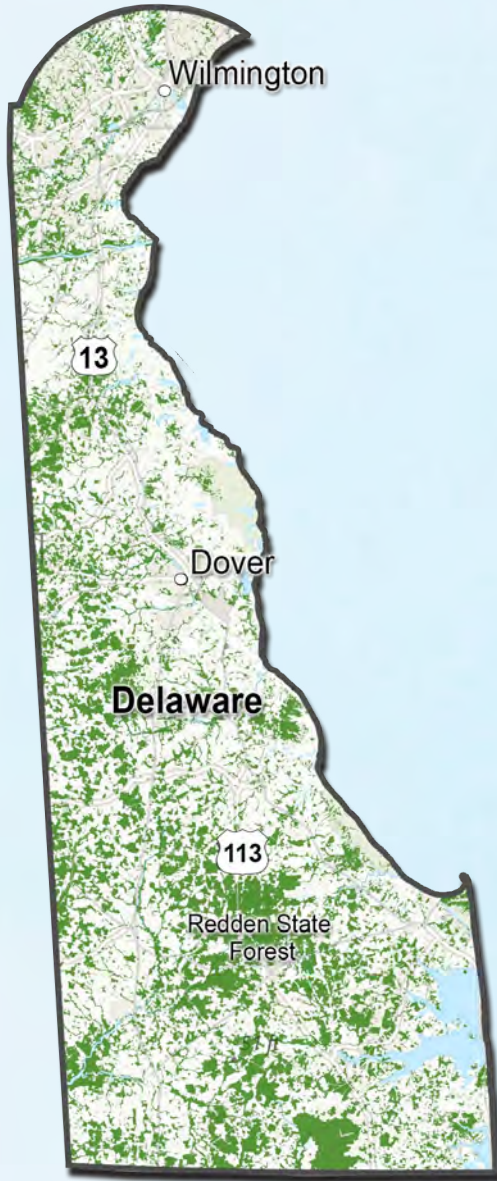


III. Forest Conditions and Trends

Figure 1. Forests of Delaware.



Source: Delaware Dept. of Agriculture

The Montréal Process criteria listed below provide broad categories or goals for sustainable forest management and are used at national and international levels. The Northeast-Midwest State Foresters Alliance and Eastern Region State and Private Forestry indicators and metrics were developed for use in region-wide and state-level forest resource assessments to measure the criteria.

Criterion 1: Conservation and Biological Diversity

Forests, and particularly native forests, support a substantial proportion of the planet’s biological diversity and terrestrial species. Biological diversity enables an ecosystem to respond to external influences, to recover after disturbance, and to maintain essential ecological processes.

Human activities and natural processes can impact adversely on biological diversity by altering and fragmenting habitats, introducing invasive species, or reducing the population or ranges of species. Conserving the diversity of organisms and their habitats supports forest ecosystems and their ability to function, reproduce, and remain productive.

INDICATOR 1

Area of total land, forestland, and reserved forestland

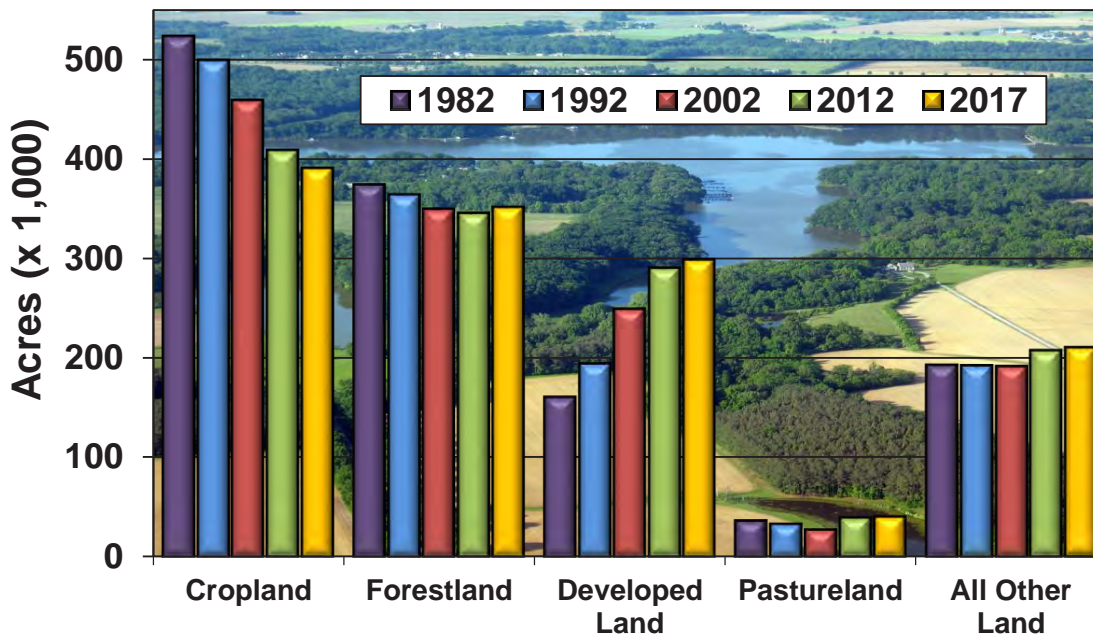
This indicator assesses the percentage of the state that is forested and the percentage of the forested area that is protected from development. The amount of forestland relative to other cover types provides an initial impression of the importance of the resource. The amount of protected forestland indicates the degree to which the resource is sheltered from mismanagement or clearing for some other non-forest use.

