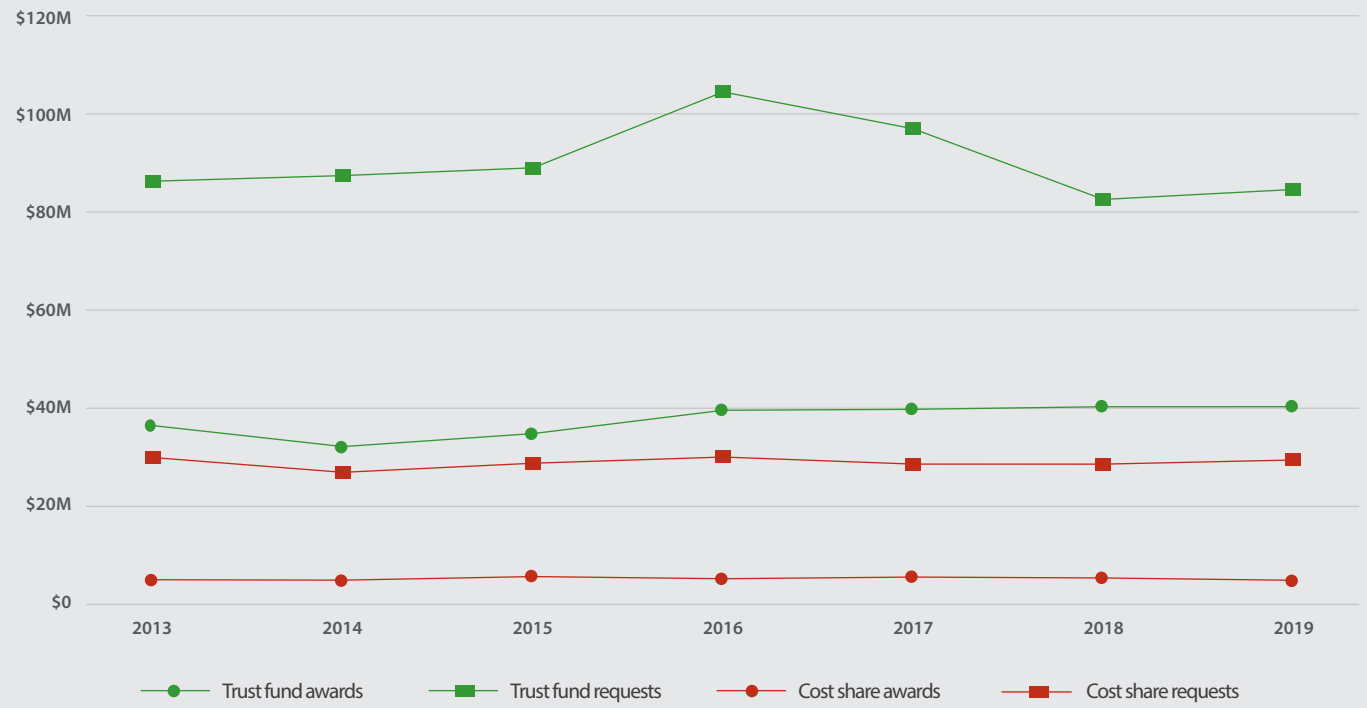
Through their short- and long-term planning processes, several state agencies routinely evaluate and report on future conservation priorities and needs. The specificity and metrics used in these assessments vary across agencies, but together they provide important insights for state-level conservation planning.

The most specific and detailed assessment of future needs is provided by the Division of Parks and Recreation in its 2018 system-wide plan for the state park system. This document outlines several strategic goals, including the continued expansion and improvement of state parks to benefit visitor experience and local economic development. To achieve these goals, the agency has identified over 134,000 acres in land acquisition needs across 58 park units. The total funding needed to acquire these lands is estimated to be roughly $311 million. The report also identifies over $420 million in funding needs for new construction, improvements, and repairs at state parks.

In its Outdoor Recreation Plan for 2020–2025, the DPR also provides a broader assessment of public park and outdoor recreation needs for the state, including local parks. Although specific funding needs are not quantified as part of this assessment, it does stress the importance

60 These estimates do not include FDP, which does not track requests on an annual cycle in the same way as the other programs.

Figure 14. Comparison of Annual Awarded and Requested Conservation Funds: Trust Funds and DA&CS Cost-Share Programs



of providing more recreation opportunities both in areas with growing populations and in areas with currently underserved populations.