Total land and forestland in Delaware

Total land area of Delaware is estimated to be about 1.25 million acres, of which approximately 359,000 acres are currently forested (Figure 1). Forestland includes forested areas that are undeveloped or not developed for non-forest land users, are at least one acre in size and 120 feet wide, and contain a canopy cover of at least 10%. This is the definition used by the U.S. Forest Service for their national Forest Inventory and Analysis (FIA) program from which much of the data in this assessment originates.

Cropland occupies approximately 390,000 acres in Delaware (Figure 2). There has been a steady decrease in cropland since 1982. Forestland showed the same trend but increased slightly from 2012 to 2017. Most of this land-use loss is attributable to development (137,000 acres) over the last 35 years or so—an average of about 3,900 acres of forestland lost per year in Delaware.

Figure 2. Acres by land cover type in Delaware, 1982–2017.



Source: USDA NRCS 2017 National Resources Inventory Summary Report

Delaware is typical of the states in the eastern United States with forested areas having declined significantly since European colonization in the 1600s. During pre-colonial times the forests of Delaware covered about 90% or 1.1 million acres of the state’s total land area. Virtually the entire state was covered in forest except for the wettest sites, particularly marshlands along the coast. Large areas of forestland were subsequently cleared for agricultural use.

Forestland coverage was at its minimum in Delaware around the turn of the 19th century with an estimated low of 350,000 acres (Table 1). Over the next 120 years, forest acreage has fluctuated due to patterns in cultivation and abandonment of agricultural fields. Presently, forestland acreage in Delaware stands at approximately 359,000 acres, just slightly more than what occurred here about a century ago.

Not surprisingly, nearly all the losses in forestland since 1986 have occurred in Sussex County, Delaware’s most rural county and home to an ever-increasing demand for coastal community development (Figure 3). New Castle and Kent Counties have experienced slight gains over this time period whereas Sussex County has experienced a loss of over 36,000 acres of forestland. The net annual loss of forestland since 1986 is 957 acres.

Change in Delaware population 2010–2019

In 2010, the population of Delaware was 879,934. Nine years later in 2019 that population had increased by 10% to 989,803 with projections to exceed 1,000,000 by the year 2020. Most of this population growth, as expected, is in Sussex County along the coastal area. This population increase is spurred on by widespread development which in turn decreases the amount of forestland in the county. This trend is expected to continue over the next decade.