The WRC also specifies conservation objectives and priorities through its planning processes, especially through its Wildlife Action Plan (WAP) (most recently from 2015). This planning document plays an essential role in maintaining the Commission's partnership with and federal funding from the FWS's State Wildlife Grant Program. The program provides $1–2 million per year for wildlife conservation in North Carolina but requires matching funds of $0.5–1 million per year from the state. The 2015 WAP does not provide dollar estimates of future funding needs, but it highlights the threats to wildlife posed by population growth and land use change across the state. It also provides detailed assessments of knowledge gaps and management needs for individual species.

Through interviews conducted for this report, representatives from the Commission emphasized the importance of developing landscape-scale conservation approaches that are informed by its WAP and that find a balance between population growth and resilient wildlife habitats. For example, the evaluation process identified over $18 million in valuable conservation projects that do not currently have funding plans but would make an important contribution to meeting its conservation mission over the next 10 years.

The DEQ has also identified conservation priorities and objectives through many of its planning efforts; however, these plans do not currently specify state-level funding needs. For example, the 2019 Nonpoint Source Pollution Management Plan identifies priority watersheds for restoration efforts, including stream rehabilitation, land conservation, and stormwater control measures. In addition,

59 The PARTF dollars do not include spending on state park land acquisitions.

through its Coastal Habitat Protection Plans, the agency recommends policies to enhance and protect coastal habitats from environmental harm. The 2021 plan currently under development specifically explores approaches such as "living shores" for wetland restoration and land conservation that will facilitate inland migration of freshwater marshes.[61]

The DCR tracks future land acquisition opportunities and priorities for preservation of cultural and historic sites. Through interviews conducted for this report, representatives from the agency identified more than 15 priority sites, including historic battlefields and landscapes. Receiving state funding for these types of sites is often challenging because of existing program priorities for preserving land with natural heritage value.

TAKING ADVANTAGE OF FEDERAL–STATE PARTNERSHIPS

LWCF Stateside Program

Over the last decade, annual federal spending from LWCF for its "stateside" program has varied from less than $75 million in 2013 to over $200 million in 2020. This program provides 50:50 federal matching grants to state, local, and tribal governments for land acquisition and improvements at parks and recreation sites.

For most of this period, total matching grants to North Carolina were less than $3 million per year, although in the last 2 years they have increased to about $5 million. The main sources of state-level matching funds for these grants have been CWMTF, NCLWF, and PARTF.[62]

Going forward, the federal funds available each year from the LWCF will increase significantly because of the newly signed Great American Outdoors Act (GAOA). One of the most important features of this new legislation is that it mandates $900 million per year in LWCF spending for conservation and outdoor recreation, with roughly half going to the stateside program.

For North Carolina, the new GAOA mandates imply that about $9 million in federal matching funds will be available each year for state and local parks and outdoor recreation areas. This means the state will be eligible to receive roughly double the funding it has received in the last 2 years and more than three times what it has been receiving in previous years.

This increase in federal LWCF funding presents both an important opportunity and challenge for state-level conservation spending in North Carolina. The match requirement means that state and local sources will need to commit an additional $4-5 million per year to take full advantage of the new LWCF funds.

REPI-Sentinel Programs

The military supports over 578,000 jobs and is the second largest economic driver in North Carolina. Therefore, the state needs to support the military's ability to operate in the North Carolina. The REPI and Sentinel programs are vital to the protection of military testing and training lands from development of land and loss of habitat that could lead to restrictions or costly training alternatives. As shown in Table 3, DOD and its partners have spent over $181 million on REPI projects at six installations in North Carolina and have protected 71,358 acres of land. Of the $181 million, private partners have provided $82 million.

REPI funds can be used as the match to meet cost-sharing requirements for any conservation program of the USDA or DOI. Whereas only military installations can apply for REPI funds, their program partners can submit applications for matching funds to other federal agencies. Every

61 http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=33880358&name=DLFE-143369.pdf; http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=33882518&name=DLFE-143373.pdf

63 https://files.nc.gov/ncparks/north-carolina-land-and-water-conservation-fund-2020-application.pdf

year, the request for funding exceeds the amount funded through congressional appropriations.[63]

The benefits of these partnerships and the role of state-level funding contributions are exhibited through the Eastern North Carolina Sentinel Landscape Partnership. Through 2019, the Eastern North Carolina Sentinel partnership leads the nation in acres protected (138,633) or enrolled in a conservation program (770,137).[64] As shown in Figure 15, the total amount of funding needed was $132.3 million with state and private partners providing $21.6 million and $21.3 million, respectively, in matching or cost-share.[65] The cost-share is a requirement for the federal funding sources; therefore, the state funding is essential to bring federal investment to North Carolina.

The partnership between REPI/Sentinel and state programs (ADFP and LWCF, Forest Service, WRC) will continue to be critical for achieving the joint goals of land conservation and support for military testing and training in North Carolina. Each year military installations apply for funding from REPI, including the Sentinel Landscape partnership, and compete with other installations around the country. The size of the state-funded match is an important criterion for these competitions and therefore a key determining factor for projects awarded to North Carolina.

The availability of matching funds can also help to avoid delays in acquisitions of larger properties. If funds are not available, larger projects are split into multiple phases, which can increase the risk of losing future phases because landowners change their minds. Multiple phases can also increase the cost of the project if land prices increase over time or it results in additional transaction costs.

FEMA BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES (BRIC) PROGRAM

In addition to the federal–state partnership programs discussed in Section 5 of this report, there are newly established federal programs offering opportunities to leverage state conservation funds. One particularly important example is FEMA's BRIC Program. Created through the Disaster Recovery Reform Act of 2018, the program is

Table 2. REPI Expenditures Through 2019

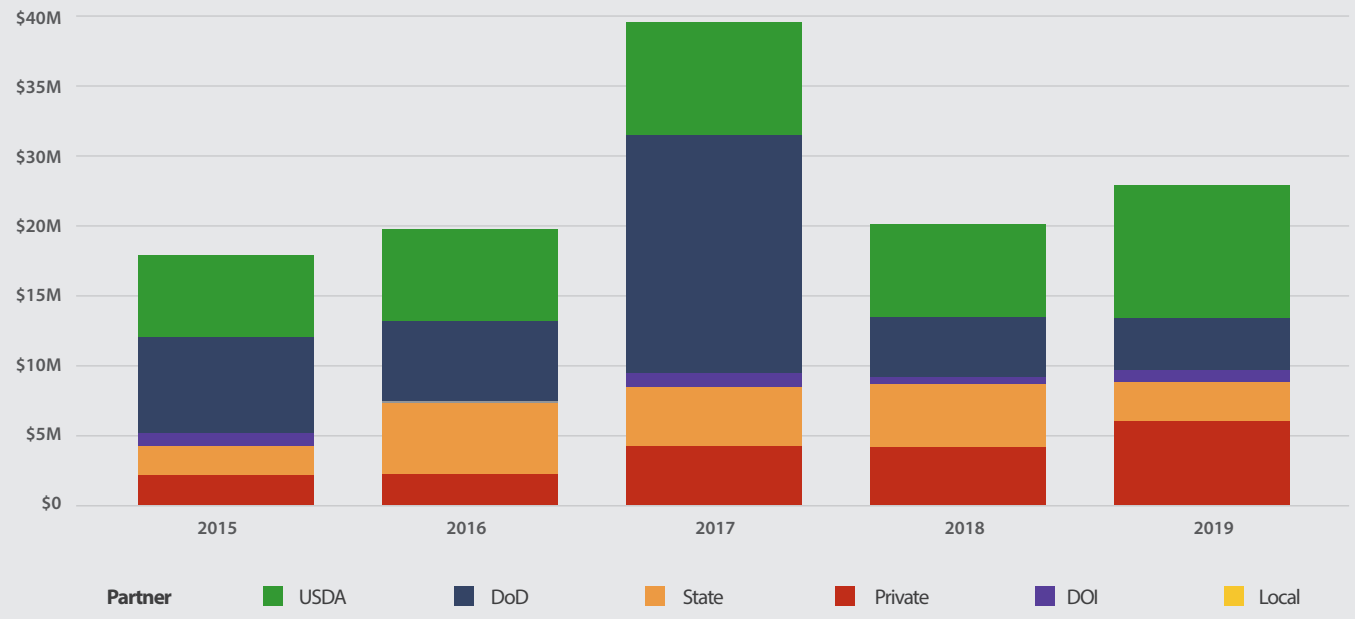
LOCATION	TOTAL ACRES PROTECTED	TOTAL FUNDS EXPENDED
Camp Butner	1,092	$3,597,774
Fort Bragg	21,747	$74,921,036
Fort Bragg United States Army Special Operations Command	2,913	$12,324,669
Marine Corps Air Station Cherry Point Piney Island	11,760	$33,062,154
Marine Corps Base Camp Lejeune and Marine Corps Air Station New River	19,665	$43,366,851
Dare County Bombing Range	14,181	$13,867,145
Total	**71,358**	**$181,139,629**

63 https://www.repi.mil/Portals/44/Documents/Reports_to_Congress/REPI2020RTC.pdf

64 2020 Sentinel Landscapes Accomplishments Report – July 2020.