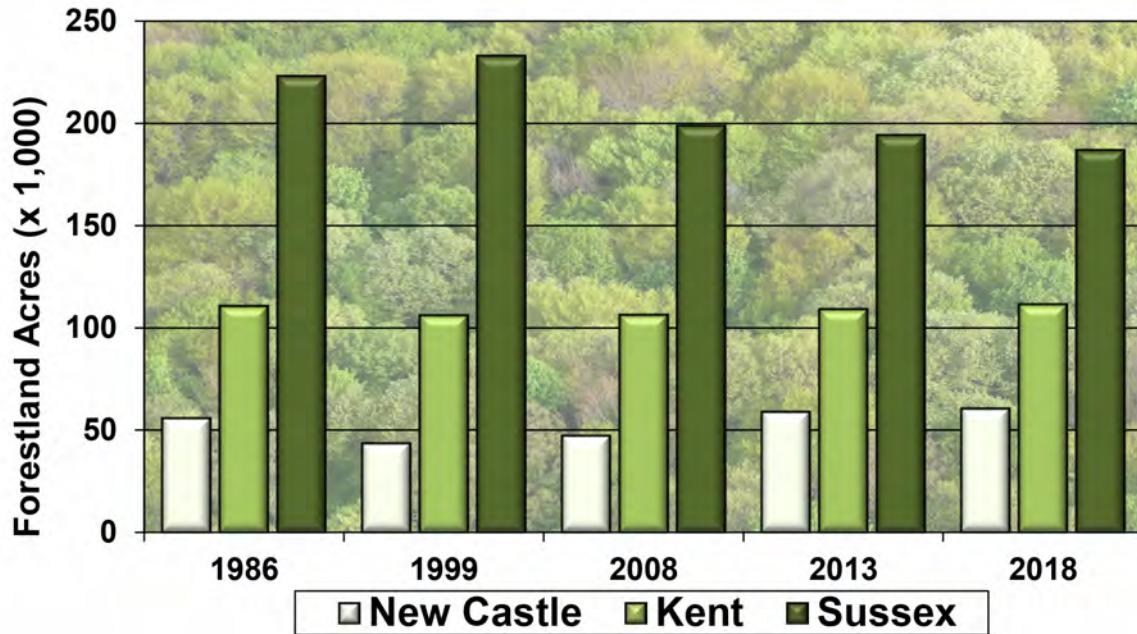
Table 1. Delaware forest acres.

Year	Acres (x 1,000)
1907	350
1920	351
1938	423
1953	454
1963	392
1977	392
1986	389
1999	382
2008	352
2012	348
2016	355
2018	359

Source: Oswalt et al. 2019. Forest Resources of the United States, 2017

Gen. Tech. Rep WO-97 U.S. Forest Service Forest Inventory and Analysis and Delaware Forest Service data

Figure 3. Delaware forest acres by county, 1986–2018.



Source: U.S. Forest Service Forest Inventory and Analysis

Protected forestland

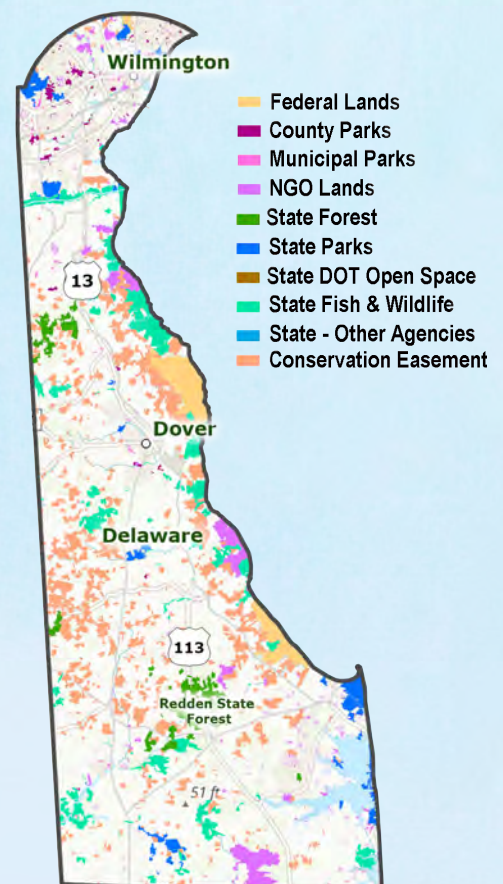
Currently, approximately one-third of all Delaware forestland is protected from development. This includes government-owned and non-governmental organization-owned (NGO) tracts of forestland and areas protected by permanent conservation easement—notably the 36,537 acres protected through easements purchased by the Delaware Aglands and Forestland Preservation Programs (Figure 4). The Forestland Preservation Program has recently received funding that will help protect additional forested acres in Delaware.

From 2002 until 2010, the Delaware Forest Service (DFS) had a string of successes in procuring six Forest Legacy Program (FLP) acquisition grants totaling \$14.925 million. Through the multi-phased Green Horizons project, the DFS purchased and protected 2,845 acres of former industrial forestland that is now part of Redden State Forest and open to the public for a variety of uses. Delaware’s Open Space program was instrumental in the success of the FLP purchases by providing required matching funds. Delaware counties and NGOs also provided significant financial assistance in protecting forestlands over the last two decades.