65 https://sentinellandscapes.org/landscapes/eastern-north-carolina/

Figure 13. Eastern North Carolina Sentinel Landscape Total Funding by Partner



designed to support states, tribes, and local communities with activities and projects that reduce risks from natural hazards. The cost-share for the program is generally 75 percent federal and 25 percent non-federal.

BRIC's first program cycle (for 2021) includes $500 million in total federal funding. The program offers an important opportunity to leverage state-level conservation funding because one its main stated priorities is to "incentivize projects that incorporate nature-based solutions."[66] For North Carolina, this especially means an opportunity to support land conservation projects that reduce flood risks and damages.[67]

Because BRIC prioritizes innovative partnerships and shared funding approaches, it also offers an opportunity to further leverage other federal funding sources. For example, the REPI program has expressed a willingness to support BRIC program assistance to state and local communities for disaster mitigation projects that also protect military installations through nature-based solutions.

66 Building Resilient Infrastructure and Communities (BRIC) | FEMA.gov

67 https://repiprogram.createsend1.com/t/ViewEmail/d/E2858F2FB5D5824F2540EF23F30FEDED

9 Summary and Conclusions

The great richness and diversity of North Carolina's natural and cultural resources cannot be sustained without significant investments in conservation. The state has a strong legacy of supporting these investments through multiple trust fund, cost-share, grant, and other programs, but state-level funding for conservation has markedly declined in the last decade.

This decline in state-funded conservation could not have occurred at a worse moment. It is happening while population growth and land development are putting increasing strain on the state's natural areas and just when a new generation of hunters, anglers, and hikers is discovering North Carolina's outdoor treasures. The COVID-19 pandemic has underscored just how much North Carolinians value nature for outdoor recreation. In 2020, the state park system experienced record visitation, and the demand for fishing and hunting licenses has markedly increased.

To help North Carolina establish a path forward for conservation investments, this report reviews and summarizes the status, benefits, and opportunities for conservation in the state. Among its key findings:

- Conservation investments are essential for protecting the vital role that natural lands across the state play in providing much needed flood protection.
- Partnering with federal agencies to conserve land near military bases will allow North Carolina to take advantage of key opportunities to protect natural lands and farms, while at the same time benefiting national defense and boosting local economies.
- The state park system needs more than $300 million in funding to acquire new lands for its parks and recreation areas.
- Applications for state-level conservation funds significantly outpace available awards each year, demonstrating the consistent need for more conservation funding.
- Taking full advantage of expanding federal conservation programs will require millions more in state matching funds every year.

The need to invest in and steward outdoor spaces has never been greater. Investing in conservation means generations to come will have more local parks and preserves, more public lands for hunting and fishing and hiking, reduced risk from floods, enhanced military readiness, and natural assets that allow rural communities to be a part of the state's growing outdoor economy.

Abbreviations

ACSP	Agriculture Cost-Share Program
ADFP	Agricultural Development and Farmland Preservation
AgWRAP	Agricultural Water Resources Assistance Program
BMP	Best management practices
BRIC	Building Resilient Infrastructure and Communities
CCAP	Community Conservation Assistance Program
CO2	Carbon dioxide
CWMTF	Clean Water Management Trust Fund
DA&CS	Department of Agriculture and Consumer Services
DCR	Department of Natural and Cultural Resources
DEQ	Department of Environmental Quality
DOD	Department of Defense
DOI	Department of Interior
DPR	Division of Parks and Recreation
EEG	Environmental Enhancement Grant
FDP	Forest Development Program
FEMA	Federal Emergency Management Agency
FWS	Fish and Wildlife Service
GAOA	Great American Outdoors Act
GHG	Greenhouse gas
LWCF	Land and Water Conservation Fund
NCCSR	North Carolina Climate Science Report
NCDOJ	North Carolina Department of Justice
NCFS	North Carolina Forest Service
NCLWF	North Carolina Land and Water Fund
NHP	North Carolina Natural Heritage Program
NHTF	Natural Heritage Trust Fund
NRCS	Natural Resources Conservation Service
PARTF	Parks and Recreation Trust Fund
REPI	Readiness and Environmental Protection Integration
USDA	U.S. Department of Agriculture
WAP	Wildlife Action Plan
WRC	Wildlife Resources Commission
WRDG	Water Resources Development Grant
WSFR	Wildlife and Sport Fish Restoration