Protected forestland in Delaware has increased significantly since 1960 (Figure 5). A large portion of this increase resulted from the passage of Delaware’s Land Protection Act in 1990, which established the state’s Open Space program and a permanent funding source for state land acquisitions. Since its inception in 1990, Delaware’s Open Space program has protected over 62,700 acres of land at a total cost of \$174,244,321 (\$104,663,343 in state funds).

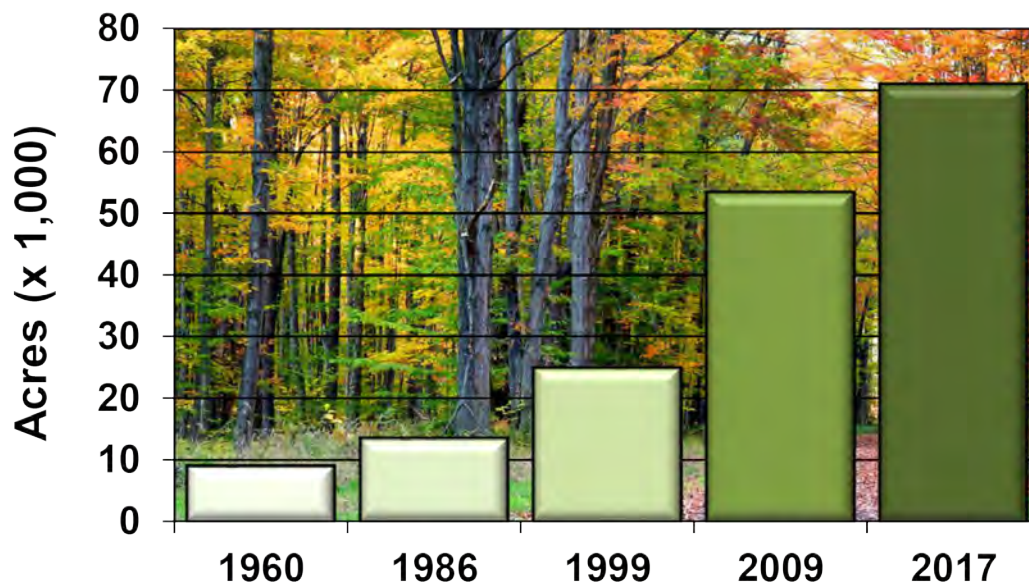
Delaware currently has no forested areas that are specifically designated as “reserved,” where no timber harvesting is allowed by statute. However, roughly 30,000 acres are owned and managed by NGOs and the Delaware Division of Parks & Recreation where silvicultural activities generally are not practiced or if so, at a minimum.

Figure 4. State, Federal and NGO Lands, 2017.



Source: State of Delaware

Figure 5. Protected forestland in Delaware.



Source: U.S. Forest Service Forest Inventory and Analysis

Urban forests

Urban forest (canopy) cover varies greatly within Delaware. The DFS completed a GIS analysis in 2019 of urban forest canopy in Delaware's 57 incorporated municipalities. Of the 89,746 acres located within municipal boundaries, 22,551 acres (25.1%) have urban tree cover. Urban tree cover varies significantly among communities, ranging from 10 to 85%. When one includes not only the incorporated municipalities, but also other urbanized areas designated by the 2010 Census (such as the area of Bear in New Castle County), the total land area within all urbanized areas totals 262,244 acres of which approximately 81,126 acres have urban forest cover, thus Delaware's total urban forest canopy coverage is approximately 31%.

Conclusions

Delaware has lost two-thirds of its forests since European settlement. This loss stabilized around 1900 with notable increases occurring in the mid-20th century. A subsequent steady decline took place until the early 21st century when remaining forest acreage leveled off around 360,000 acres—the most recent declines can be attributed to development. Forests in Delaware offer the path of least resistance when constructing massive infrastructure projects like State Route 1 or expansive housing developments. Although currently at about only 29% of the total land mass, Delaware forests are still a significant part of the landscape and a critical part of the ecological infrastructure. Currently only about one-third of Delaware forests are safeguarded against development. What remains is worth protecting either through conservation easements or fee simple acquisition. Delaware established the first state-funded program in the nation specifically designed to purchase conservation easements on working forestlands. Efforts should be made by the DFS and all concerned partners to ensure enough forestland is protected to maintain all the vital functions and natural benefits that forests provide.



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